RV-14 Wiring Harness Integration

> We would appreciate your feedback if we got it wrong somewhere or if you think the guide could be improved.
> Builders following your footsteps will appreciate it as well!

Van's Aircraft supplies wiring harness WH-00011 as part of the wings and WH-00057 as part of the tail kit for the RV-14, as well as the optional WH-00125 for the fuselage.

These can be used to support a Flyleds installation with a few modifications.

You can also follow this guide to integrate the Flyleds wiring if you only have the wing and tail harnesses.

Please refer to the drawing package for WH-00125, available from the Van's Aircraft website.

Parts list:

o M27500/ 2 wire shielded cable		10 feet
o 20 or 18AWG wire		2x 6 feet
o Molex 4 way plug	03062042	2
o Molex 4 way socket	50291758	2
o Molex 2 way plug	03061022	1
o Molex 2 way socket	03062024	1
o Molex male pins		10+2
o Molex female pins		10+2

Overview

The line diagram below gives an overview of the harness wiring used for the position, strobe, taxi and landing light circuits. More detail on each circuit is given in the following pages.
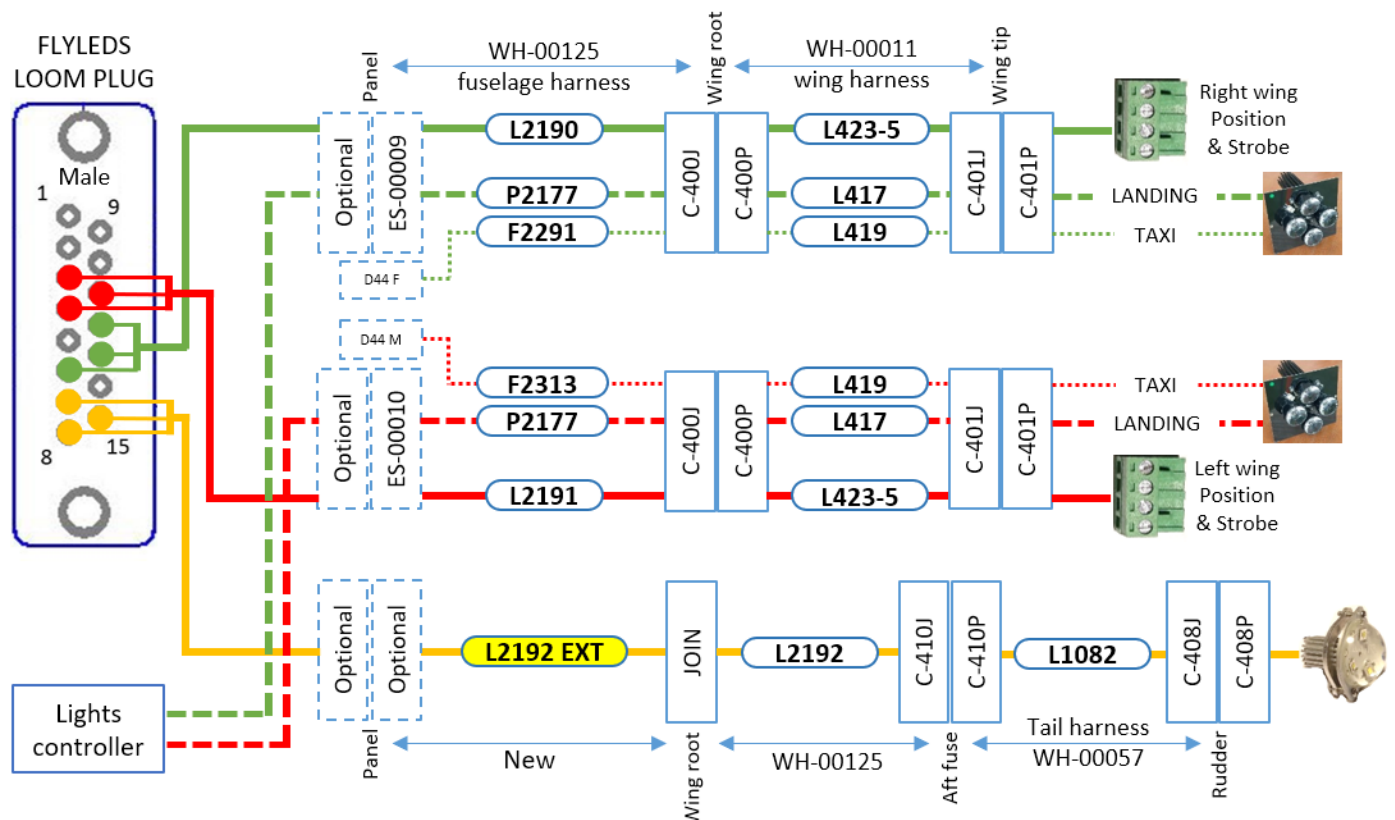
Strobe controller

We recommend mounting the Flyleds controller board somewhere behind the panel and make it part of the panel sub assembly and wiring.

If your Van's fuselage harness is fitted with Molex and D-SUB connectors at the panel end, the shielded cable to the left strobe **L2191** terminates on Molex plug ES-00010, and the right strobe cable **L2190** on Molex plug ES-00009.

1. Make the six corresponding connections from your matching harness sockets to the Flyleds controller board 15 pin D male plug as shown at left in the diagram below, or remove the wires from Van's Molex plugs ES-0009 & 00010 (if present) and connect the wires from cable L2190 and L2191 directly to the controller board plug.

* If these connections are any more than 12 inches or so long we recommend using shielded cable with the shield connected through the Molex plug as shown by the green lines below, but *not* connected at the Flyleds controller board end, as the shields are already connected to ground at the C400J wing root connectors.
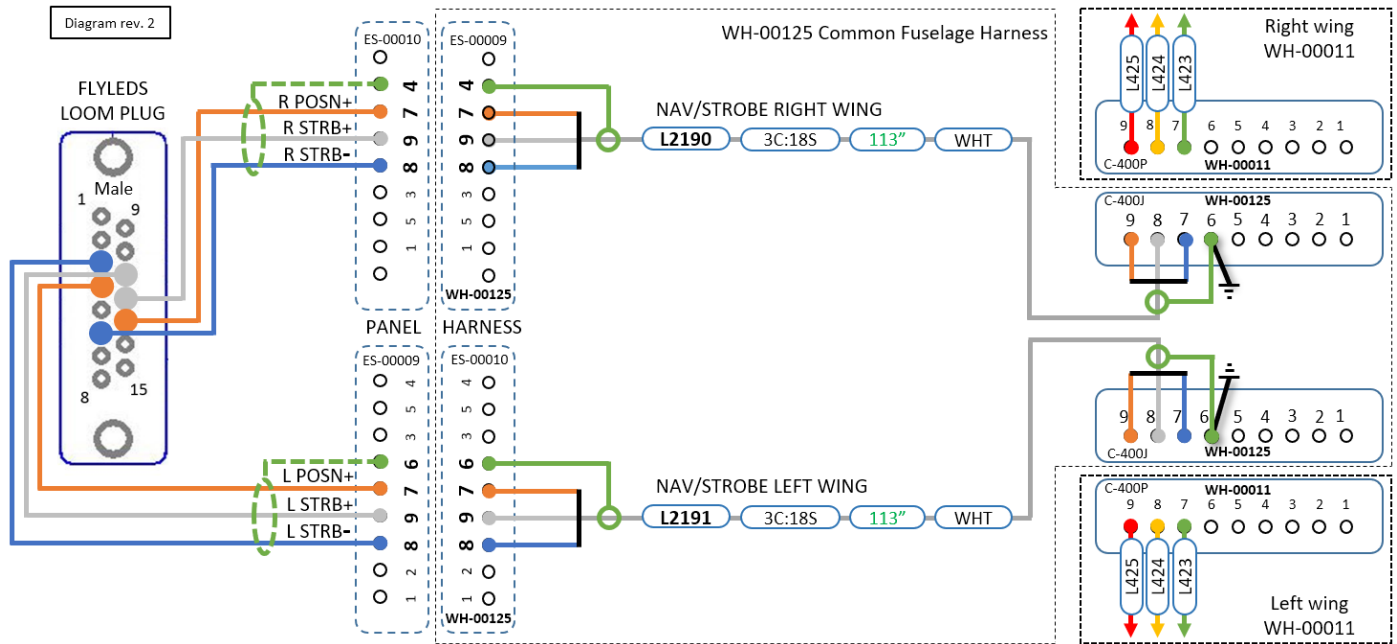
An alternative approach would be to mount the Flyleds control board elsewhere and consider it to be a part of the fuselage wiring. In this case recover wires L2190 and L2191 from the harness plugs and divert them to the Flyleds controller board plug using the same connections shown above.

If you have a Molex pin removal tool it can be used to withdraw the wire and pin from the rear of the connector. Alternatively, snip the wires a few inches from the plug and insulate the ends to allow for possible later re-use, especially for power connections as detailed below.

Fuselage wiring

For those that have not purchased Van's fuselage harness WH-00125 we recommend replicating Van's wiring using shielded cable for the wiring runs within the fuselage, as shown above.

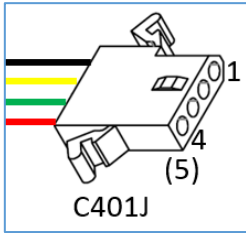## Power to the controller board

The diagram shows a conceptual view of the power connections to be made to the Flyleds controller plug.

20AWG wire can be used.

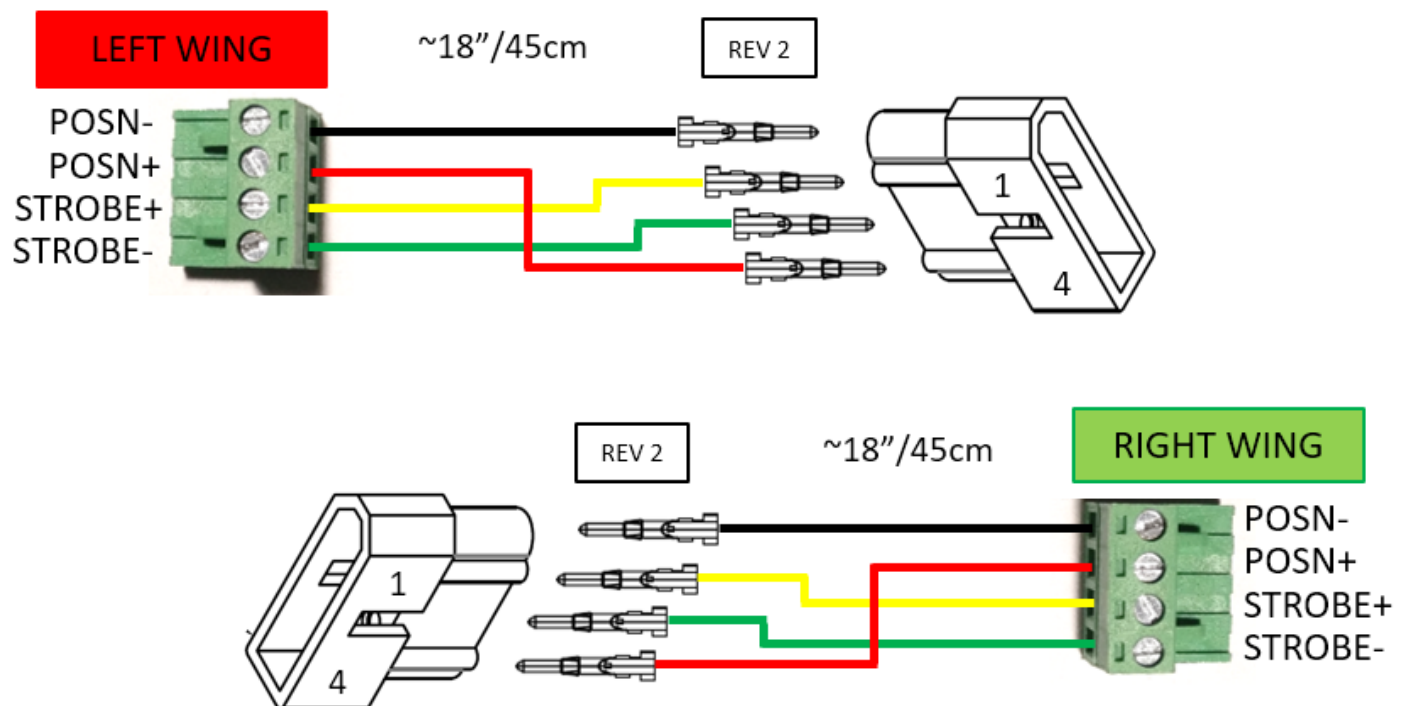Please refer to the Flyleds System Installation Guide for more details.
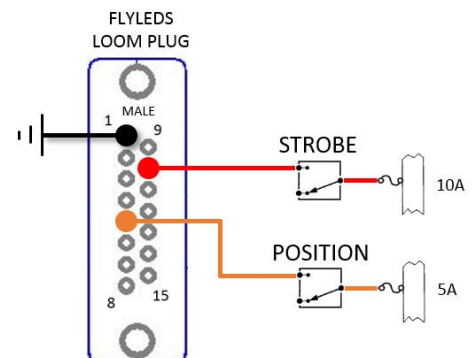
Wing tip wiring

Van's wing wiring harness WH-00011 includes a Molex connector **C401J** out at the wingtip in readiness for position (nav) and strobe lights. (See plans page 19-02 for details.)

Van's previously supplied a five pin version of this connector but as of mid-2019 the harness has a four pin version instead. If your connector has five pin locations the fifth position should be empty.
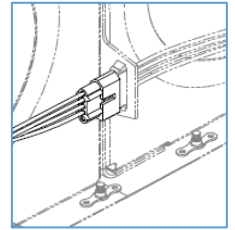
C401J

1a: If you were supplied with matching plugs (C401P) continue to use these in the following steps.

1b: If you have five pin connectors for C401J on the wing harness and no matching plugs, either use a Molex pin removal tool to withdraw the four wires from the connector, or snip the wires and re-terminate them using the **female** pins supplied in the Flyleds parts bag.

2. Re-insert these wires into the four place connector shell supplied with the Flyleds RV-14 loom kit, moving pin 1 to pin 1, pin 2 to pin 2, etc, following the colour code shown in the diagram above left.

3. Make two wiring looms as shown below to enable the connection of the Flyleds position and strobe boards to the C401J connector.

Halve, halve and halve again the two 6' lengths of wire supplied to make eight pieces approximately 18"/45cm long. 18 or 20AWG wire may be used. (The colors shown below are for clarity in matching the wing wiring only.)

The Molex connectors are marked C401P in Van's diagrams. Male pins should be used.

The green screw terminal plugs were supplied as part of your Flyleds wingtip lighting kit. They have a small cage that pulls *upwards* to grip the wire. The screws should be undone fully (ie anti-clockwise as expected) first. The wire can then be inserted, and the screw tightened (clockwise as expected) to grip the wire.

Mark the looms LHS and RHS as appropriate.

LEFT WING ~18"/45cm REV 2

POSN-
POSN+
STROBE+
STROBE-

1
4

REV 2 ~18"/45cm **RIGHT WING**

1
4

POSN-
POSN+
STROBE+
STROBE-

Note that the left and right green plugs are wired in mirror image to each other.
No harm will be done if the green plugs or the harness sides are accidentally reversed, however your strobes will flash red or green and your position lights will be bright white!

Landing Light wiring

Landing light power wires **P2177** (red , 14AWG) start at pins 2 and 3 of the left and right hand Molex connectors at the panel end of the fuselage harness, terminating at pin 1 of both wing root connectors, C400J.

Make connections to these wires directly (or via your corresponding Molex plug) to the Flyleds controller board, the Flyleds Wigwag module or your Vertical Power VP-X etc.
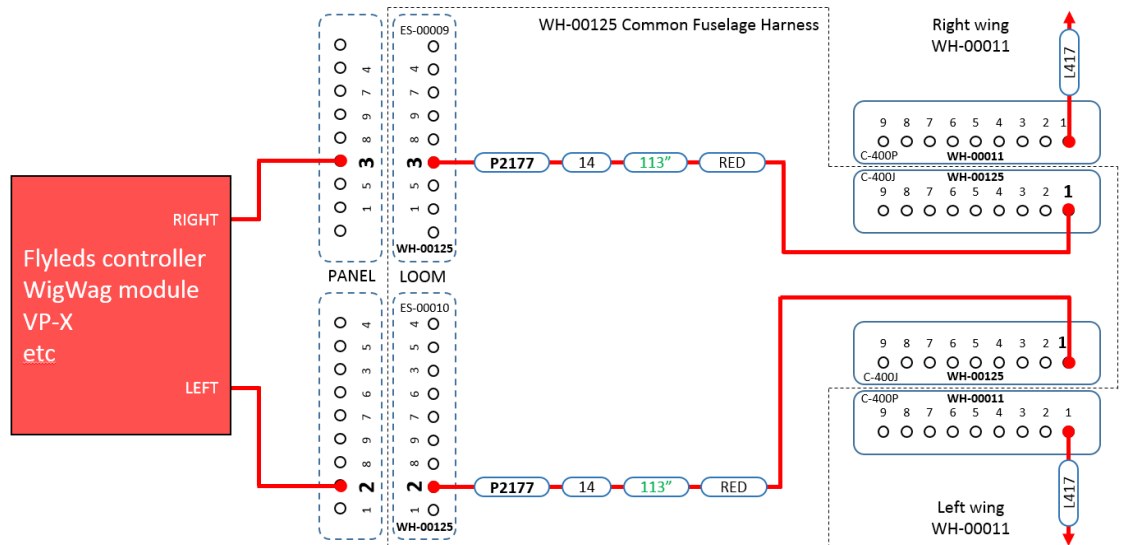
Wing wiring harness connections
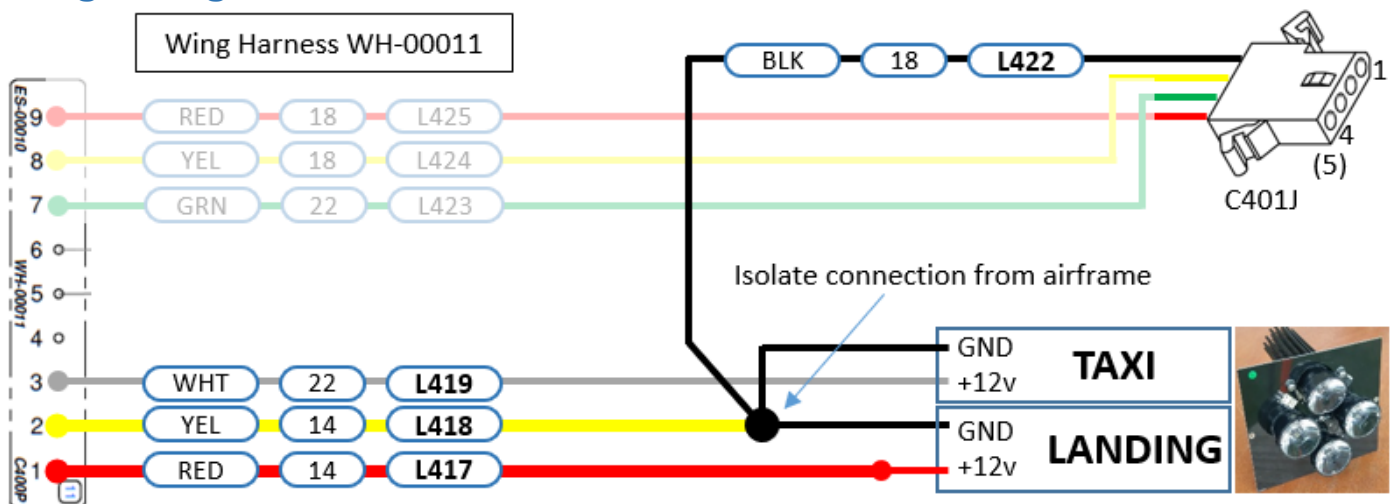
The diagram above shows part of Van's wiring harness WH-00011, located in each wing.

* Wire **L417** (red , 14AWG) from C400P pin 1 corresponds with wires P2177 above, and is used for the +12 volt supply to our Combo or Seven Stars landing lights mounted in the leading edge light bays.

Note that the power input terminals on the Flyleds Combo light will only accept 18AWG wire. Reduce the wire size with a short length of wire as required. The Flyleds Seven Stars light terminals will accept 14AWG wire.

* Wire **L419** (white, 22AWG) from C400P pin 3 may be used to power one Flyleds spotlight as a taxi light.

* Wire **L418** (yellow , 14AWG) from C400P pin 2 is the ground return wire. The grounds from the spotlight(s) as well as wire **L422** (black , 18AWG) from the wingtip position light connector C401J should be all connected to wire L418 by a suitable method of your choice such as a solder joint, butt splice or terminal block.

Note that in early versions of Van's plans, wire L422 is shown as being grounded to a nearby wing rib with a ring terminal. Remove this local ground connection and join wire L422 with wire L418 as shown here.

The common ground connection must be isolated from the wing so that *all* of the return currents flow back through yellow wire L418 to the fuselage connector.

Doing this means that any magnetic fields created by the various power wires is cancelled by the opposite magnetic field made by the ground return wire, minimising the chance of interference to a wing mounted magnetometer.

Taxi Lights

Wire **F2291** (**green/red**, 22AWG) from right wing root connector C400J pin 3 corresponds with wire L419 in the right wing wiring harness, and may be used to power a taxi light.

Wire **F2313** (**green/orange**, 22AWG) from left wing connector C400J pin 3 corresponds with wire L419 in the left wing.

Connect both of these wires to your Taxi Light panel switch. The 22AWG wire used here is suitable for the Flyleds Combo taxi light as it only draws one amp.

> **Note** that the Van's drawings for harness WH-00125 also alternatively calls out wire F2313 as "Pitot Heat Control" at the panel end, but does not make any further mention of this in the Left Wing Wiring page.
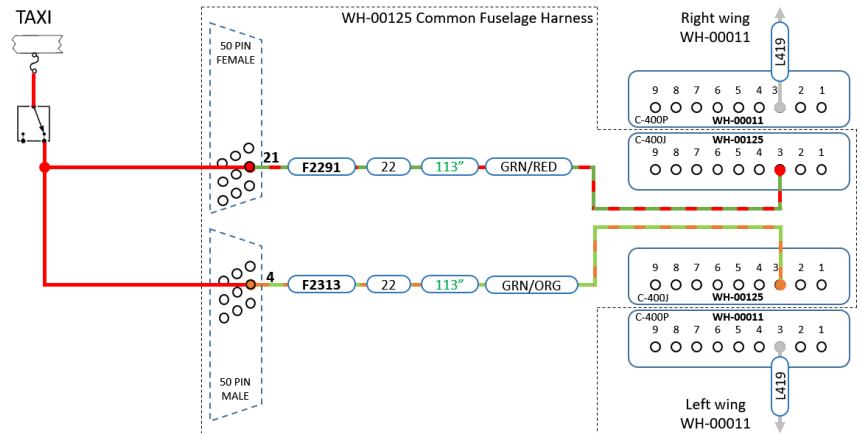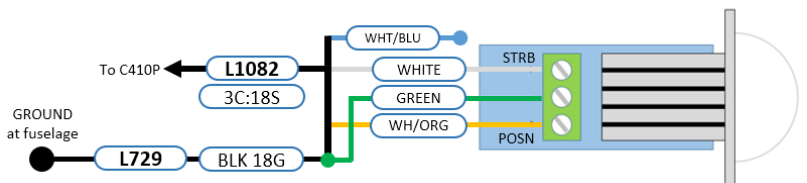

Tail light wiring

At the rudder, shielded 3 wire cable **L1082** is provided for a tail light as part of the Aft Fuselage wiring harness WH-00057 (see Van's RV-14 plans page 10-25).
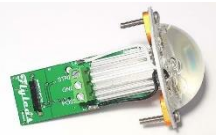
If you are installing **Van's tail light** or the Flyleds **Stand Alone tail light** as shown here, it simply needs 12 volt power from the position and strobe circuits to operate.


1. Connect the **white** wire within shielded cable L1082 to the **STRB input** of the tail light.
2. Connect the **white/orange** wire to the **POSN input** of the tail light.
3. Fold back and insulate the **white/blue** wire (sync) from cable L1082.
4. Connect the short **green** (or it could be **black!**) earth wire TP881 to the **GND** terminal on the strobe.
5. Connect the **black** earth wire **L729** to a suitable point on the vertical stabiliser if not already done.

The Flyleds standard Kit version tail light *relies* on the controller board for current limiting and for its operation in both position and strobe modes.
* Testing this light with 12 volts, no matter how briefly, *will* destroy the light! Please don't!
* Do not connect this light to ground as it will remain on and not flash, causing it to overheat.

Cable L1082 should be pre-terminated from the factory with female Molex pins. If your cable has male pins attached instead, proceed and make the appropriate adjustments at step 3 to suit.
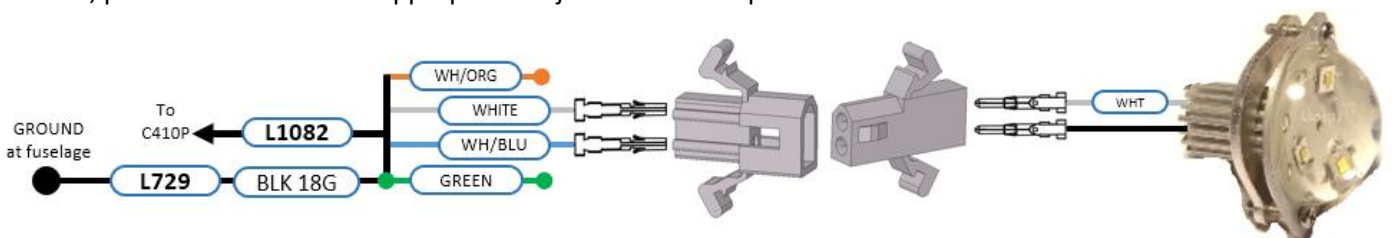
1. Insert the **white/blue** and the **white** wires into the two position Molex socket as shown.
2. The white/orange (Position +12v) and the green (or it could be black!) earth wire is not required. Insulate these and tie them out of the way to the cable jacket.
3. Crimp male pins onto the Flyleds tail light wires. Insert the wires into the Molex plug observing the polarities shown below. (No harm will be done to the tail light if the wires are reversed, it just won't work!)
4. Connect the **black** earth wire **L729** to a suitable point on the vertical stabiliser if not already done.

If you are installing our Stand-Alone Tail light, or you have already purchased Van's LN-Tail Light Kit, do not proceed with the following steps. Van's wiring harness is already configured to provide power to these lights.

Kit version tail light - Harness extension

The Flyleds kit version tail light *must* have both of its wires connected all the way forward through to the Flyleds controller board.

The Van's tail strobe wiring (**L2192**) runs from the tail and stops at the **Left Wing Root connector, C400J.**
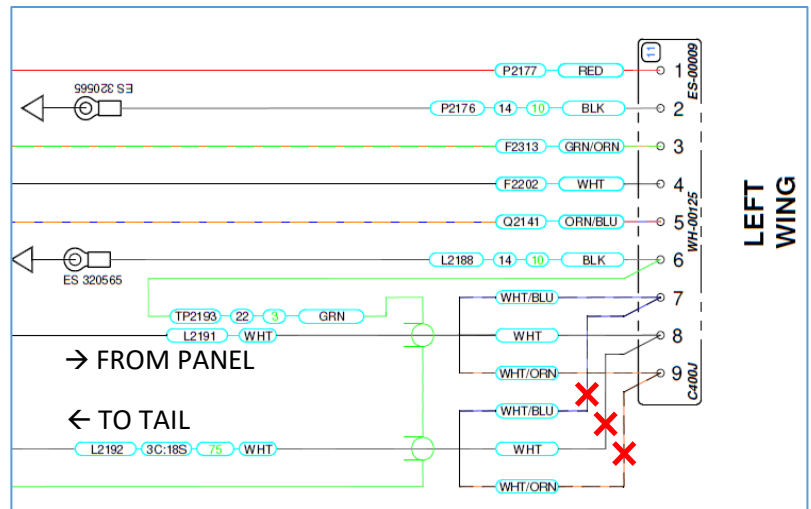You need to extend this wire run forward to the Flyleds controller board.

Figure 1: Part of Van's WH-00125 diagram

1. Disconnect the **shield wire** for cable L2192 from pin 6 of C400J.

2. Clip the wires in shielded cable L2192 (*only*!) from the plug C400J (marked ✖), leaving the wires from cable L2191 intact.

3. Join the **white/blue** and **white** wires to their corresponding wires in the supplied 10' long 2 wire shielded cable, **L2192Ext**. This is a permanent connection so the wires may be soldered together or spliced using your preferred method.
The **white/orange** wire in Van's harness is not required and can be clipped short.
Insulate and secure the connections.
Connect the shields of L2192 and L2192Ext together.

3. Run the L2192Ext cable forward to the panel following the same route as the rest of the WH-00125 (left) harness.

4. Terminate the tail light extension wires on the Flyleds plug as shown below.
Note that if your Van's WH-00125 harness is fitted with Molex and D-SUB connectors at the panel end you may wish to route the tail light connections through your own plug and socket, or use spare positions available in the Van's harness plugs.
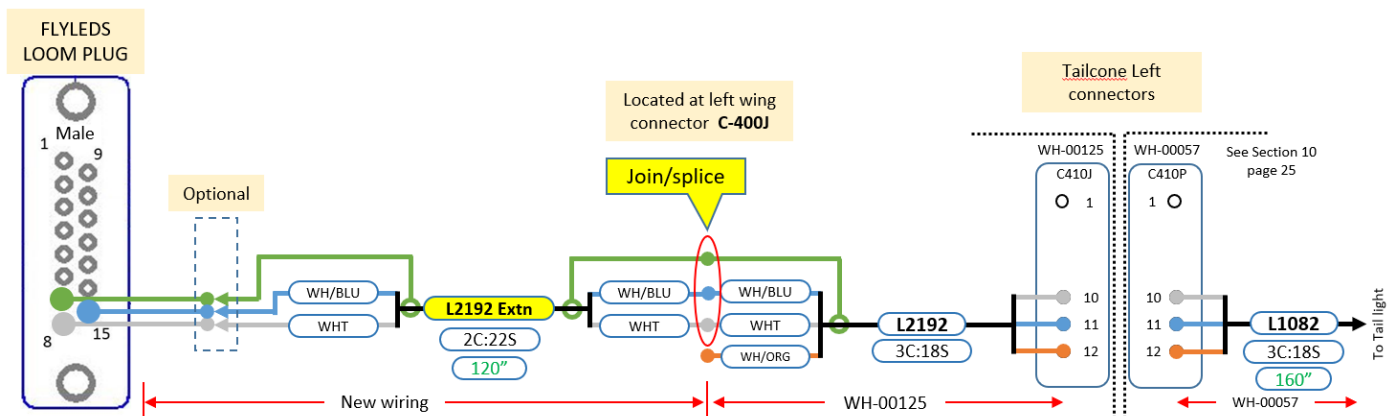
We hope this guide made things clearer for you. We welcome your feedback!