

## AP500 FAULT FINDING – NEW INSTALLATION

This Bulletin covers the AP500 model which is identified by a black plastic Electronic Module with a silver printed label. This module would normally be mounted behind the vehicle dashboard and has the Cruise Control wiring harness connected with a multi pin plug. If you can locate two Brown wires (one with a White trace line) at the vehicle brake lamp switch they will lead you to this module.



AP500 ELECTRONIC MODULE

Before we discuss the test procedure there are some important points we should verify. Command Cruise Controls are designed for 12 volt (not 6 or 24 volt) passenger cars, light commercials and four wheel drive vehicles. The gross (loaded) weight of the vehicle should not exceed 4 tonnes. **We cannot provide technical support or advice for vehicles outside these specifications, or for fitment to motorcycles, boats, stationary engines or other applications. Further, Command Cruise Controls are not suitable for very low speed use such as crop spraying, but are designed to engage in 40kmh School Speed Limit zones as a minimum. If you have purchased a kit for non-specified fitment please do not proceed as the unit will not operate.**

If you have fitted a Cruise Control and found it will not engage during calibration/road test please firstly review the following.

## THE IMPORTANCE OF THE VEHICLE BRAKE LIGHT CIRCUIT

Our Diagnostic Test will check correct operation of the brake pedal switch but not the circuit resistance value, so have you stood at the rear of vehicle while another person presses the brake pedal and checked all brake lights are working? A blown brake light bulb or circuit fault will prevent the Cruise Control from engaging. Have you also checked the main brake lamps are bulb-type and not LEDs? If your vehicle has factory-fitted or after-market LED brake lamps you will need to increase the resistance of the brake lamp circuit, please refer to LED Brake Lamp Tech Bulletin. Note, this does not refer to a third LED brake lamp (such as rear window or spoiler mount) if the primary lamps are still bulb-type.

## DID YOU CALIBRATE THE CRUISE CONTROL WHEN INSTALLATION WAS COMPLETED?

The AP500 series requires calibration before it is ready to use. This process calibrates our Electronic Module to the vehicle road speed pulse rate, which can vary significantly from one vehicle to another. It is this calibration that provides appropriate minimum and maximum engage speeds. In the kit there is a folded A4 sheet with a flow-chart on the front cover, please complete this if not already done.

## ARE YOU CALIBRATING WHILE DRIVING ON THE ROAD?

Some installers prefer to test the vehicle on a hoist or jack stands, with the engine running and the drive wheels rotating to simulate a road test. This test can mislead you as our module incorporates a sophisticated acceleration surge cut-out. It may be that the Cruise Control engaged and then disengaged so quickly you are unaware this happened. The vehicle **must** be driven on the road to successfully calibrate and to confirm operation.

## PRIMARY WIRING CONNECTIONS

There are wiring connections that must be correct for reliable Cruise Control operation. Further, these connections should be soldered and insulated to avoid potential problems. Using scotch-lock or crimp connectors, or twisting wires and wrapping with insulation tape will create problems, the only question is how quickly.

**Orange power wire** – should be connected to the ignition switched wire at the rear of ignition key barrel. Simply probing with a test light or multi meter and connecting to any ignition switched wire is not suitable. If you cannot access the rear of the key barrel locate the primary ignition wire at the fuse panel and connect there.

**Green earth wire** – must be connected to an independent earth point on the vehicle body. Do not connect to an existing earth where one or more wires go to earth, and do not connect to bolt-on metal items such as steering column or dashboard frame.

**Brown and Brown with White trace brake switch wires** – One wire must go to power input at the brake lamp switch on the pedal, the other to the switched output that supplies voltage to the rear bulbs when the brake pedal is depressed. Before engaging the Cruise Control will check firstly for 12 volts on one wire and 0 volts on the other (disengaging when it registers voltage on both) and then it will test the 0

volt wire for circuit resistance. If both tests are ok the Cruise Control should engage, if the module registers an incorrect reading it will not.

## **FITTING A CLUTCH SWITCH ON MANUAL TRANSMISSION VEHICLES**

We supply two different Clutch Switches depending on vehicle application. The first is the AA170 Magnetic Proximity type which is described in the primary manual and is wired into one of the two Brown wires that connects to the vehicle stop lamp switch. The second is our MCS Plunger Style switch which is described in the amendment sheet included in the Cruise Control box. This switch looks like a brake lamp switch, and should not be connected to either Brown wire. To correctly install this switch connect the Cruise Control Purple wire to one terminal (It doesn't matter which) and attach a wire to the second terminal and connect to independent chassis earth. If you connect the MCS switch to the Brown wire it will cause the brake lamps to come on whenever the clutch pedal is depressed, and may stop the Cruise Control from engaging.

## **PERFORMING DIAGNOSTIC TESTS**

When you have confirmed the above points we are ready to proceed with Diagnostic Testing. To perform these tests you will need to look at the small red LED on our Electronic Module (not the LED on the control switch) to confirm the module is receiving the required input signals. Please locate the module in an appropriate position now.

**Enter diagnostic mode** – We need to instruct the Cruise Control to enter this mode rather than normal drive mode which is the default setting. To do this press and hold the SET button while you turn the ignition key from the IGNITION OFF to the IGNITION ON position. Release the SET button when ignition is ON. Now switch the Cruise Control ON and the switch LED (or remote LED for Steering Wheel Switch) should go GREEN. You may notice the LED **on the Electronic Module** showing RED for few seconds which is the module preparing for signal input, when the LED on the Electronic Module goes off you are ready to proceed.

**Diagnostic Test A** – Press and hold the SET button and the LED on the Electronic Module should go RED, release and the LED should go off.

Press and hold the RES button and the LED on the Electronic Module should go RED, release and the LED should go off.

Press and hold the brake pedal and the LED on the Electronic Module should go RED, release and the LED should go off.

## **If all inputs are correct you are ready to proceed to Diagnostic Test B**

We are now going to test the actuator in the engine compartment, and it will be helpful if you have a second person to assist you. If so, have that person look at the connection of the Cruise Control cable to the vehicle throttle mechanism. Press and hold the SET button and the Cruise Control cable should progressively open the throttle. If successful press and hold the RES button and the cable should progressively close the throttle. If you don't have a second person carefully note the

position of the throttle at rest and then press and hold the SET button for approx 8-10 seconds. Re-check the throttle and it should have moved toward the full throttle position. Then press and hold the RES button for a similar amount of time and the throttle should be at (or close to) the idle-stop position. If the throttle does not move please go to the AP500 Electronic Actuator (drive motor) and remove the plastic inspection cover from the side of the metal housing. This cover is secured by the cable attachment nut which should be loosened, and one Phillips-head screw which should be removed. With the cover removed ensure the cable is correctly located in the drive pulley and reassemble. If this is intact please contact TCAG Tech Support for advice. There is no charge for this call.



AP500 ELECTRONIC ACTUATOR



WITH INSPECTION COVER REMOVED

### **If the throttle opens and closes you are ready to proceed to Diagnostic Test C**

We are now going to test for Speed Signal input to confirm the Cruise Control is receiving a speed reference. Start the engine and check switch LED is still Green (press ON button if not), drive the vehicle, preferably on a quiet road where there is little traffic. While you must ensure you drive safely, you need to check that the LED on the Electronic Module is flashing steadily ON/OFF/ON/OFF etc when the vehicle has reached a speed of 15-20kph. At this speed the rate of flash will be quite slow. As you increase the vehicle speed the rate of flash will also increase by a modest margin. If you reach a speed of 50-60kph and the LED is not flashing you have not connected the Cruise Control Blue wire to the correct vehicle Speed Signal Input wire. If you cannot locate the correct vehicle wire, contact TCAG Tech Support for advice. There is no charge for this call.

If you have successfully completed these tests then the Cruise Control should engage. You will need to turn the vehicle ignition OFF for approx 30 seconds to take the Electronic Module out of Test mode and revert to normal Drive mode. Restart the engine, switch the Cruise Control ON, and road test for engagement at different speeds starting at 50kph and working upward within local speed limits.

*DISCLAIMER: Command Auto Group Pty Ltd (hereafter referred to as the company) provides this information as a diagnostic support service to customers to assist in fault-finding automotive Cruise Control installations. When followed correctly there is no risk of damage to the Cruise Control, the vehicle to which it is fitted, other property, or personal injury. The company cannot be held liable for damage, loss or injury that occurs though product fitment to non-specified vehicles or other mechanical or electronic devices. Further the company cannot be held liable for damage, loss or injury that occurs from failure to understand and correctly apply this information, or for action taken beyond that described in this or similar technical support documents, or verbal advice provided by TCAG Technical staff.*

---