Packing list for:
HUSQVARNA 701 Enduro 2017 to 2019
(for bikes equipped with Throttle-By-Wire)
MCS 7170 TBW Kit

Slim Switch □
Above Switch □
Below Switch □

Standard Computer Bracket □
LR Computer Bracket □

Terminal Tools □

Pack in small kit carton (MCS 002xxs)

Qty	Part Number	Description
1	MCS 7170TBW	Computer configured for Husqvarna 701 Enduro (medium parts bag) Computer sealed with HST700 Heatshrink tubing
2 lengths		Self-adhesive Velcro 7cm long

OPTIONAL – One of the following three items will be supplied

1	GT-1014-90	Slim Control Switch assembly	□
OR			
1	MCS 7174-830L	Above Control Switch assembly (medium parts bag)	□
OR			
1	MCS 7174-831J	Below Control Switch assembly (medium parts bag)	□
1	Parts bag	(See below for contents)	
1	MCS 7171TBW	Cruise Control wiring harness	
1	MCS 7021TPS	Throttle Position Sensor wiring harness	
1	Installation Manual for Husqvarna 701 Enduro 2017-2019		
1	Information, Set up and Operation Manual (TBW)		
1	Operation and User Manual		
1	Trouble shooting guide (TBW)		
NOTE:	Slim switch installation manual not required – included in Installation Manual for Husqvarna 701 Enduro 2017-2019		

Parts bag contents (medium parts bag)

OPTIONAL		Terminal extractor tool set	Supply tools □
1	MCS 7029A	KTM690 Standard computer mounting bracket	□
OR	MCS 7109A	Husqvarna 701 LR computer mounting bracket	□
15cm		Single sided foam tape (computer bracket mounting)	
1	FW-C-1F	1 way Furukawa receptacle housing (tach sensor connection)	
10cm	HST3	3mm heat shrink tube (speed sensor connection)	
1		Wire Paper Clip (terminal insertion tool)	
6		100mm cable ties	
6		150mm cable ties	
6		200mm cable ties	
6		300mm cable ties	

Motorcycle
Electronic Throttle-By-Wire Cruise Control Installation Manual ©

For Husqvarna 701 Enduro & 701LR Enduro
Model years from 2017 to 2019
Equipped with Throttle-By-Wire

8 October 2024

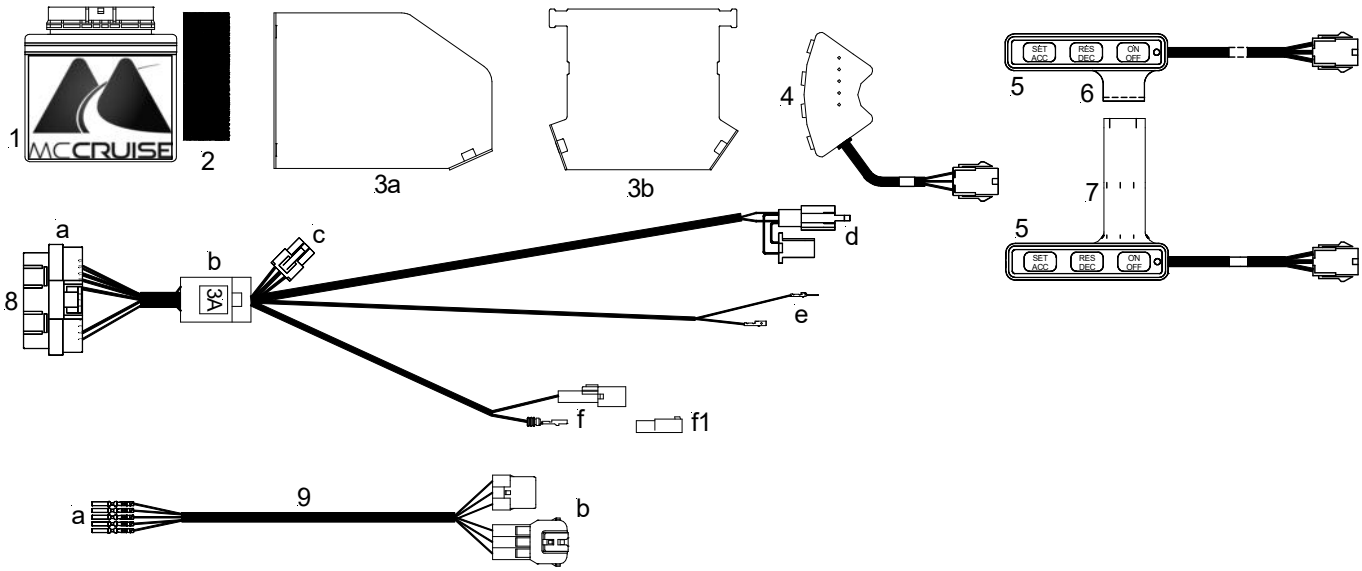
MOTORCYCLE CRUISE CONTROLS

MotorCycle Setup Pty. Ltd.
A.B.N. 94 798 167 654
AUSTRALIA

HUSQVARNA 701 & 701 LR Enduro 2017 to 2019 – Throttle-By-Wire

Parts list for MCS 7170 TBW kit

Item	Qty	Part Number	Description
1	1	MCS 7170TBW	Computer
2	2 lengths		Self-Adhesive Velcro 7cm long
3 **a**	1	MCS 7029A	Standard KTM690 Computer mounting bracket **OR**
b		MCS 7109A	Husqvarna 701 LR computer mounting bracket
	15cm		Single sided foam tape (for computer mount bracket)
4	1	GT-1014-90	Slim Control Switch.
	8cm		10mm mounting tape
OR			
		MCS 7174	Control Switch Assembly.
5	1	MCS 820-90	Control Switch
6	1	MCS 830L	Above bar switch bracket
7	OR	MCS 831J	Below bar switch bracket
	4		4-gauge x 1/2” pan head self-tap screw
8	1	MCS 7171 TBW	Cruise Control Wiring Harness
a			Computer plug (20 pin)
b			Fuse holder (3 amp fuse)
c			Control switch plug (6 pin)
d			Power/Brake sensor connectors (orange & grey wires)
e			Speed sensor connectors (blue/black wires)
f			Tach sensor connectors (yellow wires)
f1			Tach sensor connector housing
9	1	MCS 7021 TPS	Throttle Position Sensor Wiring Harness
a			Computer plug terminals
b.			TPS connectors
	1		Paper clip (terminal insertion tool)
	10cm	HST3	3mm heat shrink tube
	6		100mm cable ties
	6		150mm cable ties
	6		200mm cable ties
	6		300mm cable ties
			Installation Manual
			Information, Set up and Operation Manual
			Operation and User Manual
			Trouble shooting guide


1
MC CRUISE
2
3a
3b
4
5
6
SET ACC
RES DEC
ON OFF
7
5
SET ACC
RES DEC
ON OFF
a
b
c
d
8
3A
e
f
f1
9
a
b

Some background information for everyone on throttle-by-wire systems and cruise controls.

Frank and I at MCCruise are unapologetically conservative in our approach to this technology. The reasons are simple – even a cursory search for 'sudden unintended acceleration' on Google produces some startling results.

We cannot afford such events occurring on motorcycles – people will die – it is as simple as that. Consequently, we have made modifications and conducted exhaustive tests to ensure our kits will not cause dangerous situations. That said, with throttle-by-wire, we are totally in the hands of the motorcycle manufacturers' over-riding safety and limp-home systems kicking in appropriately. It is an area we have thought long and hard about before entering this market at all.

The other significant issue is what happens when a 'limp-home' event occurs on these vehicles. The most common response to ANY error in the signals from the twist grip/cruise control to the bike's engine management system is that the engine stops responding to throttle completely, and the engine drops to idle and sometimes stops altogether. This means that in the event of any error in signals from the twist grip and cruise control to the bike's engine management, the bike will no longer respond to throttle AT ALL, it behaves as if a throttle cable has broken. To restore control to the twist grip, the ignition switch must be turned off and back on again.

We think riders deserve to know the facts: corrosion, water ingress and electrical noise are serious potential threats on motorcycles, and we do not take them lightly.

We still have some reservations generally about throttle-by-wire systems on cars and bikes, we have not heard of any safety issues with bike systems, but a search on Google will find a lot of issues with cars, and bikes use the same type of throttle-by-wire control methods that cars use.

The design of these throttle-by-wire systems means that we physically cannot build in some of the basic safety overrides we built into our previous model cruise controls (for mechanical throttle systems), so more than ever we are reliant on the integrity of the motorcycle manufacturers' throttle control systems and safety overrides and very careful installation on the part of the installer.

Researching all this, designing and testing takes time and costs money. The cost of our product reflects that. We have put a lot of time and effort into making this product as safe as we can, and as easy to install as possible.

From you, the users, point of view, if for some reason an issue does occur, pulling the clutch will prevent the bike accelerating if too much throttle is applied, and if the engine stops producing power, pulling the clutch will allow you to roll to a stop without the engine slowing the vehicle dramatically. The engine may sit on the rev limiter, but engine management systems prevent the engine over revving on all modern motorcycles. You can then use the 'kill', or engine stop switch. With the combination of clutch and kill switch YOU retain control of the motorcycle.

Electronic Cruise Control
Installation Manual ©

WARNING: - IN THE EVENT OF ANY UNEXPECTED BEHAVIOUR RELATING TO THE THROTTLE, EITHER WITH THE CRUISE CONTROL TURNED ON OR NOT, PULL THE CLUTCH IN TO DISCONNECT DRIVE FROM THE REAR WHEEL AND USE THE 'KILL' OR ENGINE STOP SWITCH TO TURN THE ENGINE OFF.

Testing has resulted in programming to deliver safe, reliable operation on this motorcycle. It is essential that you install the cruise control in accordance with the advice in the installation instructions precisely so that electrical interference does not cause the vehicle or cruise control to behave erratically or be rendered inoperative.

WARNING: - This cruise will function properly only if your vehicle has resistor type (radio suppression) ignition wires (spark plug leads). The cruise control may not function properly if aftermarket SOLID CORE spark plug wires are installed. Please read Section 11, Safety Issues & Features before fitting & using the cruise control.

If, after reading these instructions, you feel you are not competent to install this kit, we strongly urge you to seek the assistance of your local dealer.

NOTE: - It is recommended that on most motorcycles the fuel tank is less than 1/4 full before attempting to fit the cruise control. The fuel tank must be lifted for most installation and can be very heavy when full of fuel.

CONTENTS

Chapters 1 to 5 and 8 to 11 are contained in the separate Information, Set up and Operation manual.

1. INTRODUCTION

Congratulations, you have purchased one of the most advanced cruise control systems in the world. All functions are microprocessor controlled, which reduces the complexity of installation.

Before installing your cruise control, take the time to read and understand each step in this manual. Several steps are dependent on others, so it is important know where and how each component is to be mounted before installation commences.

2. WARNINGS, CAUTIONS and NOTES

This manual contains several **cautions**, **warnings** and **notes,** which are prominently displayed. The convention used is:

A **warning** applies whenever injury could result from ignoring the warning;
A **caution** applies whenever damage to the bike or cruise control could result from ignoring the caution; and
A **note** applies where other aspects should be considered before any action to do with installation is undertaken.

EXAMPLES:

WARNING: - Always ensure the bike is properly supported on the side or centre stand and cannot accidentally fall off either stand.

CAUTION: - Before drilling any holes, make sure there are no components that may be damaged on the other side of the surface being drilled. Double check for any wiring harness that might be easily damaged by a drill bit.

NOTE: - Lay the wiring harness in place and connect the components before cable tying the harness in place.

3. TOOLS REQUIRED

NOTE – not all of the tools listed will be required for your installation, but most will be necessary or very helpful to have at hand.

- Socket and/or spanner, Torx and/or hex key set and screwdriver set to suit your motorcycle.
- Side cutters (to cut cable ties).
- Loctite ‘243’ medium strength thread locking compound or equivalent.
- Solvent and a clean cloth to clean surfaces before applying adhesive tape

4. PARTS LIST

Check that all components depicted on the first pages of this manual are included in the cruise control kit. Please phone (03) 9808 2804 within Australia, international (61 3) 9808 2804 or e-mail sales@mccruise.com for advice, if any parts are missing;

5. OVERVIEW OF CRUISE CONTROL OPERATION

Cruise control function

The principles behind your cruise control's operation are very simple:

- The computer continuously monitors the frequency of electrical pulses generated from the motorcycle's speedometer sender;

- When the SET key on the switch is pressed, the computer stores the pulse frequency at the time in memory and then continuously adjusts the throttle electronically, which controls the throttle to maintain the pulse frequency at the same figure to which it was set. If the frequency drops below the set frequency, the computer applies more throttle. If the frequency is above the set frequency, the computer releases the throttle. The key is that the computer monitors and reacts to changes very quickly and smoothly so that the speed effectively remains nearly constant.

There are three major components in most installations: the computer, the control switch and the wiring harness. The functions of each are described below:

- The computer - monitors road speed, adjusts the engine power by controlling the throttle, monitors engine rpm, the brake system and the control switch for instructions from these components.
- The control switch - sends instructions from the rider to the computer; and
- The electrical wiring harness - which connects the cruise control switch, the cruise control computer, the bike's throttle position sensor (TPS), the brake light system, the ABS system for speed signal, and one of the ignition coils for engine speed.

When the cruise control is operating, the computer electrically duplicates the operation of the throttle position sensor (TPS) which is normally operated by the twist grip.

If the throttle grip is twisted open while the cruise control is engaged the rider over-rides the cruise control. When the throttle is released, the cruise control will resume control, unless it has been disengaged by brake operation or if the motorcycle exceeds the current set speed by a significant amount such as during an overtaking manoeuvre or if the acceleration exceeds the pre-set limits in the cruise control. The cruise will also disengage if the speed drops significantly below the set speed such as when riding up hill. This is unlikely to occur on large capacity motorcycles.

6. PREPARING THE BIKE FOR CRUISE CONTROL INSTALLATION

The following directions may be used to prepare the bike for cruise installation:

NOTE: - Many of the photo in this manual are from a KTM690, which is not exactly the same, but is very similar in many most ways.

Remove the seat.

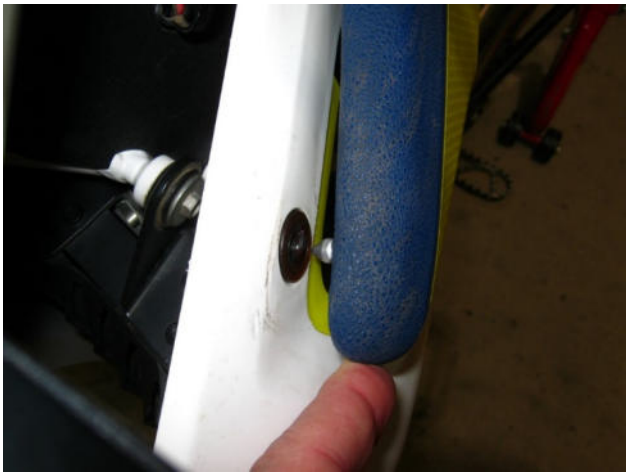
Pull the seat release tab to release the seat.

Lift the rear of the seat.

Pull the front edges of the seat outwards to….

….disconnect the fastener at the front edge of the seat.

Lift the rear of the seat and remove it from the bike.

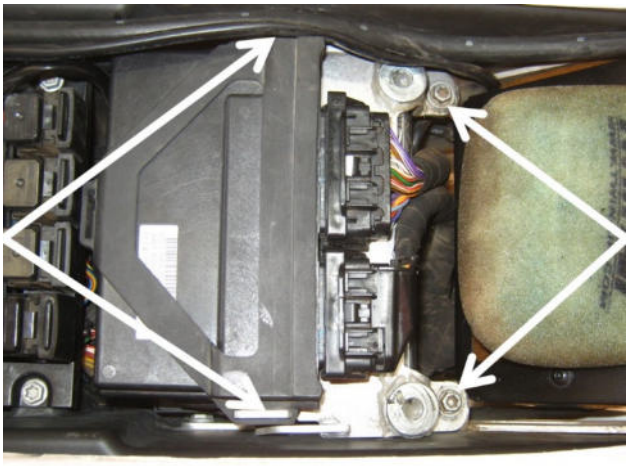


Disconnect the battery.

The battery is under the seat.

It is hidden under the bike's ECM. The ECM is attached to a mounting bracket using a rubber 'frame' attached at two tabs (left arrows).

The bracket is held with two bolts (right arrows)



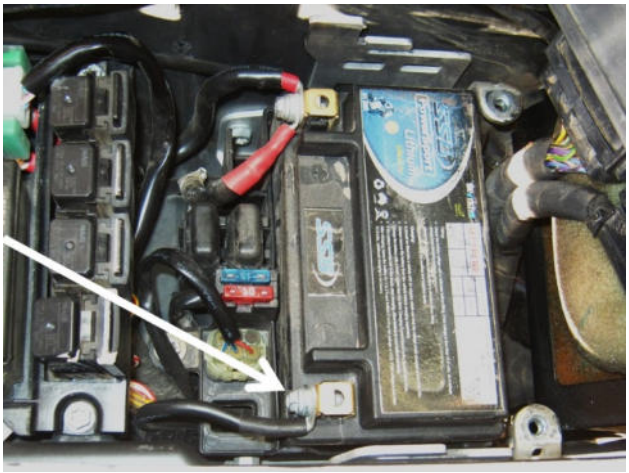
Disengage the rubber from the tabs and lift the ECM off the bracket.

Undo the two bracket mounting bolts (arrows).

Slide the bracket forward to disengage the two tabs, one each side (left side arrowed).

Disconnect the cable from the negative terminal of the battery.

Ensure that the cable cannot touch the battery terminal.



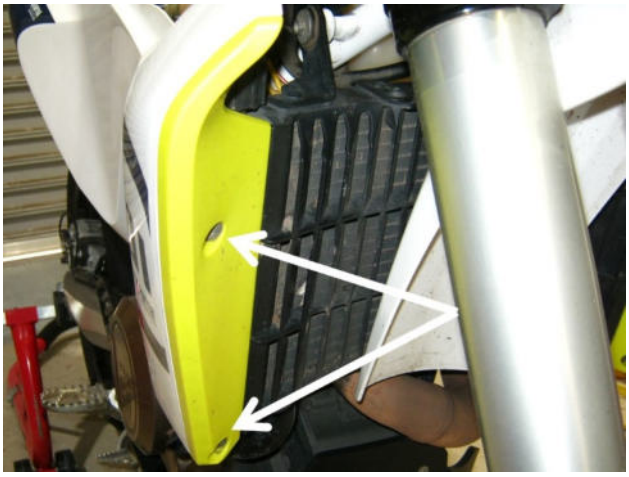
Remove the right and left side cover panels.

Remove the two mounting screws (arrows) at the upper rear edges of the panel.

Remove the two screws in the radiator surround panel.

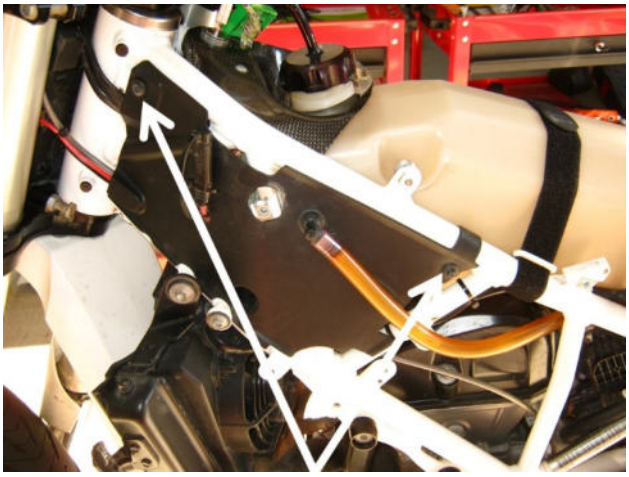
Remove the side panel from the bike.

Repeat on the left side panel

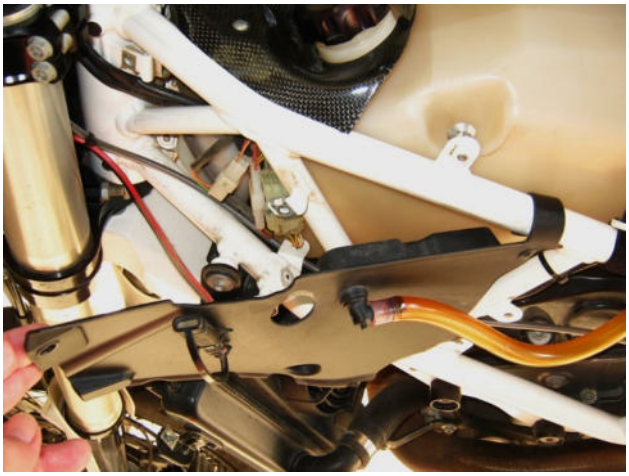


Loosen the plastic frame cover on the left side.

Remove the two screws/bolts, indicated.

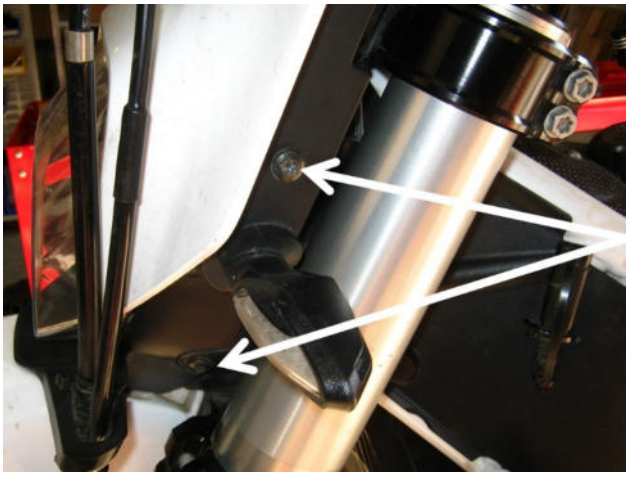


Ease the panel outwards enough to gain access to the electrical connectors behind the steering head.

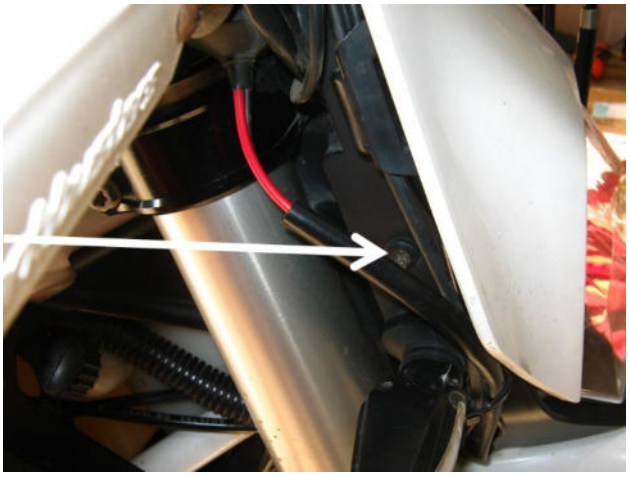


Demount the headlight assembly to allow access behind the headlight.

Undo the two screws on the left side of the headlight assembly.

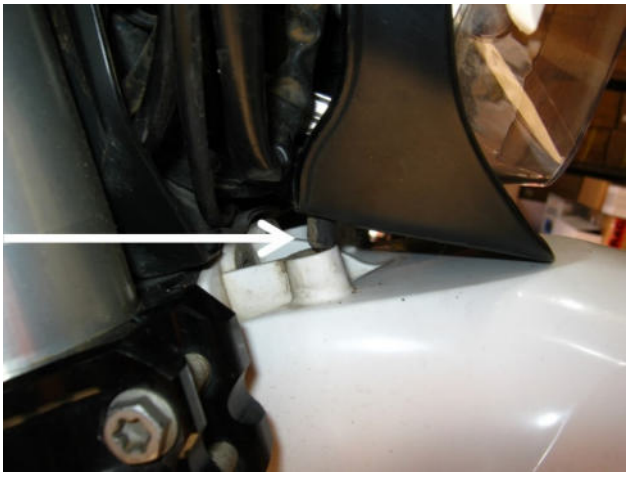


Undo the single screw on the right side of the headlight assembly.

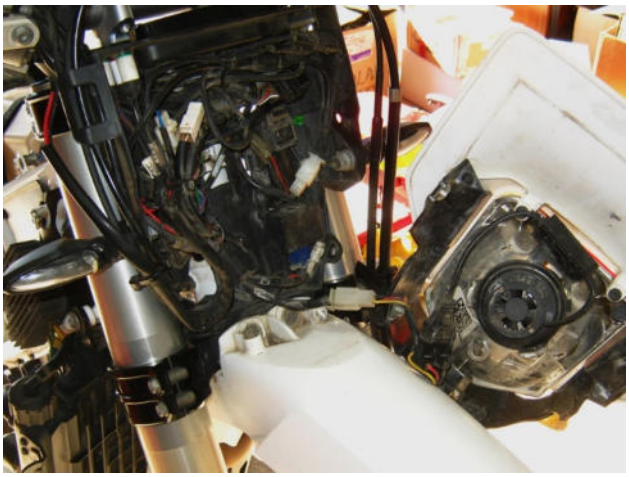


Lift the headlight out (forward) at the top and then lift it up off the two locating pegs at the bottom of the headlight (arrowed).

Lift the head light away from the bike.



Support the headlight on the left side of the bike to take the strain off the wires.



7. INSTALLATION

Installing the cruise control computer mounting bracket.

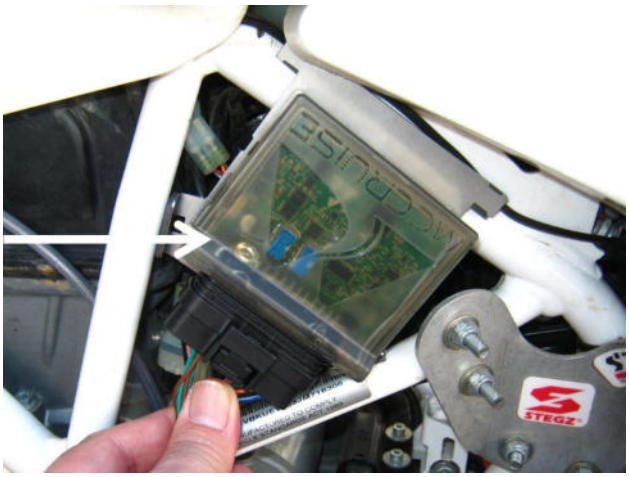
Standard mounting.

In the standard installation, the cruise computer will be mounted on the left side of the bike, next to the cylinder head.

LR (Long Range fuel tank) mounting.

If the Long Range computer mounting bracket is supplied in the kit, it is intended to be mounted in this location.

The cruise control computer then mounts on the bracket as shown.



Standard mounting bracket.

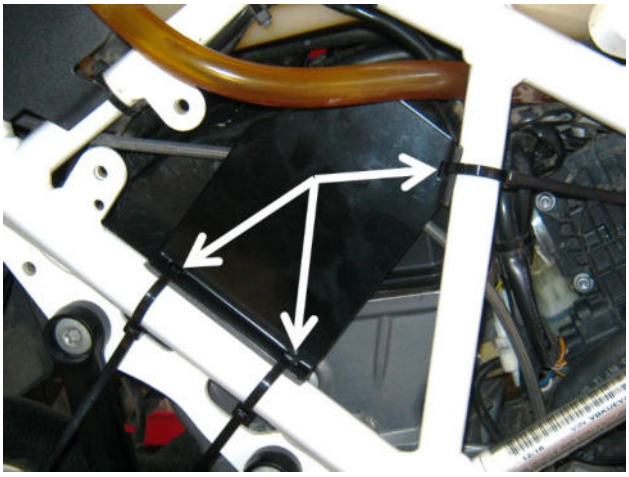
Locate the computer mounting bracket in the kit.

Locate the length of foam tape.

Cut two sections of foam tape to fit the two tabs on the mounting bracket and fit the tape to the bracket.

Position the bracket in the frame as shown, so the foam tape is in contact with the frame.

Attach the bracket to the frame using three cable ties.



Detail showing the upper cable tie.

Detail showing the two lower cable ties.

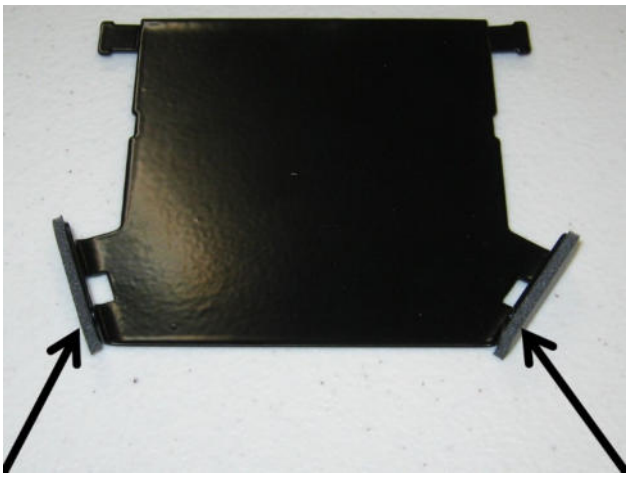
<u>LR mounting bracket.</u>

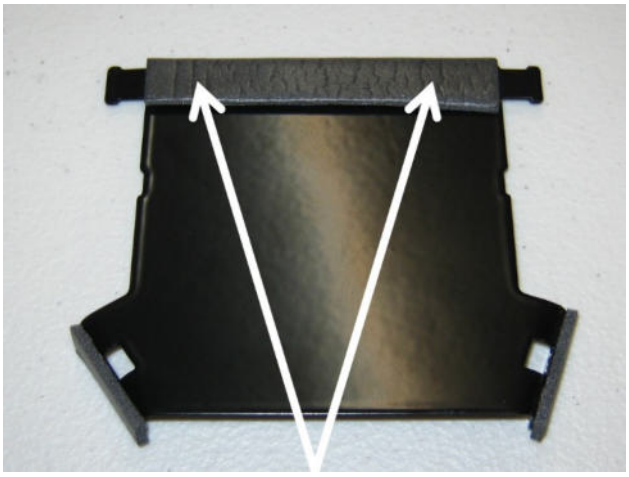
Locate the computer mounting bracket in the kit.

Locate the length of foam tape.

Cut two sections of foam tape to fit the two tabs on the mounting bracket and fit the tape to the bracket.

NOTE: - The tabs on the bracket are facing up in this photo.

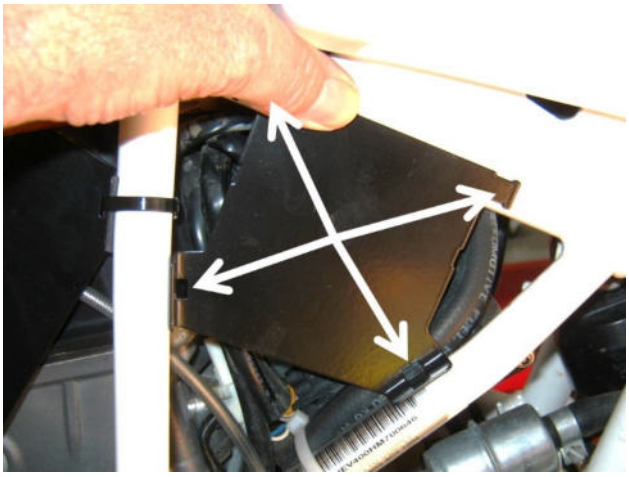




Flip the bracket over.

NOTE: - The tabs on the bracket are facing down in this photo.

Cut a longer length of tape to go on the back of the bracket and fit it to the bracket.



Position the bracket in the frame as shown, so the foam tape is in contact with the frame.

NOTE: - The tabs on the bracket should be facing out.

Attach the bracket to the frame using the two upper cable ties. Don't pull the cable ties tight yet.

It may be easier to fit the cruise control if you leave the fitment of the two lower cable ties until later after the wiring harness is connected and routed.

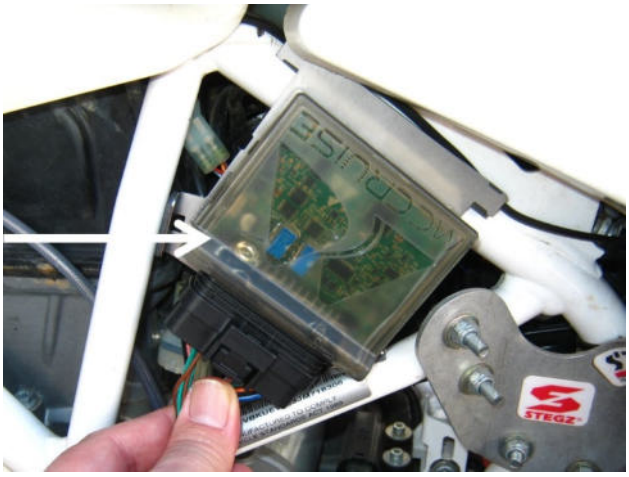
Clean the back of the cruise control computer with suitable solvent such as methylated spirits or denatured alcohol.

Apply the two lengths of the supplied Velcro tape to the back of the computer.

<u>Standard mounting bracket.</u>

Clean the computer mounting bracket with suitable solvent such as methylated spirits or denatured alcohol.

Apply the supplied Velcro tape to the bracket.



Husqvarna 701 LR mounting bracket.

Use the same procedure shown above to fit Velcro tape to the mounting bracket and fit the computer to the bracket as shown.

NOTE: - The tabs on the bracket should be facing out.

Installing the Control Switch.

There are three options for the cruise control switch.

The ‘standard’ switch is our new slim control switch.

This switch fits between the bike’s switch block and the clutch lever/mirror mount.

There is also the option to mount our original switch above the handlebar, on the mirror mount.

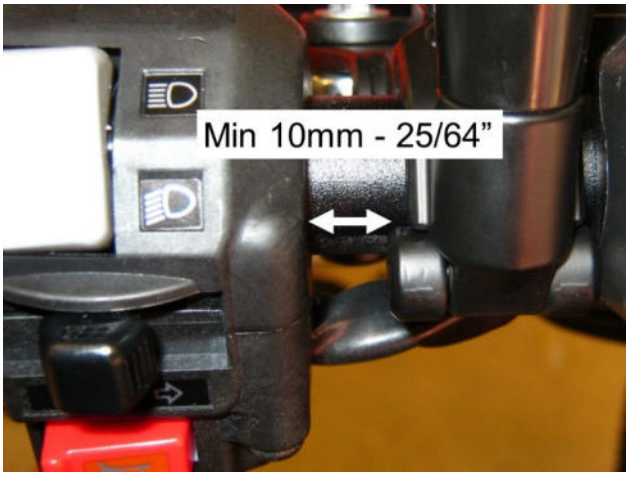
The last option is to mount the original switch below the handlebar on the mirror mount.

Fitting the slim switch.

As the bike is supplied, there is not enough space between the clutch lever mount and the bike's switch block for the 'slim' switch to fit.

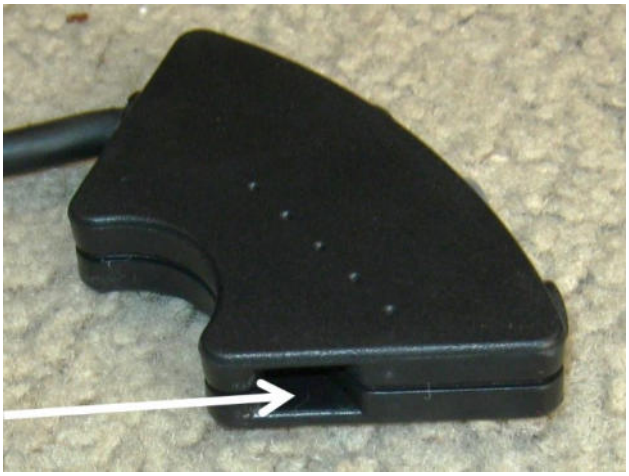
Loosen the clamp screw for the clutch lever mount and slide it along the handlebar so there is a 10mm gap.

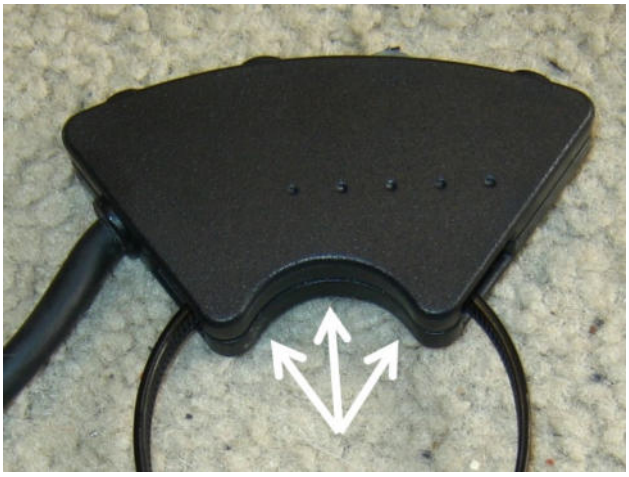
Insert the switch into the gap to determine the width required. The gap can be set so the switch is a 'neat' fit between the switch block and the clutch lever mount.



When we did this on 'our' bike, when the clutch lever is pulled all the way in, it just contacts the switch block, the grip flange and the handlebar grip itself.

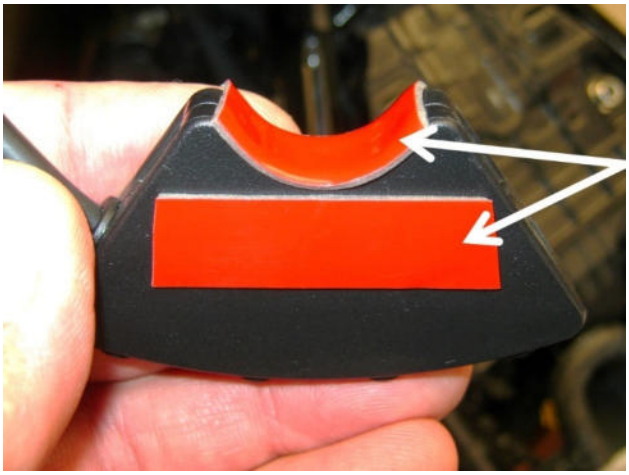
The housing has slot that runs through the switch for a cable tie, the cable tie straps the switch to the handlebar.





In order to mount the switch on the handlebar, feed one of the supplied long cable ties through the switch housing.

Clean the face (arrowed) with a suitable cleaning fluid (Methylated Spirits, Denatured Alcohol, bandage remover or similar). Allow it to dry.



The switch with the tape applied to the inside curve (upper arrow).

To improve the feel and stability of the switch you can also place a length of tape on the side of the switch to it contacts the bike's switch block (lower arrow). The tape may need to be trimmed to suit the bike's switch block.

This makes the mounting of the switch feel more solid.

Clean the handlebar with a suitable cleaning fluid (Methylated Spirits, Denatured Alcohol, bandage remover or similar). Allow it to dry.

Feed the switch wire and electrical connector below the handlebar.

Feed the cable tie around the handlebar.

CAUTION: - Take care to ensure the cable tie it routed between the handlebar and the wires from the bike's switch gear. Don't wrap the cable tie around the bike's wires or the wires will be damaged when the cable tie is tightened.

We suggest aligning the switch so the bike's indicator switch is roughly aligned with the cruise control SET button on this bike.

Trial fit the switch before peeling off the covering tape to find the best position.

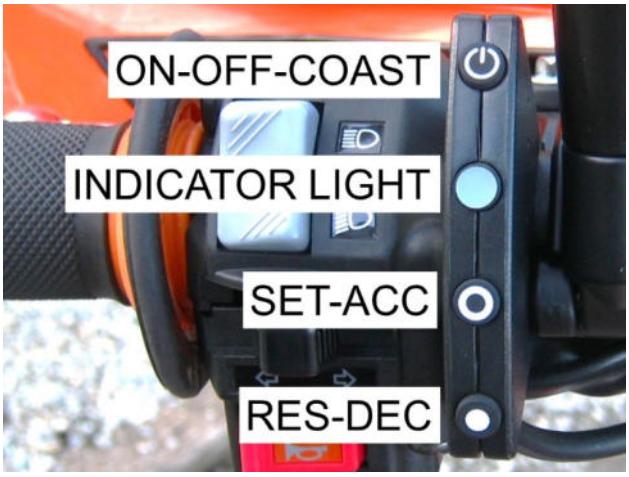
Remove the covering tape and press the switch against the handlebar, so the double-sided tape holds the switch in position.

Connect the ends of the cable tie and pull it tight to hold the switch firmly to the handlebar.

Trim the excess length of the cable tie.

Move forward a couple of pages for info about routing the switch wire.

See the next page for info about the switch buttons.



The operation of the switch is the same as our other control switch.

Press the ON-OFF button to enable the cruise control, and the indicator light will come on red – or red/green flashing if the brakes have not been applied since the ignition was turned on.

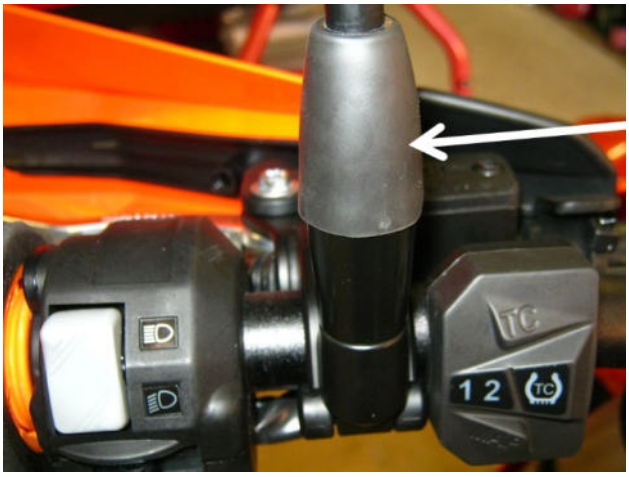
When the cruise control is engaged the light will change to yellow.

The SET/ACC and RES/DEC buttons work the same as the buttons on our older switch.

Fitting the original switches.

In both cases, the original switch is fitted on the bike's mirror mount.

Slide the rubber boot on the mirror stalk up.



Loosen the lock nut and unscrew the mirror from the adaptor. This thread is a left-hand thread, the nut and mirror must be turned the ‘wrong’ way to undo.

Undo the adaptor. This is a normal right-hand thread.

Place the switch bracket on the mirror mount and replace the adaptor with the switch mounting bracket between the adapter and the clutch lever mount.

Place the switch bracket on the mirror mount and replace the adaptor with the switch mounting bracket between the adapter and the clutch lever mount.

On the above bar mount, align the switch for easy access for the rider's thumb from the hand grip and tighten the adaptor firmly.

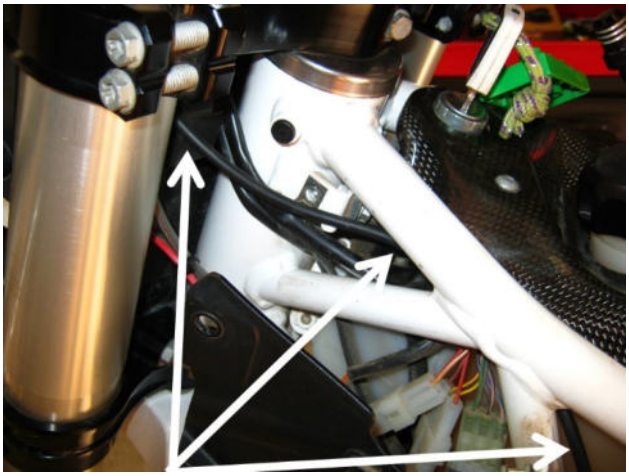
On the below bar mount, align the switch as shown and tighten the adaptor firmly.

Replace the mirror in the adaptor, align the mirror and tighten the lock nut.

Slide the rubber boot down over the adaptor.

Route the wires from the control switch down the handlebar with the bike's wires.

Route the wires to the rear below the upper frame tube.



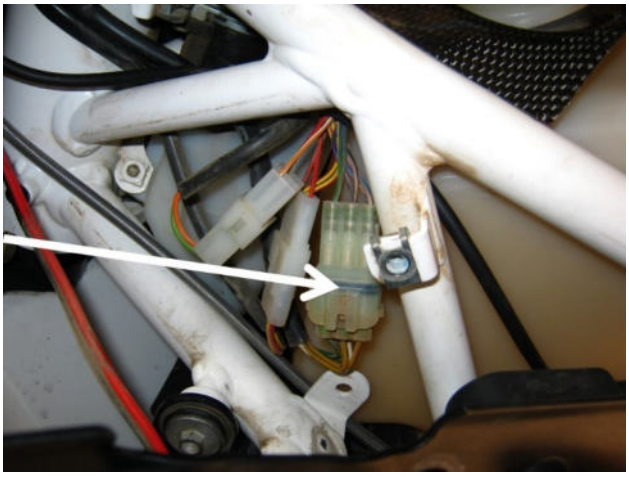
The harness should end near the computer mounting bracket.

Installing the TPS (Throttle-grip Position Sensor).

Locate the bike's throttle grip position sensor plugs.

These are located behind the steering head on the left side of the bike, a pair of 6-way plugs.

If you cannot find them follow the wires from the twist grip to the plugs.



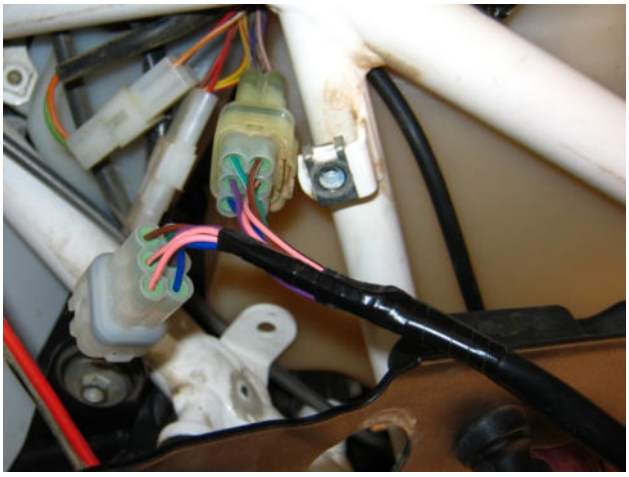
Draw the plug out of the frame.

Lift the latch to release the plug and disconnect the two halves of the plug.

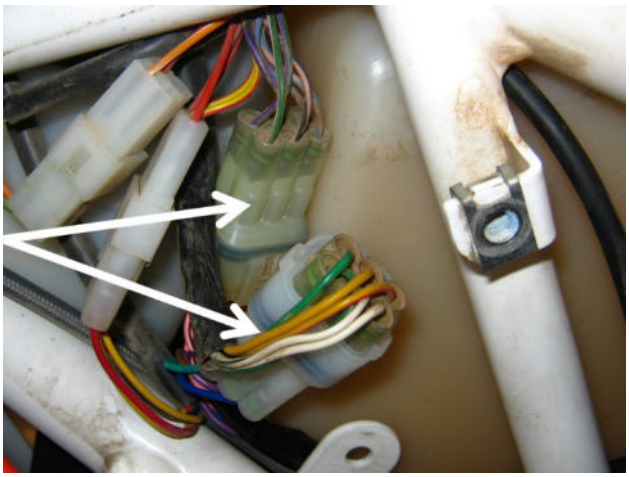
The TPS harness in the kit has two 6-way plugs on one end and 4 bare terminals on the other end.

Connect the cruise TPS harness plugs to the bike's throttle grip position sensor plugs.

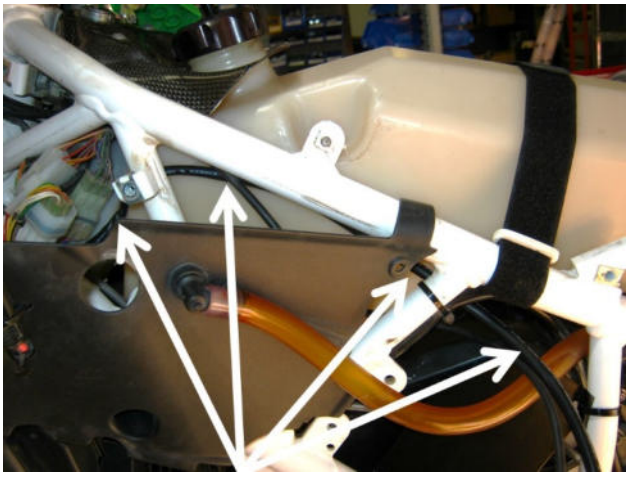
The TPS harness will bridge the connection between the bike's plugs and take the signal to and from the cruise computer.



Tuck the plugs into the cavity behind the steering head.



Route the wires to the rear of the bike with the control switch wires you routed previously to the cruise control computer mounting bracket.



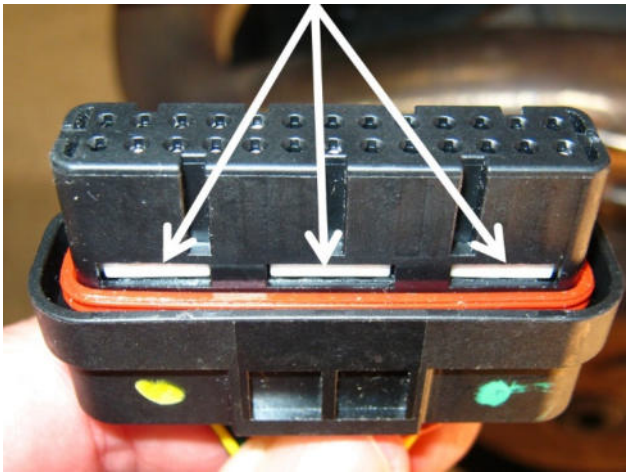
<u>Connecting the TPS sub-harness to the cruise control main harness.</u>

Locate the cruise control main wiring harness in the kit.

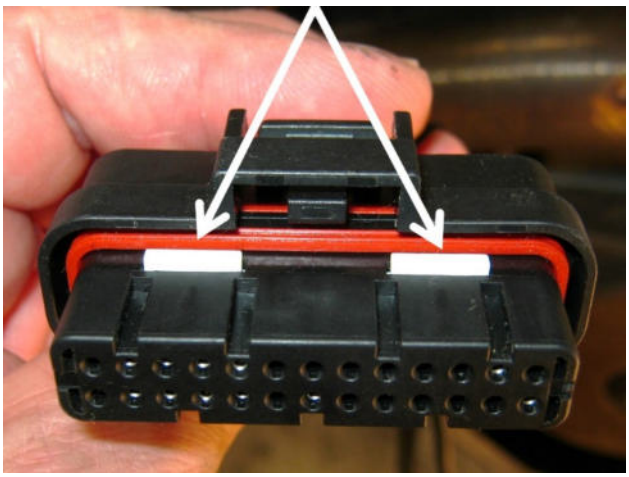
Use a suitable tool (the end of the screwdriver for example) to depress the three white rectangles on the bottom side of the cruise control harness plug.

The white rectangles will depress about 3mm (1/8”).

NOTE: - This unlocks the terminals so take care not to pull on the wires.

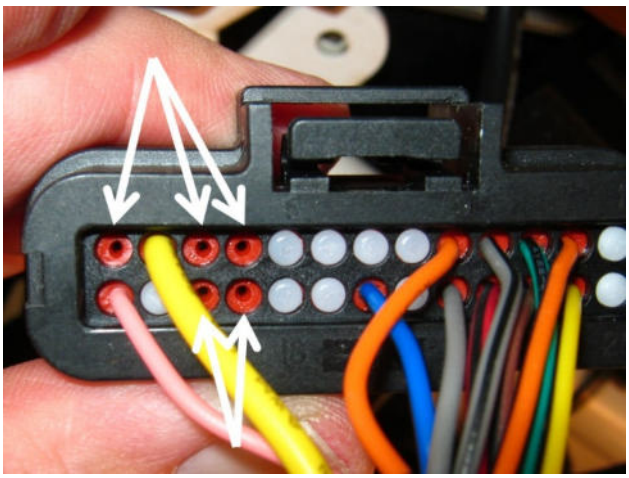


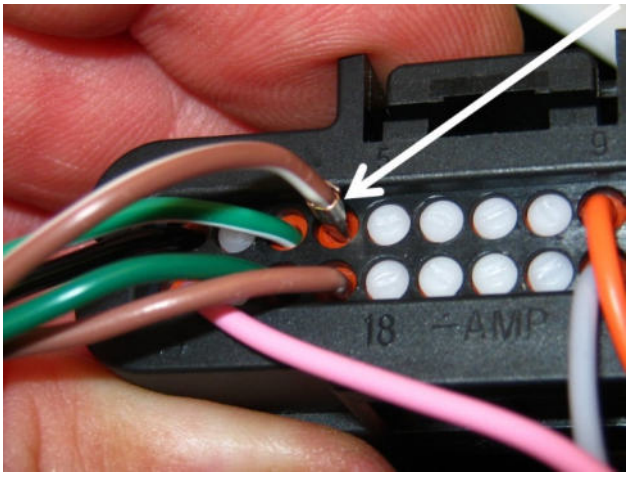
The two tabs on the other side of the plug will come out about 3mm (1/8”).



There are 5 empty terminal holes in the cruise control main harness plug.

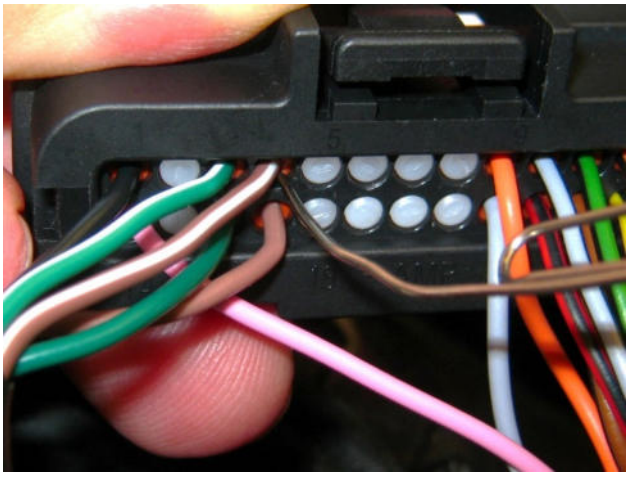
The TPS sensor harness terminals will be inserted into these holes.





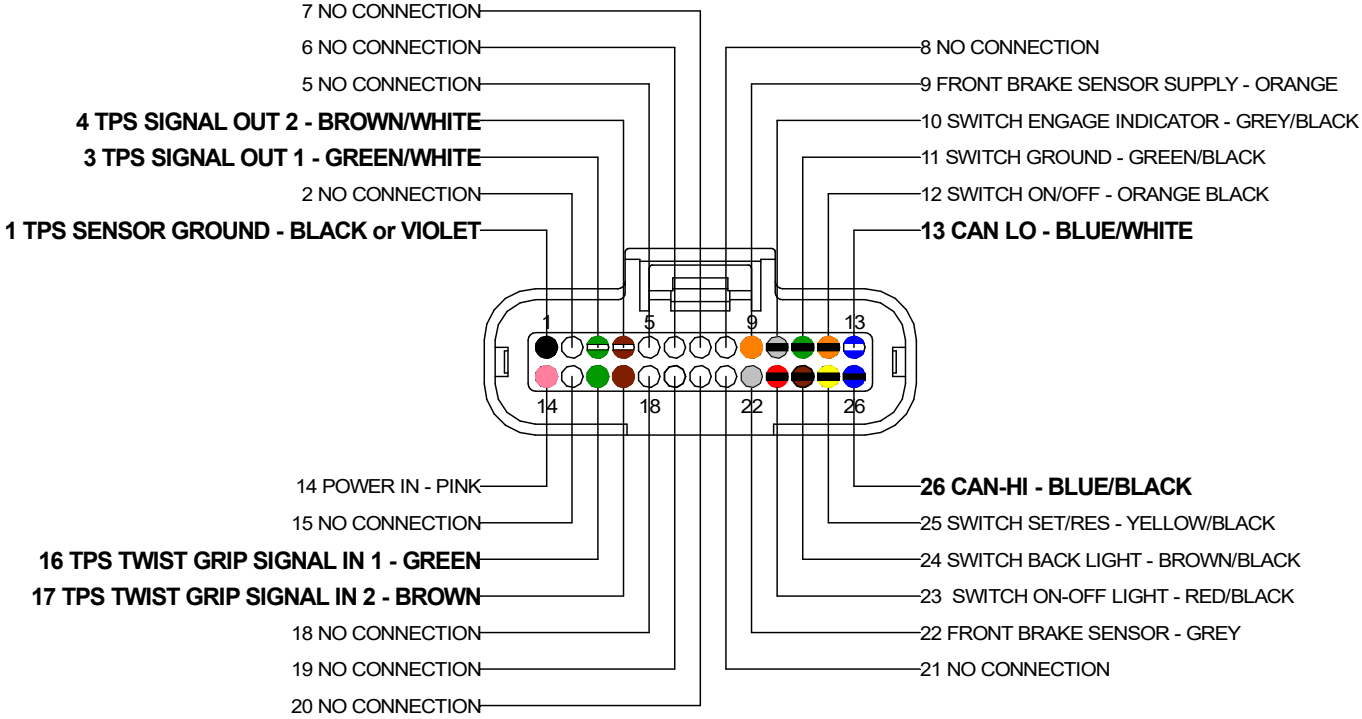
See below for details on wire colours and positions.

Insert the terminals from the TPS harness into the empty holes. In some cases, the wire is not stiff enough to push the terminal all the way into the hole, see arrow showing one terminal not fully inserted.



Use the paper clip in the kit as a terminal seating tool.

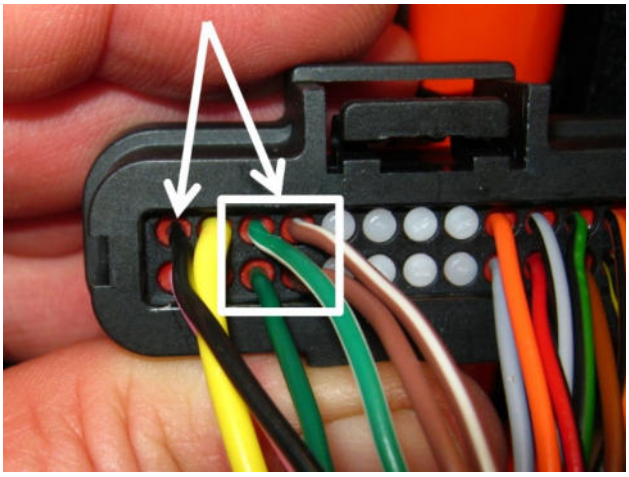
Unbend the paper clip and place the end of the paper clip on the back of the terminal and push the terminal all the way into the plug.



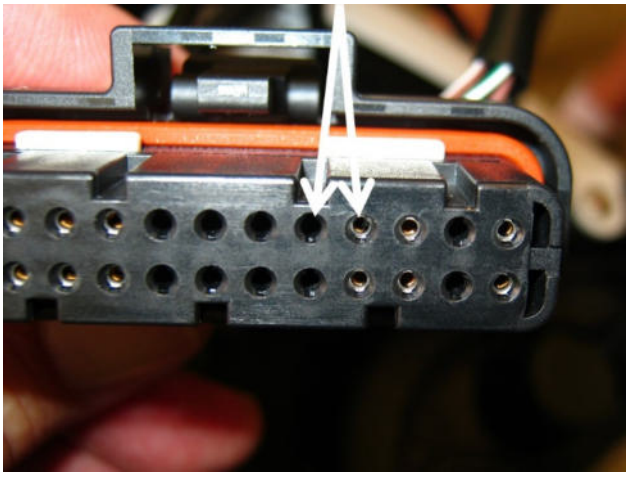
CRUISE CONTROL 26-WAY RECEPTACLE HOUSING
VIEW FROM BACK (WIRE ENTRY SIDE) OF HOUSING

The black (or violet) wire is in position 1.
The green/white wire is in position 3.
The brown/white wire is in position 4.
The green wire is in position 16.
The brown wire is in position 17.

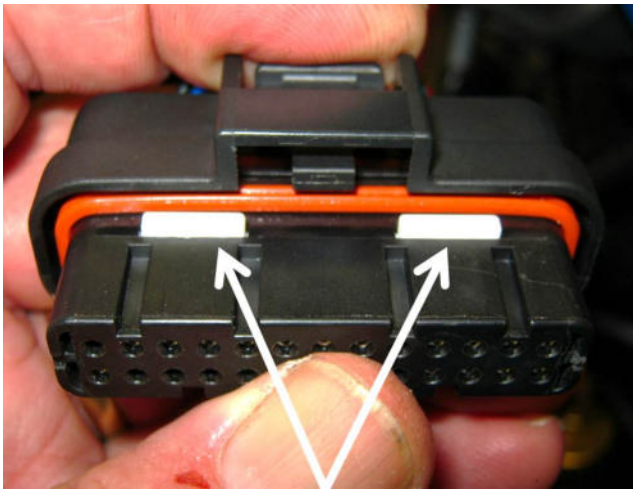
CAUTION: - The wires MUST be inserted into the correct holes; if they are not neither the vehicle nor the cruise control will work.



Check that all terminals are fully inserted. The terminal on every wire must be visible in the holes. The arrows show two holes, one with a terminal and one without.



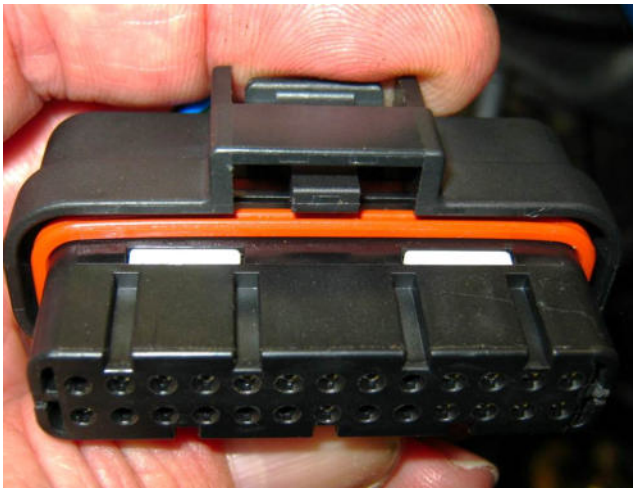
Gently push the two tabs back down so they are flush with the connector.



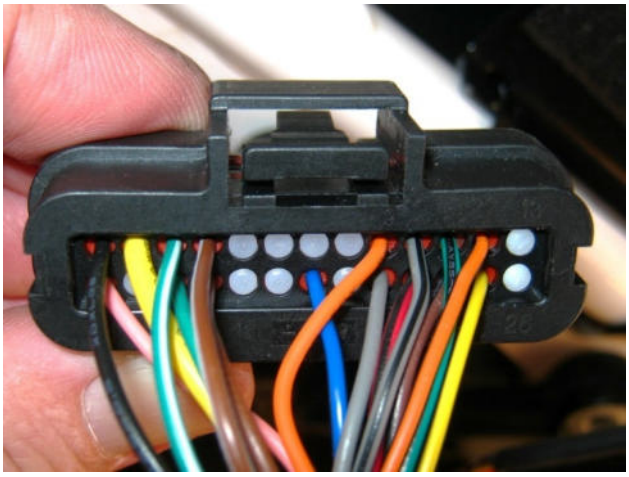
This will lock the terminals into the connector.

If the tabs do not press down easily, one or more of the terminals is not fully inserted.

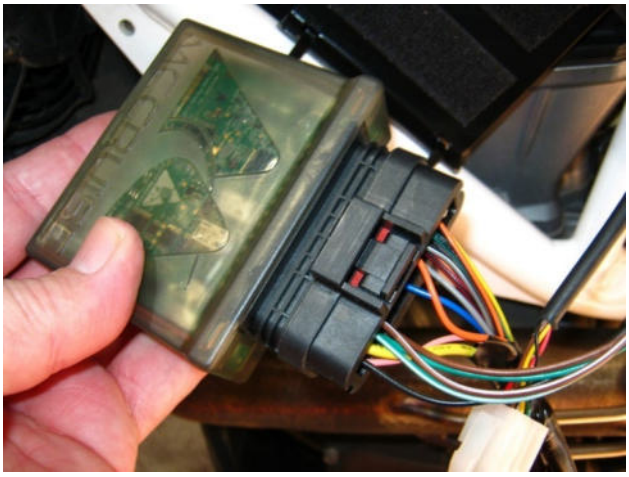
Re-check that all terminals are fully inserted into the plug.



The cruise control harness plug with the TPS harness wires fitted.



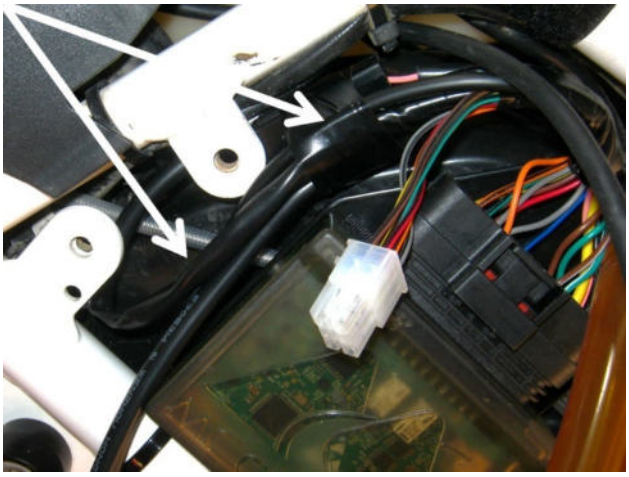
Connect the cruise control harness to the cruise control computer.



Position the computer on the mounting bracket on the Velcro tape.

On the standard bracket (not the Long-Range), route the taped section of the harness with the fuse holder down beside the computer as shown.

This is not necessary with the Long-Range bracket as the different location of the long-range bracket uses the harness length.



On the Long-Range version, route the harness from the computer up the frame tube shown by the arrows.

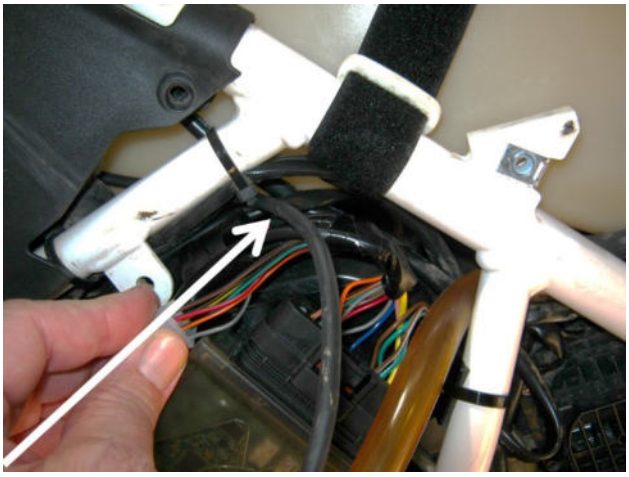
This photo is from a later model Long-Range but the layout is the same.

Tach sensor connection.

Identify the tach sensor branch. This has two thick yellow wires, one fitted with a black one-way connector, the other has a bare terminal on it.

Draw this branch forward on the left side of the bike as shown.

Route the branch across to the right side of the bike above the cylinder head.



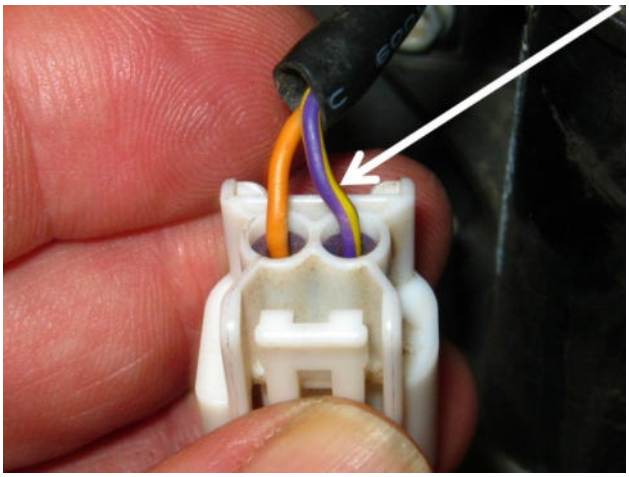
Draw the wire out on the right side of the bike (left arrows), next to the ignition coil/spark plug cap.

Disconnect the black pressure switch plug (right arrow) from the pressure switch.

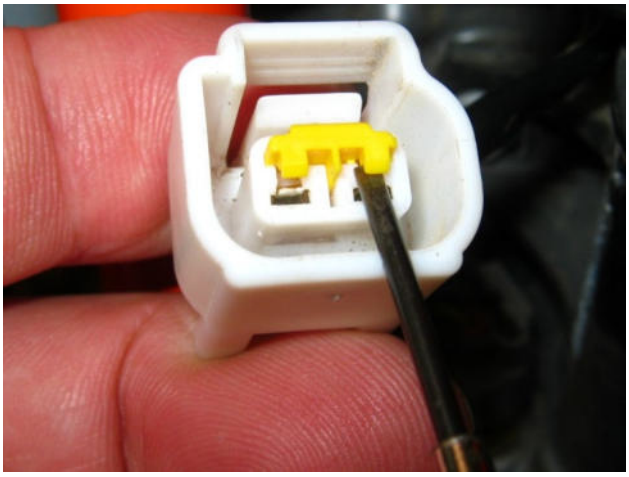
Disconnect the white connector on the ignition coil.

The wires in the back of the plug are orange and purple/yellow (purple with a yellow trace).

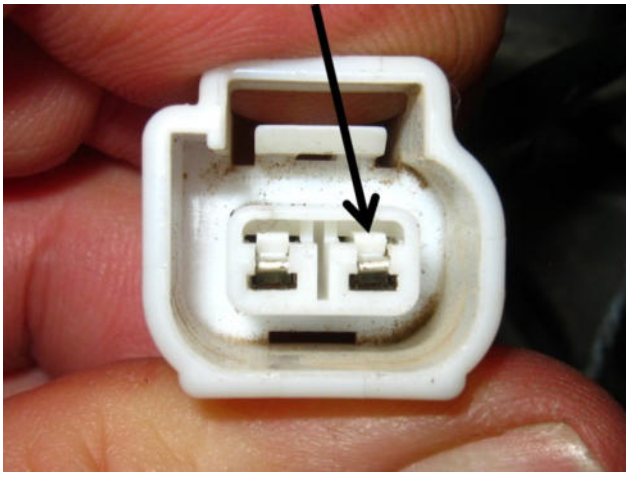
The terminal on the purple/yellow wire must be backed out of the plug.



Use a small screwdriver (a small flat blade jeweller's screwdriver is ideal) to gently lever out the yellow terminal retainer.



This tab, above the terminal must be lifted to release the terminal.

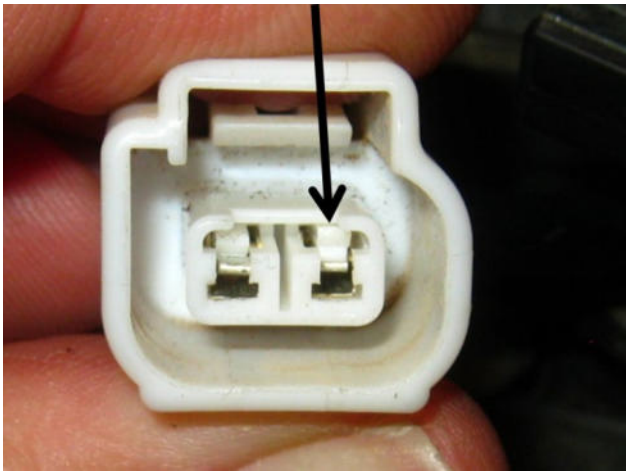


Use the small screwdriver to release the terminal lock on the purple/yellow wire.

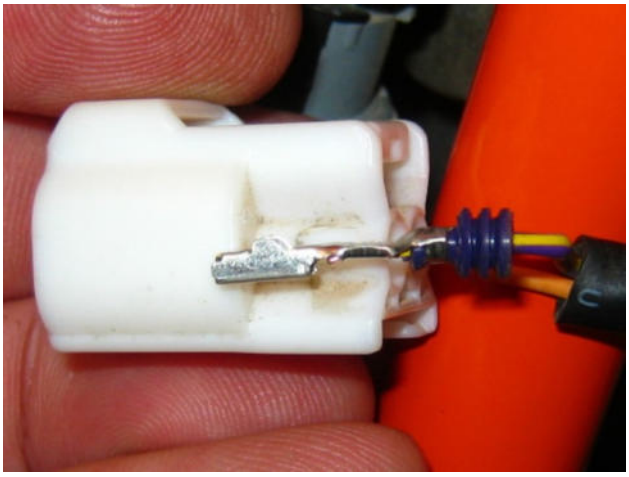
Push the terminal lock away from the terminal and gently pull the wire to remove the terminal.

This photo shows the tab lifted enough to allow the terminal to be extracted.

NOTE: - The terminal will come out easily with some resistance from the wire seal. If the terminal does not come out easily, the lock has not been released. Do NOT pull hard on the wire.

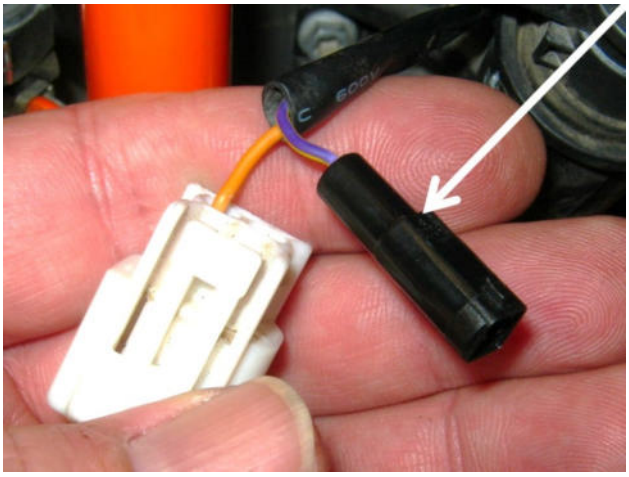


The terminal on the purple/yellow wire out of the plug.

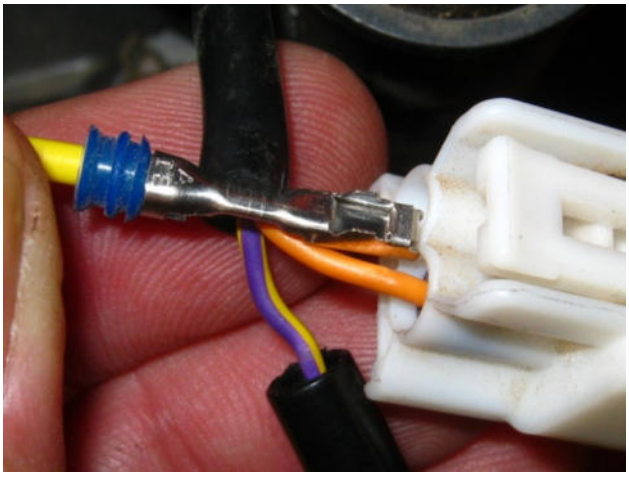


Locate the black one-way connector in the parts bag.

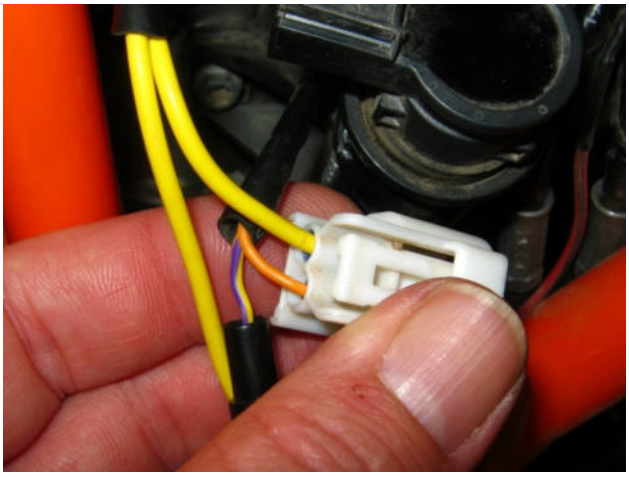
Fit the connector to the bike's terminal.



Insert the terminal on the cruise control yellow wire into the bike's ignition coil connector.

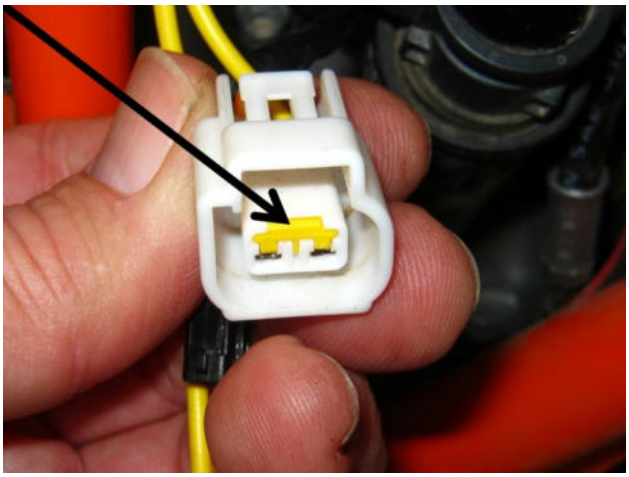


Make sure it is inserted all the way and 'clicks' into the plug.

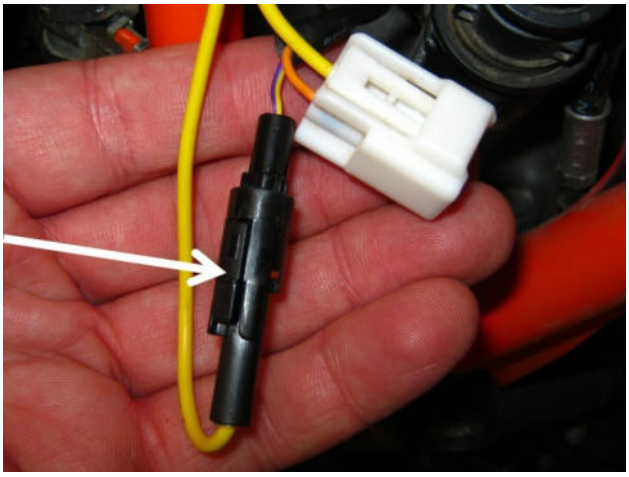


Replace the yellow terminal retainer in the plug.

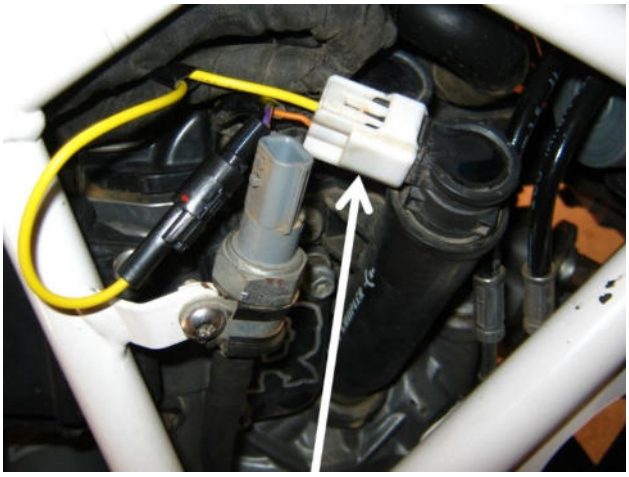
NOTE: - The terminal retainer cannot be fully inserted unless both terminals are fully inserted into the housing.



Connect the one-way plugs on the bike's purple/yellow wire to the cruise control yellow wire.

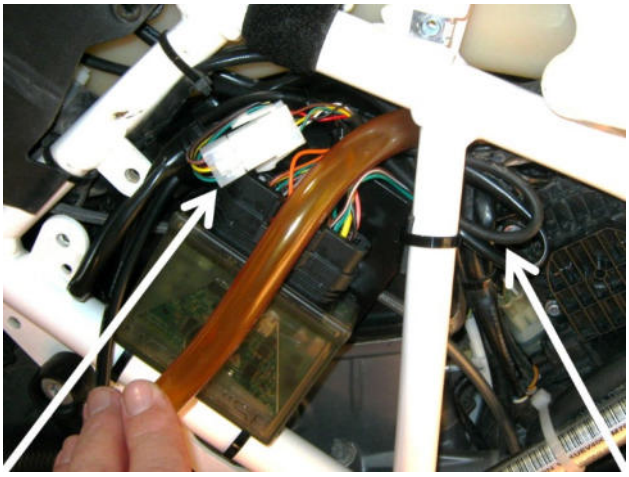


Re-connect the coil plug to the ignition coil.



Cable tie the one-way housing beside the ignition coil plug.

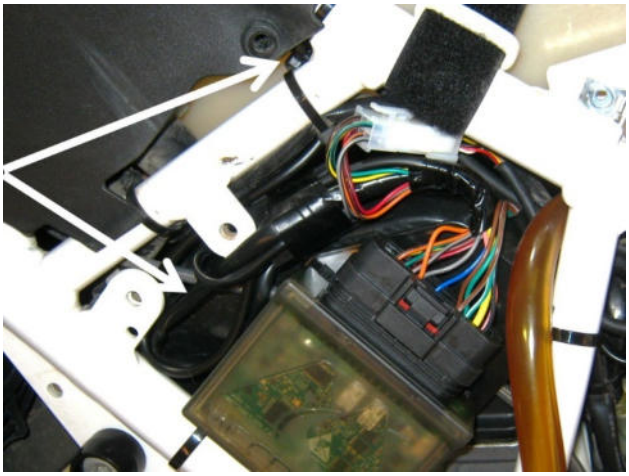
Re-connect the plug to the pressure switch.



Control Switch connection.

Route the control switch wire so any extra length goes to the rear (right arrow), then loops back to the cruise computer plug.

Connect the switch plug to the matching plug on the cruise control harness (left arrow).



Power/Brake sensor & speed sensor connections.

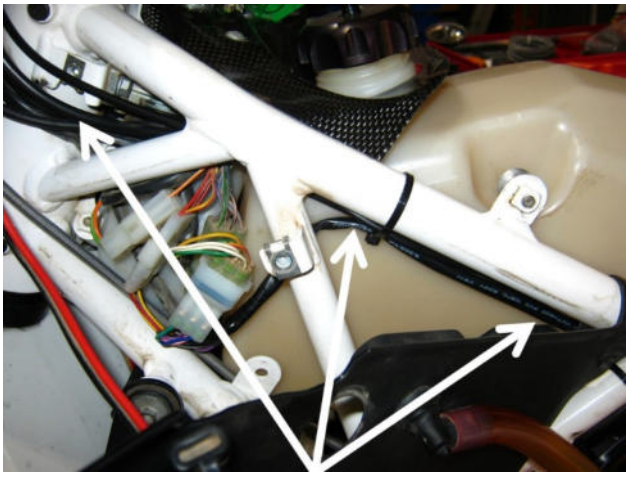
The last branches of the harness are the power/brake sensor and speed sensor connectors.

The power/brake sensor branch has two, 2-way plugs with orange and grey wires.

The speed sensor branch has two terminals on blue/black wires.

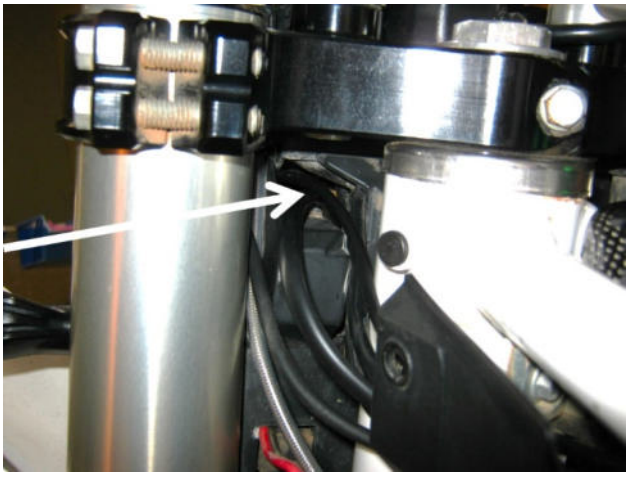
Route these branches forward inside the frame on the left side with the control switch wire.

Route these branches forward inside the frame on the left side with the control switch wire.



Route these branches forward inside the frame on the left side with the control switch wire.

Route the branch past the steering head into the area behind the headlight.



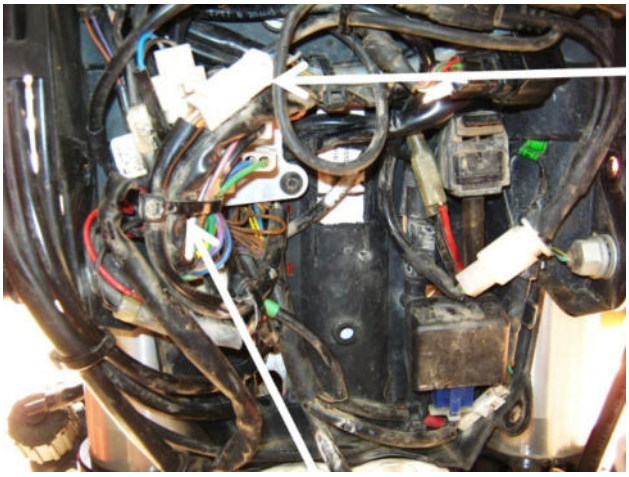
Draw the wires into the area behind the steering head.

The arrow indicates the hole we used for the wires.

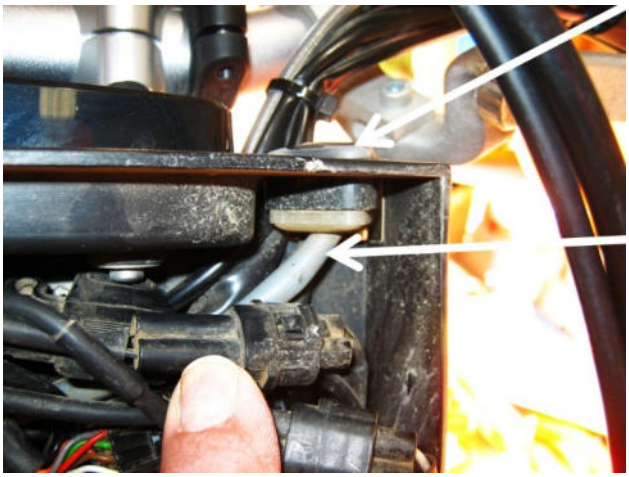
<u>Speed sensor connection.</u>

The bike's speed signal is on one of the wires in the 8-way plug (upper arow) that comes from the ABS switch.

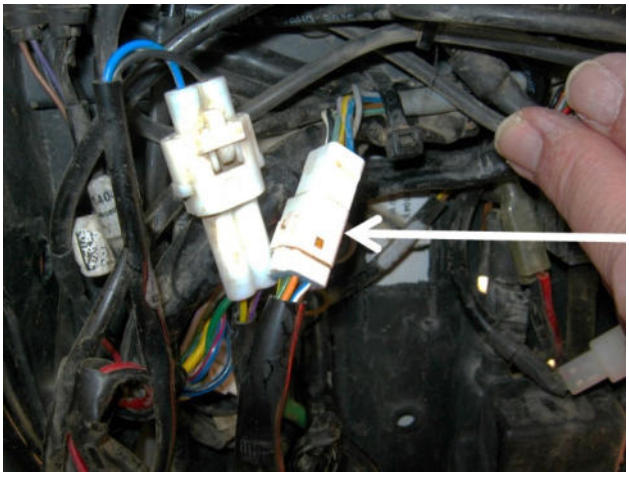
The lower arrow points to a cable tie that should be removed to allow good access to this plug.



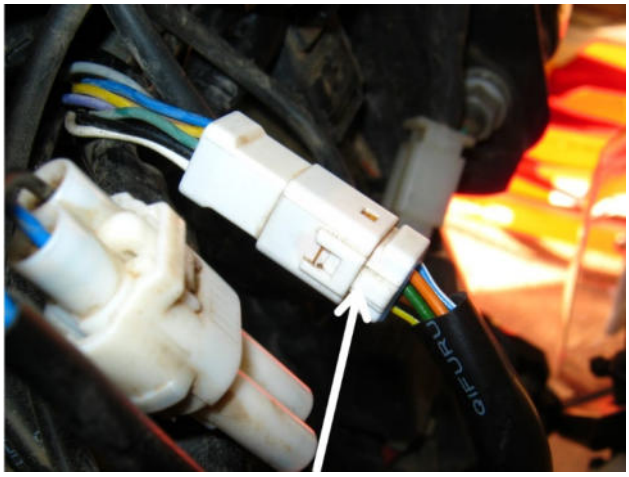
If you cannot find the plug, follow the grey wire (lower arrow) from the ABS switch (upper arrow).



The grey wire end at this 8-way plug.



Depress the latch (arrowed) and disconnect this plug.

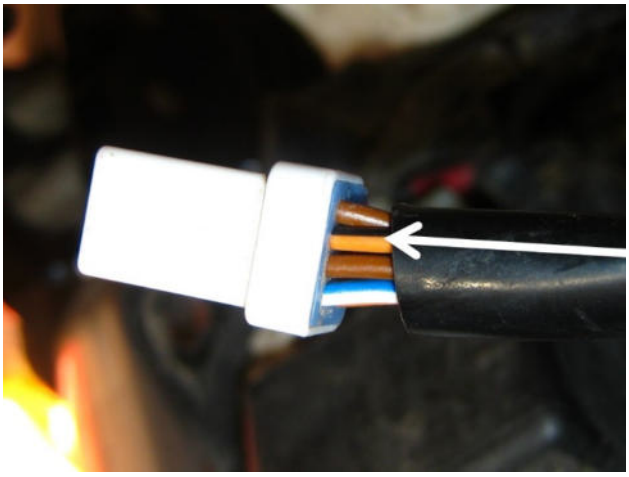


On the bottom row of the plug (opposite side to the release latch), there are four wires, blue/white, brown, orange/black and a second brown.

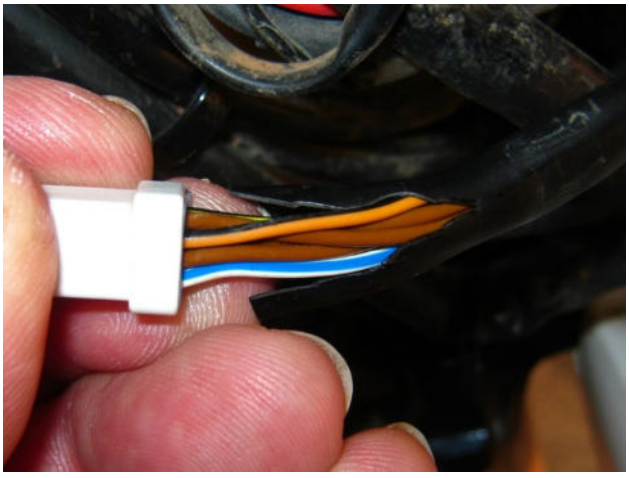
The speed signal wire is the orange /black wire.

This wire and terminal must be backed out of the plug.

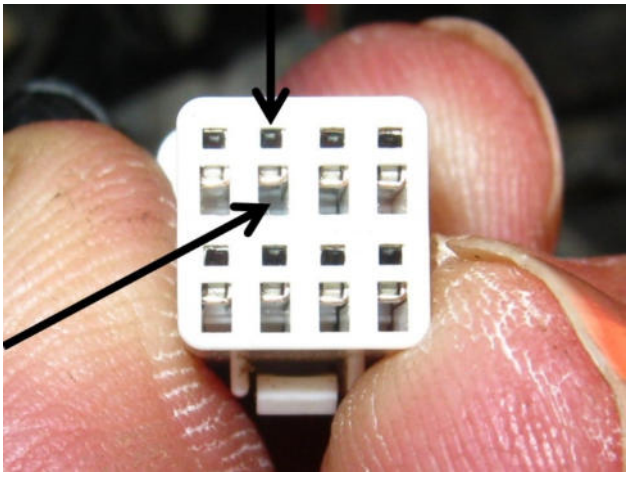
NOTE: - Take care and be gentle with these components, they are small and delicate and can be easily damaged.



Cut the plastic sheath over the wires so you have good access to the orange/black wire.



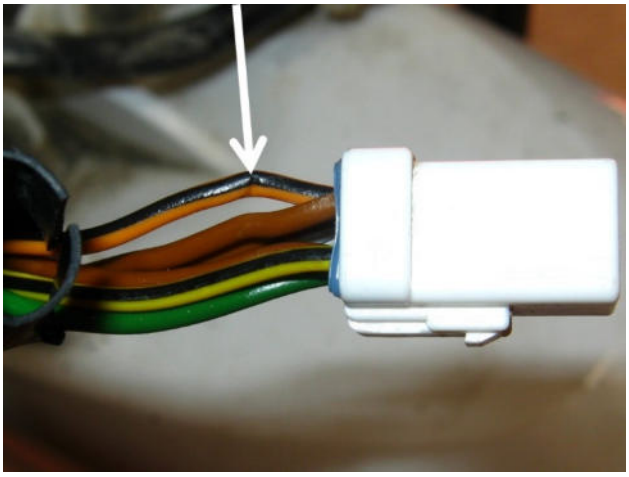
NOTE: - the connector is held upside down here, the release latch is on the bottom in this and the following photos.



The terminal connection is via the smaller hole (upper arrow).

The larger hole below (lower arrow) is the hole for the terminal removal tool.

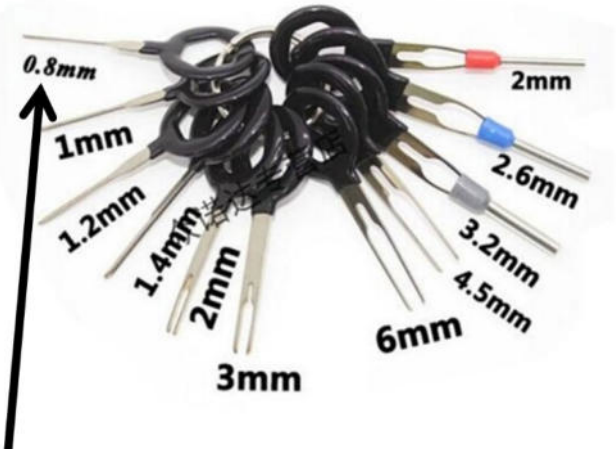
Inside this hole you can see the metal face of the terminal in the top of the hole. There is a small 'latch' at the end of the hole that the terminal tool will engage to release the terminal.



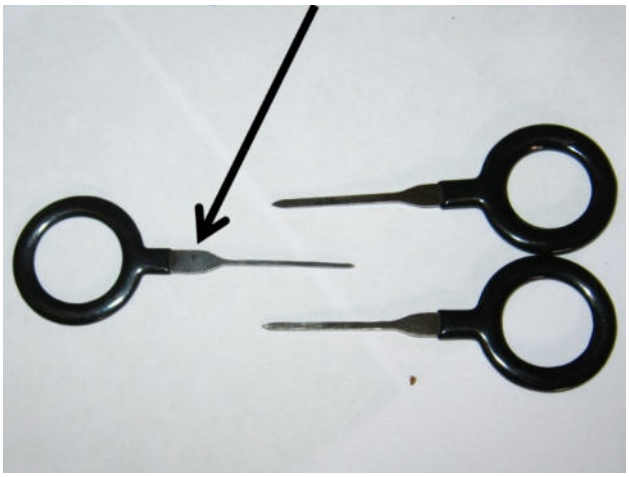
Separate the orange/black wire from the other wires.

Push and pull on the orange/black wire gently, you should be able to feel the slightest amount of movement in and out. This is the terminal moving slightly inside the plug.

Push the wire IN firmly to ensure the terminal is pushed in all the way so there is no 'load' on the terminal retaining latch.



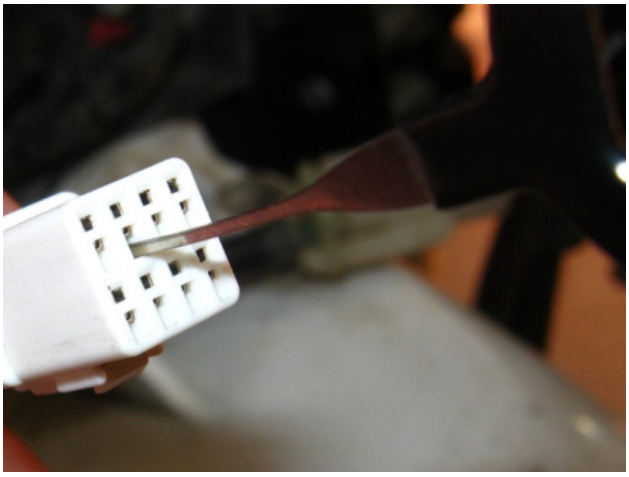
If you purchased a set of terminal extractor tools from us, you need the finest single point tool.



These sets have 3 or 4 single point tools usually, use the finest tool in the set.

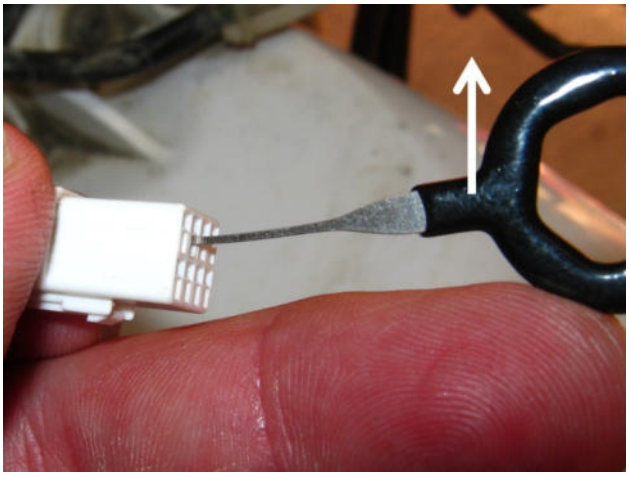
NOTE: - Trying to get consistent sourcing for these tools is difficult, and the quality of the tools is also not consistent. The end of the tool should have a smooth curve on both sides coming to a point. We have observed in some cases the tool tip is not formed correctly, and sometimes have a blunt end instead of the point. If your tool has a blunt end, use a fine file to form the end into a curve to a point.

Push the wire IN firmly to ensure the terminal is pushed in all the way. This will ensure the latch can be lifted by the tool.



Insert the tip of the tool in the tool hole, so angle upwards so the tip of the tool slides along the bottom face of the terminal.

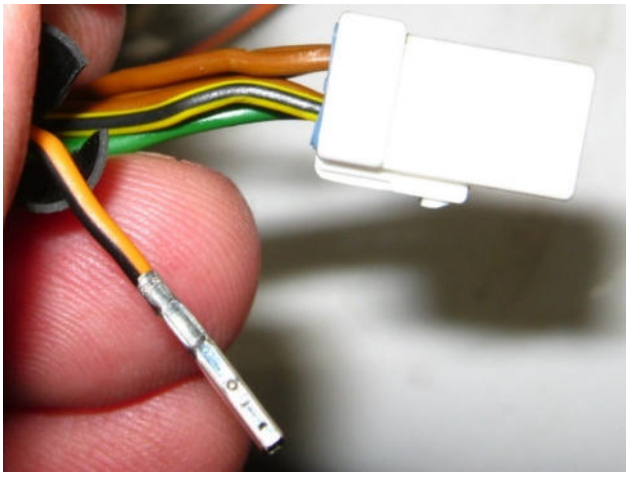
Push the tool in until it is stopped by the latch at the back of the terminal.



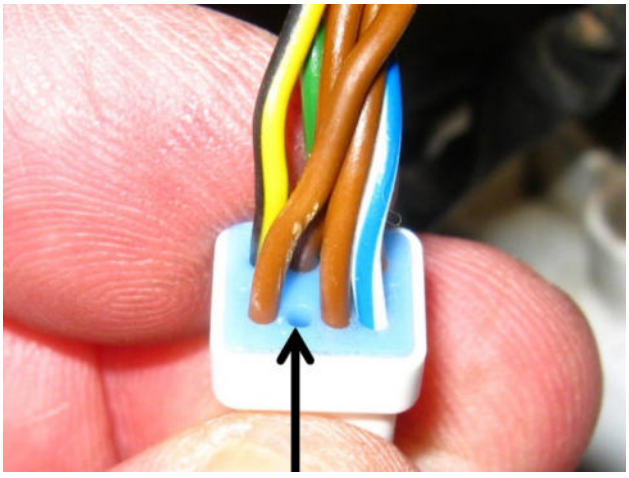
Gently push the end of the tool up to lever the latch away from the terminal, then gently pull on the wire to pull the terminal out of the plug.

If it does not move, do NOT pull the wire hard.

Remove the tool, **push the wire in firmly to ensure it is not preventing the latch from being lifted** and re-insert the tool and try again.



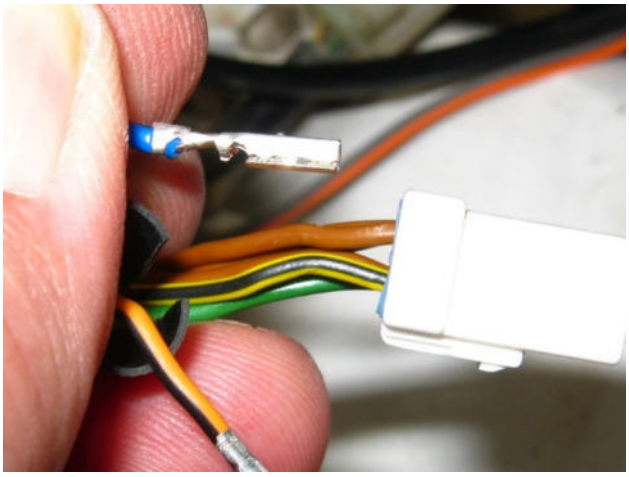
The orange/black wire and receptacle terminal out of the plug.



The empty hole the orange/black wire came from.

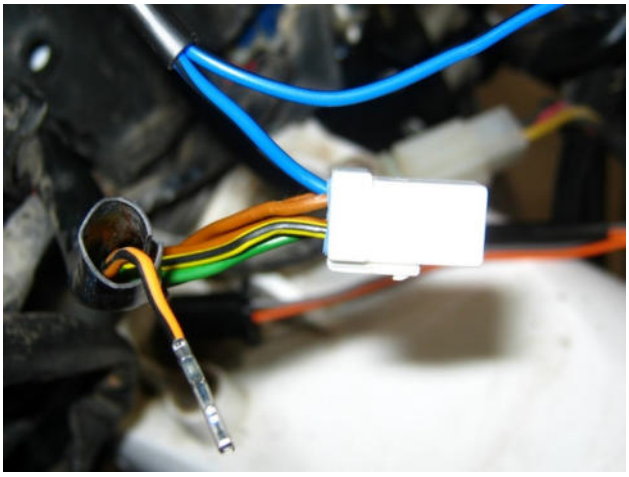
Route the cruise control blue/black speed sensor wires to the plug.

Note the orientation of the cruise control receptacle terminal to the plug.

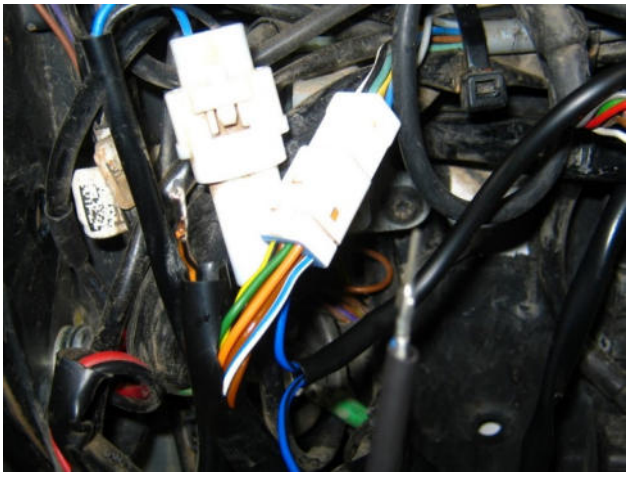


Gently insert the terminal into through the hole in the wire seal and into the plug.

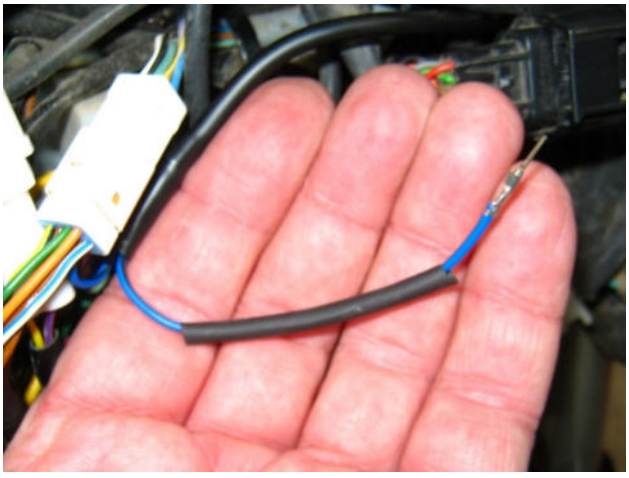
The terminal should ‘click’ into place when the latch locks the terminal into the plug.



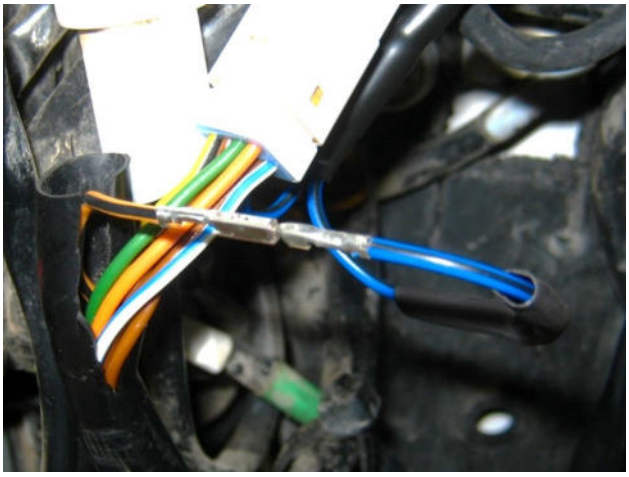
Re-connect the two halves of the plug.



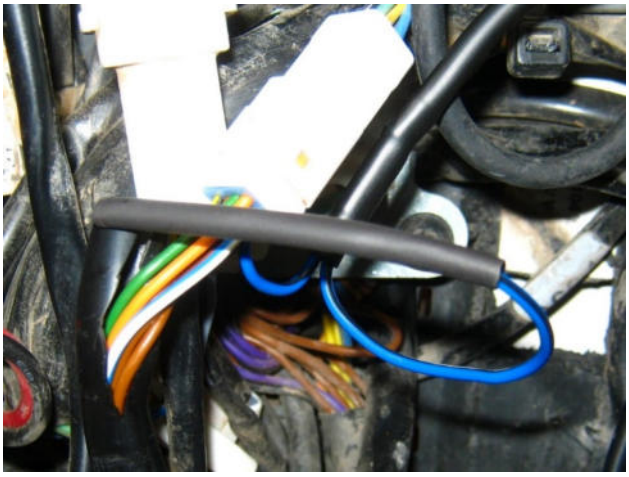
Slide the suitable length of the supplied heat shrink tube over the tab terminal on the other blue/black wire.



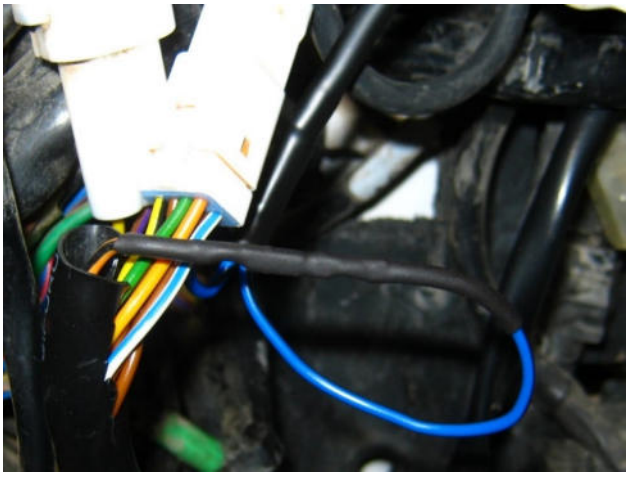
Connect the tab terminal on the blue/black cruise control wire to the receptacle terminal on the bike's orange/black speed signal wire.



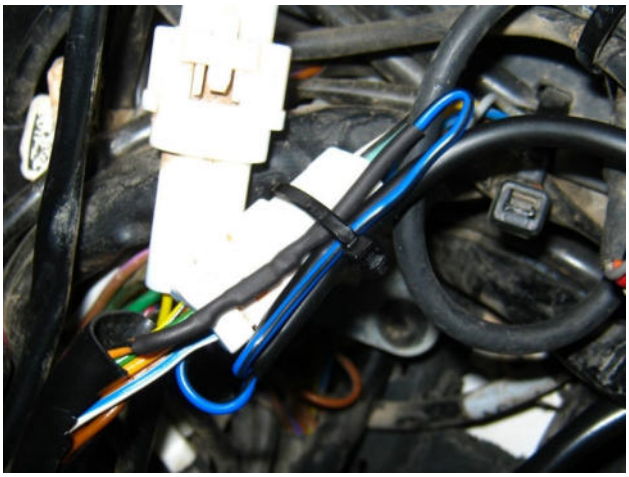
Slide the heat shrink tube over the connected terminals.

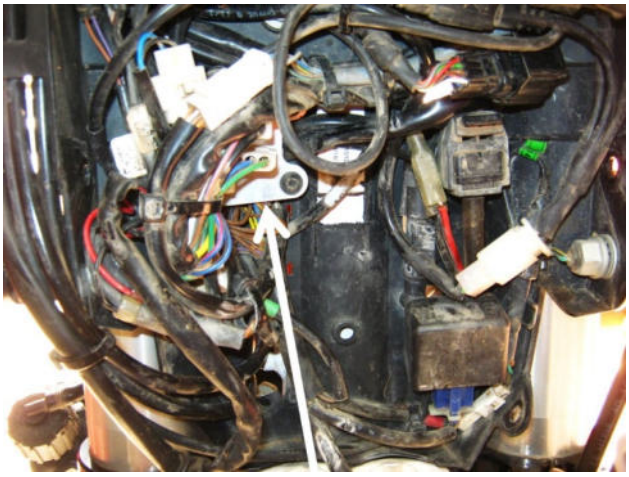


Check the terminals are fully connected and use a suitable heat source such as a hot air paint stripper gun to shrink the heat shrink tube.



Fit a cable tie to secure the terminals to the side of the 8-way plug.



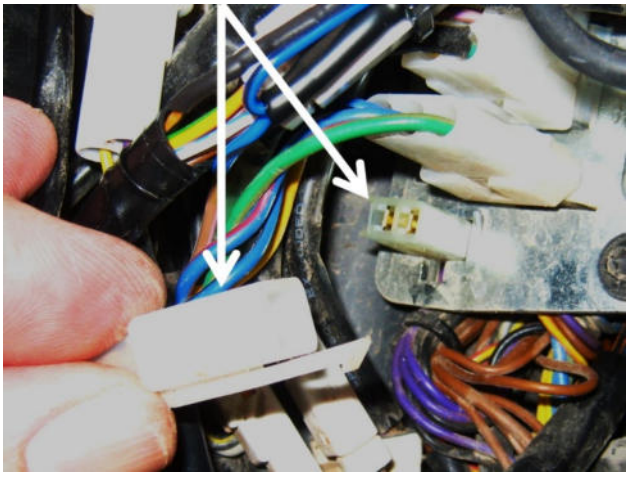


Power/Brake Sensor connection.

Locate the bike's front brake light switch connector.

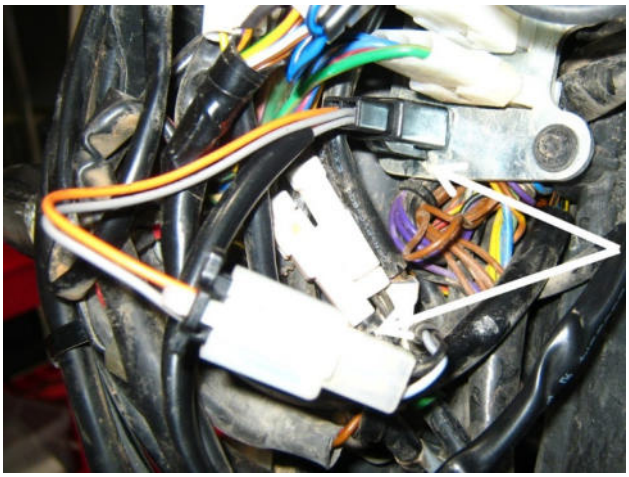
It is mounted in a bracket with a group of connectors.

The brake light switch connector is the bottom connector, a 2-way plug with black and grey wires.



Push the latch and disconnect the plug.

Keep your finger on the back of the plug in the bracket to prevent it falling out of the mount.



Connect the cruise control power/brake sensor plug to the bikes mounted plug.

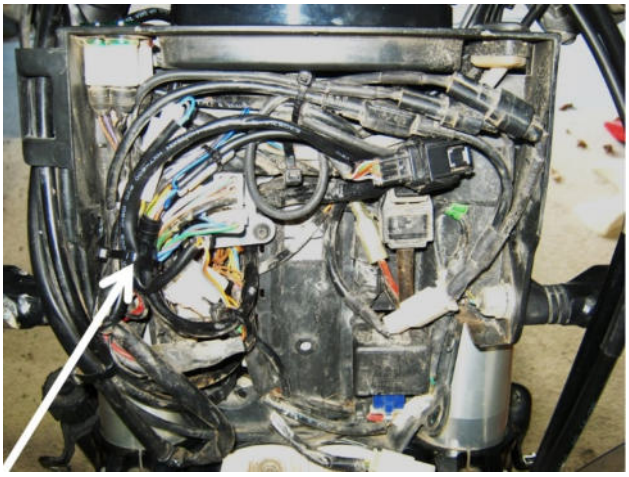
Connect the other cruise control plug to the bike's brake light switch plug.

The cruise harness will bridge the connection and take power and brake signal to the cruise control computer.

Tuck the second connector below the mounting bracket.

Secure it with cable ties if necessary.

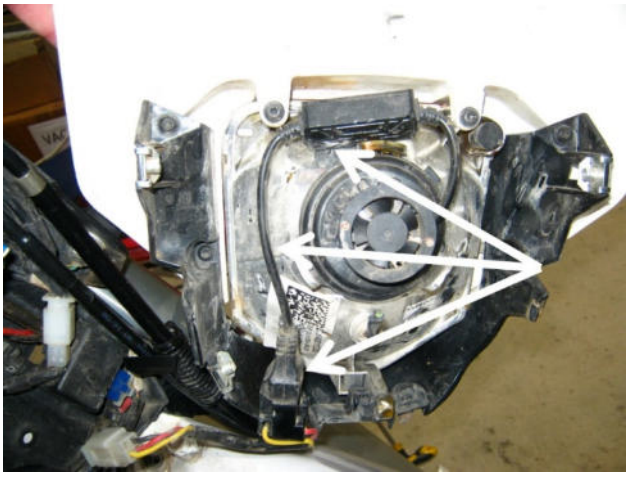
Replace the cable tie that was removed from the bundle of wires (arrowed).



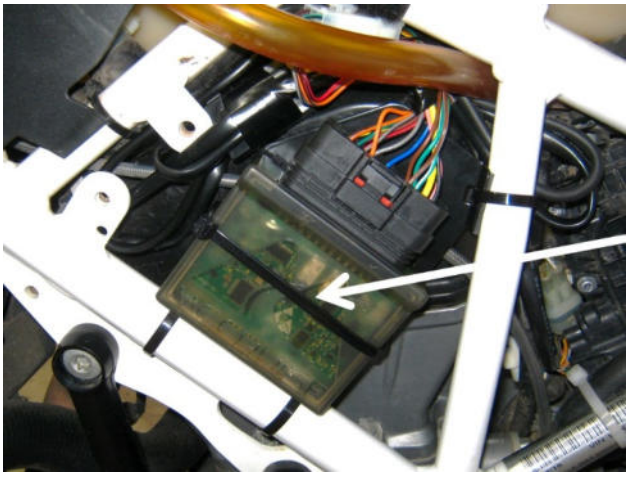
Check the routing of the headlight wires.

If all the wires and connectors are not positioned correctly the headlight will not fit.

You may need to ‘juggle’ the positions of wiring harness and plugs to make the headlight fit.

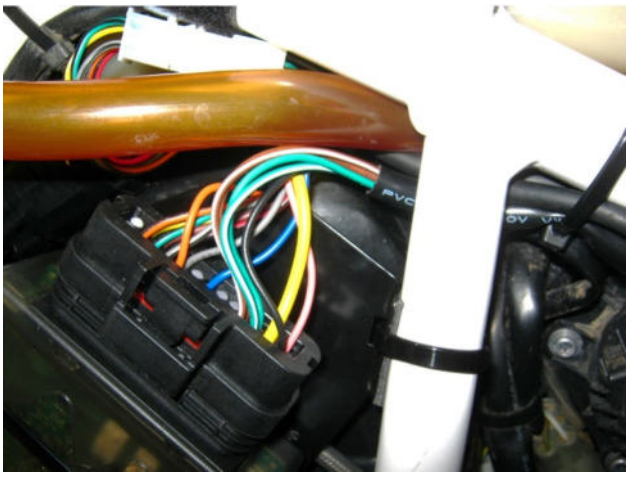


Fit a long cable tie around the computer and the mounting bracket to hold the computer.



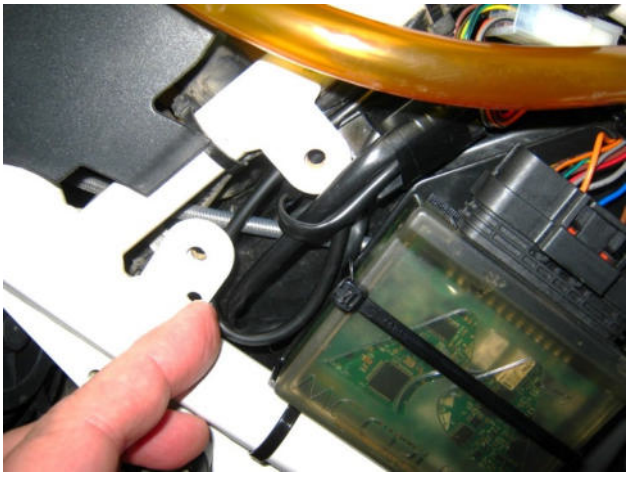
Fit a cable tie to hold the control switch and TPS wires to the frame.

Check the routing of the wires above the computer, next to the frame tube.

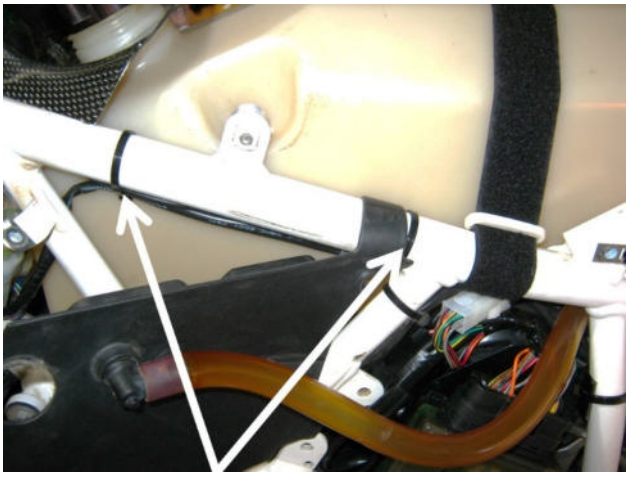


Check the routing of the wires beside the computer.

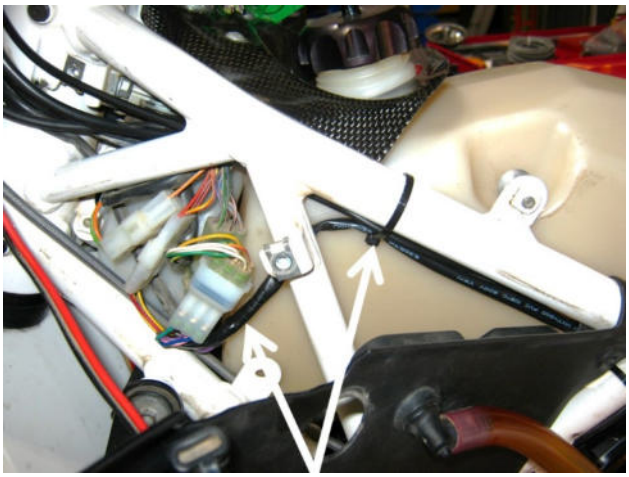
Make sure they are not contacting any sharp edges. Fit cable ties if necessary.



Fit cable ties to hold the TPS, Power & brake sensor, Speed sensor and Control switch wires against the frame tube.



Check the routing of the wires to the TPS plugs and check the connectors are ‘tucked’ into the space behind the steering head.



Final installation of the computer and harness on the standard computer bracket.

Final installation of the computer and harness on the Long-Range computer bracket – photo from a later model 701LR.

Finishing up.

Check the routing of the wires and fit cable ties where necessary.

Make sure the fitting the seat will not damage the wiring harness.

Check carefully for moving or stationary objects that might damage any wires.

Check that all wiring connections are complete and secure.

CAUTION: Take extra care to ensure that no wires will be chafed or damaged when the headlight and side panels are fitted to the bike.

Check the routing of the wires again and fit cable ties where necessary.

Re-fit the headlight assembly to the bike.

Re-connect the battery ground (negative) cables.

Your cruise control is now ready for calibration and testing!

THROTTLE POSITION SENSOR CALIBRATION AND TESTING.

Explanation:

The cruise control must 'learn' how the throttle twist grip on the bike works electrically. The calibration process 'teaches' the cruise control what signals to send to duplicate the operation of the throttle twist grip.

Good cruise control response and operation requires that the cruise control knows exactly the point where the engine speed is about to increase from idle. On many TBW (Throttle By Wire) vehicles, the engine does not respond to the throttle until some 'free play' is taken up in the grip. In order to respond quickly at low speeds, the cruise control must 'know' where the 'free play' stops, and the engine actually starts to respond to throttle.

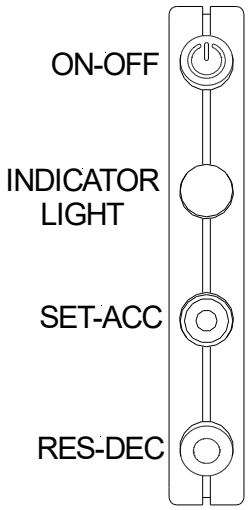
The following procedure is designed to perform, and test, the throttle twist grip calibration procedure.

Usually this model responds quickly and does not need any 'free play' compensation.

NOTE: - During this procedure, the engine must be started while the cruise control is in a calibration mode. If the battery voltage drops too much while starting the engine, the cruise control will 'reboot' (turn off and back on again), and this will 'drop' the cruise out of calibration mode. This is NOT a disaster, there is an alternate procedure if this happens, but it is simpler if the cruise does stay powered up while the engine is started. In most cases, if you start the engine and warm it up before you perform the following procedures, this will make the cruise more likely to stay powered up, as a warm engine requires less power from the battery to start AND running the engine will boost the battery voltage bit as well.

For those reasons, we recommend you start the engine and warm it up for a couple of minutes before doing the TPS Calibration and Testing.

MotorCycle Cruise Controls has two new control switches that can be supplied with the cruise control. Most of our installation manuals, brochures and photos on our web pages will show our original control switch which is no longer available.



The Slim Switch has smaller buttons with the pictographs on the buttons.

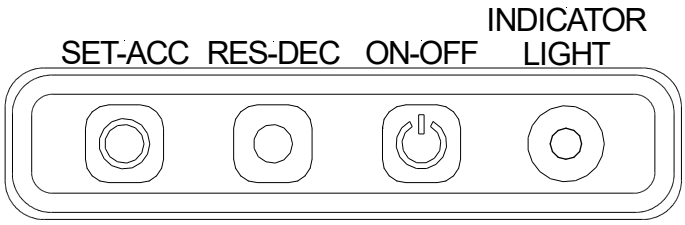
The ON-OFF button has a 'standard' power switch pictograph on it.

When it is mounted vertically on the handlebar, as shown here the orientation of the SET and RES buttons is as shown.

This is the new control switch which was released in December 2020 and is a direct replacement for the old switch both dimensionally and electrically. This switch has better button feel and better waterproofing compared to the previous control switch.

All the mounting brackets designed for the old switch will also fit this switch.

The overall size of the switch is the same, it has the same mounting brackets and the same mounting holes.



The text has been replaced by pictographs on the buttons.

Enter diagnostic mode:

Make sure the ignition switch is OFF.

Ensure the 'Engine Stop (Kill) Switch' is in the 'Engine Run' position.

Press and HOLD the SET and ON-OFF buttons on the cruise control switch. Turn the ignition switch on. DON'T START THE ENGINE. Wait until the indicator light on the switch comes on green momentarily or the back lights behind the buttons come on, then release the SET and ON-OFF buttons. Do NOT start the engine.

Apply and release the front brake, the light on the switch should come on green while brakes are applied and turn off when the brakes are released. If the light does not come on, turn the ignition off and try again from 'Enter diagnostic mode'.

Press and release the SET, RES, and ON-OFF buttons, one at a time, don't press each button more than once or twice as this may cause the bike's engine management to produce a throttle sensor fault. Make sure the light on the switch comes on green when each button is pressed and goes off when the button is released. This test confirms that the buttons are working correctly.

Apply and release the front brake.

Do NOT turn the ignition off, move to the next section below.

Enter TPS (Throttle Position Sensor) Calibration mode:

While still in diagnostic mode, press and HOLD the ON-OFF button (green light). While holding the ON-OFF button, press and release the SET button six (6) times. The green light will go out on the first press, and at the 6th press the light will come back on red. Release the ON-OFF button when the light comes on red.

Make sure the throttle is fully released (idle position).

Press and release the SET button. The light will change to green when the button is pressed and go back to red when released.

Twist the grip to apply full throttle and hold it.

Press and release the RES button. The light will change to yellow when the button is pressed and go back to red when released.

Release the throttle.

If you are not happy that the throttle position is correct in either position, you can repeat the procedure (move the throttle to the appropriate position, hold it there, press SET for idle position or RES for full throttle position.

Do NOT turn the ignition off, move to the next section below.

Confirming the calibration.

Press and HOLD the ON-OFF button until the red light changes to green (about 2 seconds).

Slowly apply the throttle. When the throttle position moves from fully released (idle) the light will start to flash green. It will continue to flash green as you apply more throttle.

At full throttle the light will change to solid yellow.

The calibration is correct if:

Throttle released – the light is solid (not flashing) green.

Between fully released and full throttle – flashing green.

Full throttle – solid (not flashing) yellow.

Past full throttle (should not happen) – flashing red/yellow – This should not occur; it means the calibration is NOT correct.

Less than idle (should not happen) – flashing red/yellow – This should not occur; it means the calibration is NOT correct.

Release the throttle.

Do NOT turn the ignition off, move to the next section below.

Checking throttle operation.

Press and HOLD the ON-OFF button until the green light changes to red (about 2 seconds).

Make sure that the bike is in Neutral gear position.

Observe the red light on the control switch and start the engine.

NOTE: - The light on the switch should remain solid red while starting the engine. If it does not, the battery does not have enough charge to maintain cruise operation during engine starter operation. If the

light does go out, there is an alternative procedure over the page marked with an asterisk (*) that can be used to complete the calibration procedure.

If the red light stays on while starting the engine:

Wait for the engine to run/warm enough to idle at its normal idle speed.

The SET button will apply a small amount of throttle with each press; the RES button will release the throttle a small amount with each press.

Press and release the SET button slowly and regularly (about 1~2 presses per second). Each press will apply a small amount of throttle. The engine will usually start to increase speed within 1 to 3 presses, but some bikes may take more presses (up to 20 or more).

Once the engine is above idle speed, press and release the SET and RES buttons to make sure the engine responds predictably and repeatedly to the SET (increase engine speed) and RES (decrease engine speed) button operation.

Checking throttle 'free-play'.

Note: - This procedure is to establish the exact point where the engine starts to respond to throttle movement.

Apply and release the front brake, the engine should return to idle.

Press and release the SET button slowly and regularly (about 1~2 presses per second). The engine will usually start to increase speed within 1 to 6 presses. **If it takes more than 3 presses to lift the engine off idle, keep the engine running and continue with the rest of the procedure below.**

Usually on this bike, the engine will respond (rpm will start to increase) within 1 to 3 presses, if that is the case there is no need to go any further, you can turn the ignition off. This completes the throttle calibration.

Calibrating throttle 'free-play'.

If it takes more than 3 presses of the SET button to lift the engine off idle keep the engine running and continue with the rest of the procedure below.

If the engine speed gets too high, apply and release the front brake, the engine will return to idle.

Use the buttons to set the engine speed slightly above idle speed, then press the RES button until the engine JUST drops to idle, then press RES one (1) more time.

Press and release the ON-OFF button, the light will change to green while the button is pressed, then go back to red. The cruise control will record the throttle position.

Apply and release the brake.

Press and release the SET button, the engine speed should start to increase within 1~3 presses. Pressing the RES button a few times should return the engine to idle reliably. Applying the front brake will release the throttle completely.

Repeat the last two lines a couple of times to ensure the result is predictable and repeatable.

NOTE: - If the engine does not return to idle using RES or it takes more than 3 presses of SET to lift off idle after brake application, return to the start and repeat the calibration procedure from the start.

Apply and release the brake. Turn the ignition off. This completes the throttle calibration.

Move on 3 pages to 'DIAGNOSTIC MODE TESTING'.

If the red light does NOT stay on while starting the engine.

If the indicator light on the control switch turns off while starting the engine, it means power to the cruise control is turning off while the starter motor is in operation. This will re-boot the cruise control in its normal operating mode. It will retain the calibration you have done, but the rest of the calibration procedure is unable to be completed.

The following different procedure allows you to complete the calibration and test the free play.

Because the cruise is 'turned off' while starting the engine, we now have to make sure the cruise control re-starts in diagnostic mode after the engine is started.

With the ignition switch OFF;

Press and HOLD the SET and ON-OFF buttons on the cruise control switch. While holding the buttons, turn the ignition switch on and start the engine. Wait until the indicator light on the switch comes on green momentarily or the back lights behind the buttons come on, then release the SET and ON-OFF buttons.

Apply and release the front brake, the light on the switch should come on green while brakes are applied and turn off when the brakes are released. If the light does not come on, turn the ignition off and try again.

Wait for the engine to warm enough to idle at its normal idle speed.

The SET button will apply a small amount of throttle with each press; the RES button will release the throttle a small amount with each press.

Press and release the SET button slowly and regularly (about 1~2 presses per second). Each press will apply a small amount of throttle. The engine will usually start to increase speed within 1 to 3 presses, but some bikes may take more presses (up to 20 or more).

Once the engine is above idle speed, press and release the SET and RES buttons to make sure the engine responds predictably and repeatedly to the SET (increase engine speed) and RES (decrease engine speed) button operation.

Note: - This next procedure is to establish the exact point where the engine starts to respond to throttle movement.

Apply and release the front brake, the engine should return to idle.

Press and release the SET button slowly and regularly (about 1 press per second) and count the number of presses until the engine JUST lifts off idle. The engine will usually start to increase speed within 1 to 6 presses.

Press the RES button ONCE, check that the engine returns to idle. If the engine has not returned to idle, press RES ONCE again.

The **'free play count'** you need to remember is the number of presses of SET, less the number of presses of RES (for example, 6 SET minus 1 RES = 5 presses).

Apply and release the front brake.

Press and release the SET button slowly and regularly (about 1 press per second) the number of times of our **'free play count'**. Check that the engine speed has not increased.

Now press the SET button one more time. The engine speed should just start to increase. If it does, this confirms that your **'free play count'** is correct. DON'T turn the ignition off.

If the **'free play count'** number is 1~3, you have finished the procedure.

If the **'free play count'** number is 4 or above you should follow the rest of this procedure to allow for this in the throttle calibration.

DON'T turn the ignition off. Stop the engine using the 'engine stop' or 'kill' switch.

Turn the 'engine stop switch' back to the 'run' position.

Apply and release the front brake. You should get a green light with the brake applied, and it should go out when the brake is released. This confirms that the cruise control is still in diagnostic mode.

Enter TPS calibration mode. While still in diagnostic mode, press and HOLD the ON-OFF button (green light). While holding the ON-OFF button, press and release the SET button six (6) times. The green light will go out on the first press, and at the 6th press the light will come back on red. Release the ON-OFF button when the light comes on red.

Make sure the throttle is fully released (idle position).

Press and release the SET button. The light will change to green when the button is pressed and go back to red when released.

Twist the grip to apply full throttle and hold it.

Press and release the RES button. The light will change to yellow when the button is pressed and go back to red when released.

Release the throttle.

If you are not happy that the throttle position is correct in either position, you can repeat the procedure (move the throttle to the appropriate position, hold it there, press SET for idle position or RES for full throttle position.

Confirm the calibration. Press and HOLD the ON-OFF button until the red light changes to green (about 2 seconds).

Slowly apply the throttle. When the throttle position moves from fully released (idle) the light will start to flash green. It will continue to flash green as you apply more throttle.

At full throttle the light will change to solid yellow.

The calibration is correct if:

Throttle released – the light is solid (not flashing) green.

Between fully released and full throttle – flashing green.

Full throttle – solid (not flashing) yellow.

Entering the 'free play count'. Press and HOLD the ON-OFF button until the green light changes to red (about 2 seconds).

Apply and release the front brake.

Press and release the SET button slowly (~1 press per second) the number of times you got in the **'free play count'**. Press and release the ON-OFF button, the light will change to green while the button is pressed, then go back to red. The cruise control will record the throttle position. Apply and release the brake. Turn the ignition off.

Confirm the 'free play count'. With the ignition switch OFF;

Press and HOLD the SET and ON-OFF buttons on the cruise control switch. While holding the buttons, turn the ignition switch on and start the engine. Wait until the indicator light on the switch comes on green momentarily or the back lights behind the buttons come on, then release the SET and ON-OFF buttons.

Apply and release the front brake - the light on the switch should come on green while brake is applied and turn off when the brake is released. If the light does not come on, turn the ignition off and try again.

Wait for the engine to warm enough to idle at its normal idle speed.

Press and release the SET button slowly and regularly (about 1 press per second). Each press will apply a small amount of throttle. The engine should now start to increase speed within 1 to 2 presses, 3 is also OK, but it should be 1~2 presses.

Press and release the RES button to reduce speed back to idle.

If the engine speed increases within 1~3 presses or SET, and pressing RES returns the engine to idle, the throttle calibration is complete.

Turn the ignition OFF.

DIAGNOSTIC MODE TESTING.

This procedure tests all the electrical connections other than the TPS sensor connection that was calibrated and tested in the previous procedure.

Enter diagnostic mode:

With the ignition switch OFF;

Press and HOLD the SET and ON-OFF buttons on the cruise control switch. Turn the ignition switch on. DON"T START THE ENGINE. Wait until the indicator light on the switch comes on green momentarily or about 3~5 seconds then release the SET and ON-OFF buttons. Do NOT start the engine.

Apply and release the front brake - the light on the switch should come on green while brakes are applied and turn off when the brakes are released. If the light does not come on, turn the ignition off and try again from 'Enter diagnostic mode'.

Test electrical connections:

1. **Button test -** Press and release the SET, RES, and ON-OFF buttons, one at a time. Make sure the light on the switch comes on green when each button is pressed and goes off when the button is released. This test confirms that the buttons are working correctly.

2. **Front brake test –** (Repeated) Apply and release the front brake, the light on the switch should come on green while brakes are applied and turn off when the brakes are released;

3. **Rear brake test -** Apply and release the rear brake, the light on the switch should come on green while brakes are applied and turn off when the brakes are released;

4. **Tach signal test** – ***The motorcycle must be in neutral to conduct this test***. Start the engine, apply the brake and check the light on the switch comes on green with brake application which confirms that you are still in diagnostic mode after starting the motor. Then watch the RED LED **inside** the cruise control computer, next to the wiring harness plug. It should start flashing and flash faster as the engine revs are increased using the throttle;

5. **Speed signal test** – ***This test can be done on most bikes with the motorcycle on the centre stand, with the rear wheel clear of the ground – HOWEVER, this may cause a fault flag on the bike's stability control system. As a result, this test is best done by riding the bike.*** Engage 4th or 5th gear and use the throttle to drive the rear wheel at about 30 to 40kph (or ride the bike), observe the light on the switch, it should flash slowly and regularly with speed signal, the flash rate will change with speed. Remember that operating other controls (brake, clutch etc) will also make the green light come on as well.

This completes the diagnostic tests. Turn the ignition off to exit diagnostic mode.

This completes the installation and testing of your new Throttle-by-Wire Cruise Control.

NOTE: If you are happy with the unit set to 2 KPH speed increment (speed bump) adjustments, no other calibration or setup is required.

If you need the unit set to 1 or 2 MPH or 1 KPH speed increments, please see below to change the settings.

Speed increment adjustment

This function adjusts the how much each press of the SET/ACC or RES/DEC buttons change the set speed (speed bump function). This can be set to 1kph or 2kph or 1mph or 2mph per press of the buttons.

- Turn the ignition switch OFF. Press and HOLD the RES and ON-OFF buttons, turn the ignition switch ON, **HOLD THE BUTTONS UNTIL THE SWITCH INDICATOR LIGHT COMES ON GREEN (a few seconds), then release the buttons**. The cruise control is now in speed pulse rate calibration mode.

- Press and HOLD the ON-OFF button. The indicator light will start flashing green. It will normally flash a number of times to display the setting (twice for setting #2) then pause for a couple of seconds, then flash the number again.

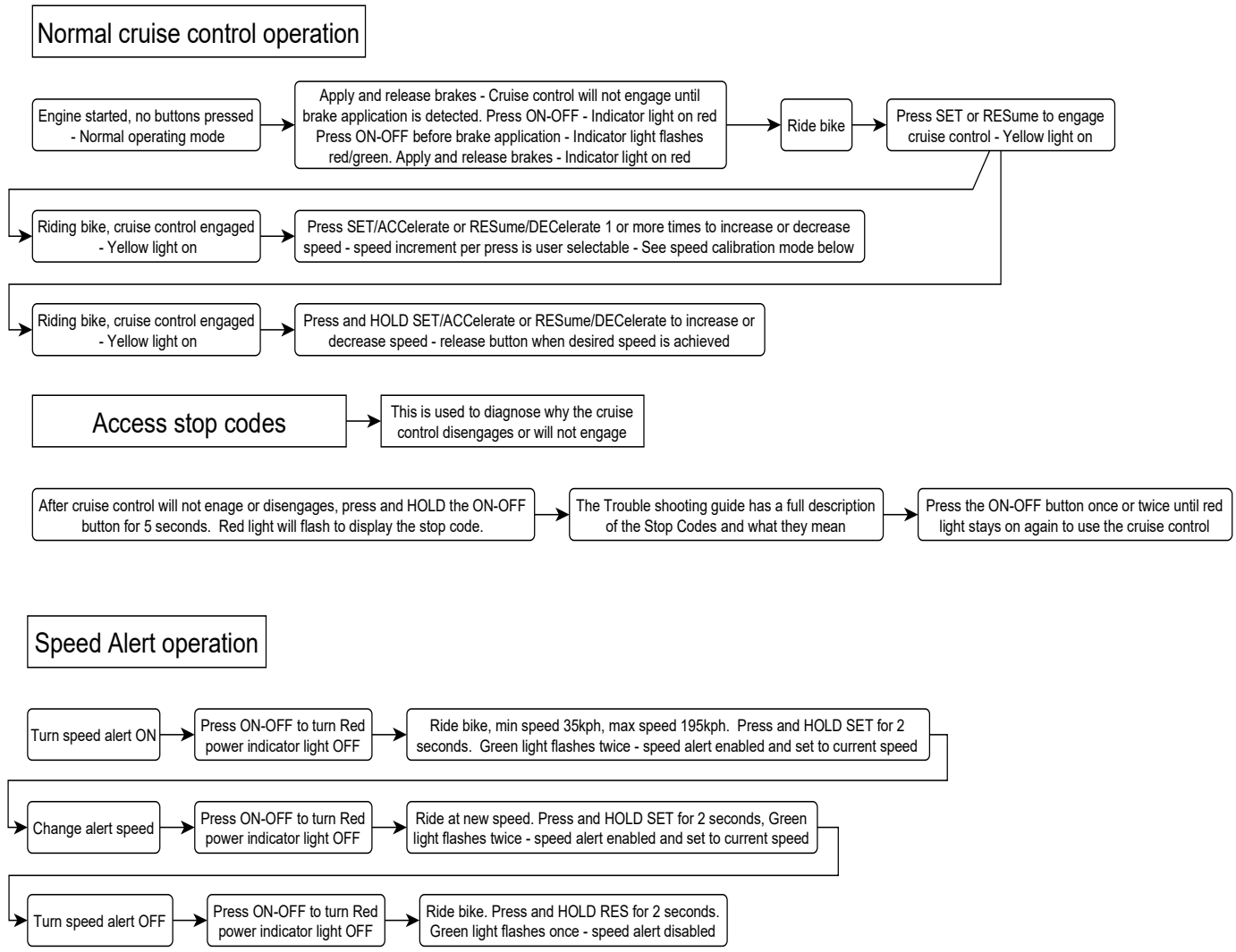
- While HOLDING the ON-OFF button, press SET to increase the number, press RES to decrease the number. #1 = 1 kph (0.6 mph). #2 = 2 kph (1.2 mph). #3 = 1 mph (1.6kph). #4 = 2mph (3.2 kph).

- Count the number of flashes to confirm your selection.

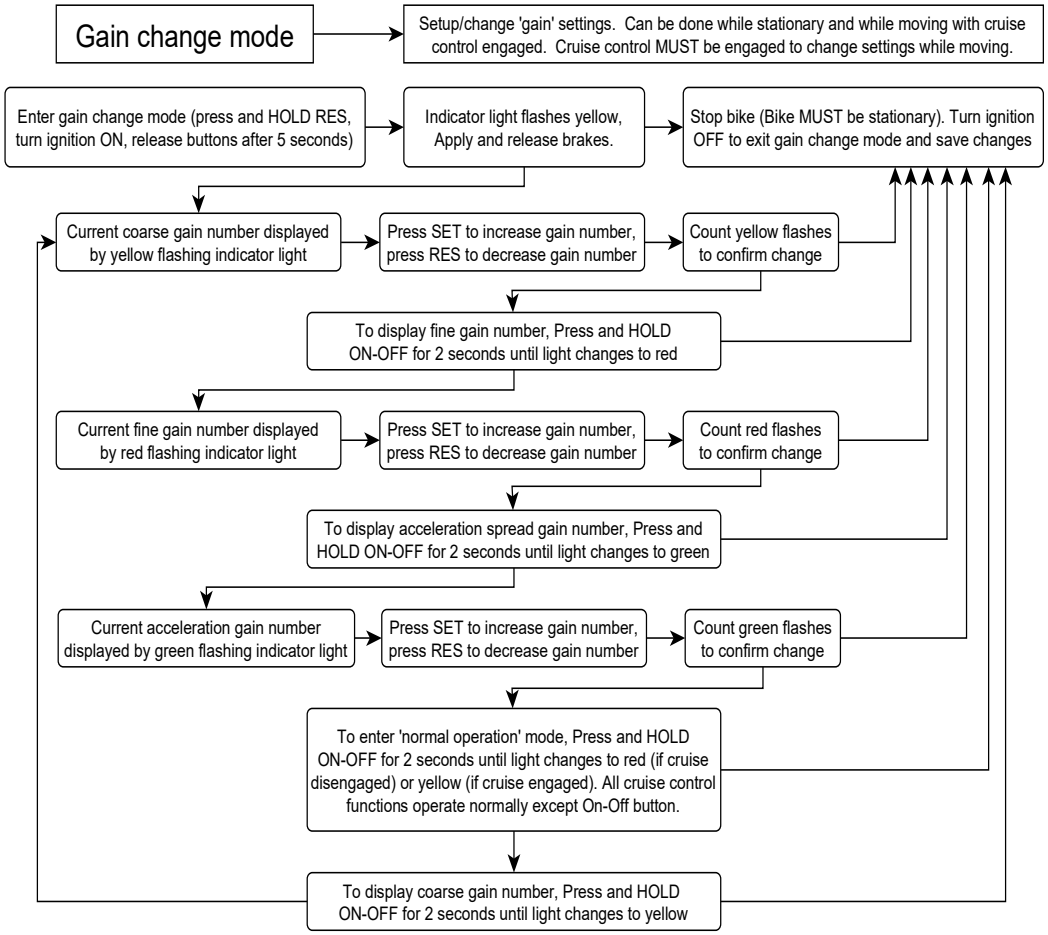
- Release the ON-OFF button when you are finished making this adjustment (the light will go back to green, no flashing), then turn the ignition switch OFF. This completes the speed increment adjustment.

Cruise Control Menu Map

Menus for normal operation



Menus for ‘fine tuning’ or adjusting the cruise control performance.



Notes: -