Cruise Control Systems

DATSUN/NISSAN

200SX, 280ZX, Maxima

DESCRIPTION

The cruise control system is a combined unit of electronic circuits with vacuum operated mechanisims. Turn signal switch on steering column incorporates a slide switch which has 3 positions: "SET", "RESUME" and "ACCEL". System will not operate at speeds of under 37 MPH.

OPERATION

MAIN SWITCH

When the main switch is turned on and the ignition switch in the "ON" position, the exciting coil of the relay will be energized and the relay will turn on, supplying current to the system. When the ignition switch is turned to "OFF" the relay will also turn off, and remain inoperative even when main switch is turned on.

SET SWITCH

The set switch has an ON-OFF switch type circuit. When the set switch is depressed, "CRUISE" light illuminates. With the switch depressed, the controller cancels the preset vehicle speed. The controller will set the vehicle speed at the speed at which the the vehicle is running when the switch is released.

"ACCEL/RESUME" SWITCH

This switch is designed to increase the set speed, or return it to that speed at which the vehicle was previously being driven before the set speed was canceled. Depressing the "ACCEL" end of the switch causes the speed to increase continuously.

Releasing it will set the vehicle speed at the vehicle's current speed. Depressing the "RESUME" end of the switch momentarily causes the vehicle speed to automatically return to the set speed at which the vehicle was being driven before set speed was canceled. Keeping the "RESUME" switch depressed causes vehicle speed to decrease.

SPEED SENSOR

The speed sensor is an ON-OFF type sensor generating 2 pulses per revolution of the cruise control cable.

SERVO VALVE

The servo valve causes the vacuum valve and atmospheric valve to open or close according to input current and adjusts the vacuum from intake manifold.

CONTROLLER

Controller compares the set speed with actual vehicle speed, and maintains preset speed by regulating current flow to servo valve.

SOLENOID VALVE

Solenoid valve acts as a saftey valve which shuts off air to the vacuum line when system activates.

ACTUATOR

The actuator uses vacuum to open and close the throttle through the servo valve.

STOP SWITCH

Stop switch cuts off power to the cruise control circuit when the brake pedal is depressed.

CLUTCH SWITCH

On manual transmission models only, a clutch switch is used to cut off power to the cruise control circuit when clutch is depressed.

INHIBITOR RELAY

On automatic transmission models only, the inhibitor relay is used to release the cruise control system when the transmission is placed in "N" or "P" position.

TROUBLE SHOOTING

INDICATOR LAMP WILL NOT GLOW

When indicator lamp will not glow with main button depressed and ignition on, problem can be a burnt out bulb, faulty main switch or faulty cruise control relay.

SET SPEED CANCELED

Bent cruise control cable. Faulty controller.

PULSATION OF SET SPEED

Excessive play or binding of cruise control cable. Leakage or clogging in vacuum hose. Binding in actuator. Faulty servo valve. Faulty controller.

EXCESSIVE SETTING ERROR

Excessive play or binding in cruise control cable. Leakage or clogging in vacuum hose. Faulty actuator. Faulty servo valve. Faulty controller. Faulty speed sensor.

SPEED DROPS IMMEDIATELY AFTER SETTING

Excessive play in cruise control cable. Leakage or clogging in vacuum hose. Faulty solenoid valve. Faulty servo valve. Faulty controller.

CANCEL CIRCUIT INOPERATIVE

Faulty controller.

TESTING

INDICATOR LAMP WILL NOT GLOW

1) When indicator lamp will not glow when set switch is depressed and released at proper vehicle speed (main switch on), set automatic transmission selector lever at any position other than "P" and "N". With ignition and main switches on, check for battery voltage at terminals 3 and 7, and 10 and 7 of harness connector. *See Fig. 1.*

2) If battery voltage is present, check for battery voltage between terminals 2 and 7 when set switch is depressed and and ignition and main switches are on. If battery voltage is not present in step **1)**, an open circuit exists. Inhibitor switch, inhibitor relay, or stop switches are faulty, or stop switch is improperly adjusted.

4) If battery voltage is not present in step **2)**, the set switch is faulty. If battery voltage is present, with ignition and main switch on, manually rotate cruise control cable to see if voltages across the harness connector

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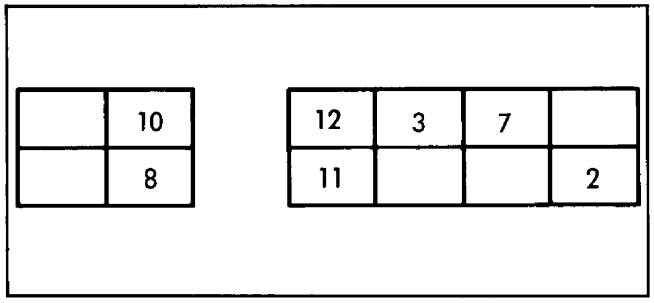
terminals 8 and 7 alternately change from 0 to 7 and vice versa.

5) If voltages change as specified, check controller, coast switch, servo valve, solenoid valve, and actuator. If voltages do not change as specified, speed sensor or controller are faulty.

Fig. 1: Cruise Control Harness Connector Terminals



VEHICLE WILL NOT ACCELERATE

1) When "ACCEL" is depressed and vehicle will not accelerate, but a constant speed is maintained by the system, set automatic transmission to "P" or "N" position. With ignition, main, and "ACCEL" switches on, test for battery voltage between terminals 12 and 7 of harness connector. *See Fig. 1.*

2) If voltage is not present, "ACCEL" and "RESUME" switch is faulty. If voltage is present, check for 0 volts across terminals 12 and 7 when "ACCEL" end is off. If there is voltage, "ACCEL" and "RESUME" switch is faulty. If there is no voltage, controller is faulty.

VEHICLE WILL NOT DECELERATE

1) When vehicle will not decelerate with "RESUME" on, or will not return to prior speed, but constant speed can be maintained, set automatic transmission to "P" or "N" position. With ignition, main and resume switches on, test for battery voltage between terminals 11 and 7 of harness connector. *See Fig. 1.*

2) If voltage is not correct, "ACCEL" and "RESUME" switch is faulty. If voltage is correct, turn "RESUME" end off and check voltage accross terminals 11 and 7. If voltage is 0, controller is faulty. If voltage is present, "ACCEL" and "RESUME" switch is faulty.

CRUISE LAMP LIGHTS, BUT SPEED IS NOT SET

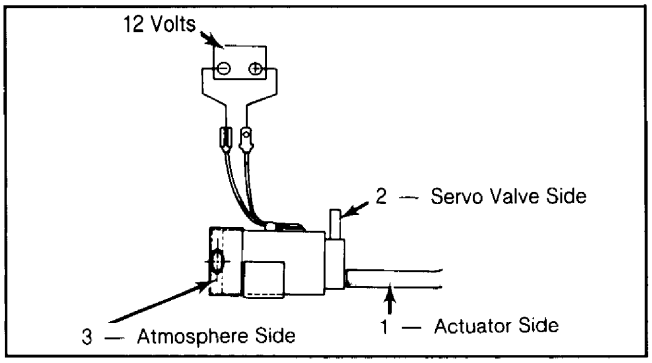
1) Apply battery voltage to release valve terminal, and check for the following conditions. With port "A" closed, no suction is possible at "B". With "A" open, suction begins at "B". If these conditions are not met, release valve is faulty.

2) If conditions are met, check servo valve for normal operation. If it operates normally, release cruise control cable and check for smooth actuator operation when vacuum is applied to actuator port. If operation is smooth, controller is faulty. If not smooth, actuator is faulty.

SERVO VALVE TEST

Measure the resistance between terminals. Resistance should be 25-30 ohms. Check to make sure valve opens or closes by blowing air through port on actuator side. *See Fig. 2.*

Fig. 2: Testing Servo Valve



Test with and without 12 volts applied between terminals.

SERVO VALVE AIR FLOW

Check Ports	Air Flow
Normal Condition	
1-2	Yes
1-3	Yes
2-3	Yes
12 Volts DC Applied Between Terminals	
1-2	Yes
1-3	No
2-3	No

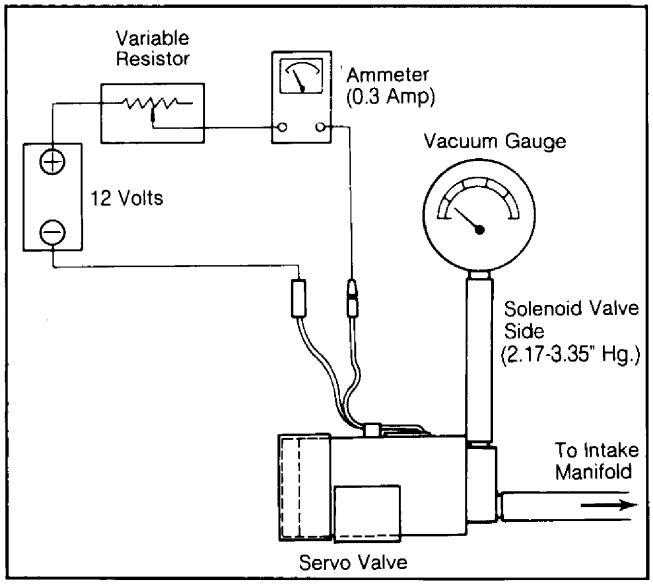
SOLENOID VALVE TEST

Measure resistance between terminals. Resistance should be 25-30 ohms. Check to make sure output vacuum of valve is okay as follows:

1) Disconnect solenoid valve side vacuum hose at solenoid valve and connect vacuum gauge. *See Fig. 3.* Start engine and run until water temperature indicator points to middle of gauge.

2) Apply 0.3 Amp direct current between terminals, using a 20 Ohm, 5 Watt variable resistor to adjust current. Vacuum gauge should read 2.17-3.35" Hg.

Fig. 3: Testing Solenoid Valve



Do not apply current with valve connected.

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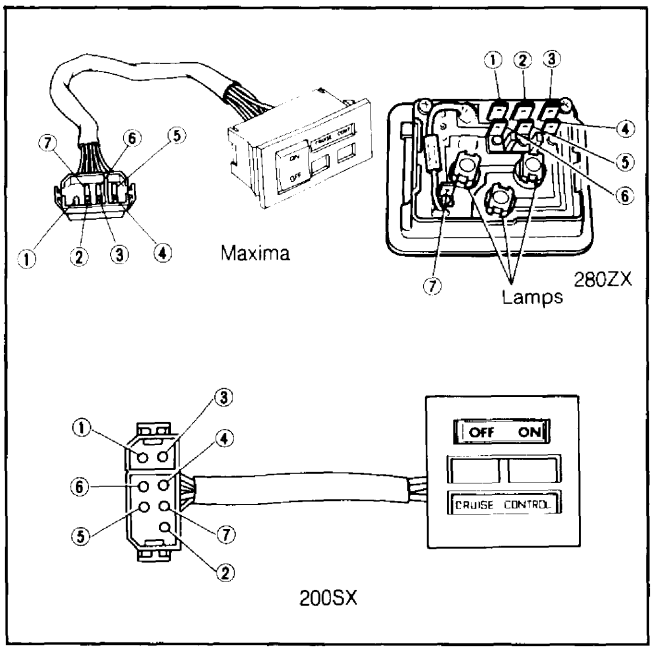
MAIN SWITCH TEST

Test main switch continuity with test light or ohmmeter. *See Fig. 4.*

Fig. 4: Main Switch Terminal Locations



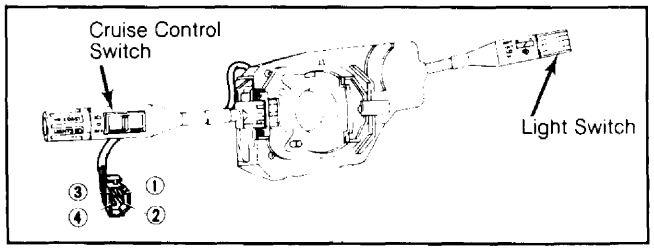
MAIN SWITCH CONTINUITY

Terminals	Normal	ON	OFF
1-2	No	Yes	No
1-6	No	Yes	No
2-6	Yes	Yes	No
3-4	Yes	....	....
5-7	Yes	....	....
6-7	Yes	....	....

"COAST" SWITCH & "ACCEL/RESUME" SWITCH TEST

Test switch continuity with an ohmmeter. *See Fig. 5.* In the "COAST" position, continuity should exist between terminals 1 and 2. In "RESUME" position, continuity should exist between terminals 1 and 3. In "ACCEL" position, continuity should exist between terminals 1 and 4.

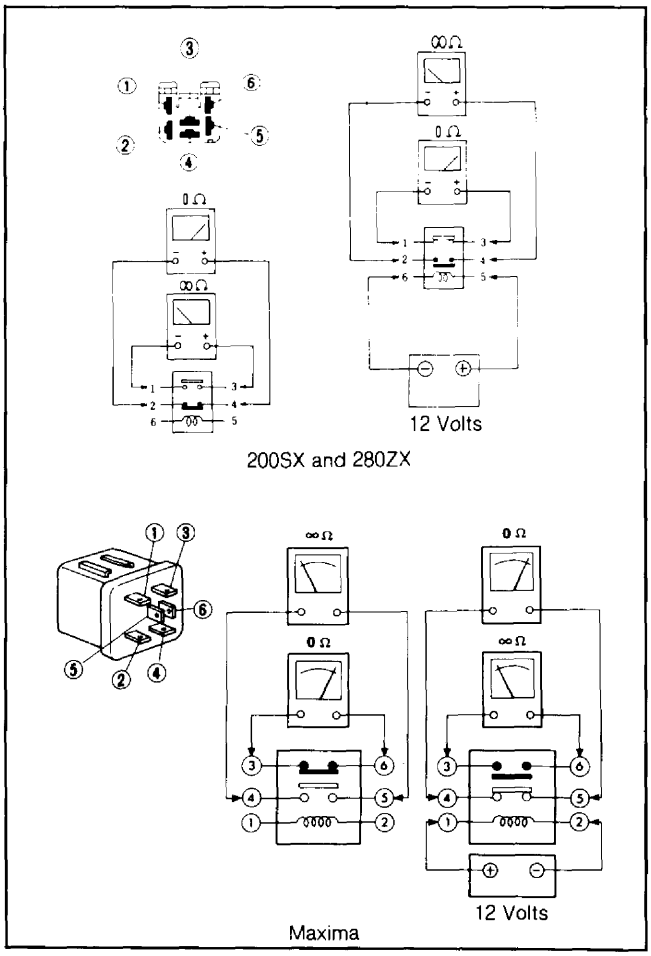
Fig. 5: "COAST" and "ACCEL/RESUME" Switch Terminal Locations



INHIBITOR RELAY

Check inhibitor relay continuity with an ohmmeter or test light. *See Fig. 6.*

Fig. 6: Inhibitor Relay Test Schematics



Test with and without 12 volts applied.

INHIBITOR RELAY CONTINUITY

Check Terminals	Continuity
200SX & 280ZX	
Normal Condition	
5-6	Yes
2-4	Yes
1-3	No
With 12 Volts Between 5 and 6	
2-4	No
1-3	Yes
Maxima	
Normal Condition	
3-6	Yes
4-5	No
With 12 Volts Between 1-2	
3-6	No
4-5	Yes

ADJUSTMENTS

CRUISE CONTROL CABLE

With throttle in idle position, adjust adjusting nut so that there is .08-.12" (2-3 mm) cable free play with no slack of cable. Tighten lock nut.

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REMOVAL & INSTALLATION

CRUISE CONTROL CABLE

Removal & Installation

Disconnect cable from actuator. Remove screw attaching cable bracket. Remove rubber boots. Loosen lock nut and remove cable from torsion shaft. To install cable, reverse removal procedure and adjust.

ACTUATOR

Removal & Installation

1) Disconnect battery ground. Disconnect cable from actuator. Disconnect harness connector of servo valve and solenoid valve, and disconnect vacuum hose connecting intake manifold to servo valve. Remove actuator attaching bolt.

2) Remove actuator with servo valve and solenoid valve from vehicle. Disconnect vacuum hose and remove servo valve and solenoid valve. To install, reverse removal procedure.

SOLENOID & SERVO VALVE

Removal & Installation

Disconnect battery ground. Disconnect harness connector and remove valve. To install, reverse removal procedure.

MAIN SWITCH

Removal & Installation

Disconnect battery ground. Push out switch from behind instrument panel. Disconnect harness connector. To install, reverse removal procedure.

BRAKE LIGHT SWITCH, BRAKE & CLUTCH SWITCHES

Removal & Installation

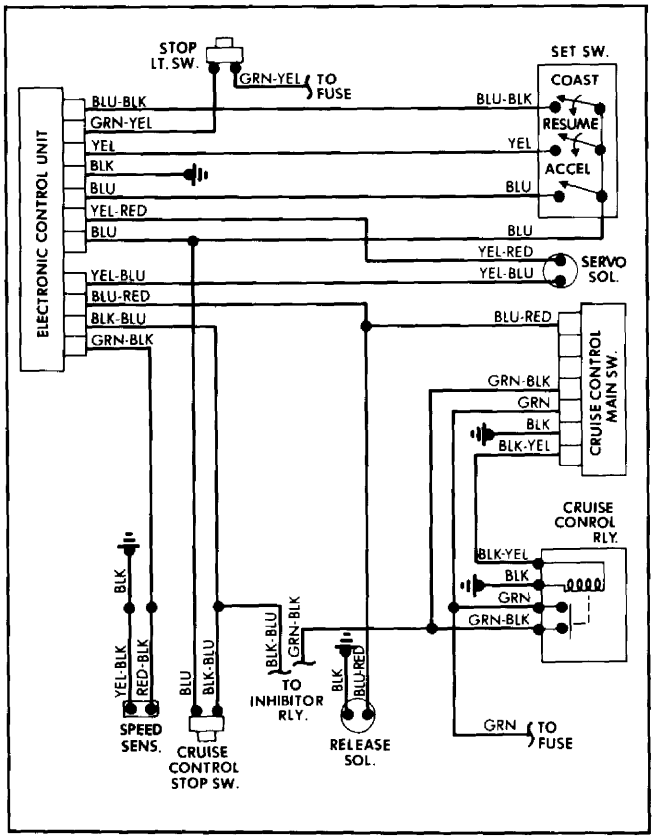
Disconnect battery ground. Remove instrument panel left lower cover and floor assist nozzle. Loosen lock nut and remove switch. To install, reverse removal procedure.

CONTROLLER & CRUISE CONTROL RELAY

Removal & Installation

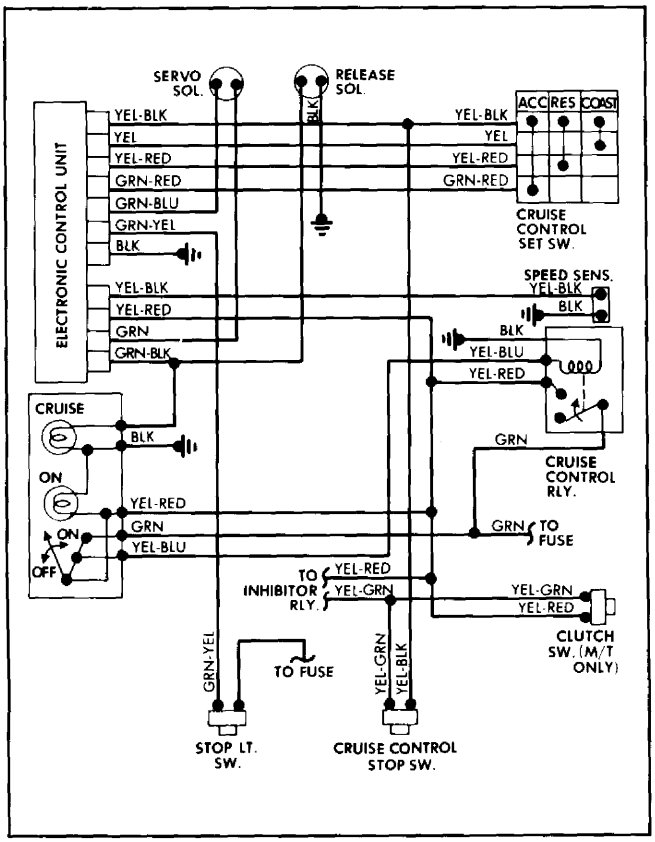
Disconnect battery ground. Remove passenger seat. Remove controller and cruise control relay. To install, reverse removal procedure.

Fig. 7: 200SX Cruise Control Wiring Diagram



Also see chassis diagram in WIRING DIAGRAM section.

Fig. 8: Maxima Cruise Control Wiring Diagram



Also see chassis diagram in WIRING DIAGRAM section.

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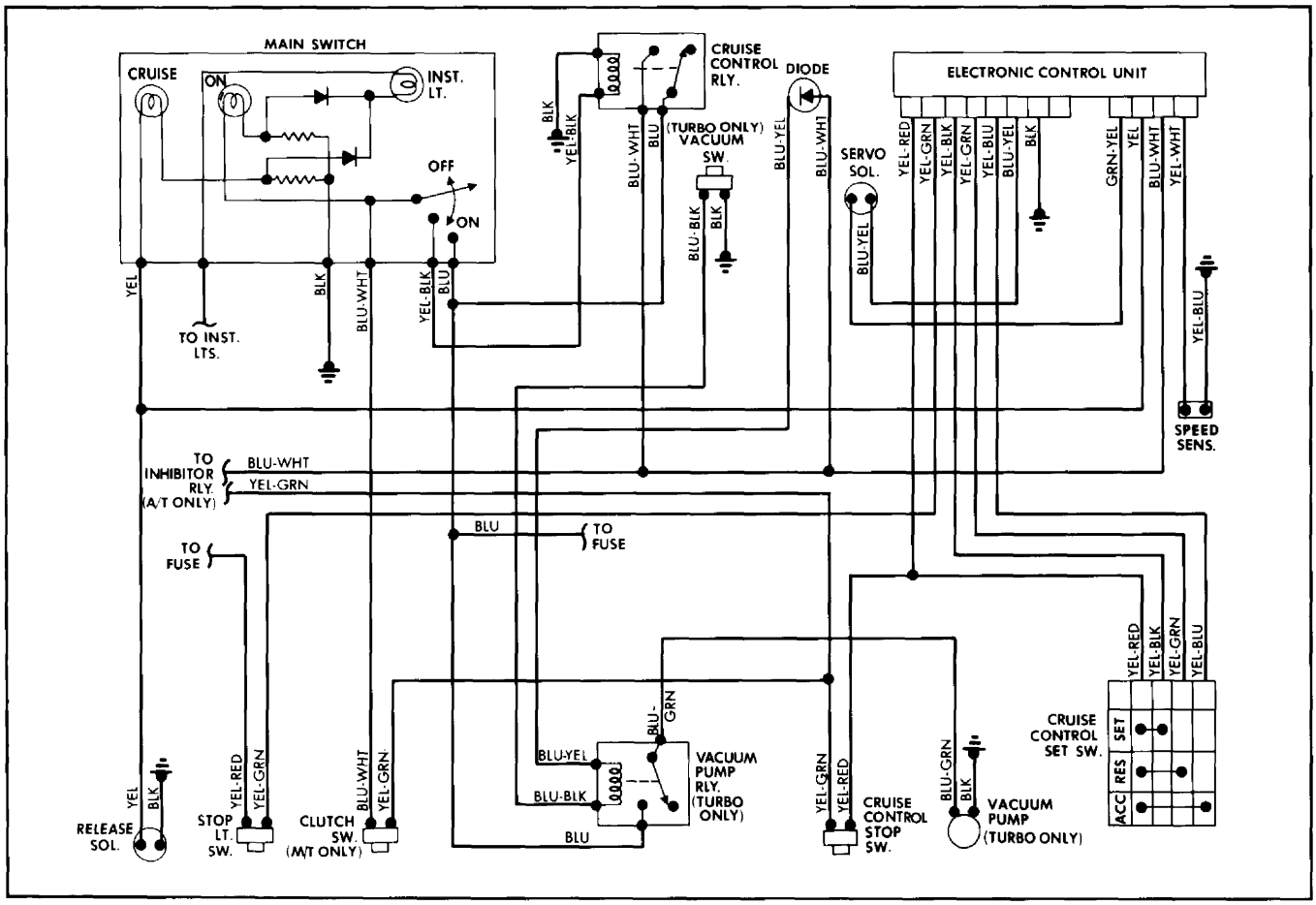
Fig. 9: 280ZX Cruise Control Wiring Diagram



Also see chassis diagram in WIRING DIAGRAM section.