



CRUISE CONTROL WITH ELECTRIC ACTUATOR

Group 61 - Chassis Electrics

Produced By:

BMW of North America, Inc.

INTRODUCED IN 1982

320 never had cruise

CRUISE CONTROL WITH ELECTRIC ACTUATOR

The electric actuator type cruise control system was introduced on the BMW 733i and 528e models in 1982. From 1983 all six-cylinder models will use this type.

The system is designed to operate at between 20 and approximately 90 mph. An electronic control unit (E.C.U.) controls an electric actuator which maintains the desired road speed via the throttle linkage.

Driver control is through a three-function switch operated by a lever mounted on the right side of the steering column behind the wiper lever.

Pushing the lever forward in the CONST position engages the system and the car will accelerate until the lever is released. The E.C.U. contains a memory circuit which will hold the speed that exists when the lever is released from the CONST. position. Momentary operation of the lever in the CONST. position will also cause engagement and lock the prevailing speed into the memory.

Cruise control may be disengaged in any of five different ways; momentarily moving the control switch up or down to OFF, applying the foot brake, shifting the automatic transmission to neutral, depressing the clutch, or whenever the actual speed drops more than 15 mph below the memory speed.

Following disengagement, the car can be returned to the previously selected speed by pulling the control lever to RESUME.

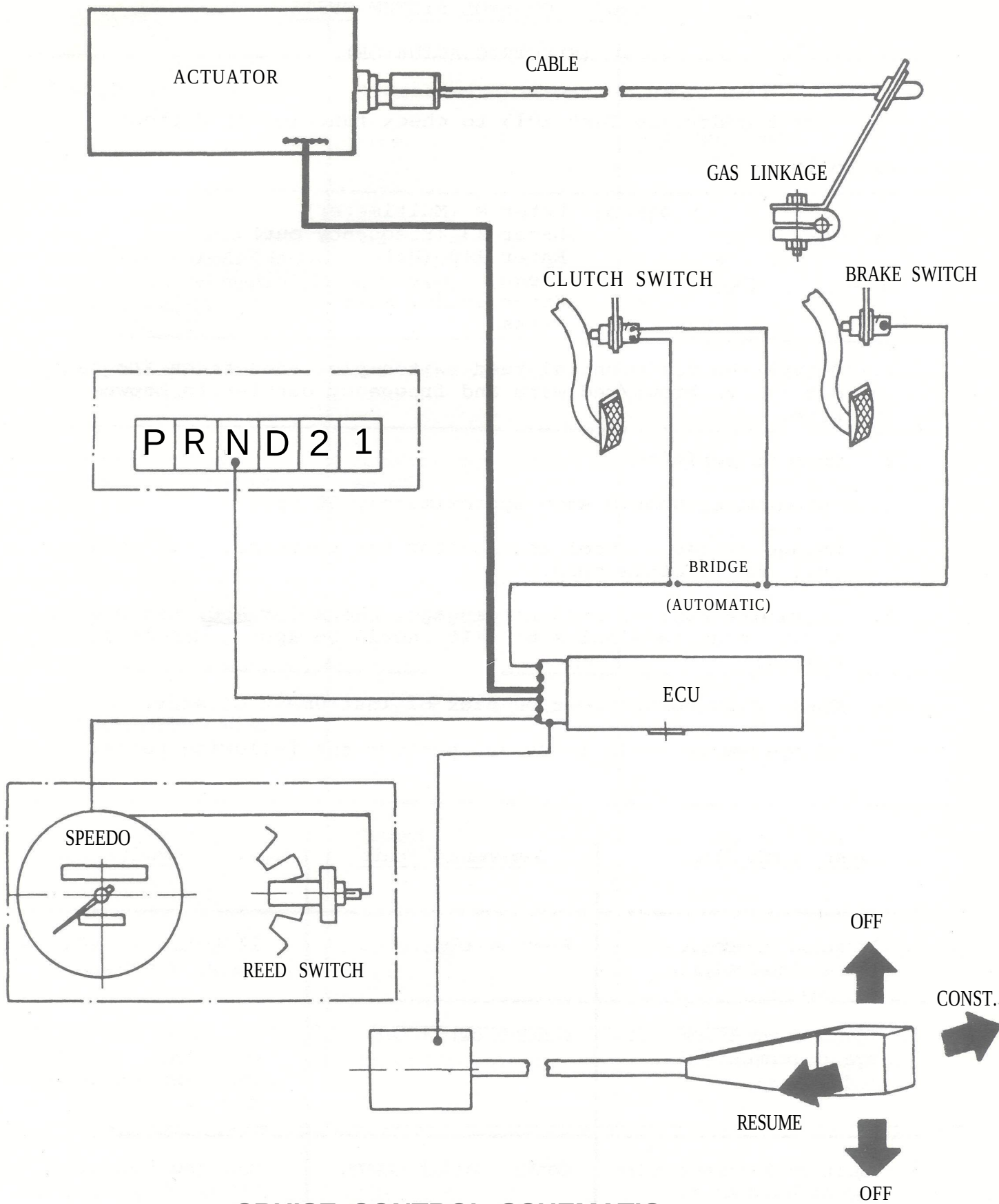
The memory circuits in the E.C.U. are reset whenever the lever is moved to CONST, but the only time the memory is cleared is when ignition is turned off.

The E.C.U. receives a processed signal from the electronic speedometer, which is equivalent to actual road speed. Consequently, speedometer problems will affect cruise control.

E-24 left of steering column

7 series left front speaker

643 glove box area



**CRUISE CONTROL SCHEMATIC
(ELECTRIC ACTUATOR)**

CRUISE CONTROL SYSTEM TESTS

(ELECTRIC ACTUATOR)

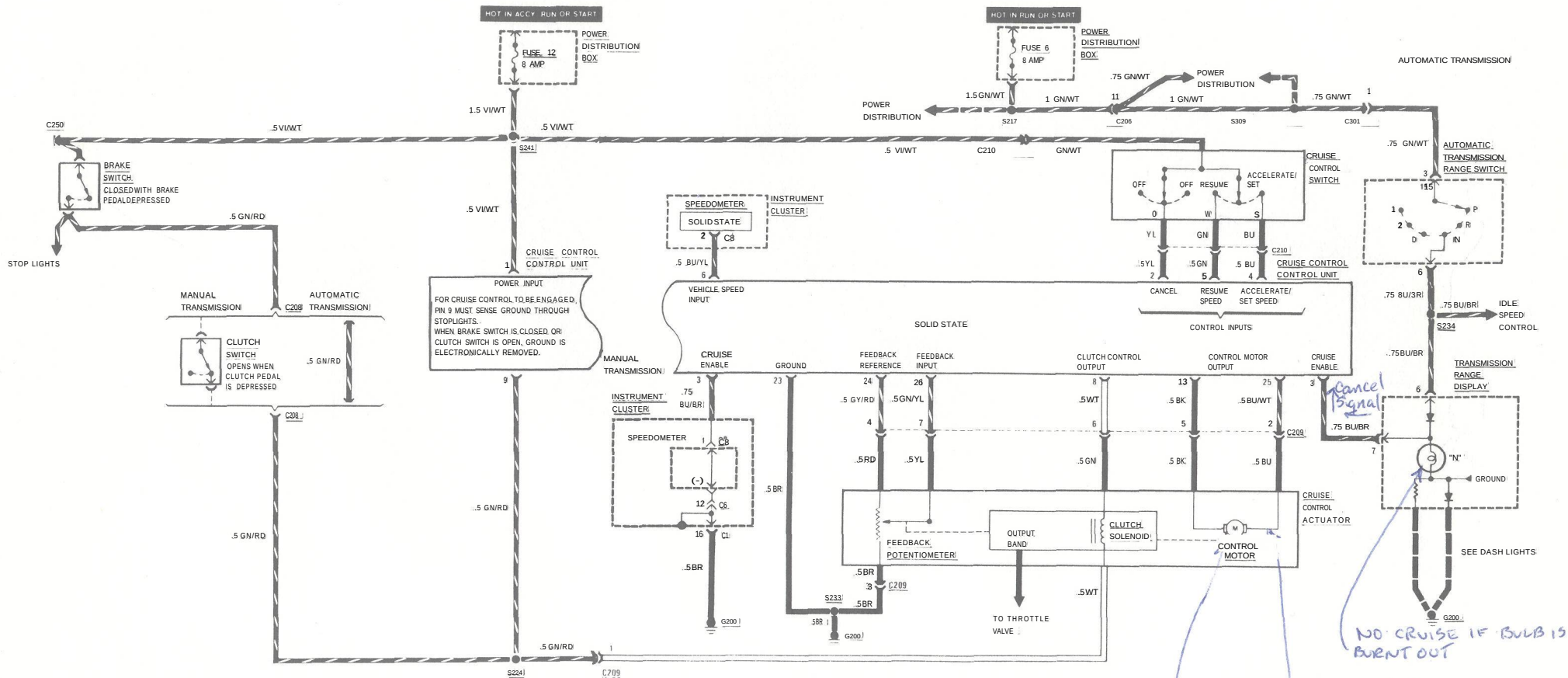
Use BMW Service Test 2013 to check function of system as follows:

Program: Enter M (Multimeter)
Enter 13 (Frequency out)
Enter 110 (Hz)
Press
Enter 02 (U. AC.)
Press

1. Detach the differential reed switch plug and attach frequency out (+) to brown/red wire and frequency out (-) to brown wire.
2. Turn on ignition.
3. Speedometer should show approximately 50 mph.
4. Engage cruise control and monitor the actuator. (It should pull the throttle open.)
5. If cruise control does not engage, check for A.C. voltage on E.C.U. plug terminal #6. (It should be approximately 4.0 volts.)
6. Check plug connections on back of instrument cluster.
7. If system is still inactive, perform the following tests:

<u>Test at ECU Plug</u>	<u>Component/Circuit</u>	<u>Result</u>
1. Ignition on-check voltage at Terminal #1.	Power supply	12 Volts. If not, check wiring and fuse.
2. Ignition on-check voltage at Terminal #2.	Control switch OFF	Move lever to OFF. Voltage drops from 12V to 0V. If not, check wiring and switch.
3. Ignition on-check voltage at Terminal #4.	Control switch CONST.	Move lever to CONST. Voltage jumps 0 to 12V. If not, check wiring and switch.

<u>Test at ECU Plug</u>	<u>Component/Circuit</u>	<u>Result</u>
4. Ignition on-check voltage at Terminal #5.	Control switch RESUME.	Move lever to RESUME. Voltage jumps 0 to 12V. If not, check wiring and switch.
5. Measure resistance Terminal #3 to ground. (Auto transmission in neutral.) (Ignition off.)	A.) Automatic Transmission B.) Manual Transmission	A.) Approximately 4 ^{10Ω} B.) < 1 B.) 85% model standard ∞ B.) 87 " " < 1Ω
6. Apply voltage to term. #8 and ground term. #9.	Actuator solenoid (Clutch)	Listen for click in actuator
7. Measure resistance Terminal #8 to ground.	Actuator and clutch switch.	Resistance approx. 30 Press clutch pedal, then resistance = ∞ If not, check wiring, clutch switch, and brake lights.
8. Apply voltage to term. #13 and ground term. #25.	Actuator motor	Listen for motor running.
9. Measure resistance Terminal #24 to Terminal #23.	Actuator potentiometer.	Resistance approx. 3000 If not, check wiring/ replace actuator.
10. Measure resistance Terminal #23 to ground.	Ground	Resistance = 0 If not, check wiring and ground.
11. Measure resistance Terminal #26 to ground.	Actuator.	Resistance approx. 3000 If not, check wiring/ replace actuator. 10%
12. Measure voltage at term. #9 (Ignition on)	Brake light switch	0 Volts then depress brake pedal voltage = 12V.



CRUISE CONTROL ELECTRICAL SCHEMATIC



CRUISE CONTROL WITH VACUUM SERVO

Group 61 - Chassis Electrics

Produced by

BMW OF NORTH AMERICA, INC.

Available 79 on 7 series automatics only
CRUISE CONTROL

The BMW cruise control is designed to operate between 20 and approximately 90 mph. An electronic control unit (E.C.U.) controls a vacuum operated servo unit which actuates the throttle linkage to maintain the required road speed.

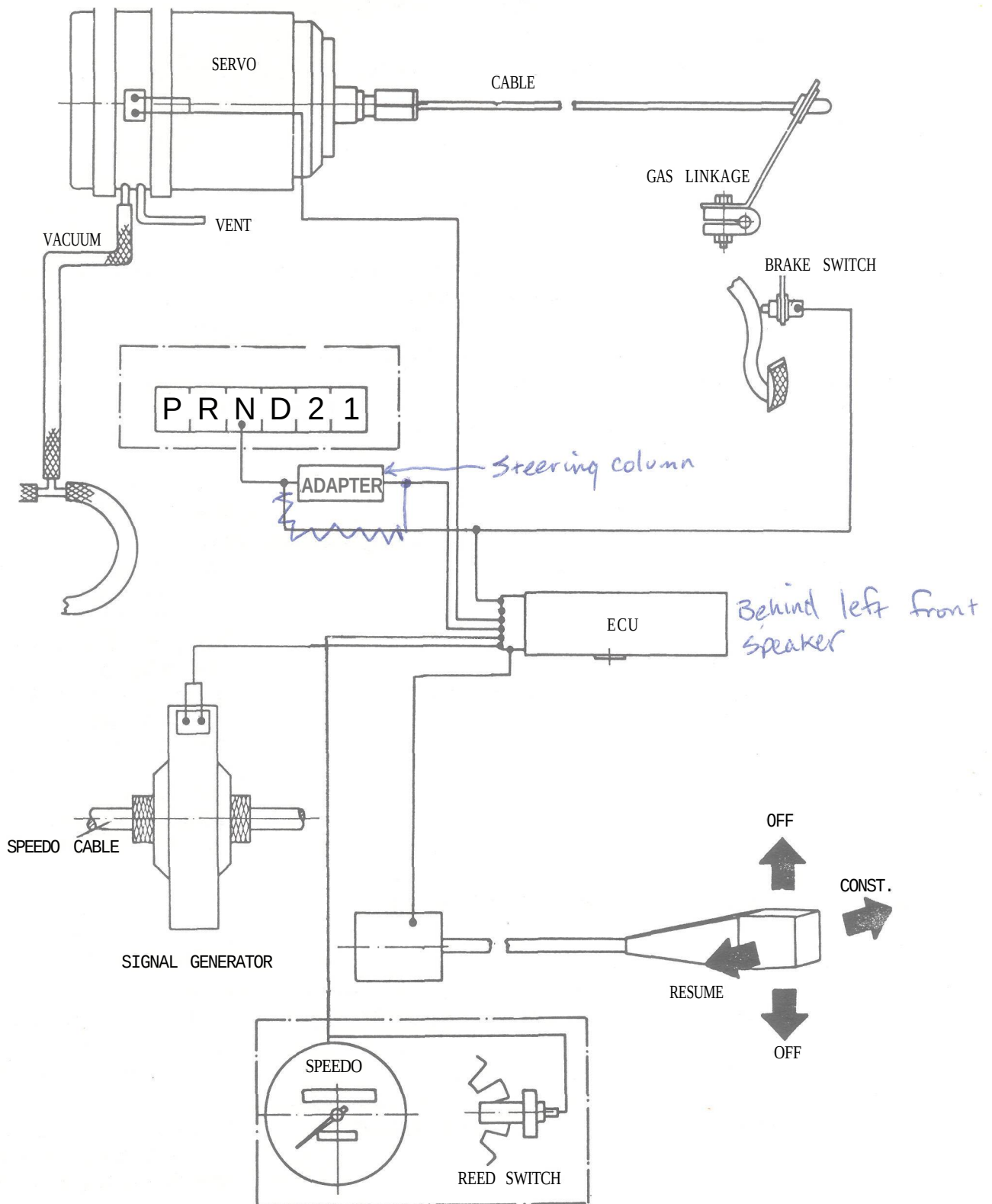
Drive control is through a three function switch operated by a lever mounted on the right side of the steering column behind the wiper lever.

Pushing the lever forward in the CONST position engages the system and the car will accelerate until the lever is released. The E.C.U. contains a memory circuit which will hold the speed that exists when the lever is released from the CONST position. Momentary operation of the lever in the CONST position will also cause engagement and lock the prevailing speed into the memory.

Cruise control may be disengaged in any of five different ways: momentarily moving the control switch up or down to OFF, applying the foot brake, shifting the transmission to neutral, or whenever the actual speed drops more than 7 mph below the memory speed.

Following disengagement, the car can be returned to the previously selected speed by pulling the control lever to RESUME.

The memory circuits in the E.C.U. are reset whenever the lever is moved to CONST but the only time the memory is cleared is when ignition is turned off.



CRUISE CONTROL SCHEMATIC

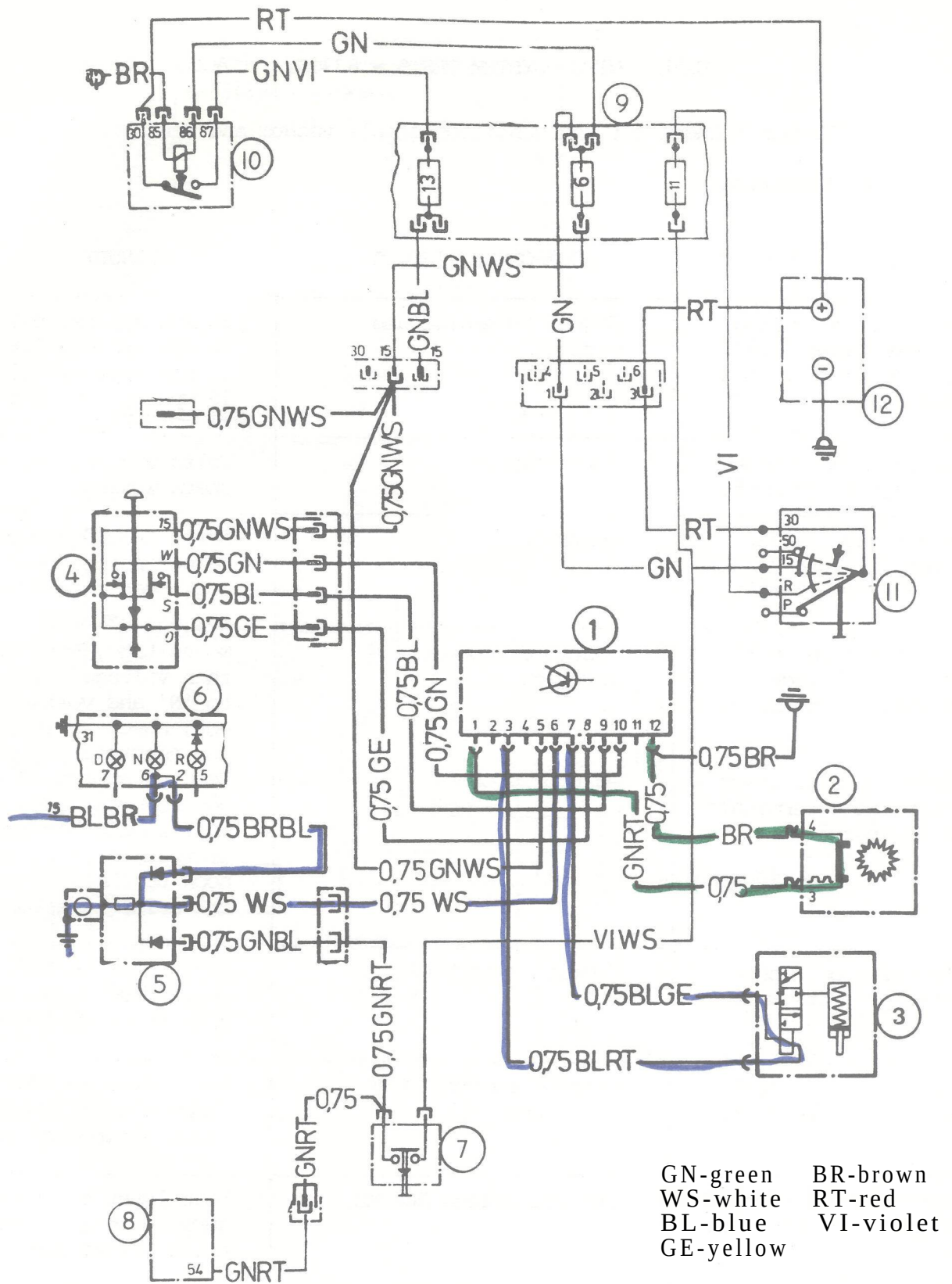
CRUISE CONTROL SYSTEM TESTS - 733i (VACUUM SERVO)

A. Vacuum - Check fit and condition of all vacuum and vent lines.

B. Electrical

TEST AT ECU PLUG	COMPONENT/CIRCUIT	RESULT
1. Measure resistance across term. 1-12 push car min. 2 feet	Reed switch in differential and wiring.	Resistance changes 0 to ∞ to 0, etc. If not, check wiring and switch.
2. Ignition on. Check voltage at term. 5.	Power supply.	Voltage - 12V. If not, check wiring.
3. Start car. Jumper term. 5 - 3 and then 12-7 momentarily.	Servo	Servo should activate and raise engine speed. If not, check wiring and Servo.
4a. Ignition on (not running). Check voltage at term. 6.	System disconnect circuit.	No voltage. Push brake pedal then voltage = 12V, or trans. to 'N' and voltage = 12V. If not, check wiring, switches, and adaptor.
b. Ignition off. Check resistance terminal 6 to ground.	Adaptor ground.	Reading approx. 20 to 150. Now reverse leads and reading must remain between 20 and 150. If reading is at ∞ with either hook up check adaptor grounding or replace adaptor.
5. Ignition on. Check voltage at term. 8.	Control switch OFF.	Move lever to OFF. Voltage drops from 12 -> 0 volts. If not, check wiring and switch.
6. Ignition on. Check voltage at term. 9.	Control switch CONST.	Move lever to CONST. Voltage jumps 0 to 12 volts. If not, check wiring and switch.
7. Ignition on. Check voltage at term. 10.	Control switch RESUME	Move lever to RESUME. Voltage jumps 0 to 12 volts. If not, check wiring and switch.

If these electrical tests are OK, then change the control unit if the system does not operate correctly.



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|-----------------------|--------------------------------|---------------------|
| 1. Control Unit (ECU) | 5. Adaptor | 9. Fuses |
| 2. Reed Switch | 6. Trans. Lights (Instruments) | 10. Relief Relay |
| 3. Servo | 7. Brake Switch | 11. Ignition Switch |
| 4. Control Switch | 8. Brake Light | 12. Battery |

CRUISE CONTROL ELECTRICAL SCHEMATIC 733IA

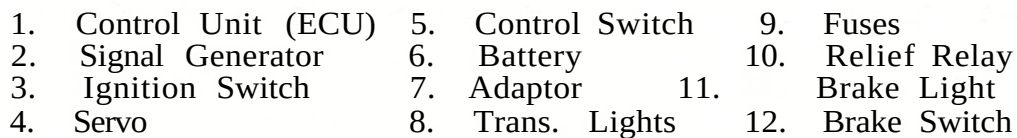
CRUISE CONTROL SYSTEM TESTS - 633CSi (VACUUM SERVO)

A, Vacuum - Check fit and condition of all vacuum and vent lines.

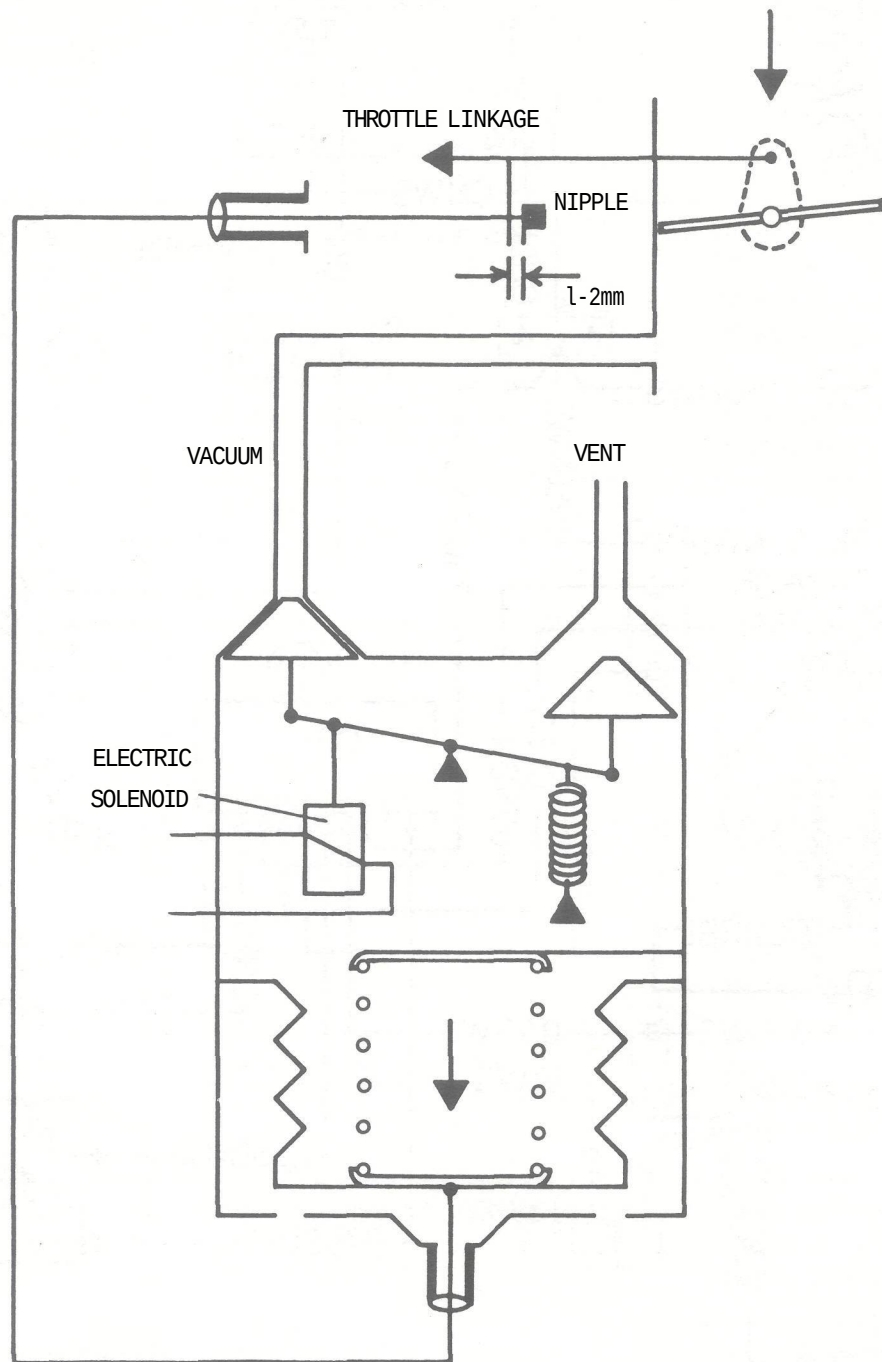
B. Electrical

TEST AT ECU PLUG	COMPONENT/CIRCUIT	RESULT
1. Measure A/C voltage across terms. 11-12. Car on hoist in gear and running.	Signal Generator and wiring.	10 mph approx. 0.7 V A/C 20 mph approx. 1.4 V A/C 30 mph approx. 2.1 V A/C 40 mph approx. 2.8V A/C <i>or 75Ω through generator</i>
2. Ignition on. Check voltage at term. 5.	Power supply.	Voltage - 12V. If not, check wiring.
3. Start car. Jumper term. 5 - 3 and then 12-7 momentarily.	Servo.	Servo should activate and raise engine speed. If not, check wiring and Servo.
4a. Ignition on (not running). Check voltage at term. 6.	System disconnect circuit.	No voltage. Push brake pedal then voltage = 12V, or trans. to 'N' and voltage = 12V. If not, check wiring, switches, and adaptor.
b. Ignition off. Check resistance terminal 6 to ground.	Adaptor ground.	Reading approx 20 to 150 . Now reverse leads and reading must remain between 20 and 150 Ω. If reading is at ∞ with either hook up check adaptor grounding or replace adaptor.
5. Ignition on. Check voltage at term. 8.	Control switch OFF.	Move lever to OFF. Voltage drops from 12 -> 0 volts. If not, check wiring and switch.
6. Ignition on. Check voltage at term. 9.	Control switch CONST.	Move lever to CONST. Voltage jumps 0 to 12 volts. If not, check wiring and switch.
7. Ignition on. Check voltage at term. 10.	Control switch RESUME.	Move lever to RESUME. Voltage jumps 0 to 12 volts. If not, check wiring and switch.

If these electrical tests are OK, then change the control unit if the system does not operate correctly.



61-08/5



New servo with old vacuum res. will cause surge.

improperly adjusted cruise control cables can cause surging.