



Installation Instructions

**PIPER**

**PA-28**

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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 Piper PA-28 aircraft models:

PA-28-140, PA-28-151, PA-28-150, PA-28-161, PA-28-160, PA-28-181, PA-28-180, PA-28R-201, PA-28-235, PA-28R-201T, PA-28S-160, PA-28-236, PA-28S-180, PA-28RT-201, PA-28R-180, PA-28RT-201T, PA-28R-200, PA-28-201T

This modification cannot be installed if the aircraft is equipped with either an in-production installed glass-cockpit system or a glass-cockpit system installed as an in-service modification.



Compiled by: \_\_\_\_\_ 20. Sep. 2023

Petr Jaroš  
Engineer, Aveo Engineering Group, s.r.o.



Approved by: \_\_\_\_\_ 20. Sep. 2023

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	31. Aug. 2018	ALL
02	Changes as marked	18. Apr. 2019	ALL
03	Removal of PosiStrobe CP and update of PosiStrobe Titania Addition of Hercules JP (9-36 VDC) Hardware changes (update)	20. Sep. 2023	12-13 18-20 10,13,16
Table 01: Record of Document Amendments			

## 0.3 Affected Pages Procedure

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

The reason(s) for EACH raise of issue and the description of respective change will be provided in Table 01 - **Details** 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 Instructions

### 1.1 General

This installation is to be performed in accordance to common practice as described in the aircraft maintenance manual and where not specific enough in accordance to common practice as described in FAR AC 43.13-2B Chapter 4 and in FAR AC 43.13 1B Chapter 11 Section 15 (Bonding) as published by FAA.

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

- Aircraft Maintenance Manual (AMM)
- AVE-WPS-64G-IM
- AVE-WPST-54G-IM
- AVE-PSPSYW-IM
- AVE-RBXP-001-IM
- AVE-H30TATSN-IM
- AVE-HJPDO-IM

All drawings applicable for this change are listed in the following document:

- AVE-MOD-010-DL, in the latest issue

The following appliances have received ETSO authorization:

- AVE-WPSTR-54G & AVE-WPSTG-54G – ETSOA 21O.10053935
- AVE-WPSR-64G & AVE-WPSG-64G – ETSOA 21O.10053936
- AVE-PSPSYW-T01 – ETSOA 21O.10068603
- AVE-RBXPR-001 – ETSOA 21O.10055069

It must be verified before installation of modification that it is not in conflict with other modification installed to this specific aircraft.

This modification cannot be installed if the aircraft is equipped with either an in-production installed glass-cockpit system or a glass-cockpit system installed as an in-service modification.

The modification is to be conformity checked and tested after embodiment in aircraft using the document AVE-MOD-010-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 Aveo Installation Manuals as listed under §1.1.

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

## 1.3 Description

This modification consists in replacement of position, anti-collision and landing lights with lights of LED type.

The lights are direct replacements and do not require any structural change on the A/C side. In some cases, the connectors are removed and the wires spliced as per FAR AC 43.13-2B Chapter 4 and in FAR AC 43.13 1B Chapter 11 Section 15.

### 1.3.1 Position and anti-collision lights

There are two options of **wingtip light** installation:

1. **Ultra Galactica** light - consists of red or green position light, white strobe and rear tail white position light. It is necessary to install Ultra Galactica if no rear white position light is installed.
2. **Ultra Embedded Galactica** light - consists of red or green position light and white strobe light. Installation of Ultra Embedded Galactica is recommended if a rear white position light is already installed.

#### Rear white position light

Provided the **Ultra Galactica** (consisting of red or green position light, white strobe and rear tail white light) is installed on wingtips, the installation of **PosiStrobe Titania** is not necessary.

The new position lights also include the **strobe** function.

#### Synchronization:

The **strobe** lights and the **RedBaron XP Galactica** may be synchronized. In order to ensure synchronization function, the blue wires of each light to be synchronized have to be connected. Provided that additional wires (min. gage 22) are to be installed for this function, these must be installed along the wire bundle in which the lights power wires run. In case the function is not used the blue wires of each light are to be capped and stowed.

Depending the PA-28 particular model, there are **two types of vertical tip fin fairings**:

1. **AVS-C230106527-A40** for following models:

- PA28-140 S/N 28-20001 thru 28-7125651 and Flite Liner 28-7225001 thru 28-7325684
- PA-28-150
- PA-28-160
- PA-28-180 S/N 28-1 thru 28-7205001

or

2. **AVS-C230103526-A40** for following models:

- PA28-140 s/n 28-7425001 & up
- PA28-180 s/n 28-7405001 & up
- PA28-235
- PA28R-180
- PA28R-200
- PA-28-151
- PA-28-161
- PA-28-181
- PA-28-201T
- PA-28-236
- PA28R-201
- PA28R-201T

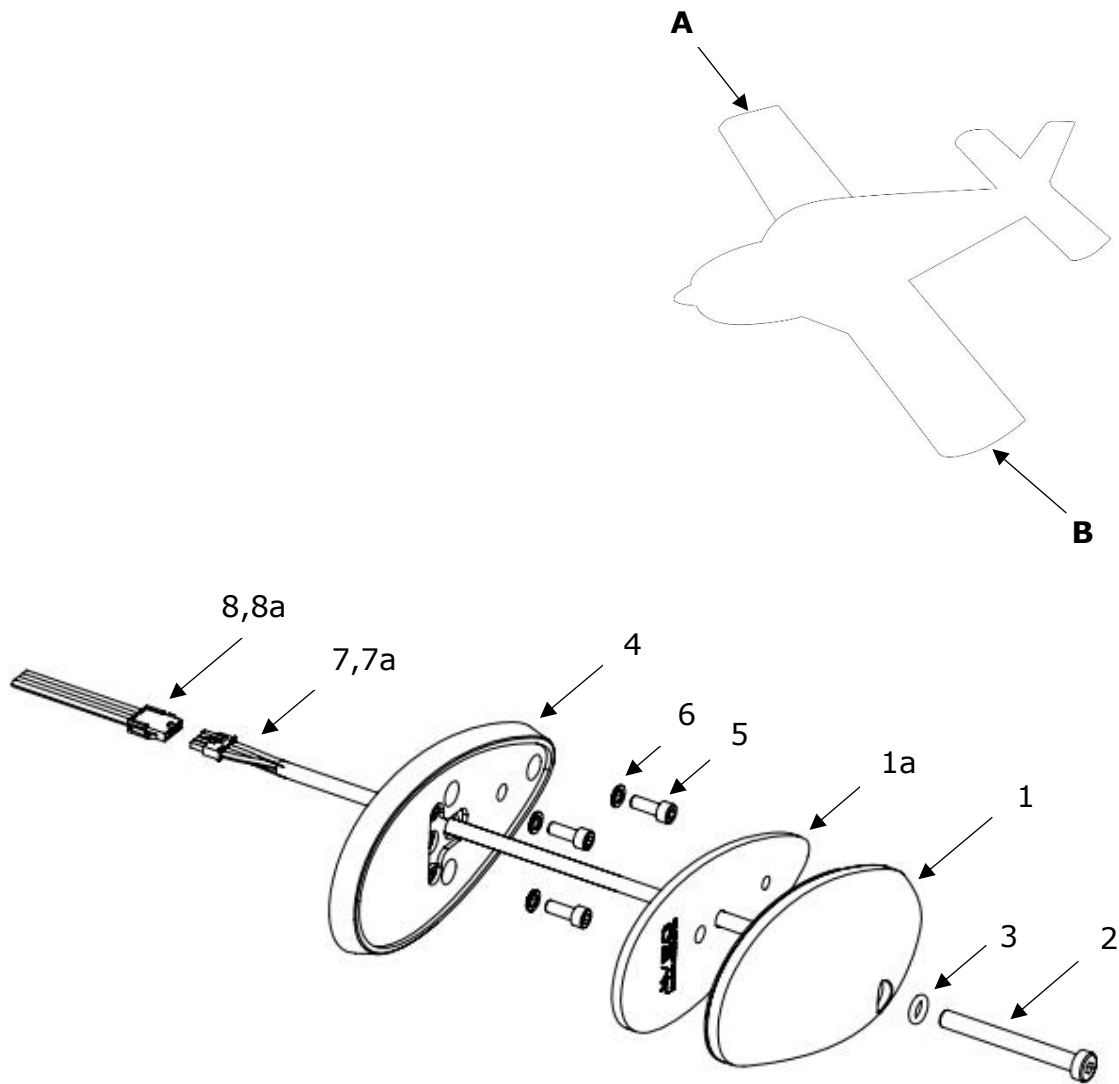
### **1.3.2 Landing light**

For replacement of the installed landing light, the same configuration can be used as was before modification. The change of configuration is not allowed.

## 1.4 Position/Strobe Lights Installation – Left and Right

**KIT Number: PPA28-01 Option 1**

**KIT Number: PPA28-02 Option 2**





**View A – Removal of strobe box**

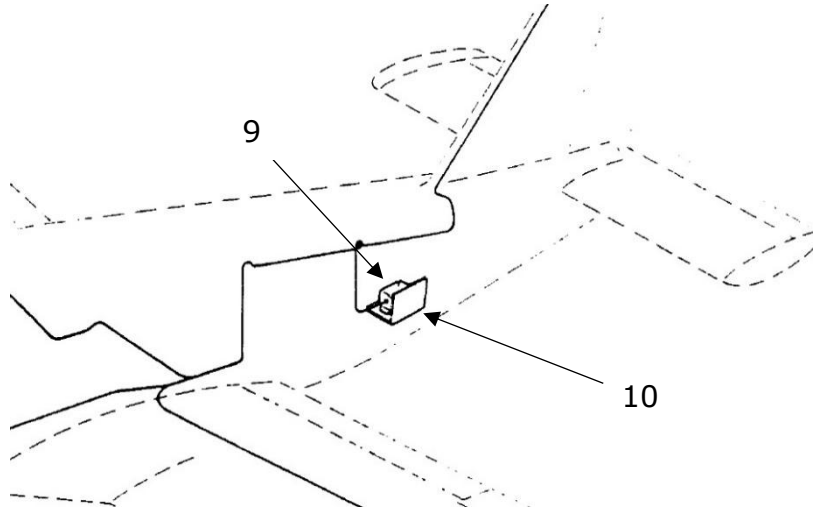


FIGURE AND INDEX NUMBER	PART NUMBER	DESCRIPTION	PARTS AVAIL	QTY PER ASSY
	<b>OPTION 1</b>	<b>KIT Number: PPA28-01</b>		
1	AVE-WPSTG-54G Mod(4)	Ultra Galactica Green (A)		1
	AVE-WPSTR-54G Mod(4)	Ultra Galactica Red (B)		1
1a	AVS-P001290550-A1A	Gasket		2
2	AVS-79840905045	Screw M5x45mm, DIN 7984		2
3	AVS-P000111909-A00	Washer d5 - Custom		2
4	AVS-P000100175-A6C	Ultra Adapter M5		2
5	AVS-92196A152	Socket Head Screw, 6-32 x 7/8"		6
6	AVS-91475A020	Split Lock Washer, #6		6
7	03-09-1041	4-Pole Connector		2
7a	02-09-2116	Pin Male		8
8	03-09-2041	4-Pole Connector		2
8a	02-09-1117	Pin Female		8
	<b>OPTION 2</b>	<b>KIT Number: PPA28-02</b>		
1	AVE-WPSG-64G Mod(4)	Ultra Galactica Embedded Green (A)		1
	AVE-WPSR-64G Mod(4)	Ultra Galactica Embedded Red (B)		1
1a	AVS-P001290550-A1A	Gasket		2
2	AVS-79840905045	Screw M5x45mm, DIN 7984		2
3	AVS-P000111909-A00	Washer d5 - Custom		2
4	AVS-P000100175-A6C	Ultra Adapter M5		2
5	AVS-92196A152	Socket Head Screw, 6-32 x 7/8"		6
6	AVS-91475A020	Split Lock Washer, #6		6
7	03-09-1041	4-Pole Connector		2
7a	02-09-2116	Pin Male		8
8	03-09-2041	4-Pole Connector		2
8a	02-09-1117	Pin Female		8
-----	-----	-----	-----	-----
	<b>View A</b>	<b>Removal of strobe box</b>		
9	481 214	Power Supply – Strobe Lights		1
	763 469	Power Supply – Strobe Lights		1
10	99031-00	Bracket Assembly – Power Supply Mounting		1

**NOTES**

1. Remove the original position/strobe light on the left and right hand sides according to AMM.
2. Remove connectors and splice wiring as per AVE-WPST-54G-IM (Ultra Galactica Embedded – Option 1) or AVE-WPS-64G-IM (Ultra Galactica – Option2).

3. Install a complete light adapter plate (item 4) using the fasteners (item 5,6).
4. Install the new light using items (1, 1a, 2 and 3) as described.
5. Remove strobe power supplies (items 9 and 10) – View A.
6. Change wiring to connect power supply lines IN with lines OUT.

**Remarks:**

Available **options for wingtip light** are described in section 1.3.1.

Only a pair of the wingtip lights may be installed. The replacement of only one side is not allowed.

If the aircraft is not equipped with the strobe function, this function cannot be installed through this change. A separate EASA modification is required for the introduction of the strobe function.

If the strobe function is not used, the blue and yellow wires described in the component installation manual are not to be used and, consequently, they shall be capped and stowed.

## 1.5 Position/Strobe Lights Installation – Tail Position

**KIT Number: PPA28-03**

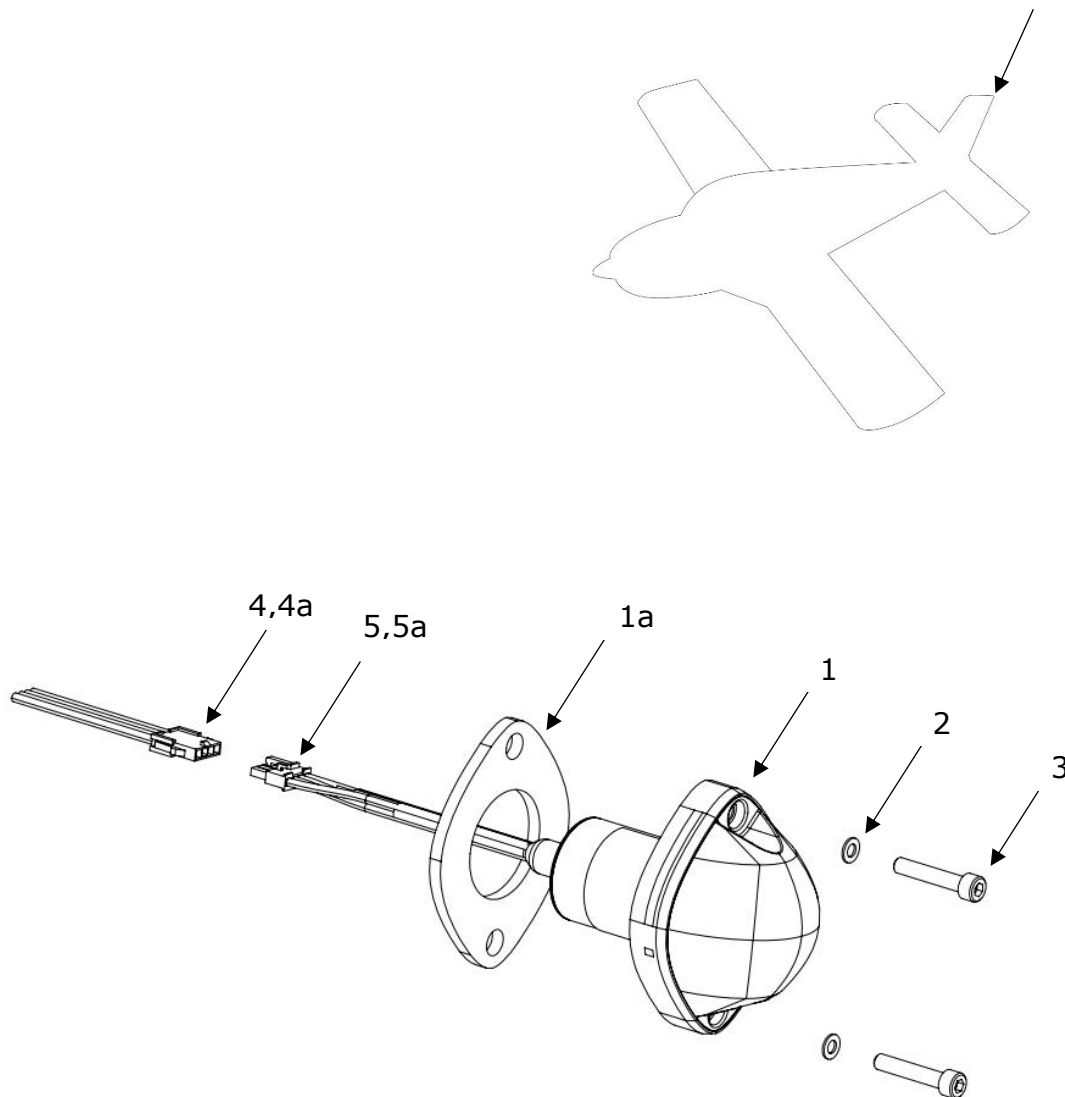


FIGURE AND INDEX NUMBER	PART NUMBER	DESCRIPTION	PARTS AVAIL	QTY PER ASSY
		<b>KIT Number: PPA28-03</b>		
1	AVE-PSPSYW-T01	PosiStrobe Titania		1
1a	AVS-P000105638-A10	Gasket		1
2	AVS-90295A359	Flat Washer – Nylon #4		2
3	AVS-92196A151	Socket Head Cap Screw 6-32x3/4		2
4	03-09-1041	4-Pole Connector		1
4a	02-09-2116	Pin Male		4
5	03-09-2041	4-Pole Connector		1
5a	02-09-1117	Pin Female		4

NOTES

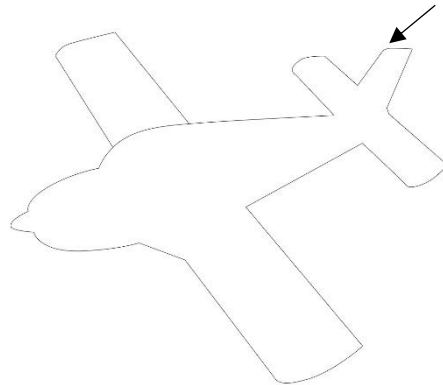
1. Remove the original tail position light according to AMM.
2. Remove connectors and splice wiring as per AVE-PSPSYW-T-IM.
3. Install the new light (item 1) using the fasteners (item 2 and 3) and gasket (item 1a).
4. Balance the rudder according AMM section 4-74.

**Remarks:**

If the aircraft is not already equipped with the strobe function this function cannot be installed through this change. A separate EASA modification is required for the introduction of the strobe function.

If the strobe function is not used the blue and the yellow wires described in the component installation manual are not used and therefore have to be capped and stowed.

## 1.6 Anti-collision Light Installation



### Option 1

**KIT Number: PPA28-04A**

**KIT Number: PPA28-04B**

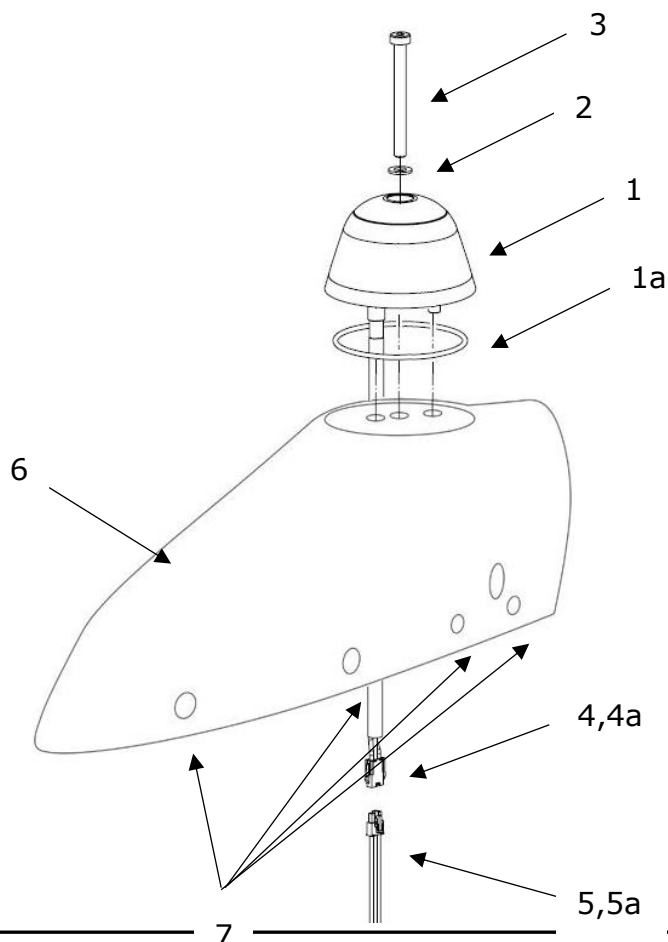


FIGURE AND INDEX NUMBER	PART NUMBER	DESCRIPTION	PARTS AVAIL	QTY PER ASSY
1	<b>OPTION 1</b> AVE-RBXPR-001 Mod(1) or AVE-RBXPW-001 Mod(1)	<b>KIT Number: PPA28-04A</b> RedBaron XP Galactica Red <b>KIT Number: PPA28-04B</b> RedBaron XP Galactica White		1
1a	AVS-OR05300200N70-D0A	O-Ring 53x2mm, DIN 3770		1
2	AVS-170299005	Washer M5, DIN 125		1
3	AVS-79840905050	Screw M5x50mm, DIN 7984		1
4	03-09-1031	3-Pole Connector		1
4a	02-09-2116	Pin Male		3
5	03-09-2031	3-Pole Connector		1
5a	02-09-1117	Pin Female		3
6	AVS-C230106527-A40	Fairing		1
<hr/>				
7	<b>Original parts</b> AN526C1032R7	Original Fasteners		8

**NOTES**

Suitable for following Piper models:

PA-28-140 s/n 28-20001 thru 28-7125651 and Flite Liner 28-7225001 thru 28-7325684,  
PA-28-150, PA-28-160, PA-28-180 S/N 28-1 thru 28-7205001

**Procedure:**

1. Remove the original fairing with anti-collision light according to AMM.
2. Remove the connectors and splice wiring as per AVE-RBXP-001-IM.
3. Install the new light (**item 1 + 1a**) using the fasteners (**item 2 and 3**) on the fairing (**item 6**).
4. Install the completed fairing with the light on the tail by using original fasteners (**item 7**).

**In case the aircraft is equipped with bonding straps for the light unit, it must be assured that those are adequately connected to the light base of the RedBaron light.**

**New fairings can only be installed if the old fairings do not include any integral electrical bonding elements in order to keep the same level of airplane protection against lightning and static electricity.**

**Option 2**

**KIT Number: PPA28-05A**

**KIT Number: PPA28-05B**

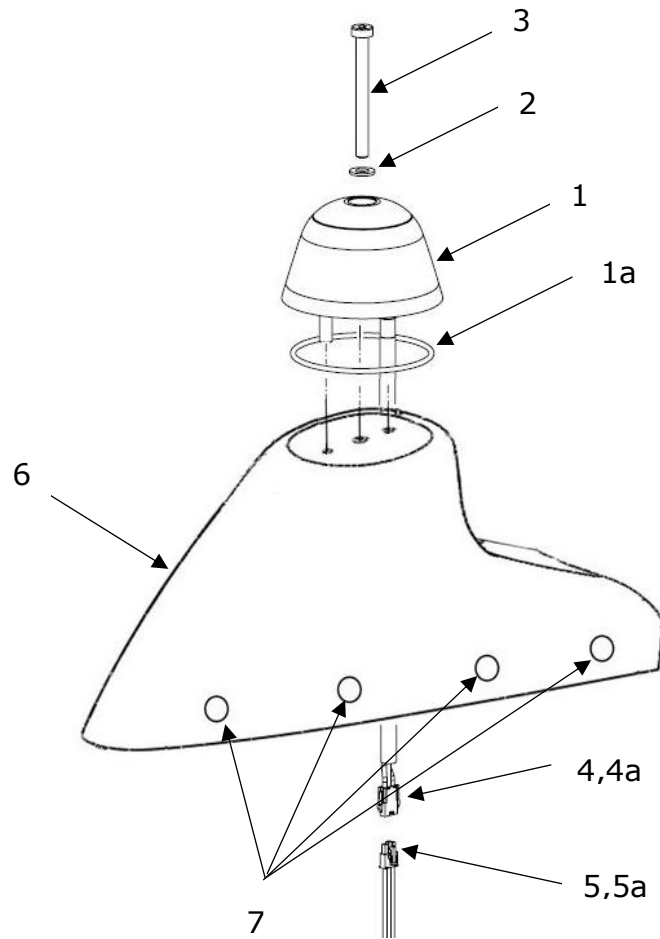




FIGURE AND INDEX NUMBER	PART NUMBER	DESCRIPTION	PARTS AVAIL	QTY PER ASSY
1	<b>OPTION 2</b> AVE-RBXPR-001 Mod(1) or AVE-RBXPW-001 Mod(1)	<b>KIT Number: PPA28-05A</b> RedBaron XP Galactica Red <b>KIT Number: PPA28-05B</b> RedBaron XP Galactica White		1
1a	AVS-OR05300200N70-D0A	O-Ring 53x2mm, DIN 3770		1
2	AVS-170299005	Washer M5, DIN 125		1
3	AVS-79840905050	Screw M5x50mm, DIN 7984		1
4	03-09-1031	3-Pole Connector		1
4a	02-09-2116	Pin Male		3
5	03-09-2031	3-Pole Connector		1
5a	02-09-1117	Pin Female		3
6	AVS-C230106526-A40	Fairing		1
<hr/>				
7	<b>Original parts</b> AN526C1032R7	Original Fasteners		8

### NOTES

Suitable for following Piper models:

PA-28-140 s/n 28-7425001 & up, PA-28-180 s/n 28-7405001 & up, PA-28-235, PA-28R-180, PA-28R-200, PA-28-151, PA-28-161, PA-28-181, PA-28-201T, PA-28-236, PA-28R-201, PA-28R-201T

### Procedure:

1. Remove the original fairing with anti-collision light according to AMM.
2. Remove the connectors and splice wiring as per AVE-RBXP-001-IM.
3. Install the new light (**item 1 + 1a**) using the fasteners (**item 2 and 3**) on the fairing (**item 6**).
4. Install the completed fairing with the light on the tail by using original fasteners (**item 7**).

**In case the aircraft is equipped with bonding straps for the light unit, it must be assured that those are adequately connected to the light base of the RedBaron light. New fairings can only be installed if the old fairings do not include any integral electrical bonding elements in order to keep the same level of airplane protection against lightning and static electricity.**

**Option 3**

**KIT Number: PPA28-08A**

**KIT Number: PPA28-08B**

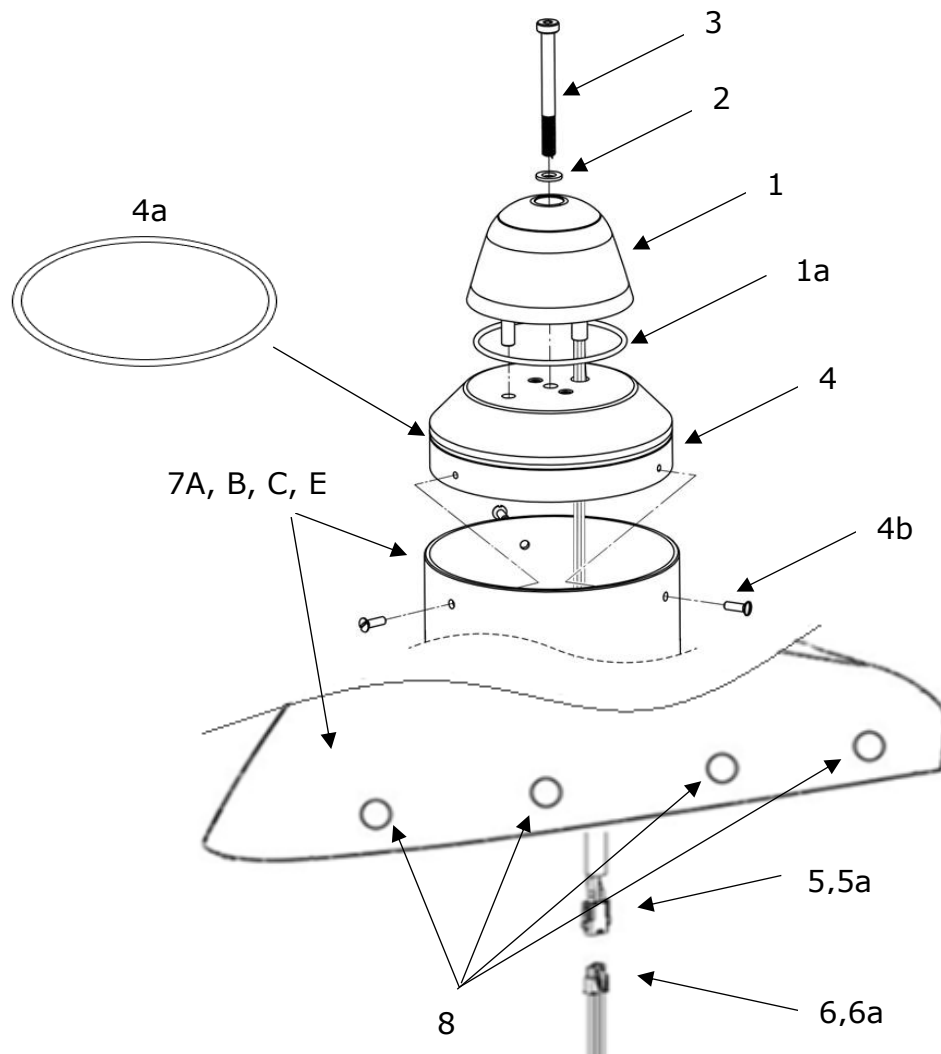


FIGURE AND INDEX NUMBER	PART NUMBER	DESCRIPTION	PARTS AVAIL	QTY PER ASSY
<b>1</b>	<b>OPTION 3</b> AVE-RBXPR-001 Mod(1) or AVE-RBXPW-001 Mod(1)	<b>KIT Number: PPA28-08A</b> RedBaron XP Galactica Red <b>KIT Number: PPA28-08B</b> RedBaron XP Galactica White		<b>1</b>
<b>1a</b>	AVS-OR05300200N70-D0A	O-Ring 53x2mm, DIN 3770		<b>1</b>
<b>2</b>	AVS-170299005	Washer M5, DIN 125		<b>1</b>
<b>3</b>	AVS-79840905050	Screw M5x50mm, DIN 7984		<b>1</b>
<b>4</b>	AVS-A020101340-A6D	RedBaron XP Adapter Assy		<b>1</b>
<b>4a</b>	AVS-OR08900200N70-D0A	O-Ring 89x2mm, DIN 3770		<b>1</b>
<b>4b</b>	AVS-91771A941	Screw UNC 6-32 x 5/16		<b>3</b>
<b>5</b>	03-09-1031	3-Pole Connector		<b>1</b>
<b>5a</b>	02-09-2116	Pin Male		<b>3</b>
<b>6</b>	03-09-2031	3-Pole Connector		<b>1</b>
<b>6a</b>	02-09-1117	Pin Female		<b>3</b>
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	<b>Original parts</b>			
<b>7A</b>	635114-006	Original Fairing		<b>1</b>
<b>7B, C</b>	96709-000	Original Fairing		<b>1</b>
<b>7E</b>	65345-003	Original Fairing		<b>1</b>
<b>8</b>	AN526C1032R7	Original Fasteners		<b>8</b>

**NOTES**

Suitable for following Piper models:

PA-28-140 S/N 28-20002 thru 28-7125651, Flite Liner Model 28-7225001 thru 28-7325684, PA-28-150, PA-28-160 and PA-28-180 with s/n 28-1 to 28-7106244.

PA-28-140 with s/n 28-7225001 to 28-732684 and PA28-180 with s/n 28-7205001 to 28-7305611.

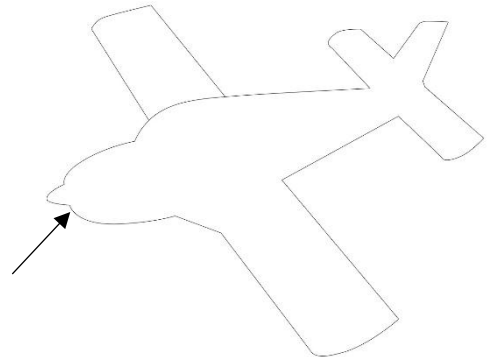
PA-28-140- and PA-28-140 Flite Liner Model with s/n 28-7425001 and up, PA-28-180 with s/n 28-7405001 and up, PA-28-235 with s/n 28-10003 and up, PA-28R-180 and PA-28R-200 airplane.

**Procedure:**

1. Remove the original fairing with anti-collision light according to AMM.
2. Remove the connectors and splice wiring as per AVE-RBXP-001-IM.
3. Install the new light (item 1 + 1a) using the fasteners (item 2 and 3) on the fairing (item 7).
4. Install the completed fairing with the light on the tail by using original fasteners (item 8).

**In case the aircraft is equipped with bonding straps for the light unit, it must be assured that those are adequately connected to the light base of the RedBaron light.**  
**New fairings can only be installed if the old fairings do not include any integral electrical bonding elements in order to keep the same level of airplane protection against lightning and static electricity.**

## 1.7 Landing Light Installation



### Option 1

KIT Number: PPA28-06

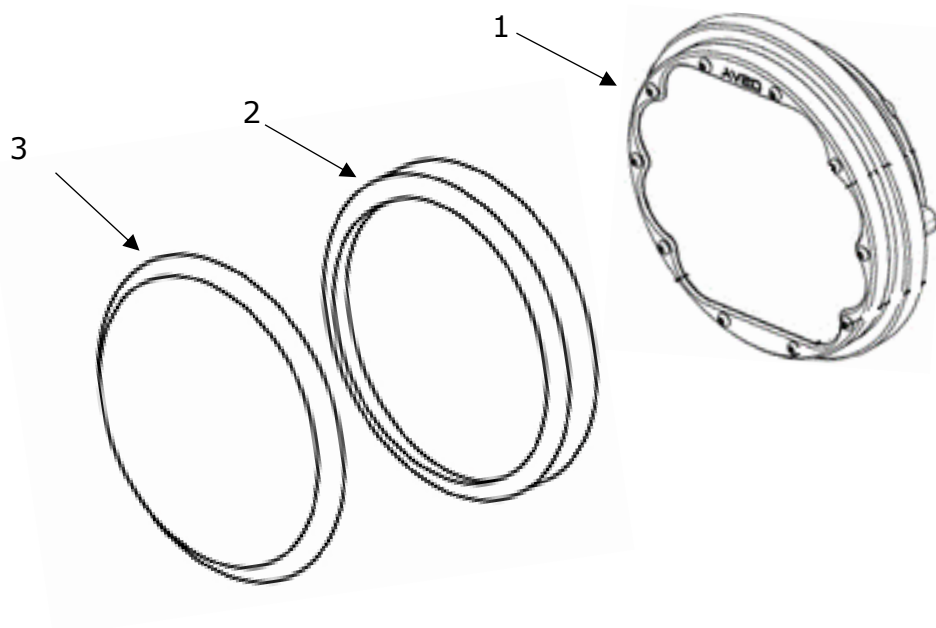


FIGURE AND INDEX NUMBER	PART NUMBER	DESCRIPTION	PARTS AVAIL	QTY PER ASSY
1	<b>OPTION 1</b> AVE-H30TATSNL-T0A Mod(1)	<b>KIT Number: PPA28-06</b> Hercules Drop-In Landing		1
2	<b>Original parts</b> 65372-00	Retainer Assembly – Landing Light		1
3	12761-02	Cover Assembly – Landing Light Opening		1
<b>NOTES</b> 1. Remove the landing light cover (items 2, 3). 2. Replace the original bulb with LED light (item 1) and connect the light according to the wiring diagram in <b>AVE-H30TATSN-IM</b> . 3. Mount the landing light cover back.				

**Option 2**

**KIT Number: PPA28-07**

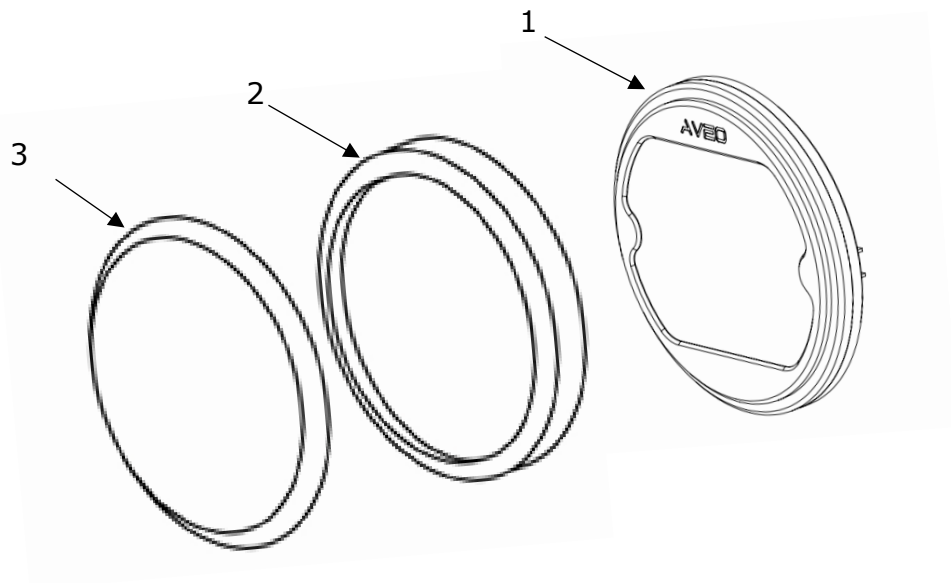


FIGURE AND INDEX NUMBER	PART NUMBER	DESCRIPTION	PARTS AVAIL	QTY PER ASSY
1	<b>OPTION 2</b> AVE-HJPDOLW-DS3	<b>KIT Number: PPA28-07</b> Hercules JP Landing (9-36VDC)		1
2	<b>Original parts</b> 65372-00	Retainer Assembly – Landing Light		1
3	12761-02	Cover Assembly – Landing Light Opening		1
<p>NOTES</p> <p>1. Remove the landing light cover (items 2, 3).</p> <p>2. Replace the original bulb with LED light (item 1) and connect the light according to the wiring diagram in <b>AVE-HJPDO-IM</b>.</p> <p>3. Mount the landing light cover back.</p>				

## Part 2 Compliance demonstration

This document is in relation to the certification program AVE-MOD-010-PFC.  
The compliance is demonstrated for the following certification specification:

Requirements	MoC	Statement of Compliance (ref. CS23 are amdt.4)
CS 23.2500  General requirements on systems and equipment function	MoC 0 MoC 2 MoC 4 MoC 5	<b>CS 23.1301</b> (a) All navigation and anti-collision lights are ETSO certified. All landing lights are qualified according to RTCA DO160 as per AVE-H30-001-CCL. (b) No changes are made which would require a changed or a new label. The equipment is labelled to be identified and with its limitation. (c) All equipment is installed within their limits. (d) The proper function is determined in a ground check as per MCS. The improved visibility had been demonstrated in document AVE-MOD-004-SR. <b>CS 23.1309</b> (a) All products have been tested to the appropriate environmental standard. In addition to that improves the new light installation the mean time between failure by a factor of about 1000. All lights are brighter at a lower power consumption and a much lower temperature.
CS 25.2625  Instructions for Continued Airworthiness	MoC 1	<b>CS 23.1529</b> The modification includes a supplement to PA28 Aircraft Maintenance Manual (AMM) modified by Aveo Modification "AVE MOD 010".