



Installation Instruction

SEARCHLIGHTS

**for AIRBUS helicopters
BK117-C2 and BK117-D2 (EC145 & H145)**

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Part 0 Manual Administration

0.1 Document Approval

This document has been established in accordance with an alternative procedure to DOA approved under EASA AP429.

This Installation Instruction is applicable for the following **Airbus helicopter** models:
Airbus H145 (EC145).



Compiled by: _____ 8. Mar. 2019
Petr Jaros
Engineer, Aveo Engineering Group, s.r.o.

Approved by: _____ 8. Mar 2019
Georg Hartl
Head of DO, Aveo Engineering Group, s.r.o.

0.2 Amendment Record Procedure

The master copy of this document shall be kept electronically as a read only document under the control of Aveo Engineering Group, s.r.o. as Master Copy.

ALL amendments to this manual will initiate a raise of issue.

The original issue will be identified by "**01**", and subsequent issues will be numbered sequentially from 02 to 99 in Table 01 - **Issue No.** column.

ALL issues of this document will be approved by Head of DO.

Issue No.	Details	Date	Affected Pages
01	Initial Issue	8. Mar. 2019	ALL

Table 01: Record of Document Amendments

0.3 Affected Pages Procedure

ALL pages affected by ANY raise of issue of this document will be listed in Table 01 - **Affected Pages** Column.

Changes from the previous issue are shown as follows:

- new text is highlighted with yellow shading: **new**
- deleted text is shown with yellow shading and a strike through: ~~deleted~~

Part 1 Installation Instruction

1.1 General

This installation is to be performed in accordance to common practice as described in *Advisory Circulars of FAA Regulations*:

- FAR AC 43.13-2B Chapter 4
- FAR AC 43.13 1B Chapter 11 Section 15 (Bonding)

and in general practice section of the **Airbus H145 (EC145)** *Aircraft Maintenance Manual (AMM)*.

The installer is responsible to follow the installation instructions in the latest revision of the following *installation manuals*:

- AVE-OLSILO-IM
- AVE-SLSILO-IM
- AVE-LS400K-IM

All drawings applicable for this change are listed in the Drawing List:

- None

The change is to be performed using the document AVE-MOD-023-MCS in the latest issue.

The aircraft modified according to this instruction may not be released back to service without the EASA design approval certificate being provided.

1.2 Continued Airworthiness

The aircraft manuals remain fully valid. The inspection intervals and the procedures of the aircraft override the general statements in the component manuals as listed under §1.1.

For inspection of the new lights themselves follow the procedure of the Aveo Installation Manuals referenced above.

1.3 Airworthiness Limitations

No new or changed airworthiness limitations result from this modification.

The airworthiness limitation section is approved and variations must also be approved.

1.4 Description

This modification rests in the replacement of searchlight and retractable landing light with lights of LED type.

The BK117-C2 and BK117-D2 (EC145 & H145) helicopter can be equipped with a search light or a retractable landing light. Searchlight and retractable landing light can both be retracted but in addition to that the search light can be rotated around the vertical axis (extended position) while the direction of the landing light is fixed.

Both lights are additional options to the customer and therefore not required to fly the helicopter in night operation as the helicopter is also equipped with a landing light fix installed in the cowling or in the lower fairing panels. These required landing lights are not affected by this modification.

1.4.1 Searchlights

Two options are available for installation of searchlights.

Both **Aveo Sapphire LS** and **Luminator LS400** can be operated:

- either in a **single mode** – white,
- or in a **dual mode** – white or infrared.
- **Aveo Sapphire LS** - is a 360 degree, full swiveling, single- or dual-mode searchlight available with different deployment angles controlled by firmware and mechanical limitations.
- **Luminator LS400** is a 360 degree, full swiveling, single or dual mode searchlight, available with different deployment angles and mechanical limitations.

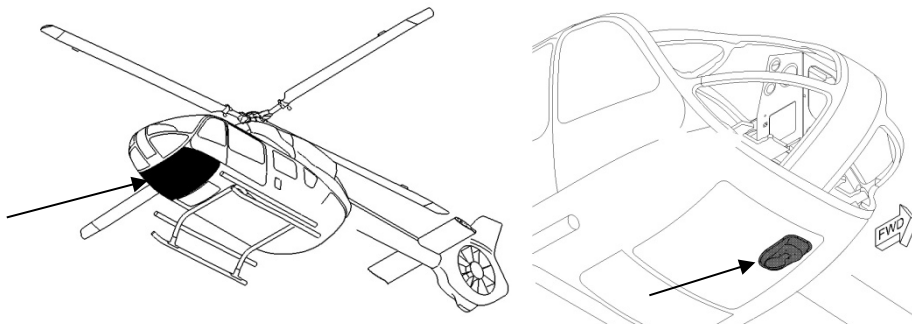
1.4.2 Retractable Landing Light

The retractable, additional landing light can be installed in the same provision described above for the search light. The difference to the search light is that the direction in the extended position is fix.

The retractable landing light is the **Aveo Omega LS**.

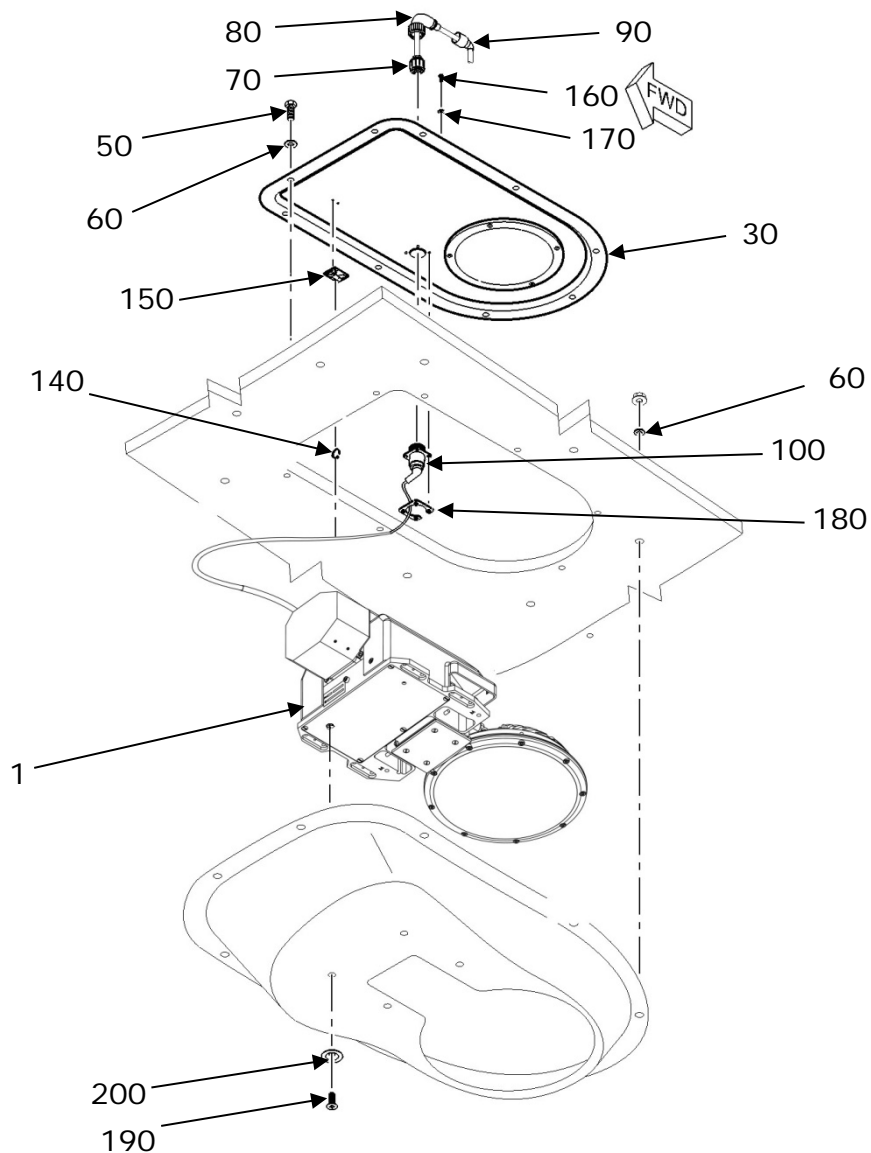
Aveo Omega LS is a high-power single-axis deployable led landing light available either **in single or dual mode**.

1.5 Search and Landing Lights Installation



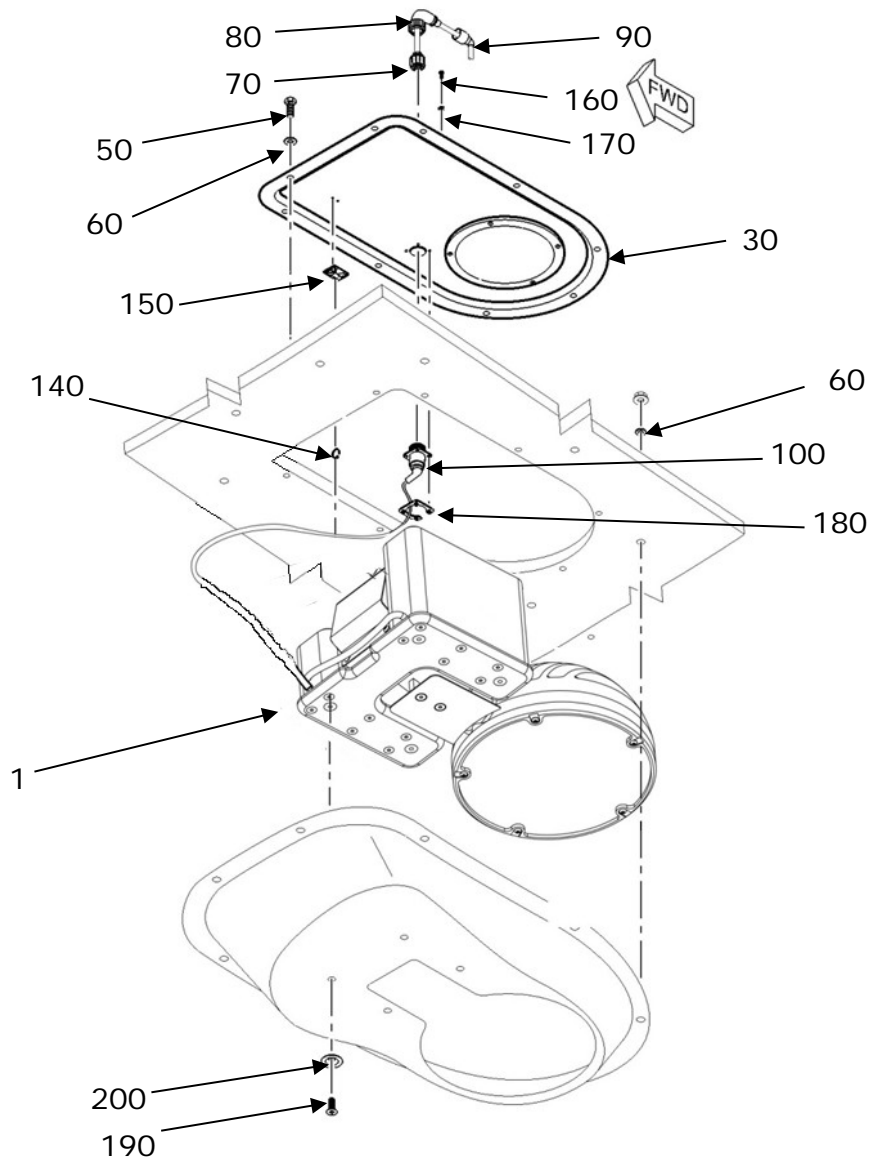
Option A-1 – Searchlight (Sapphire LS)

Kit Number: ARBB-01, ARBB-01a



Option B-1 – Searchlight (LS 400)

Kit Number: ARBB-02, ARBB-02a



Option C-1 – Landing light (Omega LS)

Kit Number: ARBB-03, ARBB-03a

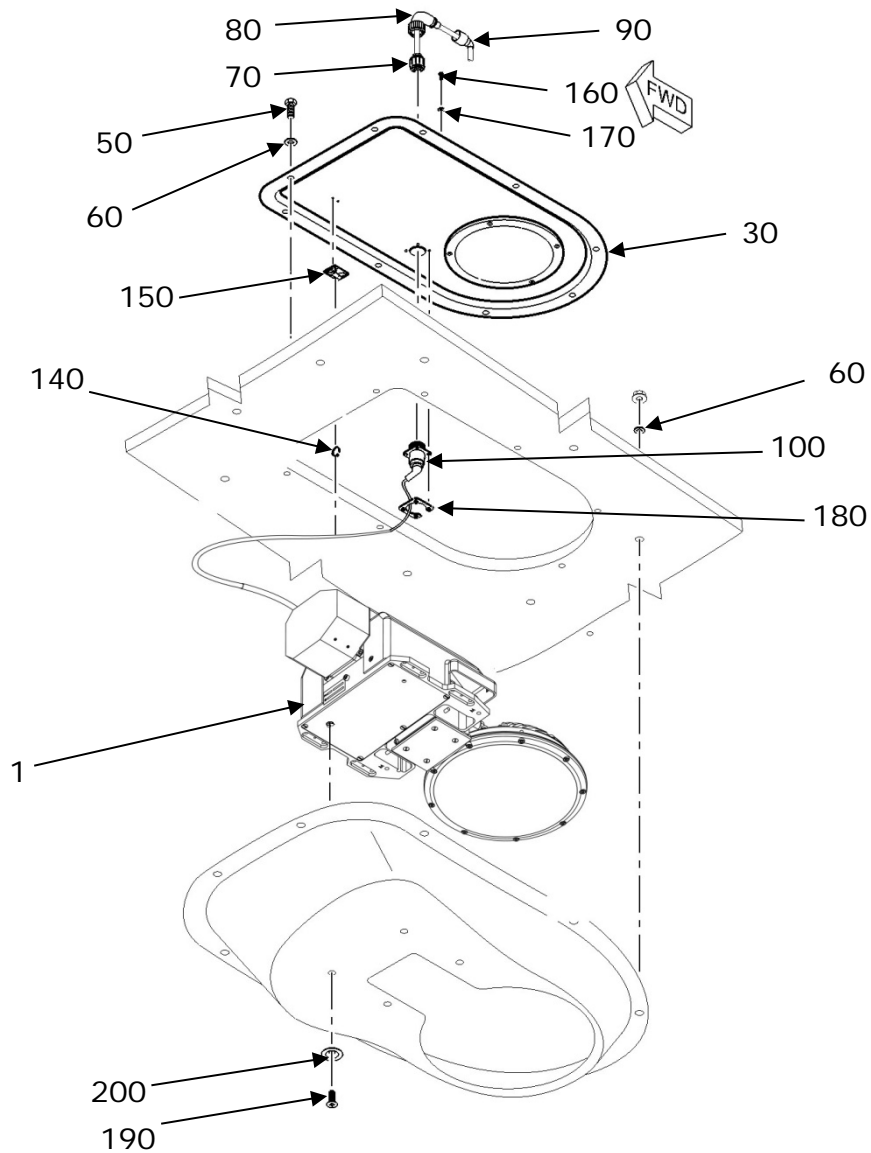
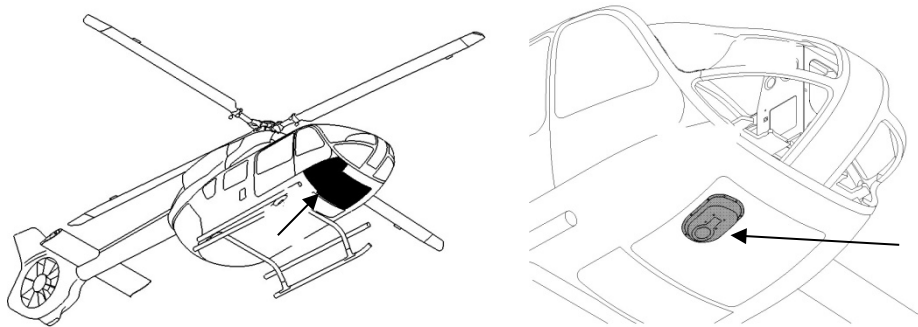


FIGURE AND INDEX NUMBER	PART NUMBER	DESCRIPTION	PARTS AVAIL	QTY PER ASSY
Option A 1	AVE-SLSILOW-M01 AVE-SLSILOWI-M01	Searchlight – Sapphire LS Searchlight – Sapphire LS Dual	ARBB-01 ARBB-01a	1 1
Option B 1	AVE-LS400KW-M01 AVE-LS400KWI-M01	Searchlight – LS400 Searchlight – LS400 Dual	ARBB-02 ARBB-02a	1 1
Option C 1	AVE-OLSILOW-M01 AVE-OLSILOWI-M01	Landing Light – Omega LS Landing Light – Omega LS Dual	ARBB-03 ARBB-03a	1 1
-----	----- Original parts -----			
Options A,B,C		-		
30	D334M3060101	Inner Cover Assy Search & Landing Light (LH)		1
50	LN9038-05024	Screw		9
60	EN2914-05010	Washer		17
70	EN3645M6DN97BN	Connector MIL-C-38999 II (EQD 6720LSAA)		1
80	EN3660-062F15B	Backshell		1
90	VG95343T18B001A	Connector Endshell With		1
100	EN3645F0DN97AN	Connector, MIL-C-38999 III (EQD 6720LSA)		1
	EN3660-062F15B	Backshell		1
	VG95343T18B001A	Connector Endshell with		1
140	E0043-1A9P	Banding Clamp		1
150	TY8G1	Support		1
160	EN3308-030010F	Bot, Hex. Head		4
170	LN9016-03L	Washer		4
180	MBBN3332A16	Fixing Plate		1
190	NAS1102-08-7	Bolt, Shear-Hexagon		4
200	EN3835-040	Washer		4

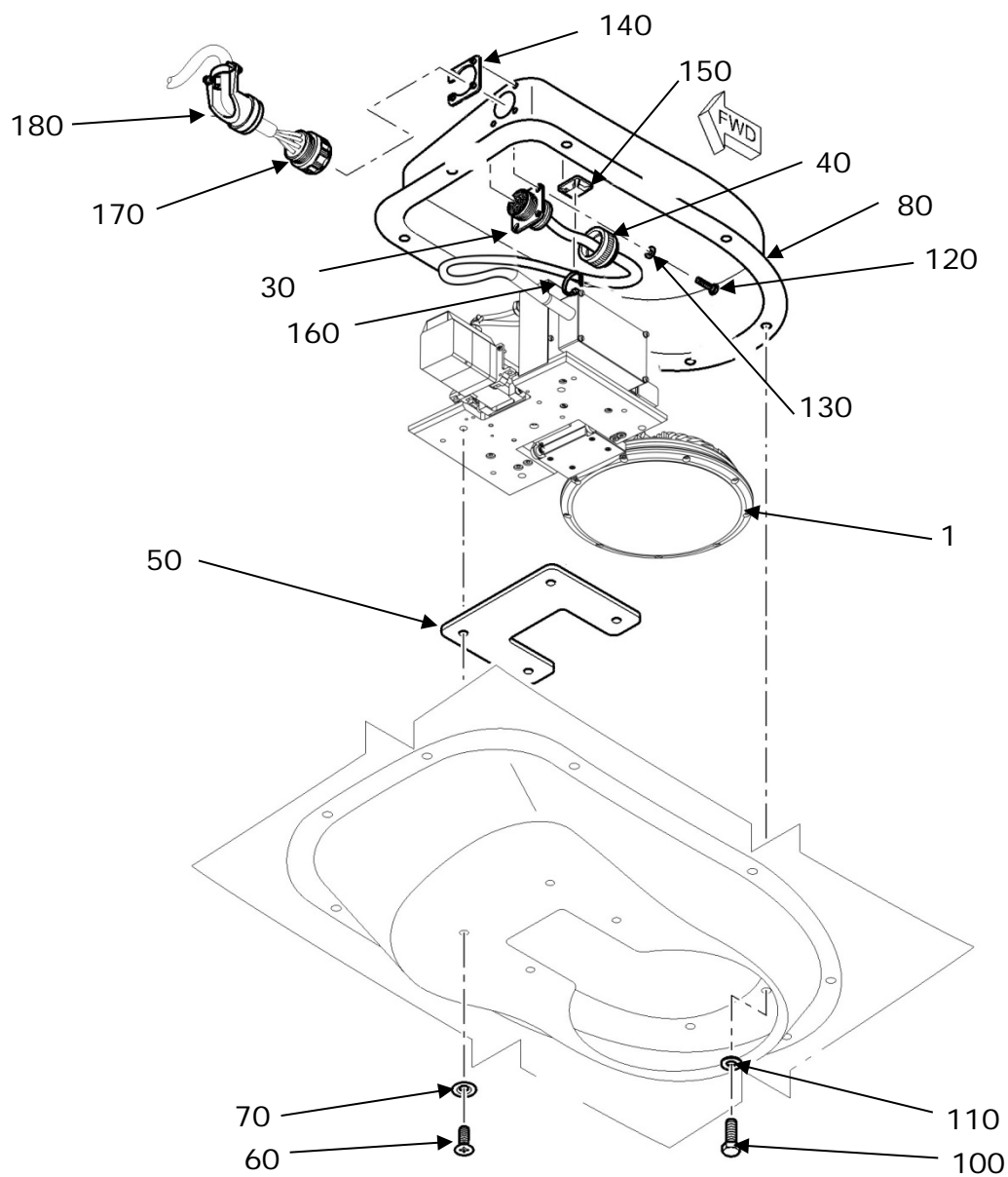
NOTES

1. Remove the original light from helicopter according to AMM.
2. Inspect the installation location for corrosion and, if necessary, repair according to the original structural repair manual.
3. Install the new Aveo light by using original fasteners as listed and depicted above.
4. Connect the wiring by using the respective wiring diagram which is included in this document in accordance with the standard practice of the aircraft maintenance manual and if not specified there, then according to the common practice referenced in § 1.1. Use the original type of connector.



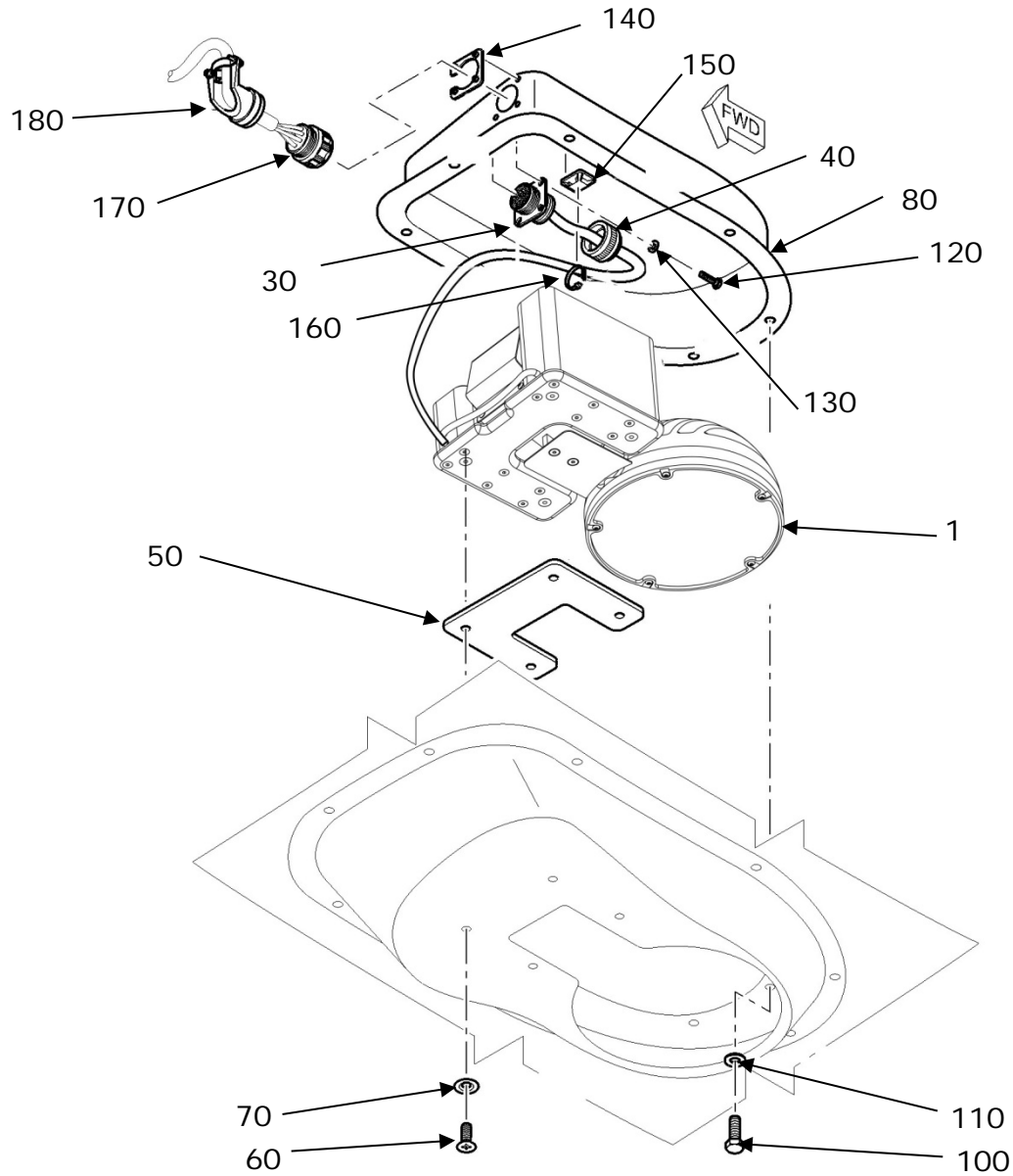
Option A-2 – Searchlight

Kit Number: ARBB-04, ARBB-04a



Option B-2 – Searchlight

Kit Number: ARBB-05, ARBB-05a



Option C-2 – Landing light

Kit Number: ARBB-06, ARBB-06a

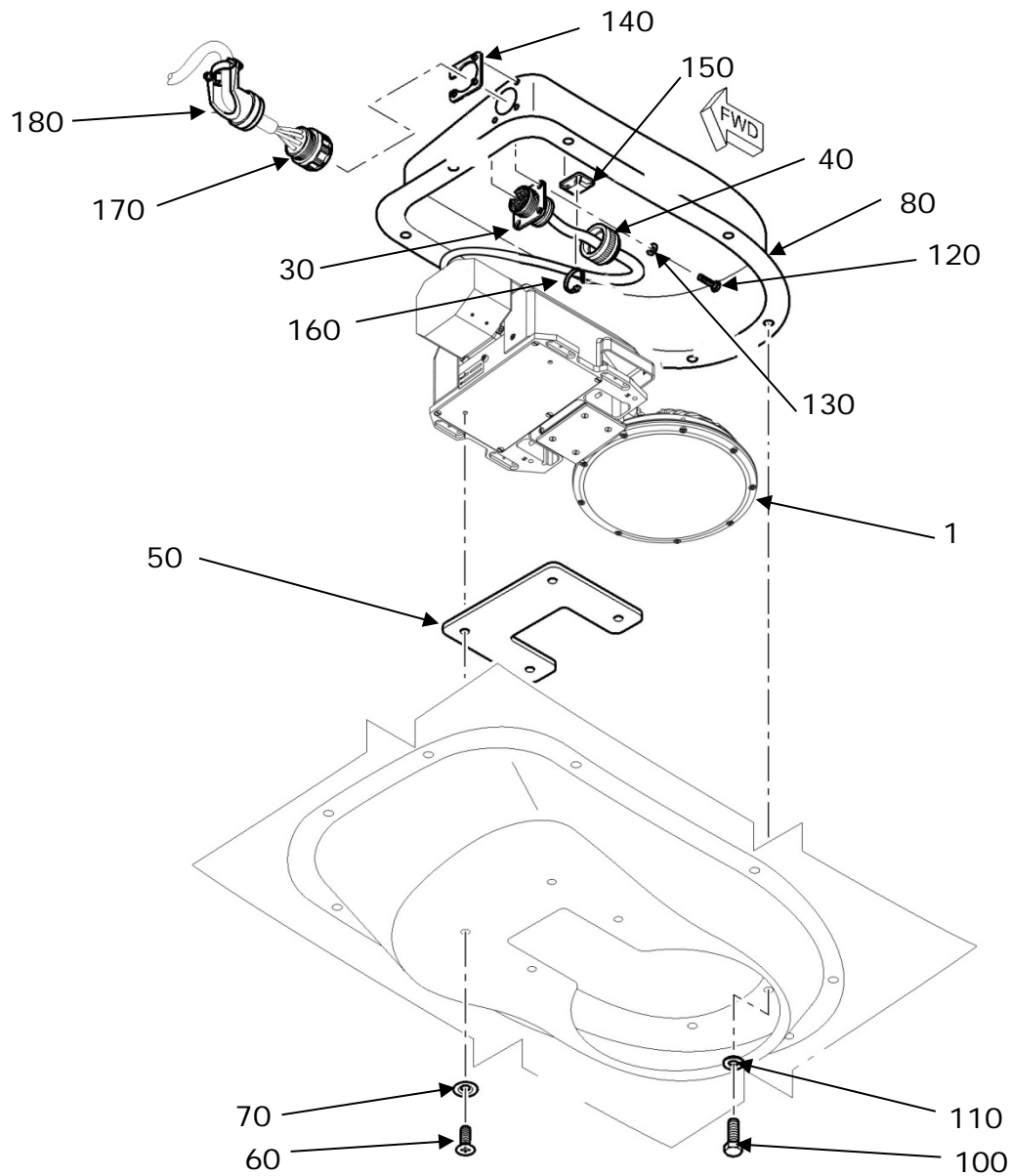


FIGURE AND INDEX NUMBER	PART NUMBER	DESCRIPTION	PARTS AVAIL	QTY PER ASSY
Option A 2	AVE-SLSILOW-M01	Searchlight – Sapphire LS	ARBB-04	1
	AVE-SLSILOWI-M01	Searchlight – Sapphire LS Dual	ARBB-04a	1
Option B 2	AVE-LS400KW-M01	Searchlight – LS400	ARBB-05	1
	AVE-LS400KWI-M01	Searchlight – LS400 Dual	ARBB-05a	1
Option C 2	AVE-OLSILOW-M01	Landing Light – Omega LS	ARBB-06	1
	AVE-OLSILOWI-M01	Landing Light – Omega LS Dual	ARBB-06a	1
-----	-----	<i>Original parts</i> -----	-----	-----
		-		
Options A,B,C				
30	EN3645F0DN97AN	Connector, MIL-C-38999 III (EQD 5720LSA)		1
40	M85049/14S15N	Backshell (EQD 5720LSA)		1
50	D334M3055201	Support Plate Searchlight		1
60	MS24694S7	Screw		4
70	EN3835-040	Washer		4
80	D334M3057101	Inner Protection Cover Assy Searchlight		1
100	LN9038-05018	Screw		7
110	EN2914-05010	Washer		7
120	EN3308-030010F	Bolt, Hex. Head		4
130	LN9016-03L	Washer		4
140	MBBN3332A16	Fixing Plate		1
150	TY8G1	Support		1
160	E0043-1A9P	Banding Clamp		1
170	EN3645F6DN97BN	Connector, MIL-C-38999 III (EQD 5720LSAA)		1
170A	EN3645M6DN97BN	Connector, MIL-C-38999 II (EQD 5720LSAA)		1
180	M85049/39-15A	Backshell (EQD 5720LSAA)		1
180A	EN3660-062F15B	Backshell		1

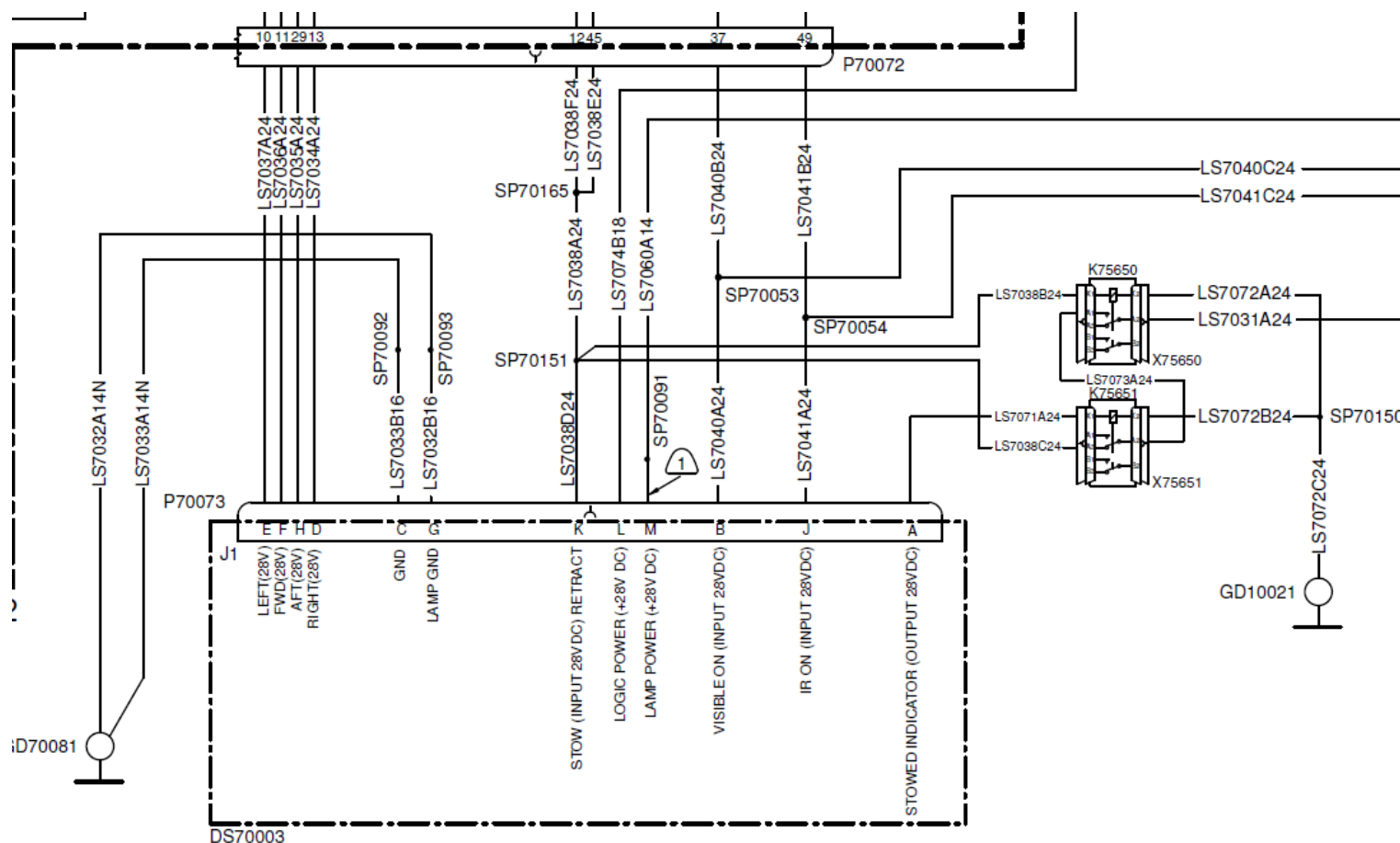
NOTES

1. Remove the original light from helicopter according to AMM.
2. Inspect the installation location for corrosion and, if necessary, repair according to the original structural repair manual.
3. Install the new Aveo light by using original fasteners as listed and depicted above.
4. Connect the wiring by using the respective wiring diagram which is included in this document in accordance with the standard practice of the aircraft maintenance manual and if not specified there, then according to the common practice referenced in § 1.1. Use the original type of connector.

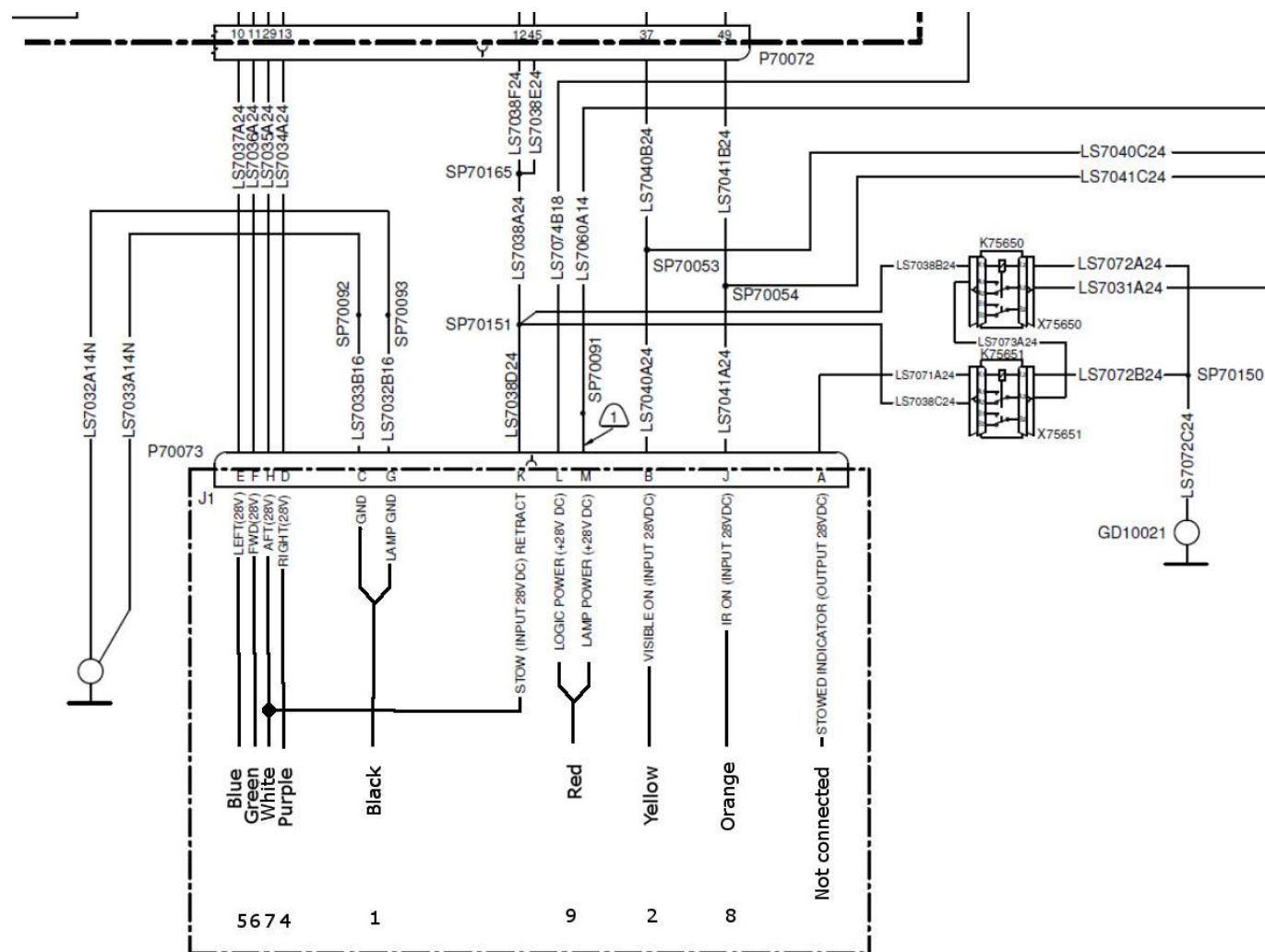
1.5.1 Wiring diagrams – BK117-C2 (EC145)



Original Installation – Detail

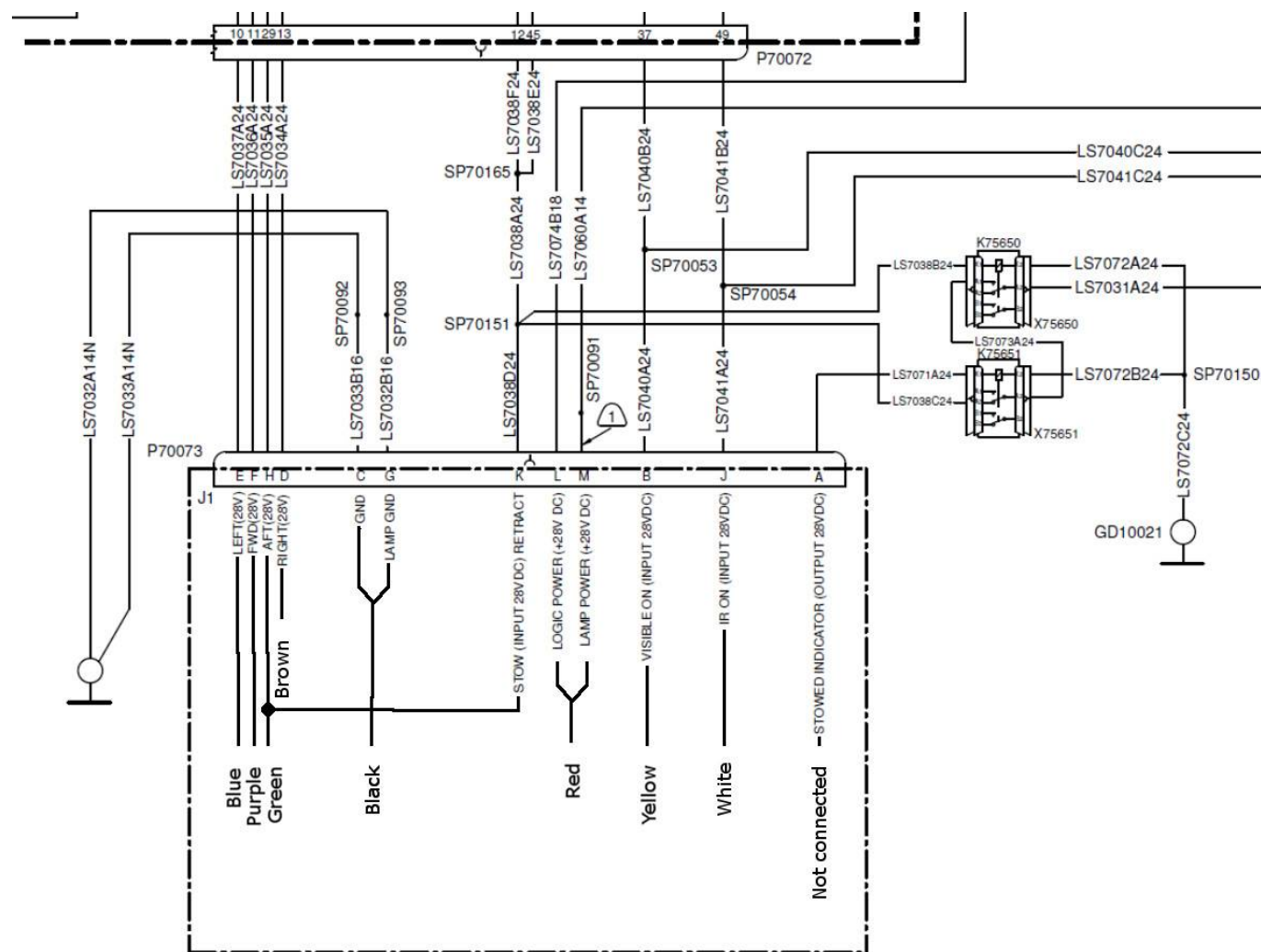


Installation LS400



Note: In case of single color light (not dual), there is no orange wire and pin J remains unconnected

Installation Sapphire



Note: In case of single color light (not dual), there is no white wire and pin J remains unconnected

Legend:

- Not connected
- Purple
- Green
- Black
- Red
- Yellow
- White
- Not connected

Connector J1 Pinout:

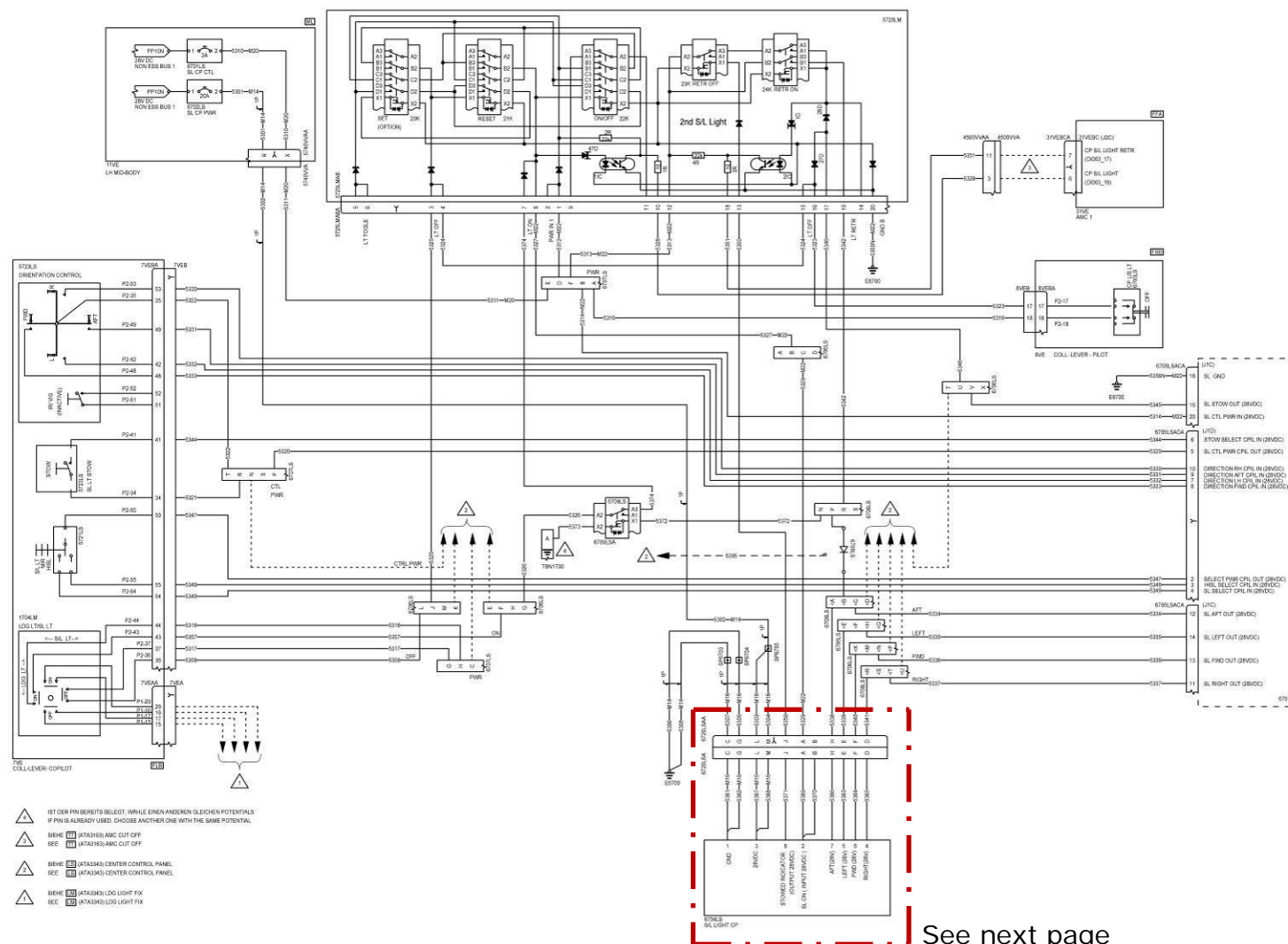
Pin	Function
1	LEFT (28V)
2	FWD (28V)
3	AFT (28V)
4	RIGHT (28V)
5	Not connected
6	GND
7	LAMP GND
8	STOW (INPUT 28VDC) RETRACT
9	LOGIC POWER (+28V DC)
10	LAMP POWER (+28VDC)
11	VISIBLE ON (INPUT 28VDC)
12	IR ON (INPUT 28VDC)
13	STOWED INDICATOR (OUTPUT 28VDC)

LED Module Assembly Details:

- LS7038B24
- LS7038C24
- LS7071A24
- LS7073A24
- LS7072A24
- LS7031A24
- LS7072B24
- LS7072C24
- SP70091
- SP70092
- SP70093
- SP70151
- SP70165
- SP70053
- SP70054
- SP70150
- GD10021

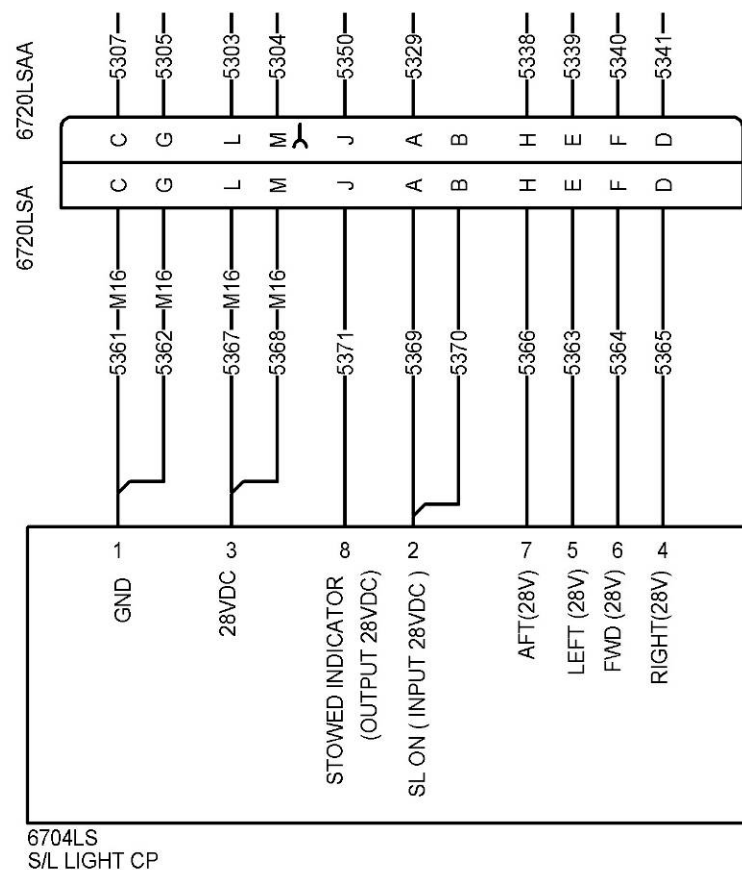
*Aveo Engineering Group, s.r.o.
Drasov 202, 261 01 Drasov
Czech Republic*

Original Installation

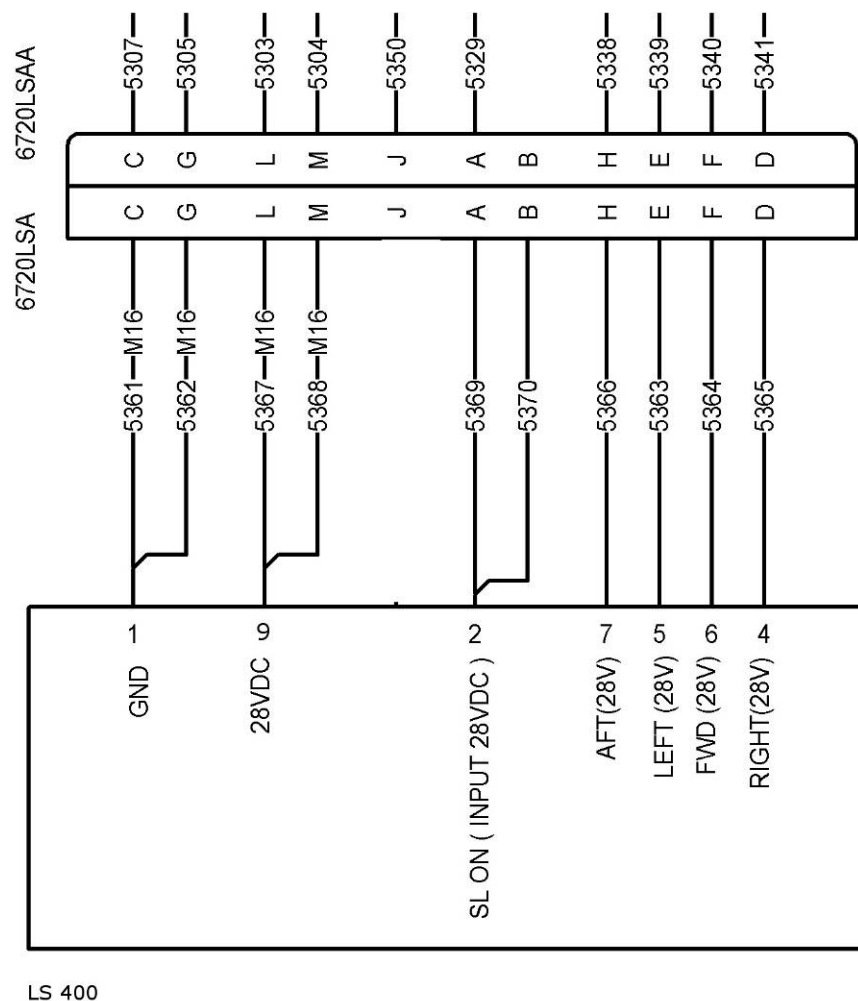


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Original Installation – Detail

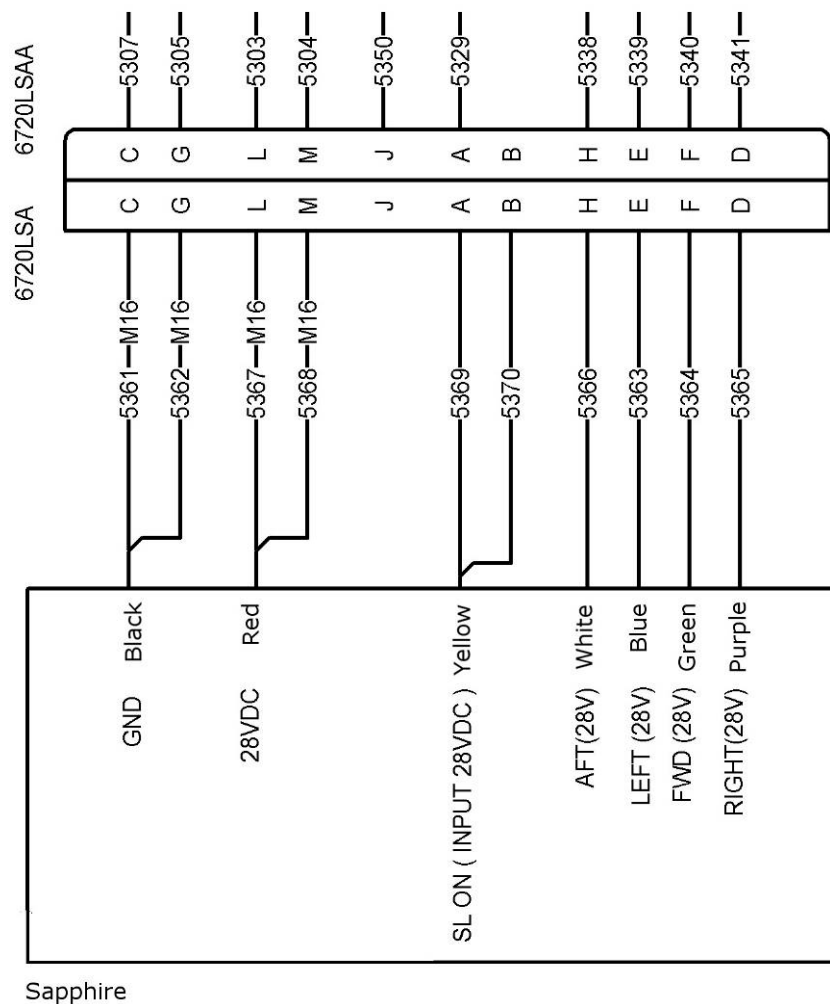


Installation LS400



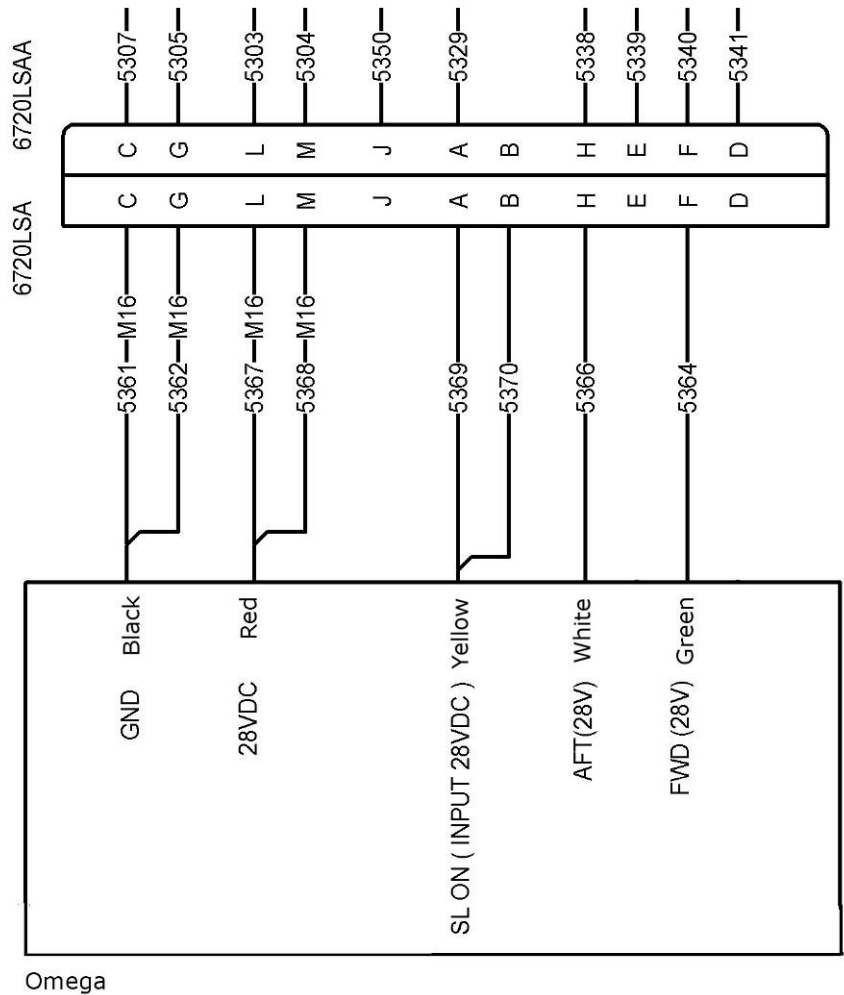
Note: For Dual Searchlight (vis/IR light) pin A is IR and pin B is visible white light 28V DC.

Installation Sapphire



Note: For Dual Searchlight (vis/IR light) pin A is IR and pin B is visible white light 28V DC.

Installation Omega



Note: For Dual Searchlight (vis/IR light) pin A is IR and pin B is visible white light 28V DC.

Part 2 Compliance Demonstration

This document is in relation to the certification program AVE-MOD-023-PFC.
The compliance is demonstrated for the following certification specification:

Requirements	MoC	Statement of Compliance
CS 29.609 Protection of structure	MoC 0	(a) All parts installed are verified to be suitable. The installation instruction requests the aircraft structure to be inspected for probable corrosion before installing the new lights. (b) Not applicable
CS 29.1301 Function and installation	MoC 0	(a) The lights are based on the Aveo Samson added to the folding mechanism. The basics Samson light is qualified according to RTCA DO160 as per AVE-S45-CCL. (b) Not applicable as the function is as original installation. (c) All equipment is installed within their limits. (d) The proper function is determined in a ground check as per MCS.
CS 29.1383 Taxi and landing lights	MoC 0	(a) The configuration of the original installation is not changed. (b) (1) and (2) are not affected as the installation is not changed. (3) is improved as the new lights are brighter than the originally installed. (c) The landing light switches and the landing light configuration are not modified.
CS 29.1529 Instructions for Continued Airworthiness	MoC 0	The modification does not require any changes to the aircraft maintenance procedure which is clearly stated in §1.2 Continued Airworthiness.