

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 diagnostic 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, actuator plug, fuse, speed sensor or speedometer connection, brake light switch, ground (usually battery negative), tach sensing (ignition coil or tachometer) and/or the clutch switch.

1 Cruise will not engage.

Brake light globe faulty
Check diagnostic stop codes (see last page)
Perform diagnostic test (See next page)
 Computer power test.
 Brake wire test
 Control switch test
 Vacuum test
 Actuator test
 Actuator cable test
 CIU test
 Magnets missing/speed sensor signal
 Loom continuity and voltage/resistance tests
 Incorrect calibration on computer
 Clutch switch test

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

Adjust cruise control sensitivity
 Check carburettor cable free play
Lubricate all throttle and cruise control cables
 Speed sensor test if sensor installed
 Actuator test
 Vacuum test
 Actuator cable test
 CIU test if CIU installed

3 Cruise lags or overshoots when engaged

Perform Speed Signal Pulse Rate calibration
 Perform Initial Throttle Pull calibration
 Adjust cruise control sensitivity
 Actuator test
 Vacuum test
 Actuator cable test
 CIU test if CIU installed

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

Check diagnostic stop codes (see last page)
 Brake light globe faulty
 Brake light switch faulty/adjustment
 Brake wire test
 Clutch switch faulty
 Actuator test

5 Cruise accelerates too slow

Actuator test
 Vacuum test
 Incorrect calibration/re-calibrate computer

6 Cruise will not disengage with brake

Brake light switch faulty
 Brake wire test
 Actuator test
 Actuator cable test

7 Engine will not return to idle

Check carburettor cable free play
 CIU test if CIU installed
 Actuator cable test
 Broken throttle spring or sticking carburettors

**8 Cruise will not operate at higher speeds
 (above 80 kph / 50 mph)**

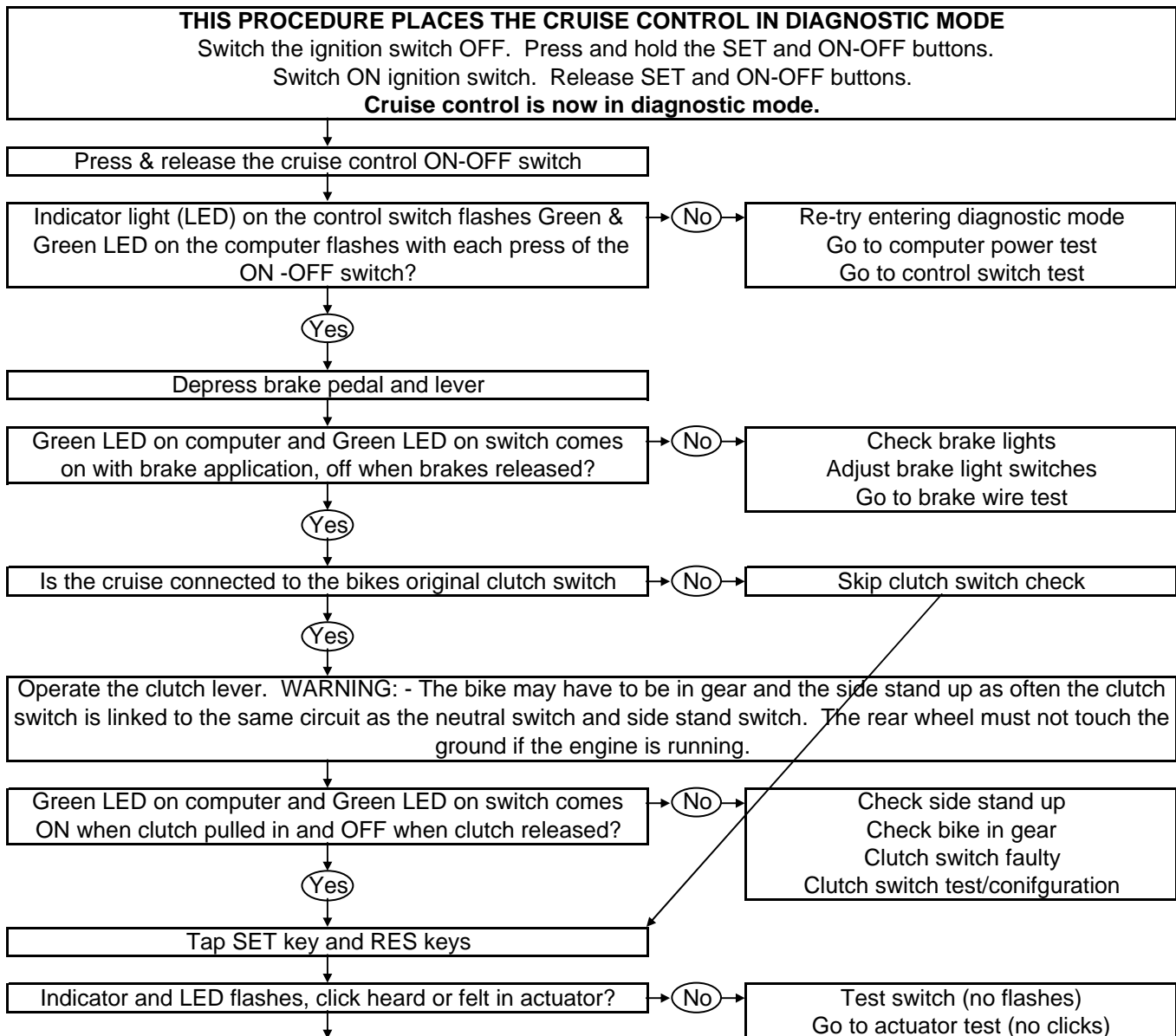
Speed sensor test / gap too small
 Too many magnets installed
 Incorrect calibration/perform speed calibration

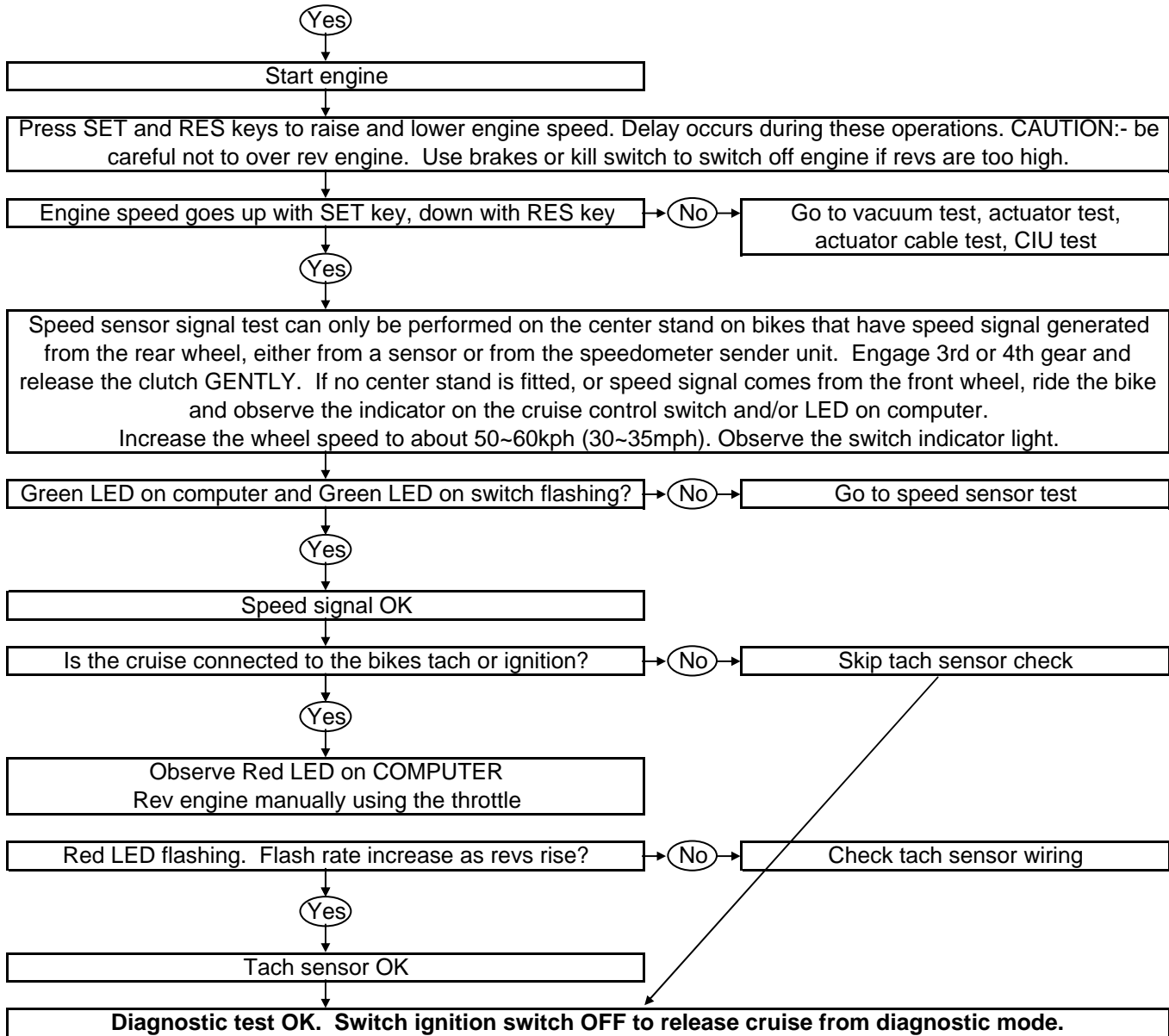
**9 Cruise will not operate at lower speeds
 (below 60 kph / 35 mph)**

Speed sensor test / gap too large
 Magnet/s missing
 Incorrect calibration/perform speed calibration

MOTORCYCLE CRUISE TROUBLE SHOOTING TESTS

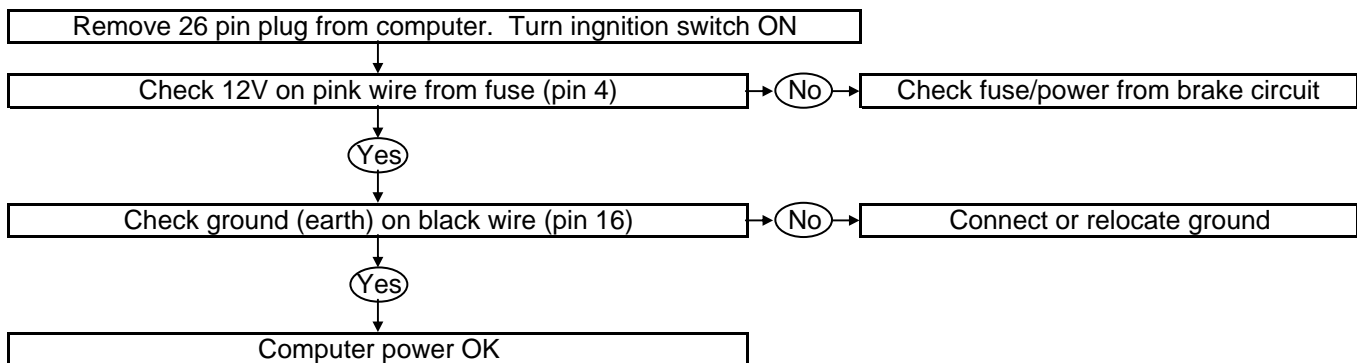
Cruise control diagnostic test





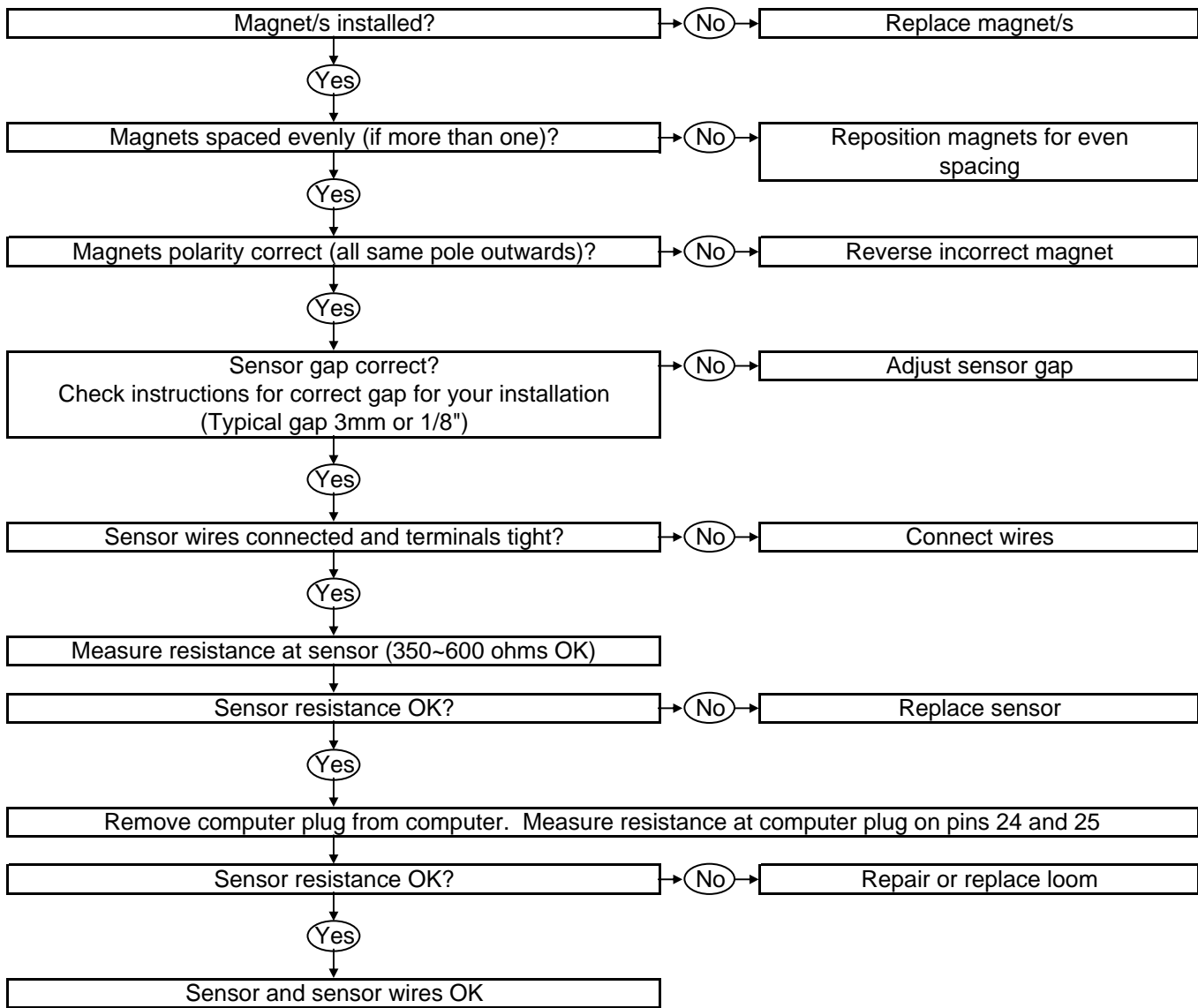
Computer power test (a multimeter set to 15 volts range will be needed for this test)

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.

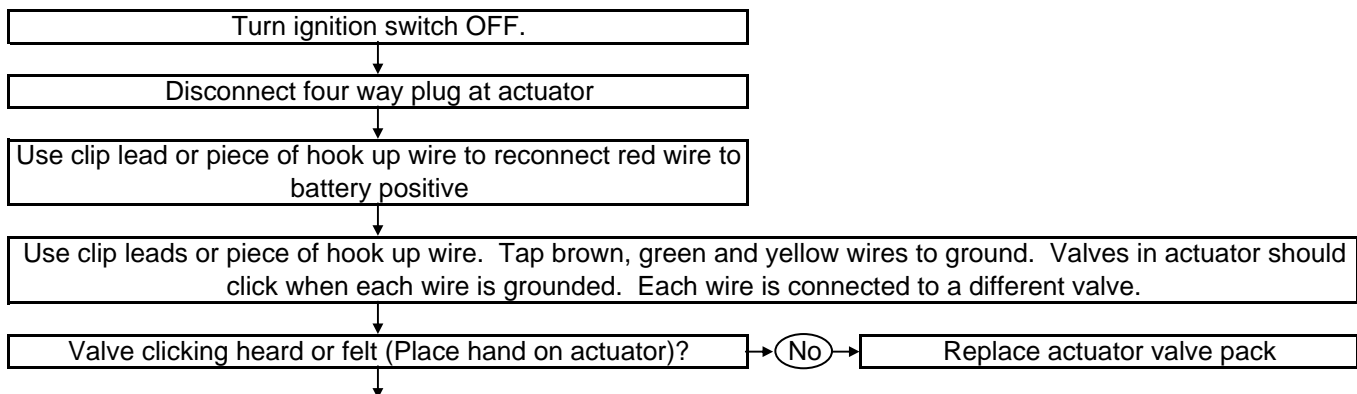


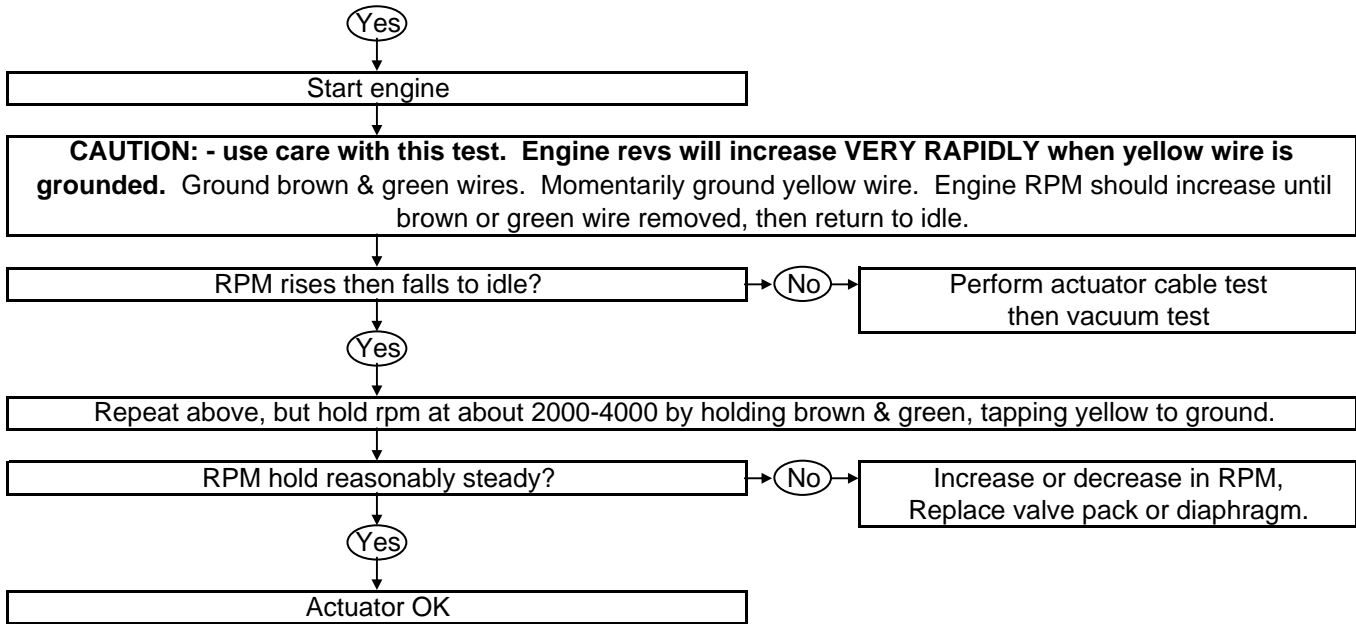
Speed sensor test (a multimeter set to 1 or 2 Kohms range will be needed for this test)

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.

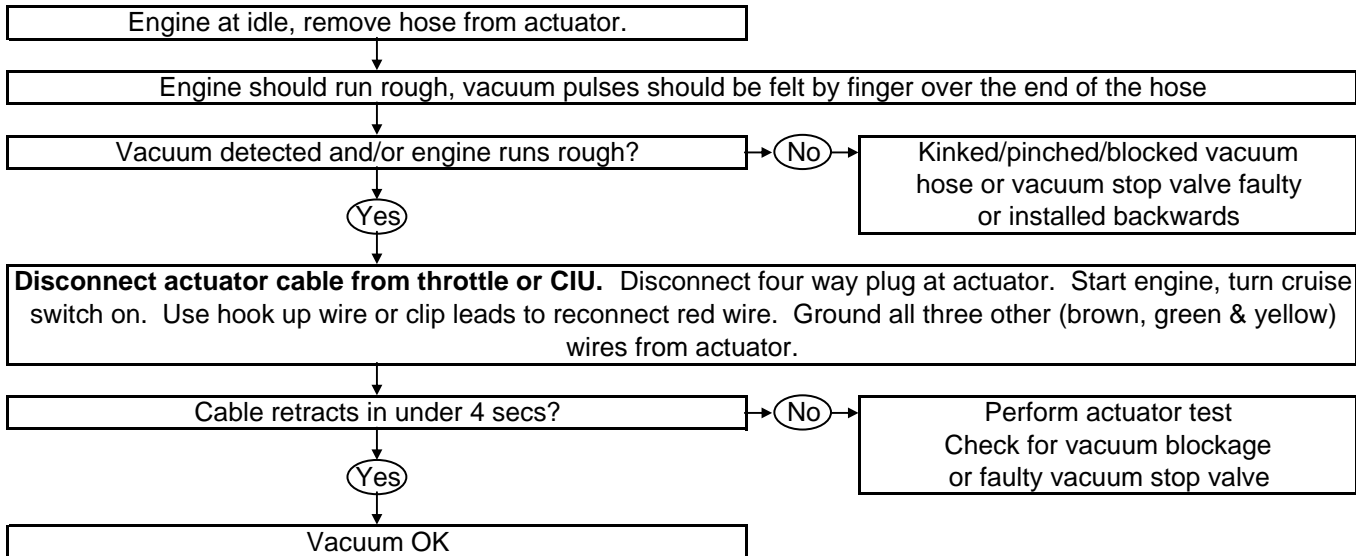


Actuator test

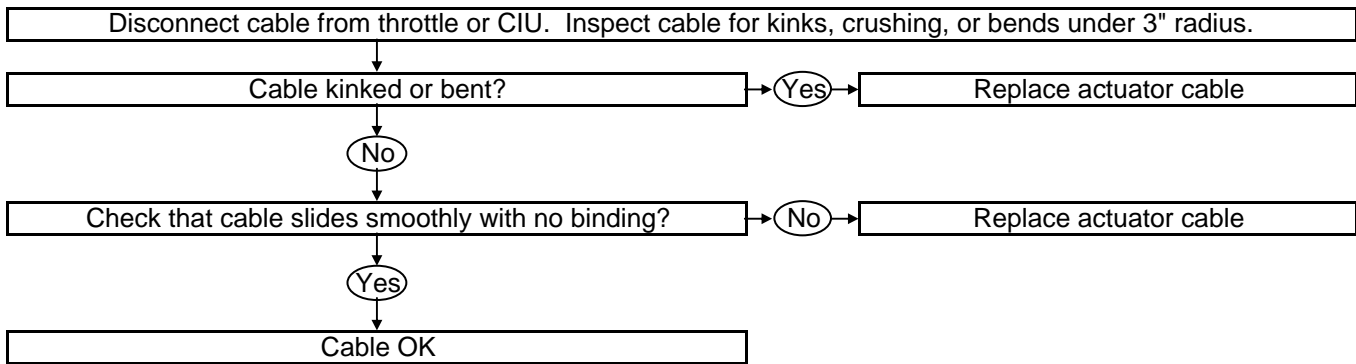




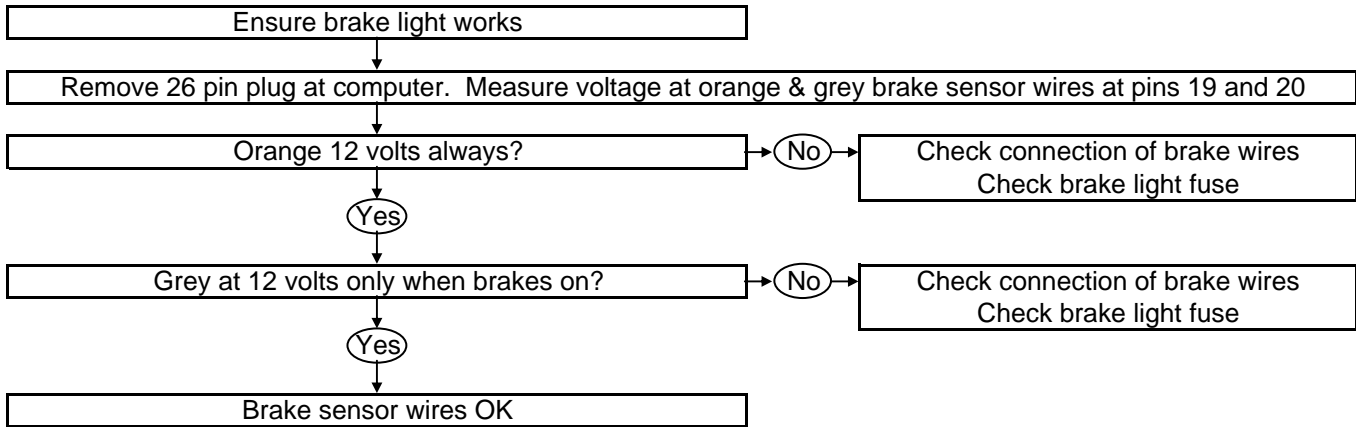
Vacuum test



Actuator Cable test

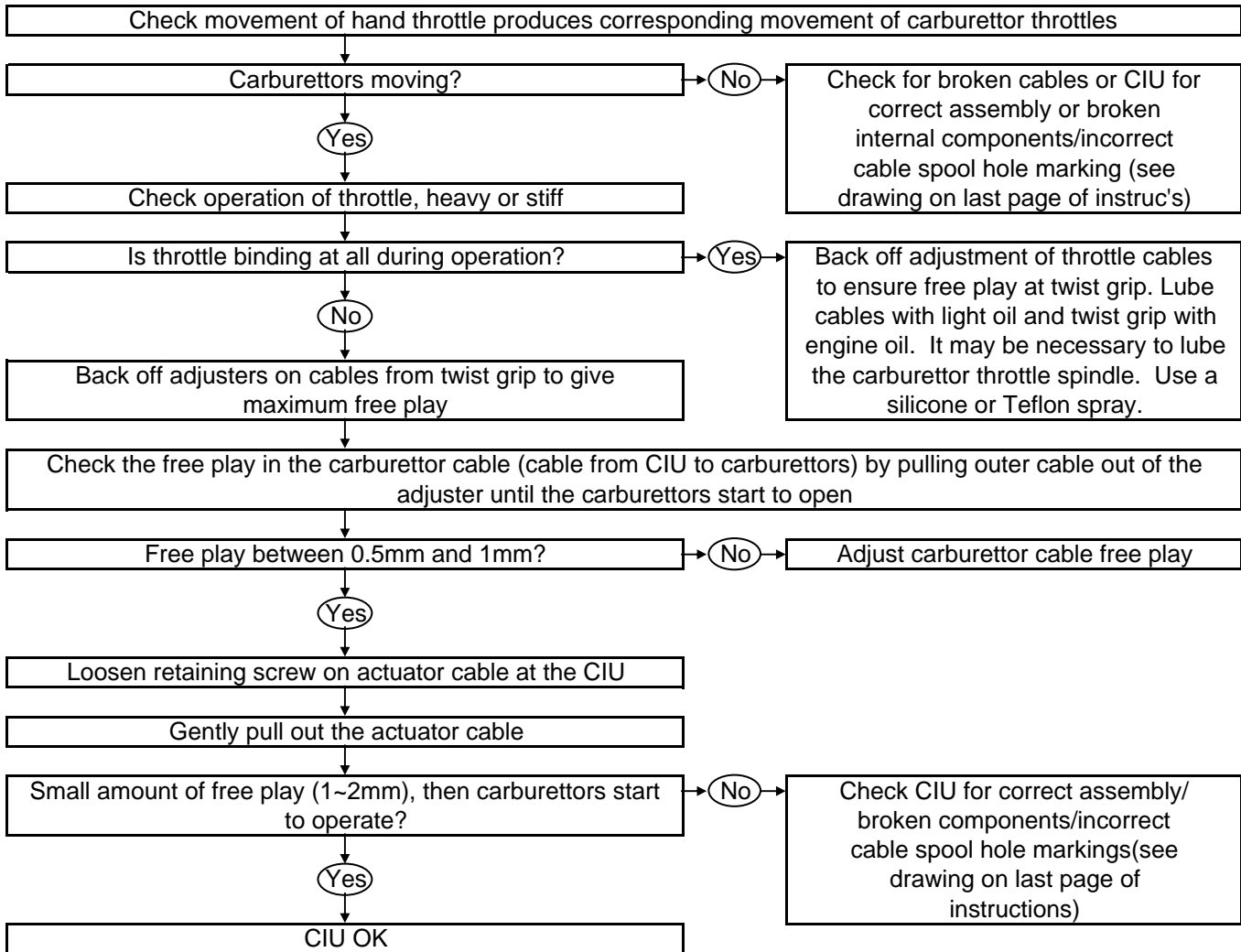


Brake wire test



CIU test

(Only models that **don't** have the actuator cable connected directly to the carburettors)



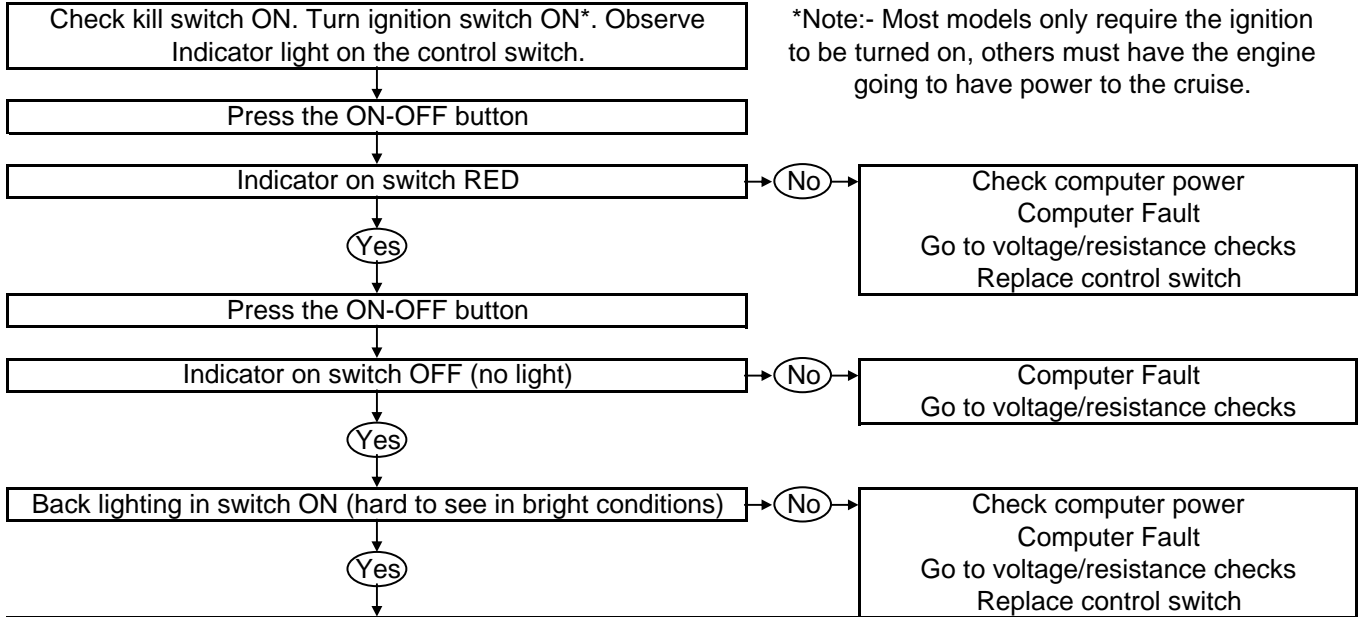
Computer calibration

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#

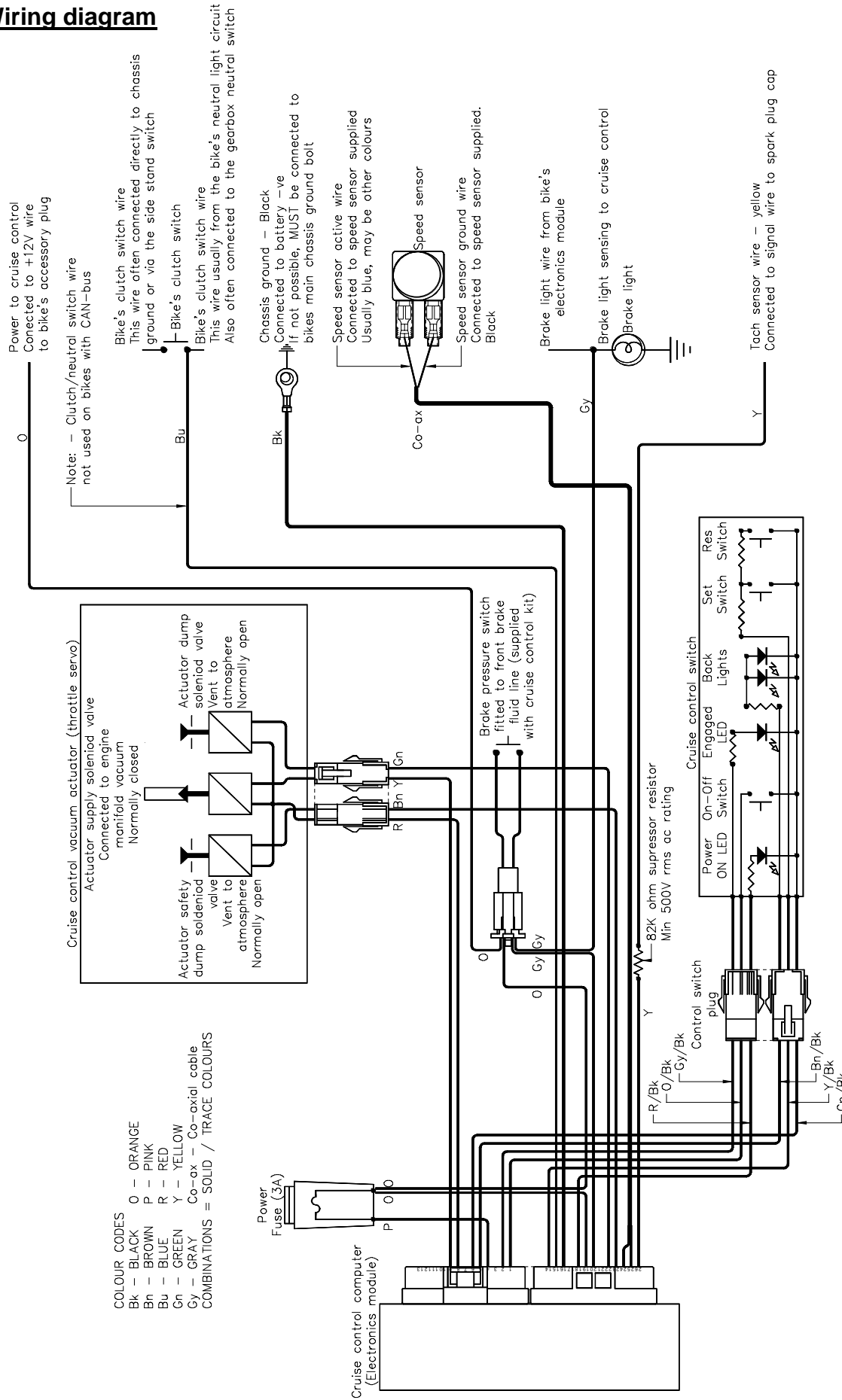
Note: - refer to switch voltage and resistance values at end of guide for detailed check of switch

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



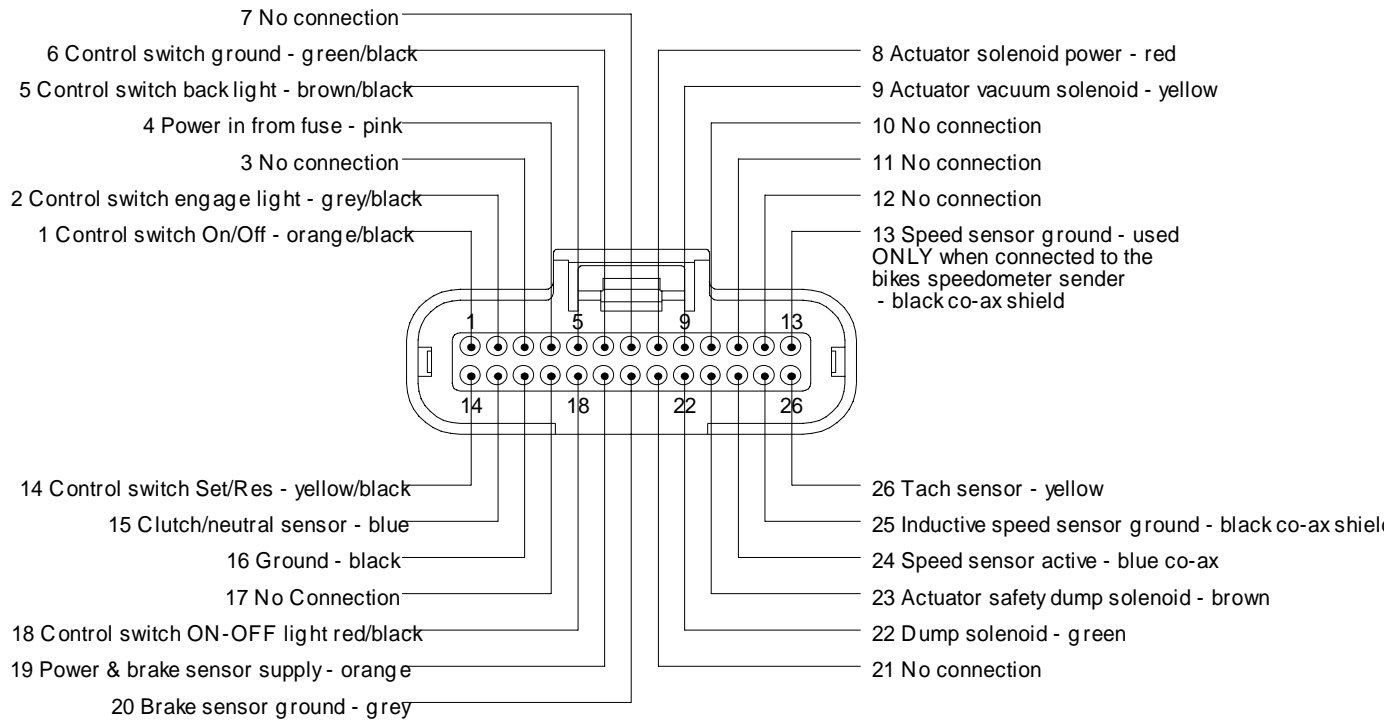
Refer to diagnostic mode checks on the second page of this guide and to voltage and resistance values at the end of this guide for detailed control switch checks.

Wiring diagram



Loom wiring pin configuration and tests

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



Resistance checks

Resistance values at loom 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 1 (power switch, orange) & Pin 6 (switch ground, green) $\infty \Omega$ (ohms) when cruise ON-OFF switch released
 " 0 Ω (ohms) when cruise ON-OFF switch pressed

SET & RES buttons

Pin 14 (switch signal, yellow) & Pin 6 (switch ground, green) $\infty \Omega$ (ohms) when no buttons pressed
 " 820 Ω (ohms) on SET
 " 1.5 K Ω (K ohms) on RES

Resistance values at loom computer plug for suspected Actuator (throttle servo) fault

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

Touch the ohmmeter probes to the pin numbers indicated

Pin 9 (actuator vacuum, yellow) & pin 8 (actuator power, red) 40~50 Ω (ohms)
 Pin 22 (actuator dump, green) & pin 8 (actuator power, red) 40~50 Ω (ohms)
 Pin 23 (actuator safety, brown) & pin 8 (actuator power, red) 40~50 Ω (ohms)
 Pin 9 (actuator vacuum, yellow) & pin 23 (actuator safety, brown) 80~100 Ω (ohms)
 Pin 22 (actuator dump, green) & pin 9 (actuator vacuum, yellow) 80~100 Ω (ohms)
 Pin 22 (actuator dump, green) & pin 23 (actuator safety, brown) 80~100 Ω (ohms)

Resistance values at loom 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 16 (ground, black) & battery negative 0 Ω (ohms)

Resistance values at loom computer plug for suspected Speed Sensor fault

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

Touch the ohmmeter probes to the pin numbers indicated

Pin 24 (sensor active, blue) & pin 25 (sensor shield, black) 350~600 Ω(ohms) if using supplied speed sensor
Unknown if units taps into motor cycle speedo.

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

Pin 1 (power switch signal, orange/black)	~12V with ON-OFF released
"	0V with ON-OFF pressed
Pin 2 (engage light signal, grey/black) Engage light OFF	0V
Pin 2 (engage light signal, grey/black) Engage light ON	~2V with brakes applied or SET or RES pressed
Pin 14 (SET & RES switch signal, yellow/black)	~3.8V
"	~1.4V with SET pressed
"	~1.9V with RES pressed
Pin 5 (back light, brown/black)	~12V
Pin 6 (switch ground, green/black)	0V

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 18 (ON-OFF indicator light, red/black) Indicator ON Red ~12V with ON-OFF pressed & released

Pin 18 (ON-OFF indicator light, red/black) Indicator OFF 0V with ON-OFF pressed & released

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.

Clutch/Neutral sensor

Clutch/Neutral sensor check should be done with the motorcycle on the centre stand where possible, side stand up and with the bike in gear (NOT in neutral). Often the clutch switch, neutral switch and side stand switch are all part of the same circuit.

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

Pin 15 (clutch/neutral sensor, blue)	0~0.5V clutch pulled in
"	6~12V clutch released

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

Pin 15 (clutch/neutral sensor, blue)	~12V clutch pulled in
"	~0V clutch released

Power

Pin 4 (12V power in , pink)	~12V
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Actuator (throttle servo)

Pin 8 (actuator solenoid power, red)	0V after brakes applied
"	~12V after SET or RES pressed
Pin 9 (actuator vacuum solenoid, yellow)	10~13V after SET or RES pressed and released
"	0V after brakes applied
"	10~13V with 0V pulse when SET key pressed*
"	10~13V with RES key pressed
Pin 22 (actuator dump solenoid, green)	0V after SET or RES pressed and released
"	0V after brakes applied
"	0V with SET key pressed
"	0V with ~12V pulse when RES key pressed*
Pin 15 (actuator safety dump, brown)	0V

* **Note:** - Pulse length to actuator are very short (about 10mS) and may not be detected by digital multimeters, and will only produce a small flicker of the needle on analog multimeters. A test plug is available from the factory that uses LED's as a visual indication that the pulse is being produced.

Ground

Pin 16 (ground, black)	0V
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Speed sensor

Note: - Pin 13 is used when the motorcycles speedometer sender is used OR pin 25 is used when the MCS 027 inductive speed sensor provided with the cruise control kit is used.

Pin 13 (speed sensor ground, black) when used	0V
Pin 24 (speed sensor active signal, blue)	See note below
Pin 25 (inductive speed sensor ground, black) when used	0V

Note: - Speed sensor signal with MCS 027 passive coil speed sensor will be about 0.1V pulse when the magnet passes the wheel. Meter needle will flicker on 0.5v range. If the cruise is connected to the motorcycles speedometer sender is may produce a similar signal (some BMW use this type of speedo sender) or it will be a 0V to 4~8V pulse that occurs with wheel rotation.

Brake sensor

Pin 19 (power/brake sensor supply, orange)	~12V
Pin 20 (brake sensor, grey)	0~1V with brakes OFF
"	~12V with brakes applied

Unused positions

- Pin 3 NOT USED
- Pin 7 NOT USED
- Pin 10 NOT USED
- Pin 11 NOT USED
- Pin 12 NOT USED
- Pin 17 NOT USED
- Pin 21 NOT USED
- Pin 13 **OR** 25 NOT USED

Diagnostic stop (error) codes

This cruise control has diagnostic stop code function built in. The red light (LED) beside the connector on the cruise control computer displays the code by flashing. This stop code is displayed whenever the cruise control fails to engage when SET or RES are pressed or whenever the cruise control disengages. 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.

Ride the bike at normal speeds (50~100 kph or 30~60 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 controlling 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 actuator, check voltages to the actuator, check vacuum to the actuator, check actuator operation, check actuator cable and CIU operation.

If the engage light does NOT come on when you press SET, or the cruise control disengages unexpectedly, stop the bike. DON'T TURN THE IGNITION SWITCH OFF. Observe the RED LED (light) beside the connector on the computer. If the cruise control will not engage or disengages, the red LED 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 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. The stop code will NOT work if the cruise control disengages because the cruise control computer loses power (blown fuse or broken wire).

Remember, if the engage light does come on when the SET button is pressed, 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**Code****Possible cause**

ON-OFF switch signal detected (ON-OFF switch OFF)	1	ON-OFF switch OFF or faulty
No speed signal	2	Speed signal/sensor/wiring faulty
Below minimum engage speed (about 35kph)	3	Speed pulse rate too slow/faulty#
Above maximum engage speed (about 180kph)	4	Speed pulse rate too high/faulty#
Over speed or under speed (150% or 80% of current SET speed)	5	Speed signal/sensor/wiring faulty
Brake signal detected	6	Brake light/switch/wiring fault
Neutral/clutch signal detected	7	Neutral/clutch switch/wiring fault
Computer re-boot	8	Cruise Control Computer reset*
Exceed maximum allowable acceleration	9	Too much speed pulse variation
Overrev sense (tacho sensing)	10	Changed gear or clutch slip
Configuration lost	11	Cruise Control memory failure%
Not configured	12	Calibration routine must be performed%

#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: - If the computer resets repeatedly it should be returned for warranty investigation.

%Note: - Code 11 and 12 require 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.