Trouble Shooting Guide

Problem:	**Undertake the following test**
1 Cruise will not engage.	**Perform diagnostic test on next page FIRST**

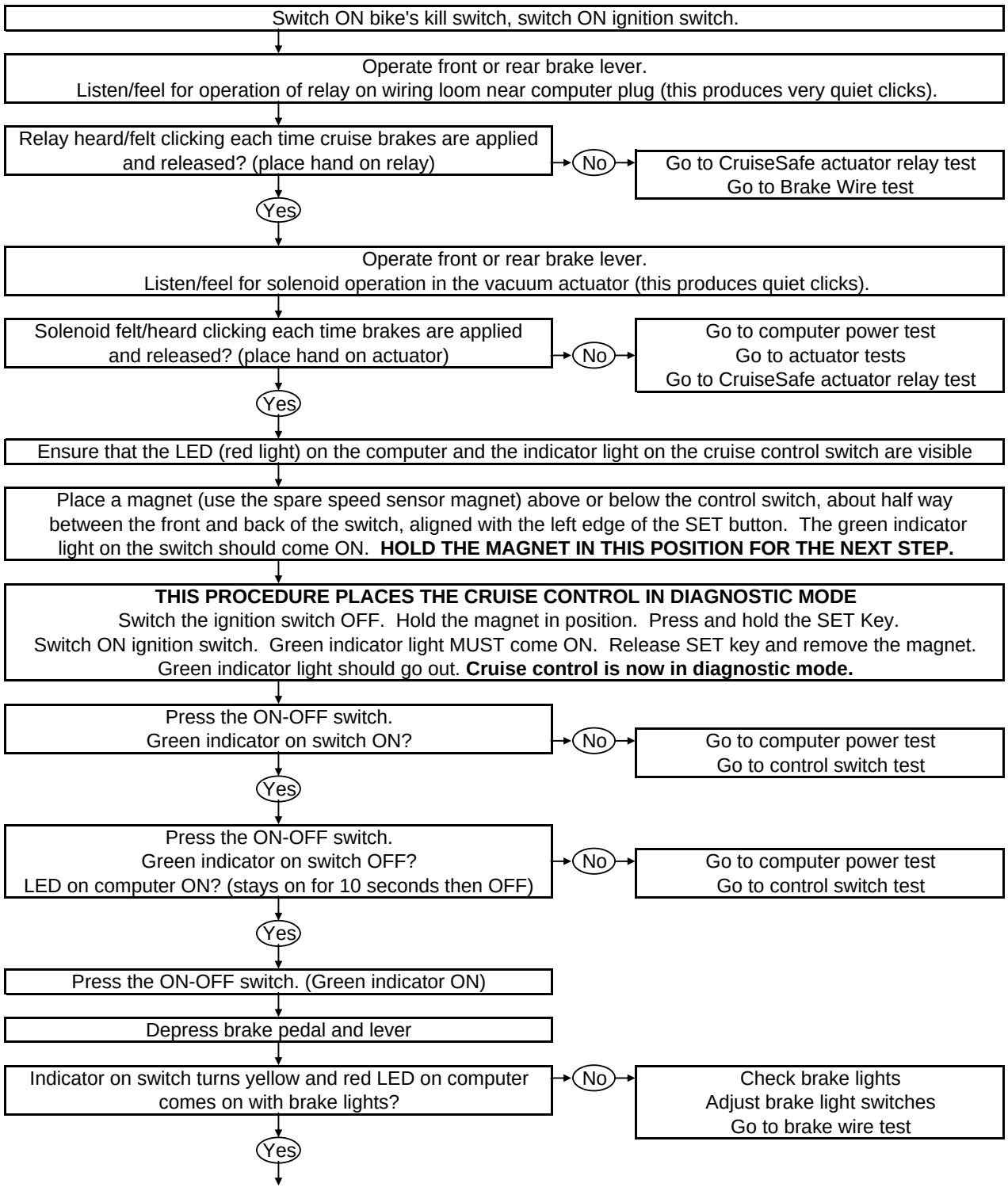
NOTE: - The most common cause of cruise control malfunction is loose or dirty electrical connections. Disconnect, clean and reconnect ALL electrical connections if the cruise control will not operate in diagnostic mode. The usual connections are: computer plug, control switch plug, actuator plug, fuse, 'CruiseSafe' relay, speed sensor or speedometer connection, brake light switch, ground (usually battery negative) and either tach (ignition primary) or the bike's clutch switch.

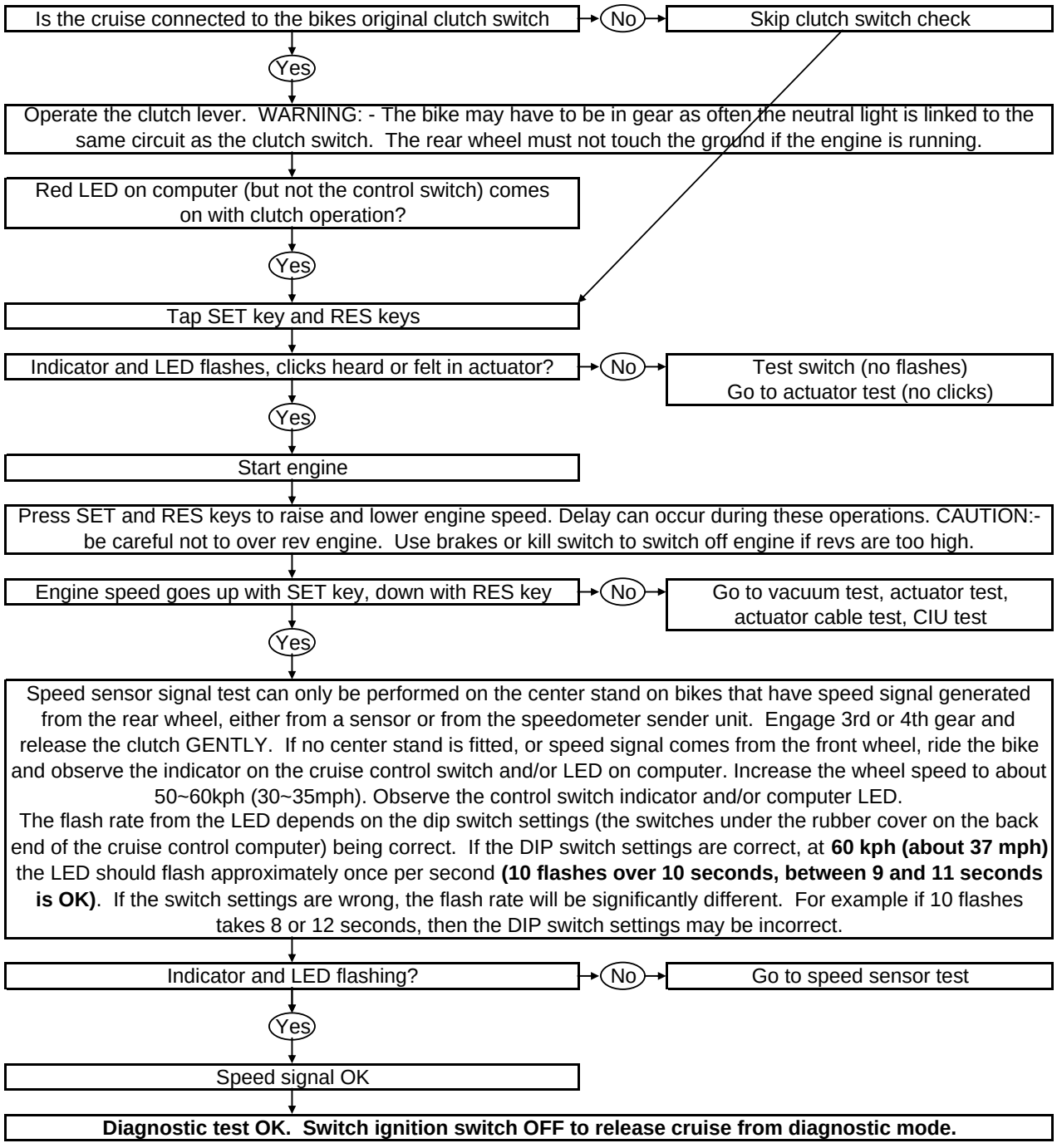
a. Check computer dip switch settings
b. Computer power test.
c. Speed sensor test if sensor installed
d. Actuator test
e. CruiseSafe actuator power relay test
f. Vacuum test
g. Actuator cable test
h. Brake wire test
i. CIU test
j. Control switch test
k. Loom continuity and voltage/resistance tests

2 Cruise control erratic, surges or looses/gains speed.	a. Adjust gain/check dip switch settings b. Check carburettor cable free play c. Speed sensor test if sensor installed d. Actuator test e. Vacuum test f. Actuator cable test g. CIU test if CIU installed
3 Cruise lags or overshoots when engaged	a. Adjust gain/check dip switch settings b. Actuator test c. Vacuum test d. Actuator cable test e. CIU test if CIU installed
4 Cruise disengages (Note: Carefully check all wiring for intermittent connections)	a. Tach sensor test b. Brake light switch adjustment c. Brake wire test d. Actuator test
5 Cruise accelerates too slow	a. Actuator test b. Vacuum test
6 Cruise will not disengage with brake	a. Brake light switch faulty b. Brake wire test c. Actuator test d. Actuator cable test
7 Carburettor will not return to idle	a. Check carburettor cable free play b. CIU test if CIU installed c. Actuator cable test d. Broken throttle spring or sticking carburettors
8 Cruise will not operate at higher speeds (above 80 kph / 50 mph)	a. Speed sensor test / gap too small b. Too many magnets installed c. Incorrect calibration, check dip switch settings
9 Cruise will not operate at lower speeds (below 60 kph / 35 mph)	a. Speed sensor test / gap too large b. Magnet/s missing c. Incorrect calibration, check dip switch settings

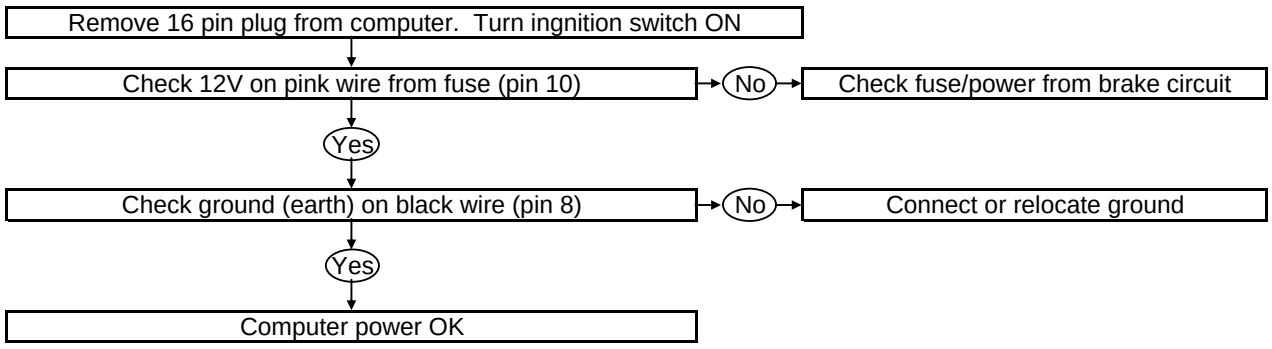
MOTORCYCLE CRUISE TROUBLE SHOOTING TESTS

Cruise control diagnostic test

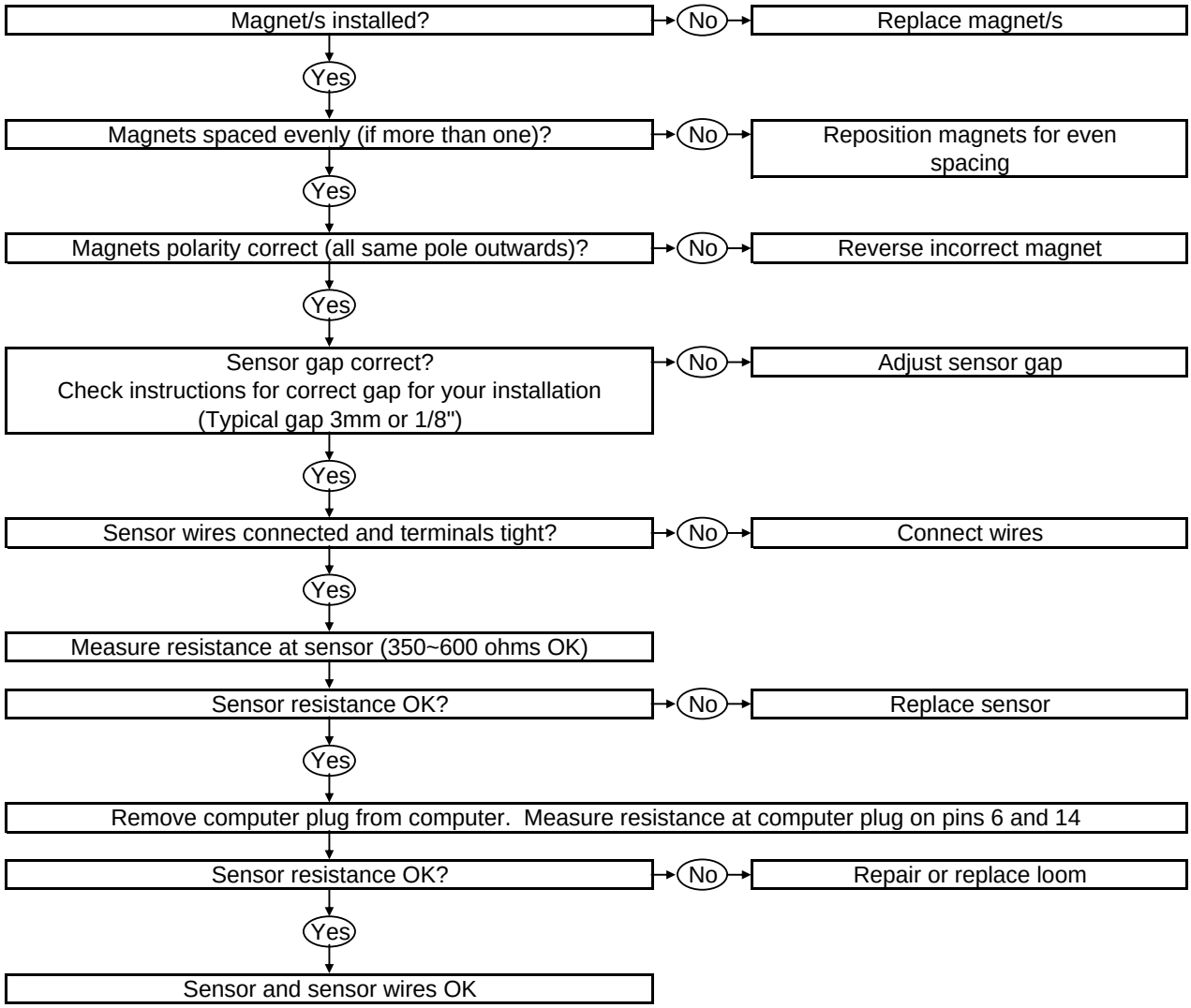




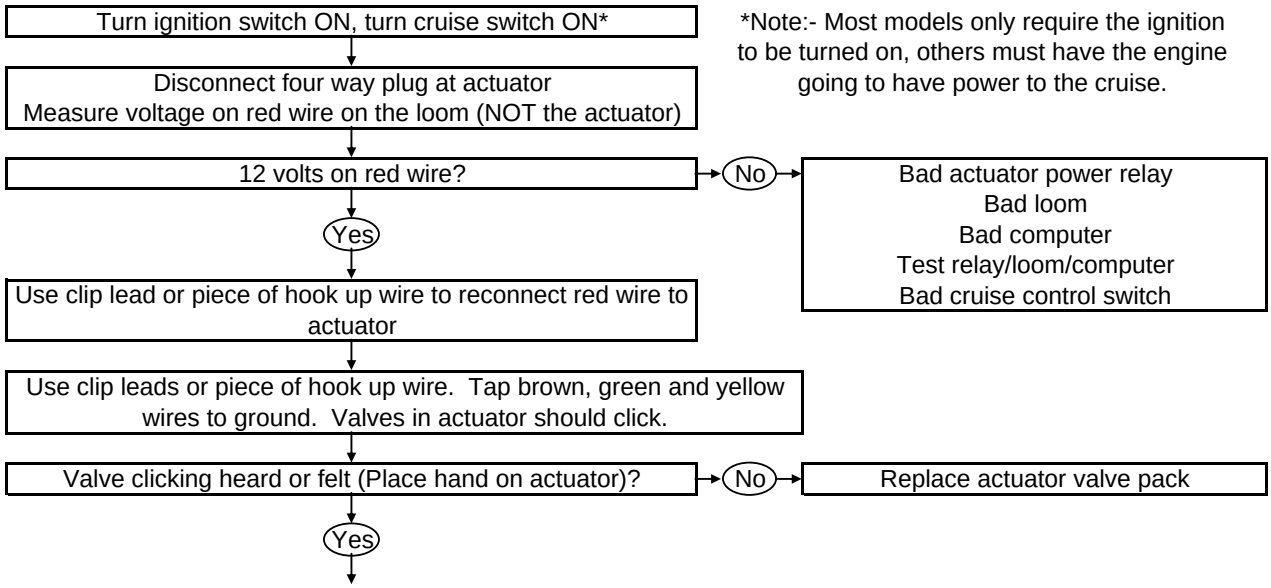
Computer power test



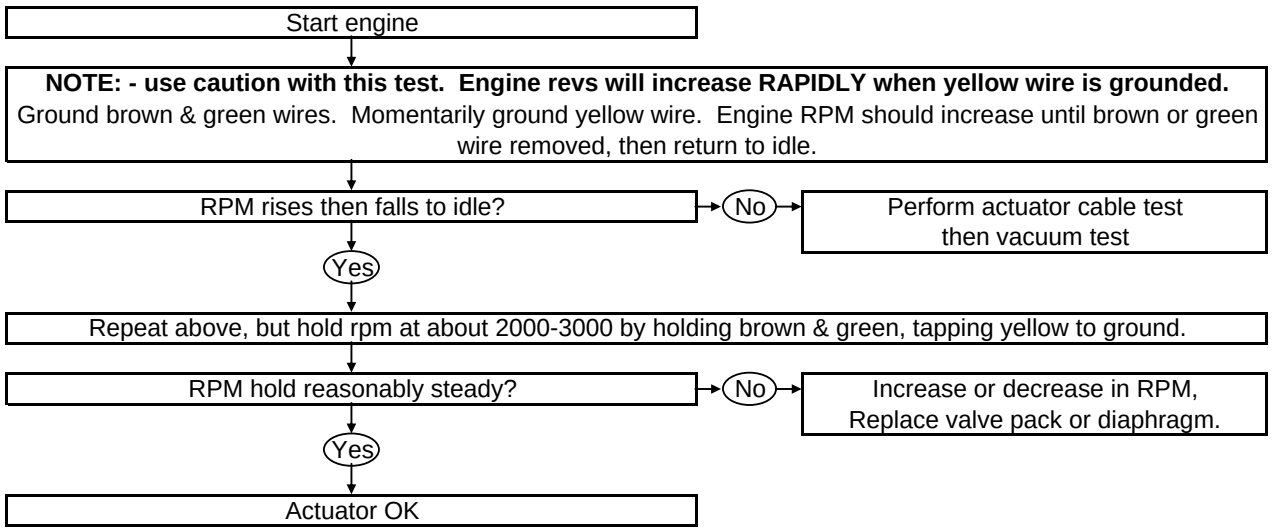
Speed sensor test



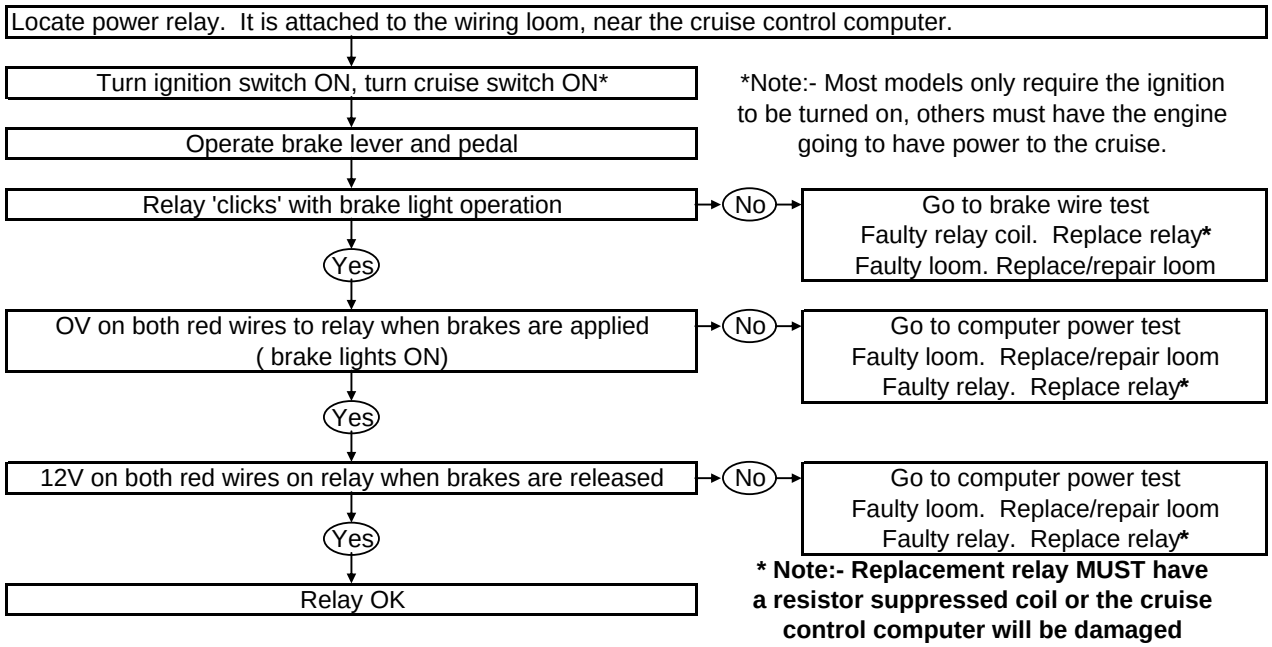
Actuator test



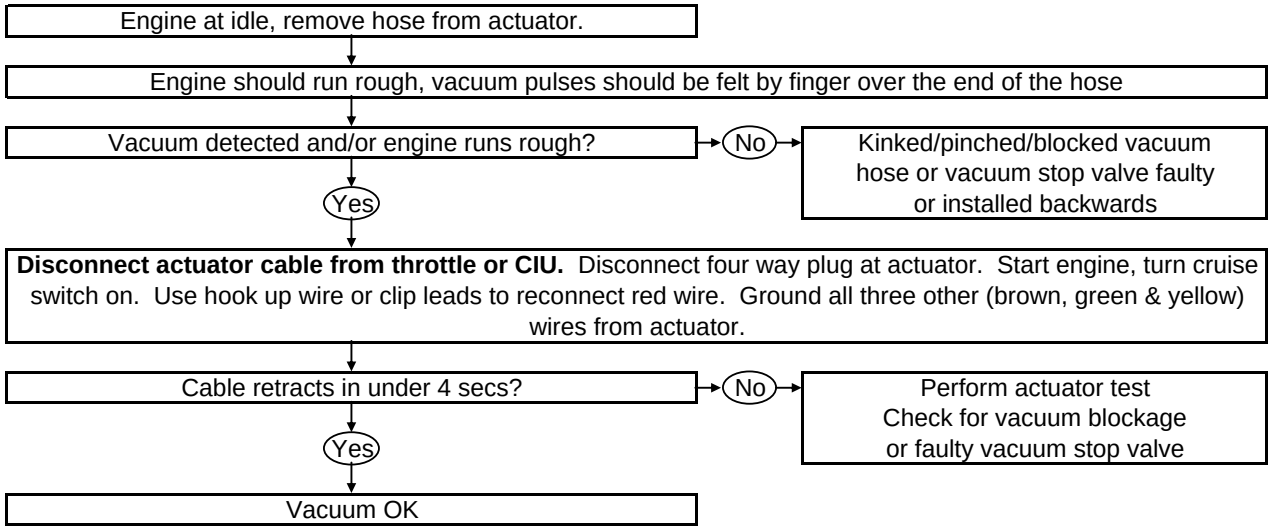
*Note:- Most models only require the ignition to be turned on, others must have the engine going to have power to the cruise.



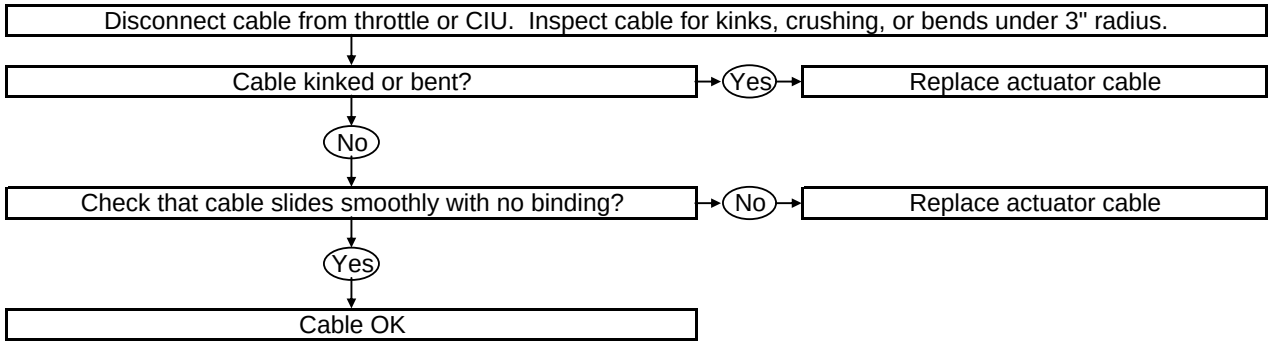
CruiseSafe actuator power relay test



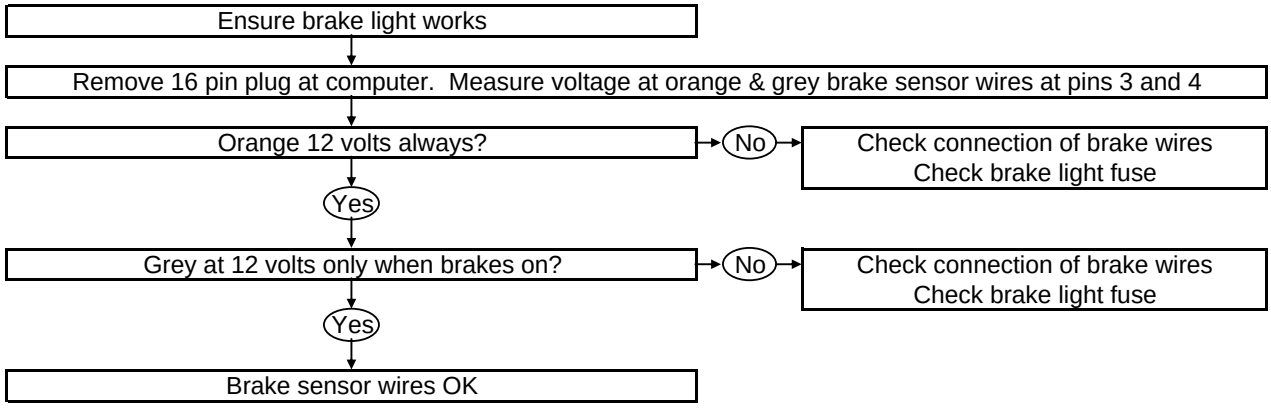
Vacuum test



Actuator Cable test

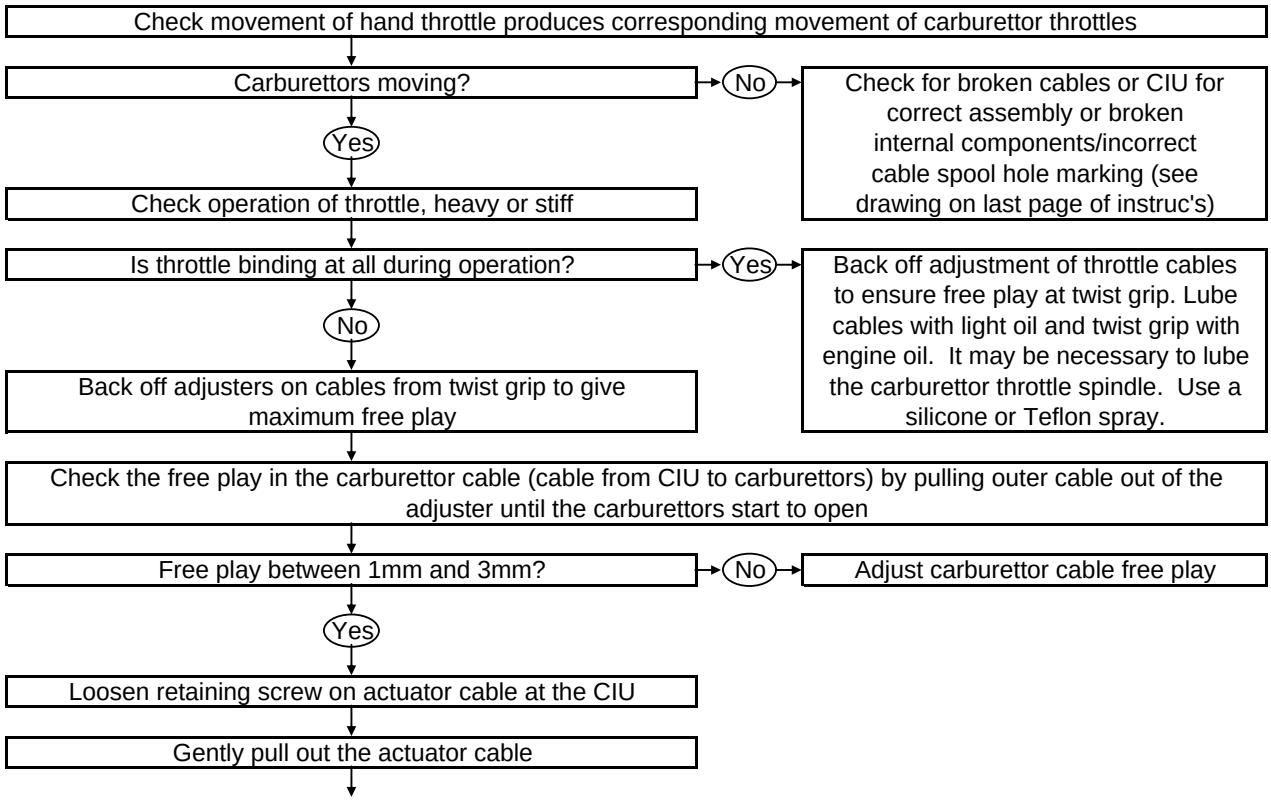


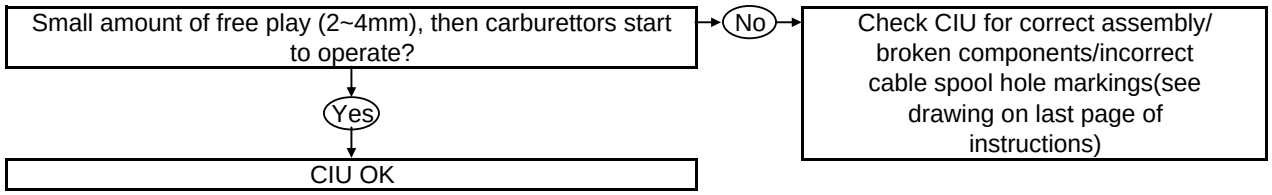
Brake wire test



CIU test

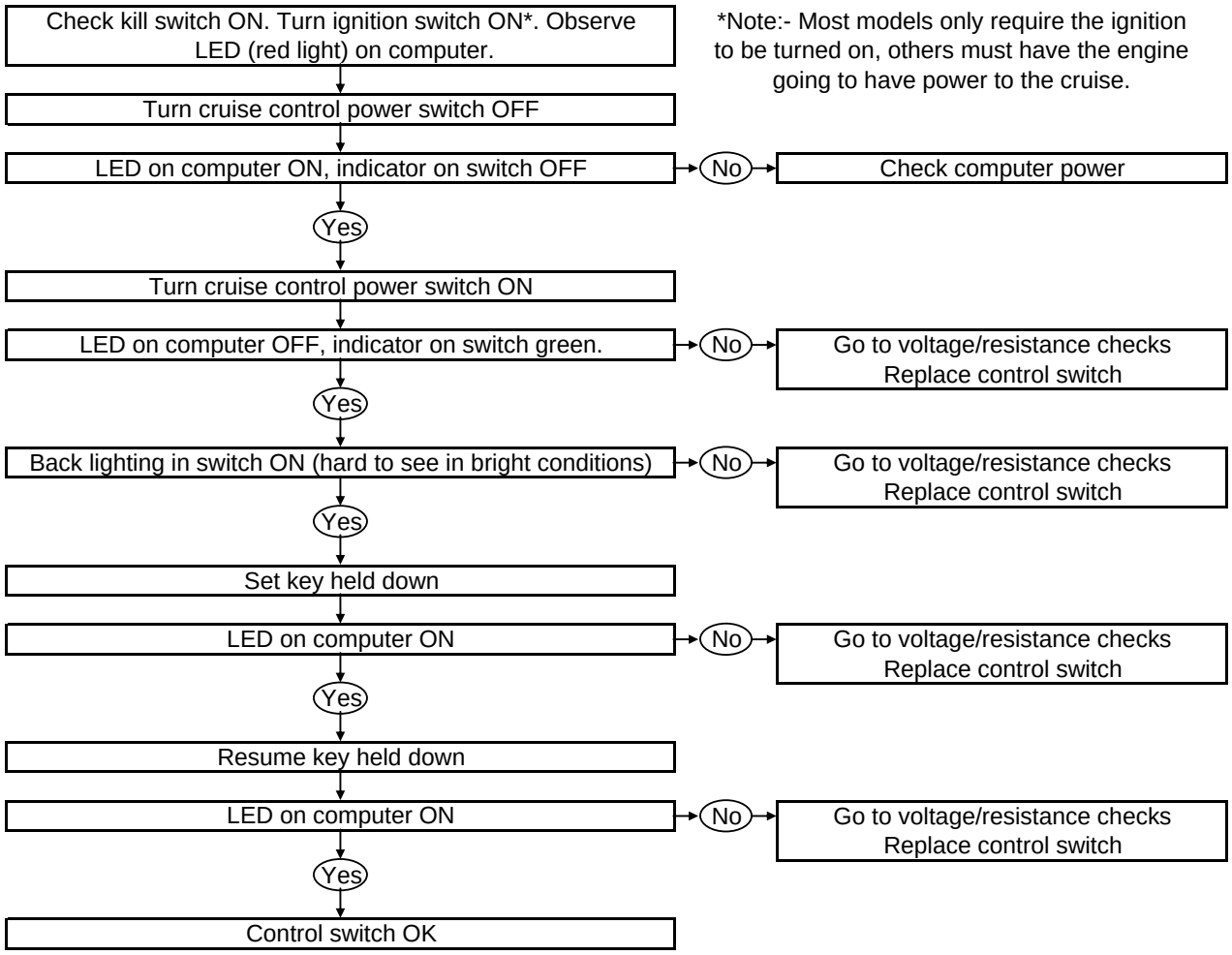
(Only models that **don't** have the actuator cable connected directly to the carburettors)





Control switch test#

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



Tach sensor test

Note: - This test can be used if the cruise control disengages at random without any input from the rider.

Refer to the installation instructions for the cruise control. Find the section, 'Installing the wiring loom' which will be in Section 7 of the manual. Find the reference to 'Connecting the tach or ignition sensor'. In this section you will be shown how to connect the tach sensor wire to the bike's ignition coil or tachometer signal.

↓

Disconnect the yellow wire on the cruise control loom from the bike's ignition coil or tachometer. Reconnect the bike's original coil wire or tachometer wire to its original connection. Tape up the yellow cruise control wire to prevent electrical short circuits.

↓

Test ride the bike to check if the cruise control still disengages randomly.
WARNING: - The clutch disengage function on the cruise control will not work. DO NOT OPERATE THE CLUTCH WHILE THE CRUISE CONTROL IS ENGAGED.

↓

Does the cruise operate normally without disengaging at random? → (No) → Contact MotorCycle Setup for possible solutions

↓ (Yes)

Reconnect tach sensor wire
Return to other tests for cruise disengage

Computer DIP switch settings

Refer to the computer installation section of the Installation Manual (Section 7), Road Test & Adjustments in the Installation Manual (Section 9) or the section on adjusing the gain in the Operation & User manual. These sections will also give you the correct original setting for your bike.

DIP switch setting table for speed signal Pulses Per Mile,
Speed Signal Input select and Gain setting

Speed signal PPM Low range
Switch 1 Dip 1 & 2 with switch 2 DOWN

PPM	1000	2000	3000	4000	5000	6000	8000	10000	12000
DIP1	–	–	–	o	o	o	+	+	+
DIP2	–	o	+	–	o	+	–	o	+

Speed signal PPM High range
Switch 1 Dip 1 & 2 with switch 2 UP

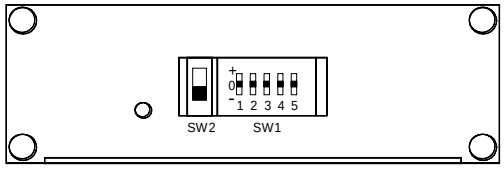
PPM	16000	32000	48000	64000	80000	96000	128000	160000	192000
DIP1	–	–	–	o	o	o	+	+	+
DIP2	–	o	+	–	o	+	–	o	+

Speed signal input select
Switch 1 Dip 3
DIP 3 – for tach (ignition coil)
DIP 3 0 or + for low voltage (sensor or speedo)

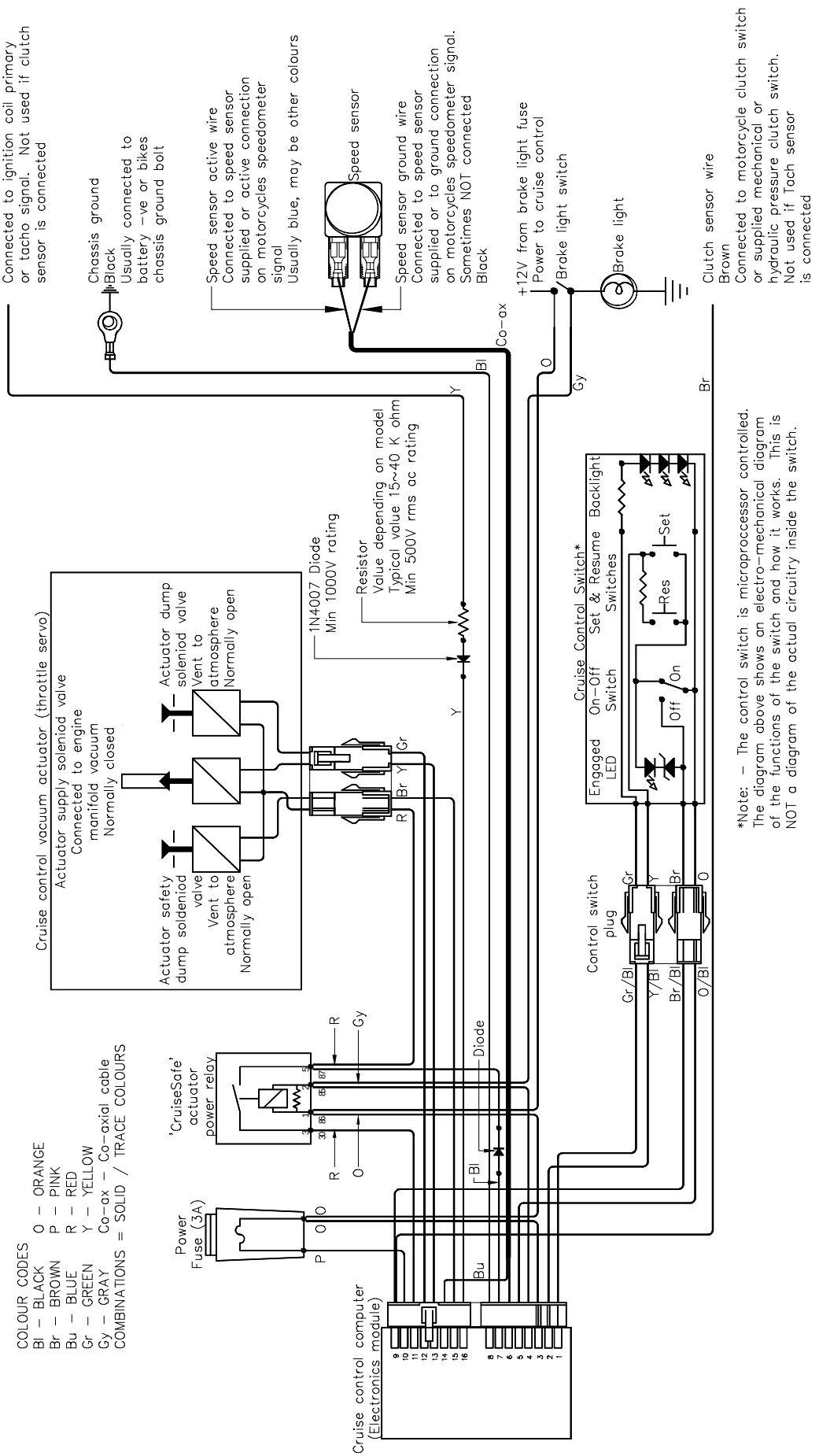
Gain setting

Switch 1 DIP 4&5	LOW			MEDUIM			HIGH		
DIP4 Coarse	–	–	–	o	o	o	+	+	+
DIP5 Fine	–	o	+	–	o	+	–	o	+

Switch 2
Down for low pulse/mile
Up for high pulse/mile

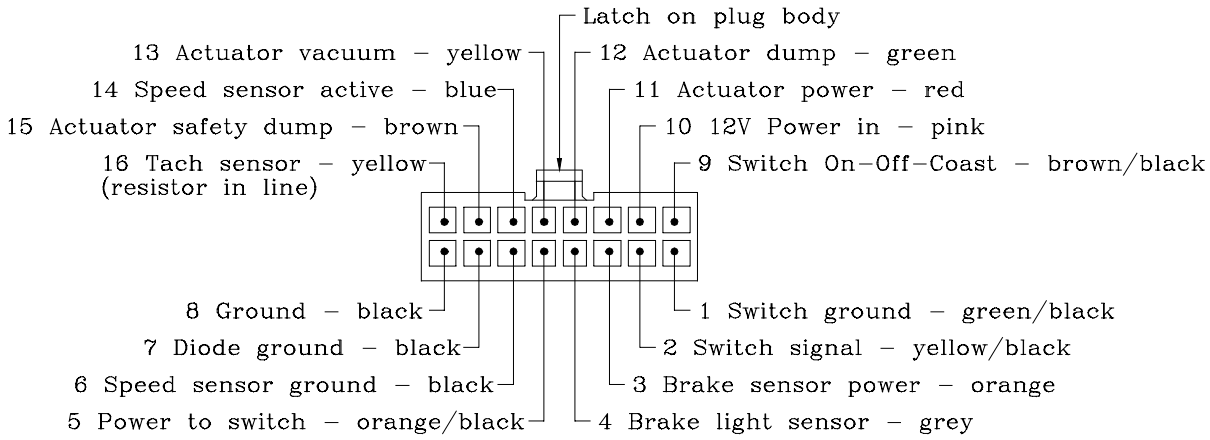


Wiring diagram



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.



View from back of loom plug
(wire entry side)

Resistance checks

Resistance values at loom computer plug for suspected Control Switch fault
(check with ignition switch **OFF** and computer **UNPLUGGED** from loom)
Use a speed sensor magnet and place it above OR below the control switch, about half way between the front and back of the switch, and aligned with the left (outside) edge of the SET button. Hold magnet in this position.
Touch the ohmmeter probes to the pin numbers indicated

SET & RES

Pin 2 (switch signal, yellow) & pin 5 (power to switch, orange)	∞ Ω(ohms)
"	0 Ω(ohms) when SET button pressed
"	1500 Ω(ohms) when RES button pressed

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 12 (actuator, green) & pin 11 (actuator relay, red)	∞ Ω(ohms) (no continuity)
Pin 13 (actuator, yellow) & pin 11 (actuator relay, red)	∞ Ω(ohms) (no continuity)
Pin 15 (actuator, brown) & pin 11 (actuator relay, red)	∞ Ω(ohms) (no continuity)
Pin 12 (actuator, green) & pin 13 (actuator, yellow)	80~100 Ω(ohms)
Pin 12 (actuator, green) & pin 15 (actuator, brown)	80~100 Ω(ohms)
Pin 13 (actuator, yellow) & pin 15 (actuator, brown)	80~100 Ω(ohms)

Resistance values at loom computer plug for suspected Actuator (throttle servo) & CruiseSafe relay fault
(check with ignition switch **ON** and computer **UNPLUGGED** from loom)
Touch the ohmmeter probes to the pin numbers indicated

Pin 12 (actuator, green) & pin 11 (actuator relay, red)	40~50 Ω(ohms) with brakes released
"	∞ Ω(ohms) with brakes applied
Pin 13 (actuator, yellow) & pin 11 (actuator relay, red)	40~50 Ω(ohms) with brakes released
"	∞ Ω(ohms) with brakes applied
Pin 15 (actuator, brown) & pin 11 (actuator relay, red)	40~50 Ω(ohms) with brakes released
"	∞ Ω(ohms) with brakes applied

Resistance values at loom computer plug for suspected <u>ground connection</u> fault
(check with ignition switch **OFF** and computer **UNPLUGGED** from loom)
Touch the ohmmeter probes to the pin numbers or locations indicated

Pin 8 (ground) & vehicle frame	0 Ω(ohms)

Resistance values at loom computer plug for suspected <u>Speed Sensor</u> fault
(check with ignition switch **OFF** and computer **UNPLUGGED** from loom)
Touch the ohmmeter probes to the pin numbers indicated

Pin 14 (sensor active) & pin 6 (sensor sheild)	350~600 Ω(ohms) if using supplied speed sensor
	Unknown if units taps into motor cycle speedo.

<u>Voltage checks</u>

<u>Voltage values at loom computer plug</u> (check with ignition **ON** (engine running on some models) and cruise control in diagnostic mode. See the next line to put cruise control in diagnostic mode.
Use a speed sensor magnet and place it above OR below the control switch, about half way between the front and back of the switch, and aligned with the left (outside) edge of the SET button.
Hold the magnet in position. Press and hold SET key. Turn ignition switch ON. Release SET key and remove magnet. Place +ve probe in the back of the computer plug to measure voltages and -ve probe to motor cycle frame or on pin 8, ground.

Control switch

Pin 1 (switch ground, green)	0V
Pin 2 (SET & RES switch signal, yellow)	0V (ON-OFF switch MUST be ON)
"	11~14V with SET pressed (ON-OFF switch ON)
"	3~5V with RES pressed (ON-OFF switch ON)
Pin 5 (power to switch, orange)	11~14V
Pin 9 (ON-OFF switch signal, brown)	11~14V with ON-OFF switch OFF
"	3~6V with ON-OFF switch ON *
Pin 9 Clutch and/or neutral sensor (on some models only)	11~14V when clutch operated or neutral selected

* Note: - On some bikes if clutch and neutral switch are connected to cruise control, the bike will have to be in gear to read the 3~6V. When the clutch is operated or neutral selected pin 9 will be at 11~14V always.

Actuator (throttle servo)

Pin 11 (actuator power, red)	10~13V with brakes released
"	0V with brakes applied
Pin 12 (actuator dump, green)	10~13V with brakes released
"	0V with brakes applied
"	0~1V with SET key pressed
"	0V with 10~13V pulses with RES key pressed
Pin 13 (actuator vacuum, yellow)	10~13V with brakes released
"	0V with brakes applied
"	10~13V with 0V pulses with SET key pressed
"	10~13V with RES key pressed
Pin 15 (actuator safety dump, brown)	0V

Speed Sensor

Pin 14 (speed sensor active signal, blue)	See note 1 below
Pin 6 (speed sensor ground, black)	0~0.1V

Note 1: - 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 occures with wheel rotation.

Tach Sensor

Pin 16 (Tach sensor, yellow) DO NOT CHECK VOLTAGE. THIS IS AN TACHO (IGNITION PRIMARY) INPUT AND MAY BE HIGH VOLTAGE. Ignition signal may be checked with an oscilloscope if tach input is not working.

Brake Sensor

Pin 3 (brake power, orange)	11~14V, max 1V drop with brakes applied
Pin 4 (brake light sensor, grey)	0~1V with brakes released
"	11~14V with brakes applied

Power	
Pin 10 (12V power in , pink)	11~14V
Ground	
Pin 7 (diode ground, black)	0V
Pin 8 (ground, black)	0V