

Trouble Shooting Guide

Problem:

Undertake the following test

NOTE: - The most common cause of cruise control malfunction is loose or dirty electrical connections. Disconnect, clean and reconnect ALL electrical connections if the cruise control will not operate in diagnostic mode. Check the stop codes on the computer as that will give you an indication of what might be stopping the cruise control from engaging. The usual connections are: computer plug, control switch plug, throttle servo plug, fuse, speed sensor or speedometer connection, brake light switch, ground (usually battery negative), neutral sensing (neutral switch and sometimes tach sensing (ignition coil or tachometer)).

1 Indicator light on control switch flashing red/green after ON-OFF button pressed to turn cruise control on

Brakes have not been operated after ignition turned on

Brake light globe faulty or brake light stuck on
Brake light wiring fault

Check stop codes (see page 4)

2 Cruise will not engage.

Brakes have not been operated after power up
Brake light globe faulty or brake light stuck on

Check stop codes (see page 4)

Perform diagnostic test (see page 5)

Clutch/Neutral switch test

Clutch/Neutral sensor polarity (see diagnostic mode)

Computer power test.

Brake wire test

Control switch test

Throttle calibration tests

CIU test

Speed sensor signal

Harness continuity and voltage/resistance tests

Incorrect calibration or computer not calibrated

NOTE: The cruise control will NOT engage after power up (ignition turned on) until the brakes have been applied and released at least once.

Use the result of the stop code and diagnostic test to indicate which of the following tests should be performed

3 Cruise control erratic, surges or loses/gains speed.

Adjust cruise control sensitivity

Speed sensor test if sensor installed

Speed sensor test if sensor installed

Check throttle sensor calibration

4 Cruise lags or overshoots when engaged

Perform Speed Signal Pulse Rate calibration

Adjust cruise control sensitivity

Check throttle sensor calibration

**5 Cruise disengages
(Note: Carefully check all wiring for intermittent connections)**

Check diagnostic stop codes (see page 4)

Brake light globe faulty

Brake light switch faulty/adjustment

Brake wire test

Clutch/neutral switch faulty

6 Cruise accelerates too slow

Incorrect calibration/re-calibrate computer

Check throttle sensor calibration

7 Cruise will not disengage with brake

Brake light switch faulty

Brake wire test

**8 Cruise will not operate at higher speeds
(up to 25 kph / 15 mph)
Check diagnostic stop codes (see next page)**

Speed sensor test / gap too small

Incorrect calibration/perform speed calibration

**9 Cruise will not operate at lower speeds
(below 5 kph / 3 mph)
Check diagnostic stop codes (see next page)**

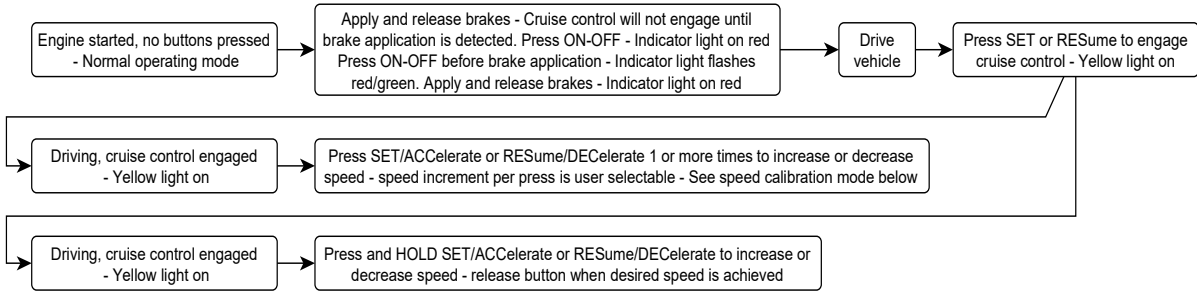
Speed sensor test / gap too large

Incorrect calibration/perform speed calibration

CRUISE CONTROL MENUS

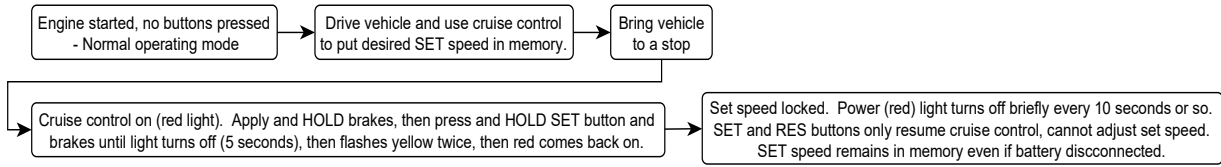
This section shows all the menus and sub-menus used for normal operation, diagnostics, setup and calibration and adjustment procedures available on the QuadCruise ATV cruise control

Normal cruise control operation



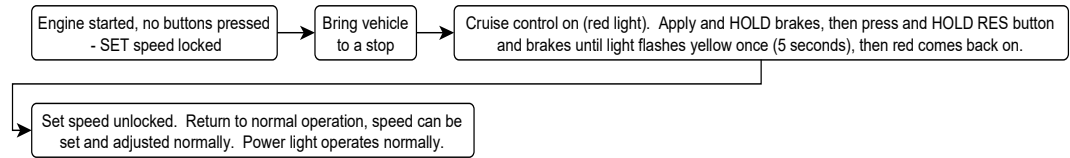
Normal cruise control operation - Lock SET speed

If a fixed speed is desired for spraying or similar operation, the SET speed can be locked to prevent accidental changes to SET speed.



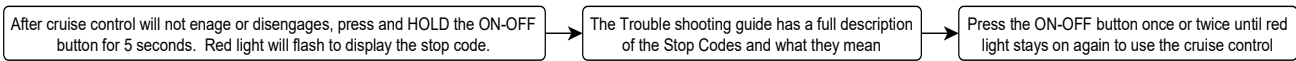
Normal cruise control operation - Unlock SET speed

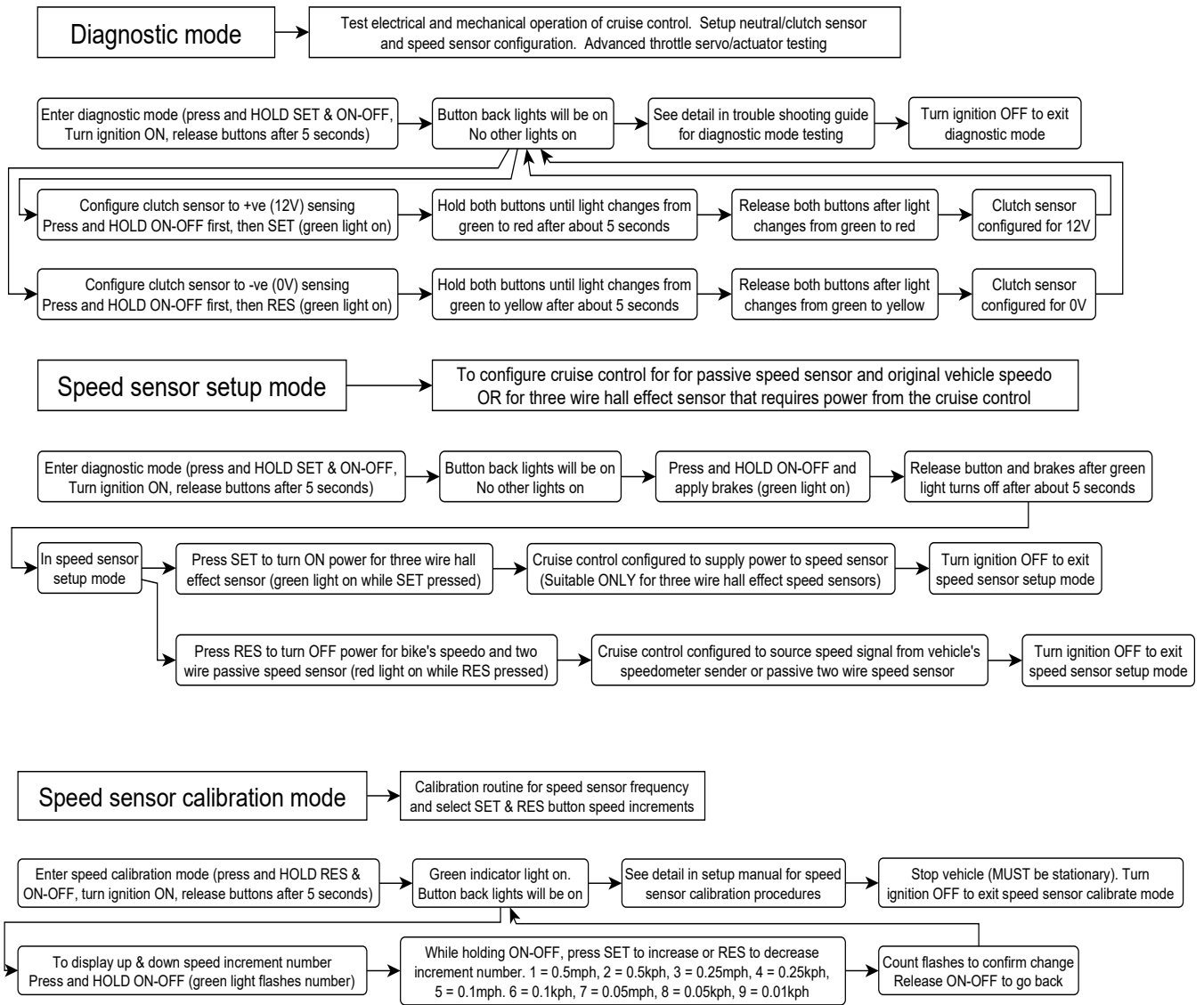
Return to normal operation without locked SET speed.

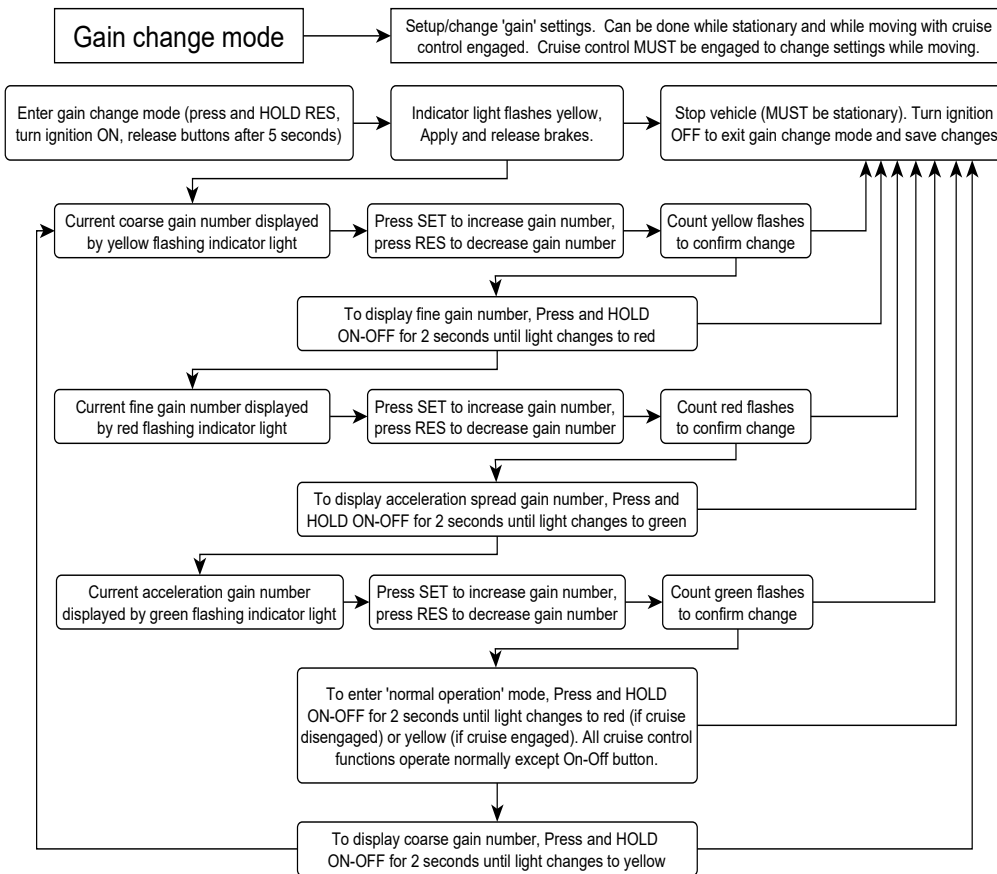


Access stop codes

This is used to diagnose why the cruise control disengages or will not engage







MOTORCYCLE CRUISE TROUBLE SHOOTING TESTS

Diagnostic Stop Codes

This cruise control has stop code function built in. The indicator light on the control switch can display the stop code at any time by pressing and holding the ON-OFF button for 5 seconds. The red light (LED) beside the connector on the cruise control computer also displays the code by flashing at all times. This stop code is displayed whenever the cruise control fails to engage when SET or RES are pressed or whenever the cruise control disengages and on power up.

When the ignition is first turned on stop code 11 (power reset) will be shown, unless there is a fault that causes another code to display. The cruise control may be disengaged by the operator on purpose (by applying the brakes for example, a code 6 would display), by the operator accidentally (manually accelerating for example, a code 4, 5, or 9 would display) or if there is a fault. Note that this is NOT a fault code, it is a stop code and a code is produced and displayed at all times except when the cruise control is engaged.

Drive the vehicle at normal speeds (6~15 kph or 4~10 mph). Press SET to engage cruise control. If cruise control does not engage, check that the indicator light does NOT come on YELLOW (red indicates power on, yellow indicates cruise is engaged).

If the engage light DOES come on (yellow light), but the cruise control does not control the vehicle speed, then the problem is either an electrical or mechanical failure in the throttle control system, as the cruise control 'believes' that it is engaged and is trying to control the vehicle speed. Enter diagnostic mode (second page of this manual) and perform a full diagnostic test. In particular, check that the engine rpm can be raised and lowered using the SET and RES keys in diagnostic mode. If engine rpm cannot be raised in diagnostic mode, check electrical connections to the cruise control throttle servo, check voltages to and at the servo, test servo operation, check servo cable and CIU operation.

If the engage light does NOT come on when you press SET, or the cruise control disengages unexpectedly, stop the vehicle. DON'T TURN THE IGNITION SWITCH OFF. Press and hold the ON-OFF button for 5 seconds or observe the RED LED (light) beside the connector on the computer. If the cruise control will not engage or disengages, the red LED on the computer and the control switch (if ON-OFF is pressed for 5 secs) will flash to indicate what is **preventing** the cruise control from engaging, or what was the **last** cause of the cruise control disengaging.

The red LED will flash on and off, about once per second, the number of times that indicate the appropriate stop code number, then will pause for 2 to 3 seconds then will flash the stop code again. The computer red LED will continue to flash this code until power (ignition switch) is turned OFF or the SET or RES button is used to engage or attempt to engage the cruise control. To stop the code being displayed on the control switch, press and release the ON-OFF button.

Remember, if the engage light does come on when the SET button is pressed (light changes from red to yellow), the cruise control HAS engaged, even if the throttle is not being operated. If this happens, when you stop the bike, you could get any one of several different stop codes displayed. Any of the following codes are possible in this event, 2, 3, 5, 6, 7, 9 or 10 as any of these events could be what disengages the cruise control when you slow down to a stop. None of these codes are the real cause of the problem, the problem is an issue with the throttle control systems.

Stop Code Description

<u>Stop Code Description</u>	<u>Code</u>	<u>Possible cause</u>
ON-OFF switch signal detected	1	ON-OFF switch accidentally pressed/faulty
No speed signal	2	Speed signal/sensor/wiring faulty
Below minimum engage speed (about 2.5kph)	3	Speed pulse rate too slow/faulty#
Above maximum engage speed (about 30kph)	4	Speed pulse rate too high/faulty#
Over speed or under speed (200% or 50% of SET speed)	5	Speed signal/sensor/wiring faulty
Brake signal detected\$	6	Brake light/wiring fault/sticking brake switch
Clutch/neutral signal detected Hi-Lo input	7	Clutch/neutral/sidestand switch/wiring fault
Clutch/neutral/gear position signal detected Voltage level input	8	Clutch/neutral/sidestand switch/wiring fault
Exceed maximum allowable acceleration	9	Too much speed pulse variation^
Overrev sense (tacho sensing)	10	Changed gear or clutch slip, ignition system wiring/connection fault.
Power reset	11	Fault in power wiring to cruise control <u>or</u> ignition turned off and back on.
Not yet calibrated/lost calibration	12	Calibration routine must be performed%*
Brake signal detected OR no brake power detected\$	13	Brake light/wiring fault/sticking brake switch OR bad brake power connection or blown brake fuse
Brakes not detected on power up (if cruise turned on, indicator light on switch will flash red/green until brakes are detected)	14	Brakes not applied (cruise will not engage until brake application has been detected)
Lost tach signal	15	Tach sensor wiring fault
Disengage/brake application time out@	16	SET or RES button pressed too soon after cruise disengaged or brakes released
Brake circuit logic failure	17	Internal circuit fault in cruise computer
CruiseSafe brake circuit power fault	18	Internal circuit fault in cruise computer
CruiseSafe brake circuit no power fault	19	Internal circuit fault in cruise computer
CruiseSafe monitor circuit fault	20	Internal circuit fault in cruise computer
Servo current leak	21	Not used on TBW computer
Servo current too high	22	Not used on TBW computer
Servo current too low	23	Not used on TBW computer

#Note: - Speed pulse rate errors could also be caused by the computer calibration being incorrect for the vehicle.

See Chapter 9 of the Information, Set up & Operation Manual to re-calibrate the speed signal pulse rate.

\$Note: - Brake application can produce stop code 6 OR stop code 15 depending on how the brake light switch is wired in the vehicle. If the brake light switch controls power to the brake light (the most common method) , stop code 6 will be generated. If the brake light switch control ground from the brake light, stop code 15 will be generated.

Stop code 15 will also be generated if power to the brake light system fails, ie. A blown brake circuit fuse.

^Note: - Speed pulse acceleration errors can be caused by intermittent/dirty wiring connections, missing speed sensor magnets or one or more magnets that have been turned around (wrong pole facing the speed sensor).

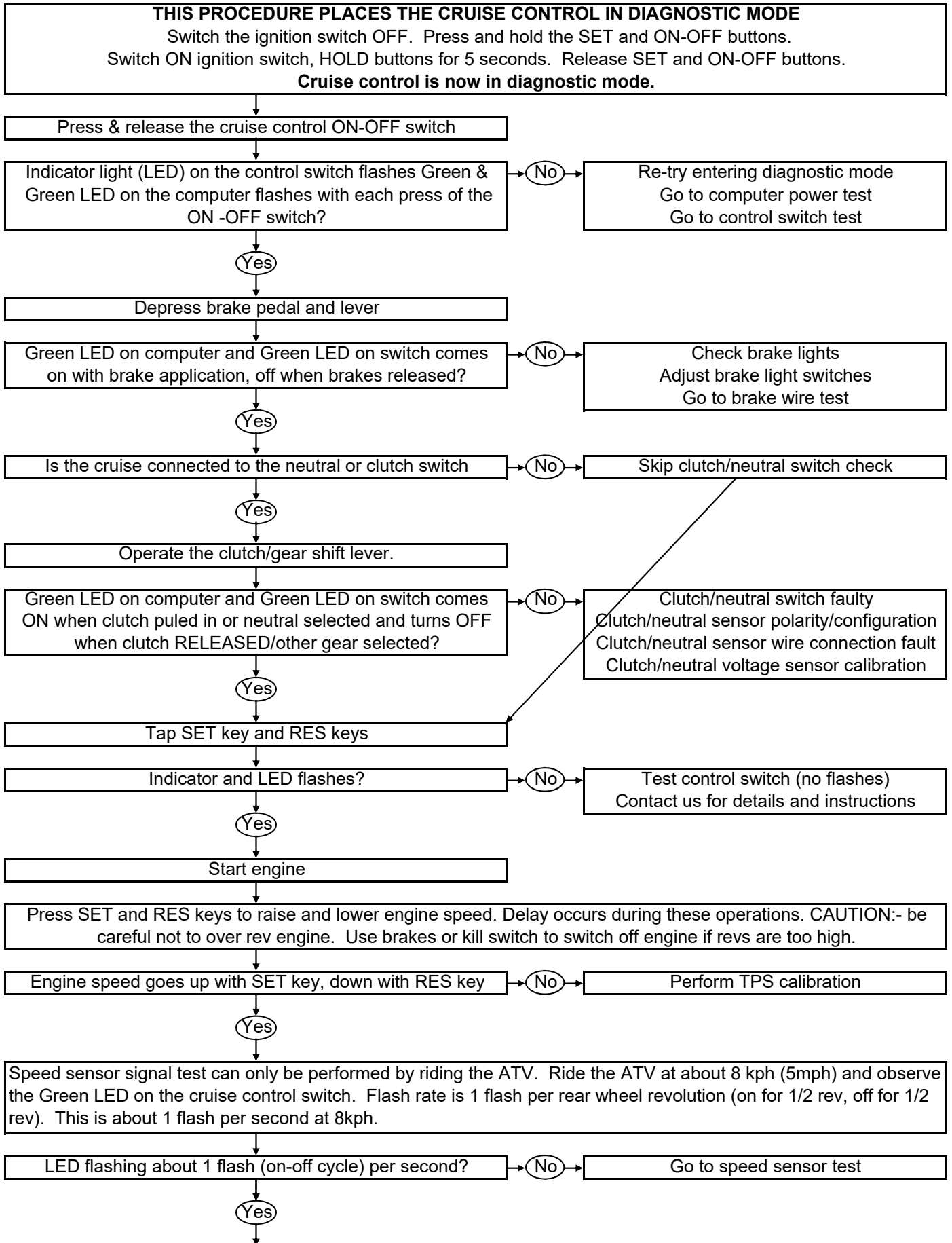
*Note: - If the computer resets or has to be re-calibrated more than once it should be returned for warranty investigation.

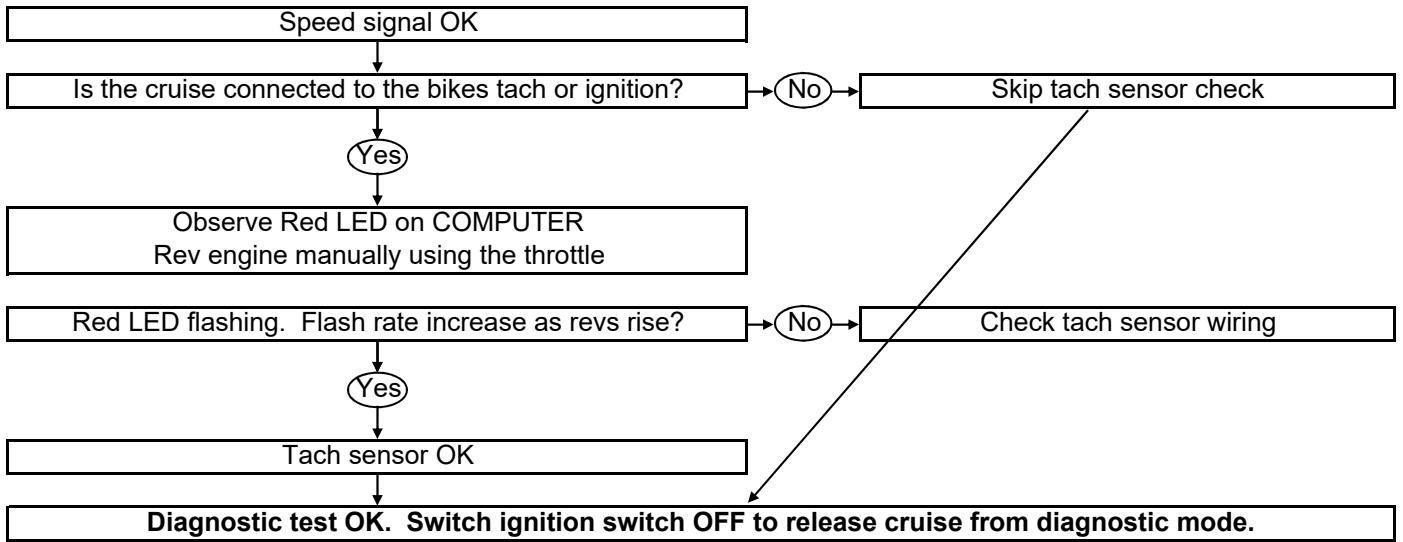
%Note: - Code 12 requires that the configuration of the computer be rebuilt. This is easy for the user to do.

See Chapter 8 (Diagnostic Mode Operation) of the "Information, Set up & Operation Manual" to perform a full diagnostic check to ensure that everything works as it should and to configure the clutch/neutral sensor. See Chapter 9 (Calibration, Adjustments & Road Test) of the "Information, Set up & Operation Manual" to re-calibrate the speed signal pulse rate and initial throttle pull and to adjust the sensitivity.

@Note: - After the cruise control is disengaged AND every time after the brakes are released, there is a delay time of ~1.5 seconds during which the cruise control will not engage.

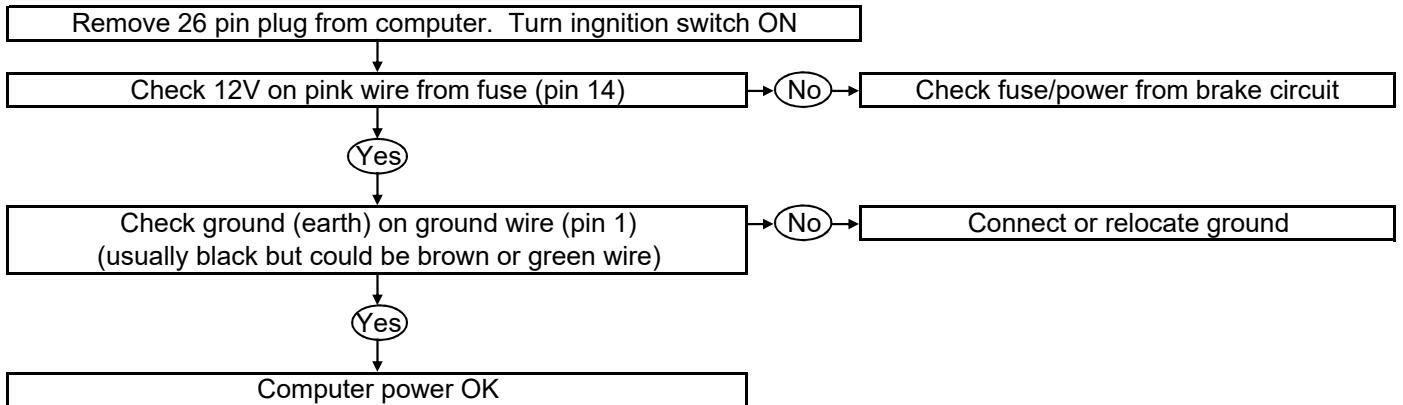
Cruise control diagnostic test



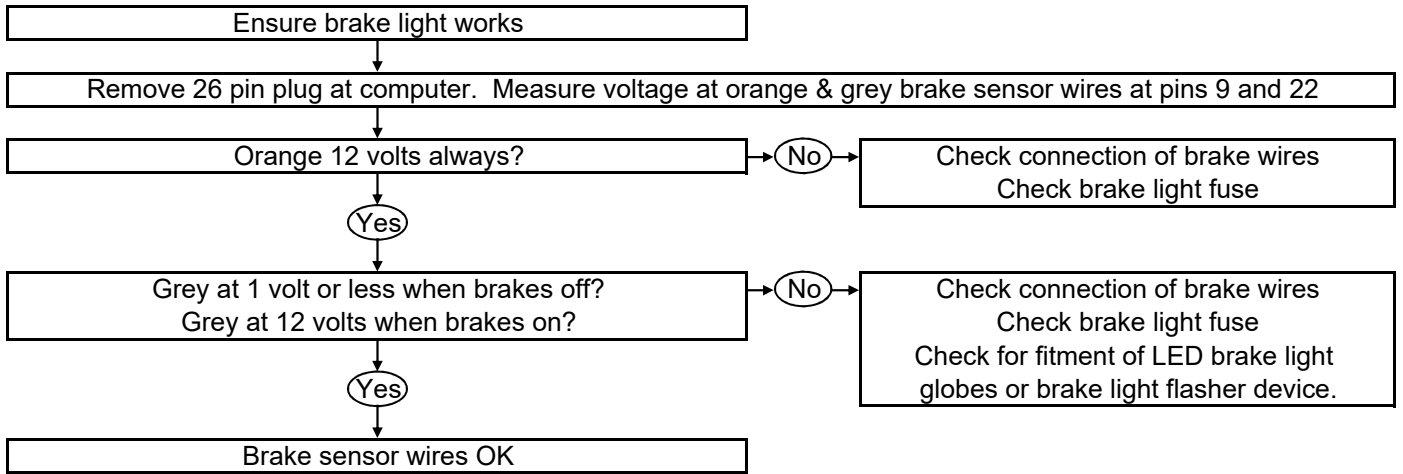


Computer power test (a multimeter set to 15 volts range will be needed for this test)

Note: - You will need a small pin with a rounded or tapered end and not over 1.0mm (0.040") diameter to use as a test probe. Wire paper clips are ideal. This can be inserted into the terminal holes in the 26 way computer plug. **BE CAREFUL NOT TO DAMAGE THE TERMINALS. IF THE PROBE WILL NOT SLIP INTO THE TERMINAL HOLE EASILY, DON'T USE IT.**



Brake wire test

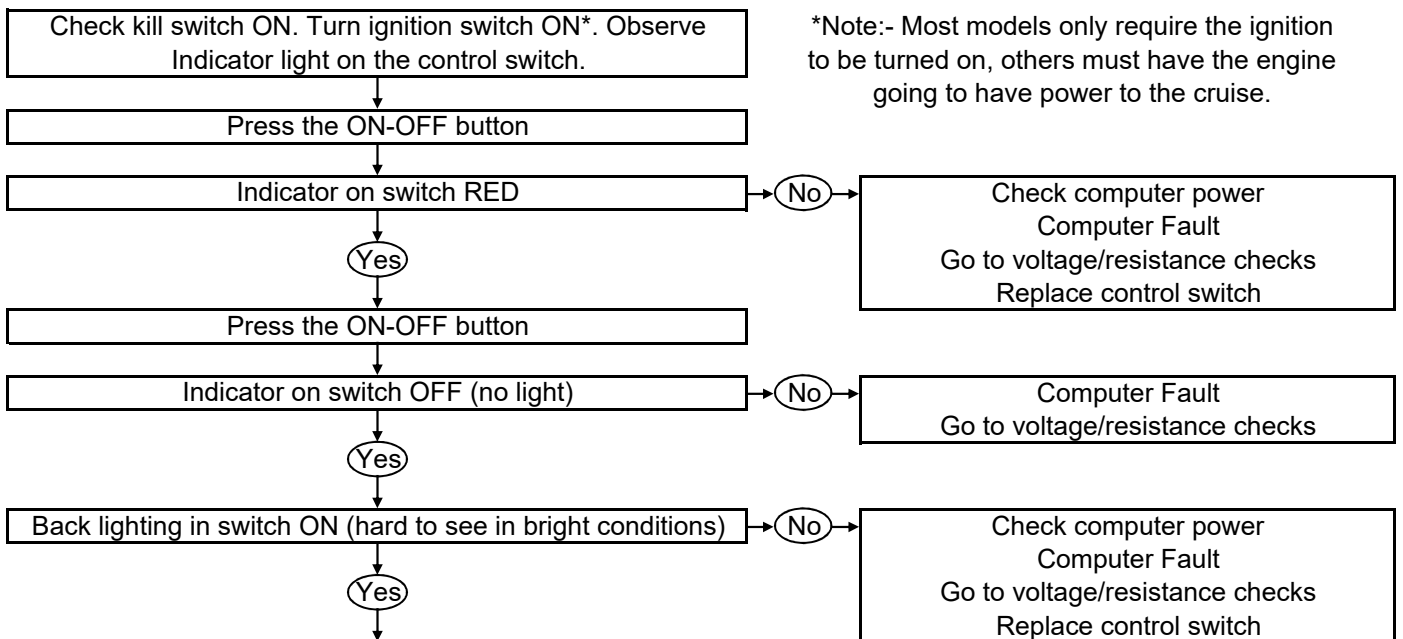


Computer calibration

Refer to the Chapter 9 (Calibration, Adjustment & Road Test) of the Information, Set up & Operation Manual for information about Speed Sensor Pulse Rate and Initial Throttle Pull calibration and Adjusting the Sensitivity.

Control switch test#

Note: - refer to switch voltage and resistance values at end of guide for detailed check of switch

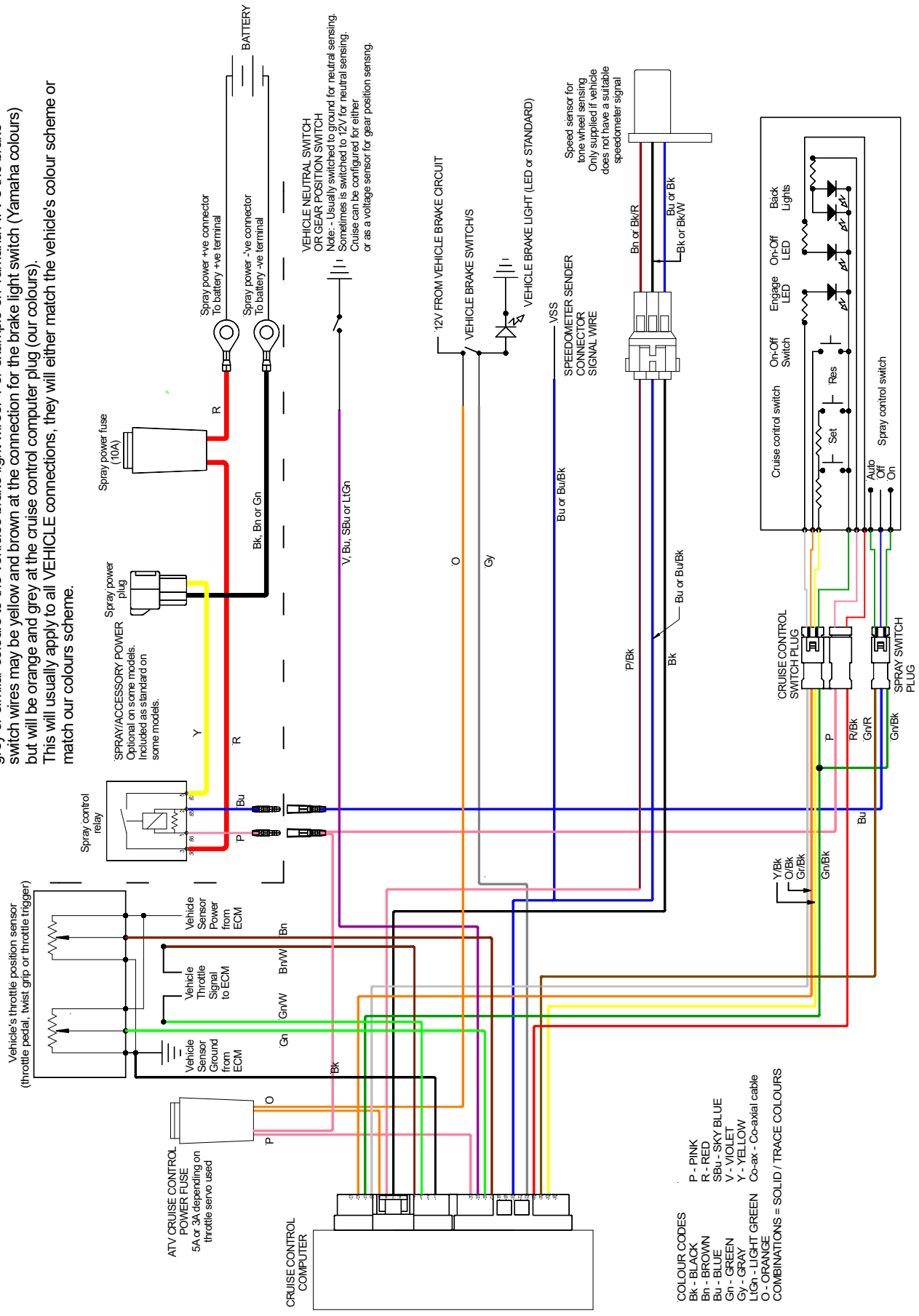


*Note:- Most models only require the ignition to be turned on, others must have the engine going to have power to the cruise.

Refer to diagnostic mode checks on the third page of this guide and to voltage and resistance values at the end of this guide for detailed control switch checks.

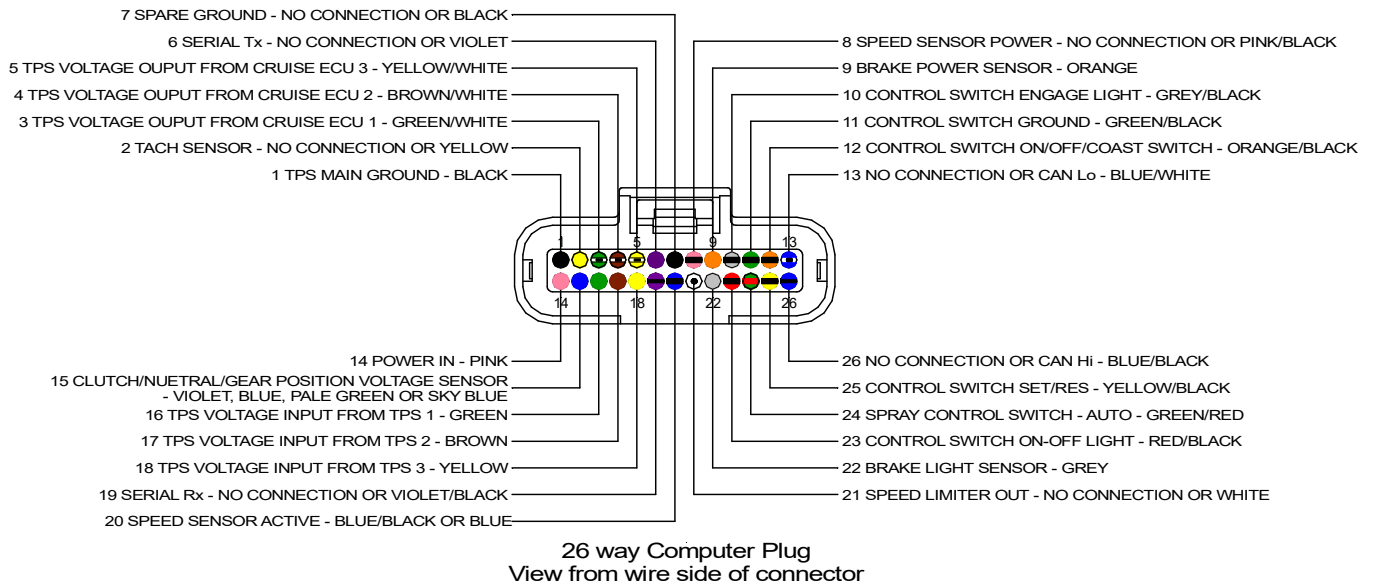
Wiring diagram

NOTE: - In many cases, the wires on the cruise control harness that connect to the vehicle wires will be colour matched to the vehicle wires. The brake power and sensor wire are orange and grey at the cruise control computer harness plug, at the vehicles brake light plug may still be orange and grey or similar colours to the vehicles brake light wires. For example on Yamaha ATV's the brake switch wires may be yellow and brown at the connection for the brake light switch (Yamaha colours) but will be orange and brown at the connection for the brake light switch (our colours). This will usually apply to all VEHICLE connections, they will either match the vehicle's colour scheme or match our colours scheme.



Harness wiring pin configuration and tests

Harness computer plug pin configuration Check continuity of all wires and that the wires go to the correct pins.



Resistance checks

Resistance values at harness computer plug for suspected Control Switch fault

Note: - check with ignition switch **OFF** and computer **UNPLUGGED** from loom

Note: - You will need a small pin with a rounded or tapered end and not over 1.0mm (0.040") diameter to use as a test probe. Wire paper clips are ideal for this. This can be inserted into the terminal holes in the 26 way computer plug. **BE CAREFUL NOT TO DAMAGE THE TERMINALS. IF THE PROBE WILL NOT SLIP INTO THE TERMINAL HOLE EASILY, DON'T USE IT.**

Note: - switch wires have a black trace (stripe) unless otherwise specified below

ON-OFF switch

Pin 12 (power switch, orange) & Pin 11 (switch ground, green) ∞ Ω(ohms) when cruise ON-OFF switch released
 " 0 Ω(ohms) when cruise ON-OFF switch pressed

SET & RES buttons

Pin 25 (switch signal, yellow) & Pin 11 (switch ground, green) ∞ Ω(ohms) when no buttons pressed
 " 820 Ω(ohms) on SET
 " 1.5 KΩ(K ohms) on RES

Resistance values at harness computer plug for suspected ground connection fault

(check with ignition switch **OFF** and computer **UNPLUGGED** from loom)

Touch the ohmmeter probes to the pin numbers or locations indicated

Pin 1 (ground, black) & battery negative 0 Ω(ohms)

Voltage values at loom computer plug

Note: - check with cruise computer plugged in, ignition ON and cruise control ON in DIAGNOSTIC mode

Do the following to put cruise control in diagnostic mode: Turn ignition switch OFF. Press and hold the SET and ON-OFF buttons. Turn the ignition switch ON. Release the SET and ON-OFF buttons. Cruise control is now in diagnostic mode.

Place +ve probe in the back of the computer plug to measure voltages and -ve probe to battery negative or frame.

Note: - you will need a small sharp probe to either push through the wire insulation or push in between the seal and the wire on the back of the computer plug to contact the terminal inside the plug.

Control switch

Note: - switch wires have a black trace (stripe) unless otherwise specified below

Note: - check with cruise computer plugged in, ignition ON and cruise control ON in DIAGNOSTIC mode

Do the following to put cruise control in diagnostic mode: Turn ignition switch OFF. Press and hold the SET and ON-OFF buttons. Turn the ignition switch ON. Wait 5 seconds, then release the SET and ON-OFF buttons. Cruise control is now in diagnostic mode.

Pin 10 (engage light signal, grey/black) Indicator light OFF	0V with no buttons pressed
Pin 10 (engage light signal, grey/black) Indicator light Green	~2V with brakes applied or SET or RES pressed
Pin 24 (spray control auto signal, green/red)	0V after SET or RES pressed, spray switch in Auto
Pin 24 (spray control auto signal, green/red)	~12V after brakes applied, spray switch in Auto

Note: - check with cruise computer plugged in, ignition ON and cruise control NOT in DIAGNOSTIC mode

Turn ignition switch OFF, then turn ignition switch back ON to release cruise from diagnostic mode

Pin 11 (switch ground, green/black)	0V
Pin 12 (power switch signal, orange/black)	4~5V with ON-OFF released
"	0V with ON-OFF pressed
Pin 23 (ON-OFF indicator light, red/black) Indicator light ON Red	~12V with ON-OFF pressed & released
Pin 23 (ON-OFF indicator light, red/black) Indicator light OFF	0V with ON-OFF pressed & released
Pin 25 (SET & RES switch signal, yellow/black)	~4.8V no buttons pressed
"	~2.0V with SET pressed
"	~2.8V with RES pressed

Clutch/Neutral sensor (only the Hi-Lo sensor, this does not apply to Voltage Level sensor)

Clutch sensor check should be done with the vehicle in gear (not in neutral) for clutch sensor test. Often the clutch switch & neutral switch are all part of the same circuit. Neutral sensor check should not have any special requirements.

Clutch/Neutral sensor (when configured for 0V or low signal detection)

Pin 15 (clutch/neutral sensor, violet, blue or light green)	0~0.5V clutch pulled in or neutral selected
"	5~12V clutch released or other gear selected

Clutch/Neutral sensor (when configured for 12V or high signal detection)

Pin 15 (clutch/neutral sensor, violet, blue or light green)	6~12V clutch pulled in or neutral selected
"	~0V clutch released or other gear selected

Power

Pin 14 (12V power in , pink)	~12V
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Throttle Position Sensor and CAN-BUS inputs and outputs

Pin 1 (vehicle sensor ground, black)	~0V
Pin 3 (Ch 1 V out from cruise control, green/white)	Typ 0.5 to 4.5V varies with throttle position
Pin 4 (Ch 2 V out from cruise control, brown/white)	Varies with throttle position
Pin 5 (Ch 3 V out from cruise control, yellow/white)	Varies with throttle position
Pin 16 (Ch 1 V in from vehicle TPS, green)	Typ 0.5 to 4.5V varies with throttle position
Pin 17 (Ch 2 V in from vehicle TPS, brown)	Varies with throttle position
Pin 18 (Ch 3 V in from vehicle TPS, yellow)	Varies with throttle position
Pin 13 (CAN Lo, blue/white or match vehicle colour)	
Pin 26 (CAN Hi, blue/black or match vehicle colour)	

NOTE: - Channel 1 of TPS usually has voltage range from around 0.5V at idle, to 4.5V at full throttle.

Channel 2 of TPS may have similar voltage range to 1, or reverse (4.5V at idle, to 0.5V at full throttle) OR may be roughly half voltage (0.25V at idle to 2.75V at full throttle). Channel 3 (if used) will be another variation on these numbers. These are approximate and indicative numbers only and will vary for different makes and models.

Speed sensor

Pin 20 (speed sensor active signal, blue or blue/black)	0V to 4~12V pulses with wheel rotation (normally 5V)
Pin 7 (speed sensor ground, black) OR	0V
Pin 1 (main ground, black)	0V
Pin 8 (speed sensor power, pink/black)	12V

Note: - Pins 7 and 8 are usually only used when the cruise control kit comes with a speed sensor and tone wheel, usually fitted to a drive shaft, rear axle or rear wheel. If the vehicle has an electric speedometer, the cruise control speed signal wire will be connected to the vehicles speedometer sender wire on pin 20.

Brake sensor

Pin 9 (power/brake sensor supply, orange)	~12V
Pin 22 (brake sensor, grey) incadescent (standard) lights	0V with brakes OFF
Pin 22 (brake sensor, grey) LED lights	0~2V with brakes OFF
Pin 22 (brake sensor, grey)	~12V with brakes applied

Unused positions

- Pin 2 NOT USUALLY USED
- Pin 5 NOT USED (used if third channel for TPS required)
- Pin 6 NOT USUALLY USED
- Pin 7 SPARE GROUND - USUALLY NOT USED WHEN CONNECTED TO VEHICLES SPEEDO SENDER
- Pin 8 SPEED SENSOR POWER - NOT USED WHEN CONNECTED TO VEHICLES SPEEDO SENDER
- Pin 13 Only for CAN-BUS connection
- Pin 18 NOT USED (used if third channel for TPS required)
- Pin 19 NOT USUALLY USED
- Pin 21 NOT USED OR SPEED LIMITER OUTPUT - WHITE OR WHITE/BLACK
- Pin 26 Only for CAN-BUS connection

Notes: