Cambridge Avionics

Rotax 912iS HIC/Power Wiring Harness

Part No: CAV11

Option C : Wire-ended EMU/EMS Connections

Specification and Installation Manual

(Please retain for reference)

Version 1.4
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Product	
Variant	
Serial #	
Mod/Comment	
Date	

[This is a sample manual for web access]

CE 2006/95/EC
EN55022
EN55011/B

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CONTENTS

1. INTRODUCTION

The CAV11 is a wiring harness designed to connect the Rotax 912iS Harness Interface Connectors (HICs) and Fuse-Box power connections to the aircraft panel, EMU/EMS and Rotax maintenance equipment.

All connections to the HIC terminals and power terminals are provided ready crimped, making installation a simple matter of feeding the cables through the firewall (if applicable) and inserting into the HIC and Power Connector housings included with the 912iS engine.

Wires are logically grouped together to simplify installation and the Rotax maintenance connections are fitted with the correct D-Sub connectors. In addition, a start relay is provided, along with appropriate connectors.

This manual includes important information regarding the installation and operation of the equipment and should be read before use.

2. HARNESS DETAILS AND SPECIFICATIONS

Take time to identify and understand the harness components before installation. It will be useful to read the Rotax 912iS installation manual in conjunction with this document.

There are 18 main parts to the harness, summarised in the table below.

Cable/Group Name	Wires	Insulation	Size	Termination 1	Termination 2	Length (cm)	Label	Colour(s)
EMU/EMS Lane A	3	PTFE	20AWG	HIC terminal	Wire-ended	150	EMU Lane A	W/B/G
EMU/EMS Lane B	3	PTFE	20AWG	HIC terminal	Wire-ended	150	EMU Lane B	W/B/G
Rotax maintenance Lane A	3	PTFE	20AWG	HIC terminal	9-pin D-Sub	50	Maint Lane A	W/B/G
Rotax maintenance Lane B	3	PTFE	20AWG	HIC terminal	9-pin D-Sub	50	Maint Lane B	W/B/G
Switch leads, Lane A	2	PTFE	16 AWG	HIC terminal	PIDG Faston	120	Lane A	W
Switch leads, Lane B	2	PTFE	16 AWG	HIC terminal	PIDG Faston	120	Lane B	W
Switch leads, Main fuel pump	2	PTFE	16 AWG	HIC terminal	PIDG Faston	120	Fuel Pump 1	W
Switch leads, Aux fuel pump	2	PTFE	16 AWG	HIC terminal	PIDG Faston	120	Fuel Pump 2	W
Lamp leads, Lane A	2	PTFE	18AWG	HIC terminal	Wire-ended	120	Lamp Lane A	R/B
Lamp leads, Lane B	2	PTFE	18AWG	HIC terminal	Wire-ended	120	Lamp Lane B	R/B
Starter switch leads	2	PTFE	18AWG	HIC terminal	PIDG Faston	120	Starter	W
Fuse box power lead terminal #1	1	PTFE	12AWG	Power terminal	Wire-ended	150	1 Backup	W
Fuse box power lead terminal #2	1	PTFE	12AWG	Power terminal	Wire-ended	150	2 Start Pwr	W
Fuse box power lead terminal #3	1	PTFE	12AWG	Power terminal	Wire-ended	150	3 Battery	W
Regulator A ground lead	1	PPE	12AWG	PIDG Ring M4	Wire-ended	150	Reg A Gnd	B
Regulator B ground lead	1	PPE	12AWG	PIDG Ring M4	Wire-ended	150	Reg B Gnd	B
Main fuel pump extension cable	2	PPE	16AWG	PIDG Butt	PIDG Butt	110	FP1 extn	R/B
Aux fuel pump extension cable	2	PPE	16AWG	PIDG Butt	PIDG Butt	90	FP2 extn	R/B

Colour codes: W = white R = red B = black G = green

3. CABLE GROUP PINOUTS

Some of the cable groups require to be connected the correct way round at the HIC end or at the other termination and these are dealt with below.

3.1 ECU Indicator Lamps

The indicator lamp wires are only polarity sensitive if LEDs are used (as per the alternative arrangement in the Rotax manual). Colour coded cabling is provided to facilitate this (and the correct polarity is indicated on the diagram in Section 5).

3.2 Fuel Pump Extension Cables

These twisted pairs are colour coded. The colours may not match those in the existing Rotax harness but should be connected such that the Rotax harness cables are correctly extended and not cross-coupled.

3.3 CANbus Connections

All the CANbus cabling (for both the EMU/EMS and Maintenance ports) has the following colour coding:

CAN Low : Green
CAN High : White
CAN Gnd : Black

Ensure that the HIC terminals are correctly inserted according to this scheme and that the other ends of the EMU/EMS cables are correctly connected to the EMU/EMS units(s) according to the manufacturer's instructions.

3.4 Fuse Box Power Leads

The fuse box power leads are all the same colour but must be assembled into the correct pin locations in the fuse box 3-pin connector. The leads are labelled with pin numbers to facilitate this and reduce the possibility of error.

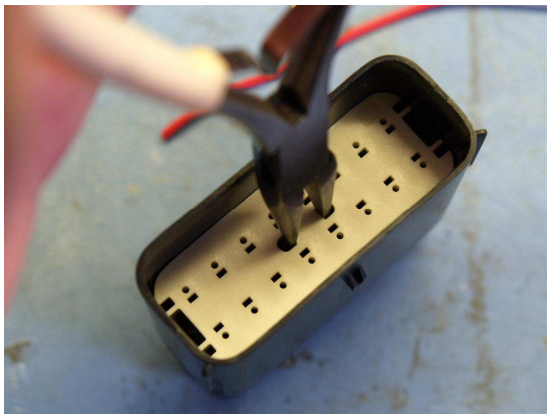
4. INSTALLATION

Installation is largely straightforward and self-evident if done in conjunction with the appropriate sections of the Rotax 912iS installation manual, which should be read carefully and fully understood before installation commences. The following notes may be found to be useful.

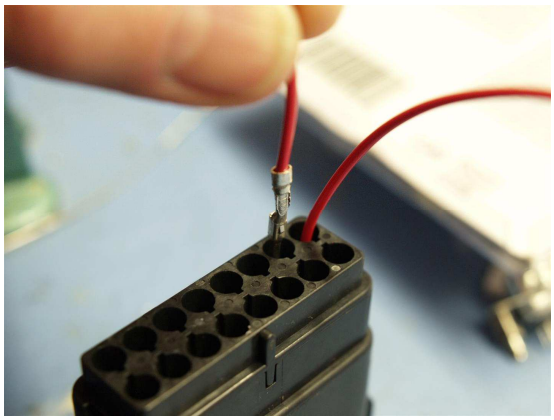
4.1 HIC Connections

If the installation calls for the HICs to be on the engine side of the firewall it will be found easiest to pass the cables HIC-terminal-first through the firewall from the cockpit side before inserting them into the appropriate HIC connector.

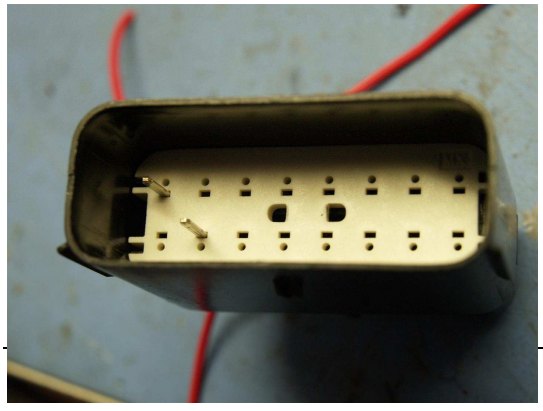
Some tips on the use of the HIC housings follow.



1. *Before inserting the terminals into the HIC housing, ensure that the white TPA lock is in the correct position for insertion. This is easily checked by gently pulling it using a pair of long-nosed pliers as shown. There are two distinct positions of the TPA lock, and (from this angle) it needs to be in the uppermost position (which is approximately 12.5mm below the top of the housing).*



2. *Insert the terminals from the other side of the housing, lining up the locating feature on the terminal (on the opposite side to the crimp closures) with the slot in the hole. Gently push the terminal down, through the sealing rubber gasket and keep going until it clicks into place. This does not require much force.*



3. *When all the terminals have been inserted, use the long nose pliers to push the TPA lock down into its locked position (which is approximately 17.5mm below the top of the housing). Note that the TPA lock can be un-locked again as often as required should further terminals need to be inserted.*

4.2 Fuse Box Power Connector

It may be found easier to build up the power connector assembly away from the aircraft. Installation is then simply a matter of passing the open-ended cable ends through the firewall from the engine side before connecting the 3-pin power connector to the fuse box.

1. *The 3 power cables in the process of being fitted into the housing. (Note that the cables are red here but this colour, as well as the labelling technique, may differ on the cables supplied).*

2. *Final housing assembly. Note the use of heatshrink tubing.*

3. *Housing tightened and cable grip attached*

4.3 Regulator Ground Cables

The ring terminations should be connected to one of the threaded studs on the appropriate regulator ground plates (at either end of the fuse box). At the other end of the cables, Regulator B ground then requires to be connected to airframe ground at a convenient point and Regulator A ground will connect to the Start Power and Backup Battery switches on the panel (as per the wiring diagram in the Rotax installation manual).

4.4 Start Relay and Connections

Unless a start button of high current capacity (5A) is to be used, most installations will require the use of a relay in the starter circuit to make the 'start button' connections as shown on the EMS wiring diagram in the Rotax installation manual.

A relay is supplied for this purpose and should be connected as follows:

Relay Pin Identifier	*Description*	*Connect to*
85	Relay coil	Airframe ground
86	Relay coil	+12V to start (See Note 1 below)
30	Relay contact	Loom starter cable
87	Relay contact	Loom starter cable
87a (if present)	NC contact	(Do not connect)

Connectors are provided for connecting to pins 85 and 86. The connectors for pins 30 and 87 are already fitted to the starter cables in the wiring harness and may be connected either way round.

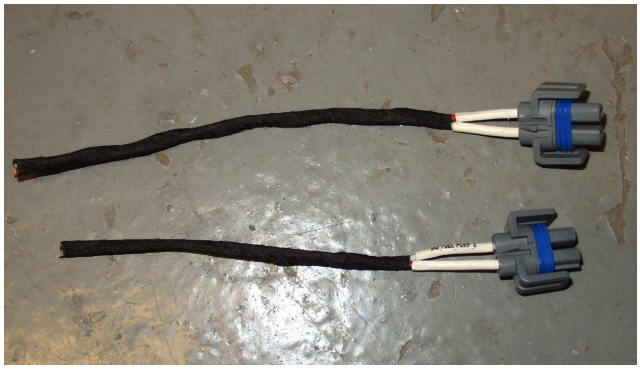
Note 1: When +12V is applied to the relay, it closes the 'start switch' connections in the HIC which in turn triggers the main Rotax starter relay and starter motor. The +12V may be supplied by whatever means is most convenient based on the installation (typically a 'start' button).

4.5 Fuel Pump Extension Cables (If Applicable)

If required, the fuel pump cables are extended by cutting the Rotax loom and inserting the extension twisted pair cabling, after passing the cut ends through the firewall. Ensure that correct polarity is observed and also that the correct pump labelling is maintained.

The following photographs use a EuroFOX installation as an example.

1. *Cut the fuel pump cables about 15cm from the connector ends. Don't mix them up .. cut one at a time and label the cables on the harness side of the cut.*

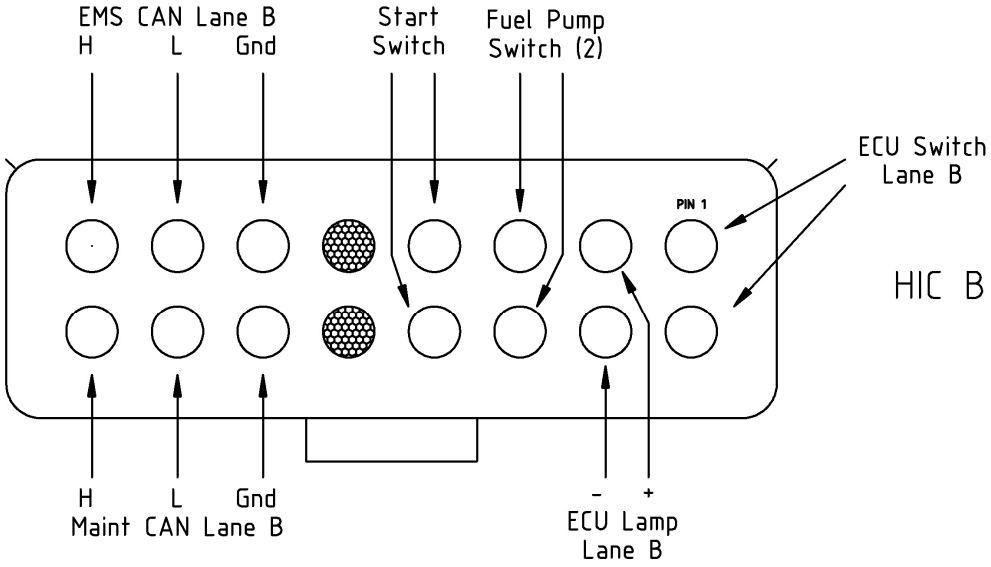


2. *The loose ends, after cutting.*

3. *Insert and connect up the extension cables. Note that the harness wire colours may not match those in the Rotax loom (this is unimportant, provided that the correct polarity is observed).*

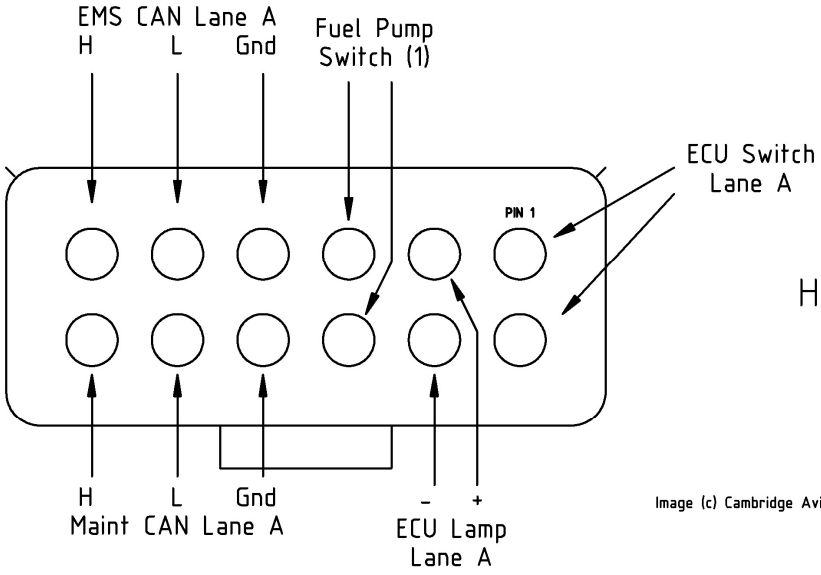
5. HIC CONNECTIONS

Connectors are viewed from terminal insertion side.



Rotax iS HIC Connectors

Viewed from terminal insertion side



6. CERTIFICATIONS AND DISCLAIMER

The equipment is manufactured in the UK according to EN ISO 9000 / EN ISO 9001 and is CE marked according to 2006/95/EC, EN55022 and EN55011 Class B.

The equipment ***is not*** approved by FAA, EASA or CAA .

Important Note:

This equipment is not approved for installation in type certified aircraft.

Disclaimer:

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The manufacturer reserves the right to alter any aspect of the product specification without notice.

7. LIMITED WARRANTY

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