WHELEN®

ORION™ SERIES

LED Position/Anti-Collision Lightheads

Proudly Designed, Tested and Manufactured in America!

LIGHTING REGULATIONS

WHELEN® MANUFACTURED IN AMERICA

Requirements, Locations, & Distribution Patterns

All aircraft must have an approved anti-collision light and position light system for nighttime operations. The position lights consist of an Aviation Red on the left side, an Aviation Green on the right and an Aviation White Taillight (REF. FAR 23.1389).

The anti-collision lighting system is required under FAR PART 91.205(c). There are different requirements affecting different aircraft. These aircraft are categorized by the date of application for type certificate. Home built aircraft are determined by the date of issuance of the Experimental Operating Limitations. The different categories are as follows:

Aircraft for which type certificate was applied for After April 1, 1957 to August 10, 1971:

These anti-collision systems must produce a minimum of 100 effective candela in Aviation Red or White (REF. FAR 23.1397), 360º around the aircraft's vertical axis, 30º above and below the horizontal plane (REF. FAR 23.1401).

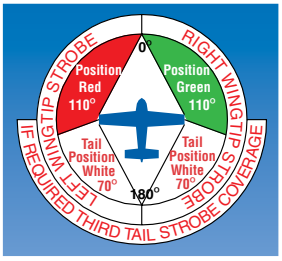
Aircraft for which type certificate was applied for After August 11, 1971 to July 18, 1977:

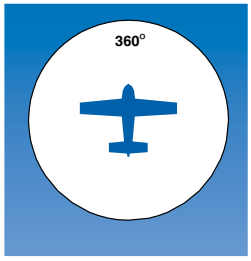
These anti-collision systems must produce a minimum of 400 effective candela in Aviation Red or White (REF. FAR 23.1397), 360º around the aircraft's vertical axis, 30º above and below the horizontal plane (REF. FAR 23.1401).

Aircraft for which type certificate was applied for After July 18, 1977:

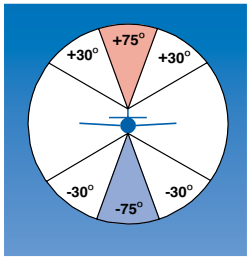
These anti-collision systems must produce a minimum of 400 effective candela in Aviation Red or White (REF. FAR 23.1397), 360º around the aircraft's vertical axis, 75º above and below the horizontal plane (REF. FAR 23.1401).

Note: The position lights must be wired independently of anti-collision lights.





An approved anti-collision strobe light system must project light 360° around the aircraft's vertical axis. One or more strobe lights can be used.



An approved anti-collision strobe light system must project light + or - 30° above and below the horizontal plane of the aircraft. One or more strobe lights can be used. The + or - 75° projected light is required since July 18, 1977.

Installation Locations

Wingtip: The major difference in systems is the location of the strobe power supplies which can be mounted locally, one in each wingtip, or a single power supply can be mounted in the fuselage. Installation time can be greatly reduced if done in conjunction with an annual or one hundred-hour inspection. Properly installed power supplies & cabling are necessary for the safe operation of Whelen or any light systems.

Fuselage: Fuselage mounted units can be either self-contained with the power supply and lighthead as one unit, or remote lightheads run off a separate power supply. To meet the field of coverage, one must be on the top of the fuselage and one on the bottom.

Vertical Fin: Finally, if applicable, a single anti-collision light can be mounted on the vertical stabilizer. It can be either a self-contained or remote lighthead depending on the aircraft.

VERTICAL FIN

One anti-collision strobe light mounted on the vertical fin will meet the minimum requirements on most aircraft. A half red and half white lens is recommended.

WINGTIP

Two wingtip strobe lights that protrude beyond the wingtip.

ENCLOSED WINGTIP

Enclosed wingtip anti-collision strobe lights, require a third strobe light on the tail or vertical fin, to fill in the required light envelope. This is an approved anti-collision system.

FUSELAGE

In a fuselage mounted anti-collision strobe light system, a minimum of two strobe lights are necessary to get the required vertical coverage. This is an approved anti-collision system.

Technologies

Lighting Technology Glossary

Halogen Lamp: *A halogen lamp is an incandescent lamp with a tungsten filament contained within an inert gas.*

Strobe Tube: *Strobe light consist of a tube containing an inert gas, such as Xenon. Capacitors inside the light are charged up to a relatively high voltage, roughly 300 volts for small strobes, then discharged via a trigger to create a bright burst of light.*

LED: *LEDs are solid-state devices and are subject to very limited wear and tear if operated at low currents and low temperatures. A square wavelength creates higher visability with longer on time.*

FAR SPEC

FAR SPEC

A Technical Standard Order (TSO) is a minimum performance standard and does not equal compliance with the applicable Federal Aviation Regulations. In fact other manufacturers produce TSO approved items with operational characteristics that contradict the FARs. Whelen designs products as FAR-SPEC, Federal Aviation Regulations – Specified Lighting. FAR-SPEC is compliant with all applicable FAR's making your installation legal.

* Installers must follow the approved guidance for installation of the product to be FAR-SPEC compliant

ORION™600 SERIES

Whelen Engineering is proud to introduce the ***NEW*** ORION600 Series of FAA/TSO approved LED aviation lighting. Incorporating the latest state-of-the-art LED Technology available in an all-inclusive package, the ORION600 series eliminates the need for external flasher boxes. Flush mountable for a wide variety of applications with minimal integration and easily retrofitable to the Whelen legacy strobe products. The ORION600 series is quite simply the brightest form of LED Anti-collision and Position lighting available.

FAR SPEC

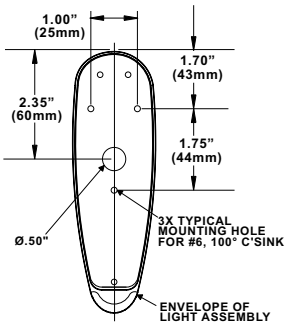
FAA/TSO-C96a & TSO-C30c

ORION™600 Position/Anti-Collision Lighthead

All LED self-contained wingtip mounted Position/Anti-Collision system. Eliminates the need for external power supplies and reduces current draw and provides thousands of hours of operation.

- **Fully FAA/TSO-C96a & TSO-C30c Approved**
- **FAR SPEC Certified compliant**
- **Replaceable hard coated polycarbonate lens to maintain maximum light output**
- **Aerodynamic design without sacrificing light output**
- **Exceeds FAA minimum intensity requirements for maximum visibility and increased safety of flight**
- **Environmentally tested and certified to RTCA/DO-160G standards**

Mounting Pattern

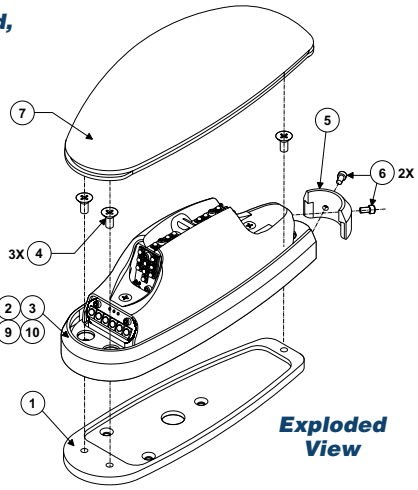


Drawing #	Weight	Dimensions H x W x L	Current Draw 12V / 28V	Position LED colors	Anti-Collision LED color	Lenses
71733	0.5 lbs. (227gm)	2.04" (52mm) x 1.78" (45mm) x 5.65" (144mm)	0.48 / 0.17 Amps Position 1.0 / 0.5 Amps Avg. ACL	Aviation Red Aviation Green Aviation White	Aviation White	Clear Polycarbonate Hardcoat, Field Replaceable

Model #	Part #	Description	Approvals
OR6001G	01-0771733-01	Wingtip PTA Green, 12 VDC	FAA TSO-C96a Class II / TSO-C30c Type II & III
OR6001R	01-0771733-02	Wingtip PTA Red, 12 VDC	FAA TSO-C96a Class II / TSO-C30c Type I & III
OR6002G	01-0771733-11	Wingtip PTA Green, 28 VDC	FAA TSO-C96a Class II / TSO-C30c Type II & III
OR6002R	01-0771733-12	Wingtip PTA Red, 28 VDC	FAA TSO-C96a Class II / TSO-C30c Type I & III

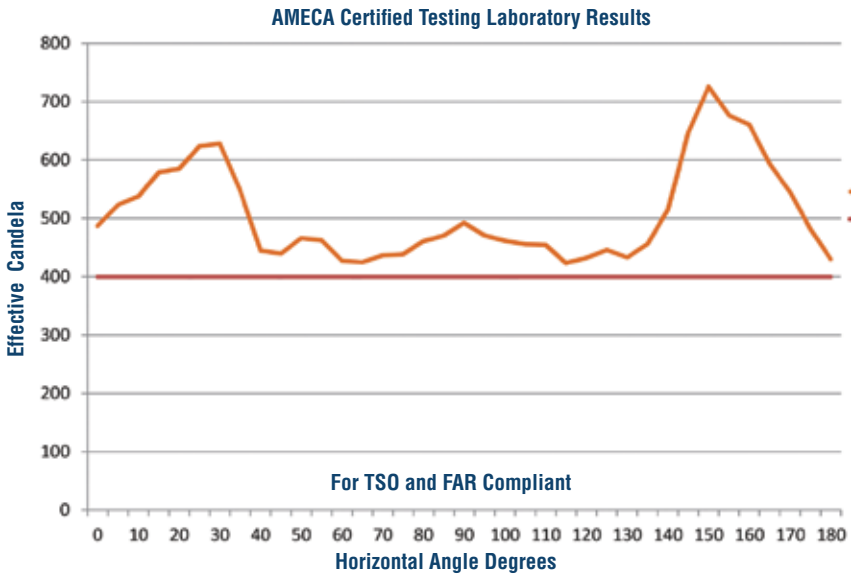
Item #	Part Number	Part Exploded View Description
1	06-171708-000	Baseplate
2	01-0271759-01	Assembly, 12V LED Wingtip Light Green
3	01-0271759-02	Assembly, 12V LED Wingtip Light Red
9	01-0271759-11	Assembly, 28V LED Wingtip Light Green
10	01-0271759-12	Assembly, 28V LED Wingtip Light Red
4	14-0050581-03	Screw, 4-40 x 5/16 P100FH MS24693-C3
5	19-171730-000	Retainer
6	14-026A36-03M	Screw, 2-56 X 3/16 SCKT HD HEX W/NYLOK
7	68-4971726A30	Lens, Clear, Hard Coat

ORION™600 Parts Proudly Designed, Tested and Manufactured in America!



Exploded View

Whelen Engineering... *Performance you can trust.*



NOTE: All non-FAA approved parts in this catalog are signified by a (—) in the approval column. Parts without FAA approval may still be purchased, however, installation of these parts on U. S. Type Certificated products will require FAA approvals.

ORION™650E SERIES

Whelen Engineering is proud to introduce the ***NEW*** ORION650E Series of FAA/TSO approved LED aviation lighting. Incorporating the latest state-of-the-art LED Technology available in an all-inclusive package, the ORION650E series eliminates the need for external flasher boxes. Flush mountable for a wide variety of applications with minimal integration and easily retrofitable to the Whelen legacy strobe products. The ORION650E series is quite simply the brightest form of LED Anti-collision and Position lighting available.

ORION™650E Position/Anti-Collision Lighthead

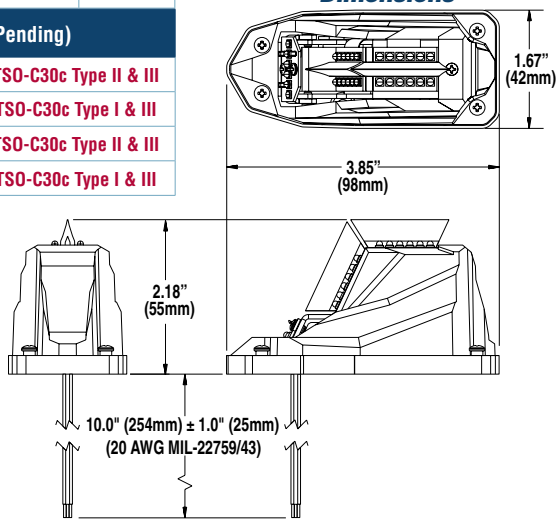
All LED self-contained wingtip mounted Position/Anti-Collision system. Eliminates the need for external power supplies and reduces current draw and provides thousands of hours of operation.

- **Fully FAA/TSO-C96a & TSO-C30c Approved**
- **FAR SPEC Certified**
- **Exceeds FAA minimum intensity requirements for maximum visibility and increased safety of flight**
- **Environmentally tested and certified to RTCA/DO-160G standards**

Drawing #	Weight	Dimensions H x W x L	Current Draw 12V / 28V	Position LED colors	Anti-Collision LED color	Lenses
90701	.27 lbs. (122gm)	See dimension drawing	0.30 / 0.15 Amp (Position) 0.70 / 0.35 Amp (Anti-Collision)	Red (left) and Green (right)	Aviation White	—

Model #	Part #	Description	Approvals (Pending)
OR6501GE	01-0790701-01	Embedded PTA Green, 12 V	FAA TSO-C96a Class II / TSO-C30c Type II & III
OR6501RE	01-0790701-02	Embedded PTA Red, 12 V	FAA TSO-C96a Class II / TSO-C30c Type I & III
OR6502GE	01-0790701-11	Embedded PTA Green, 28 V	FAA TSO-C96a Class II / TSO-C30c Type II & III
OR6502RE	01-0790701-12	Embedded PTA Red, 28 V	FAA TSO-C96a Class II / TSO-C30c Type I & III

Dimensions



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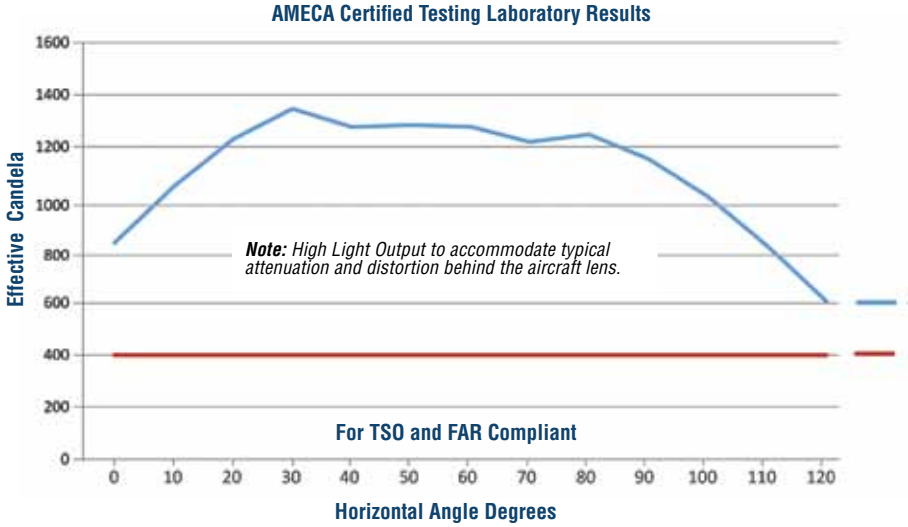
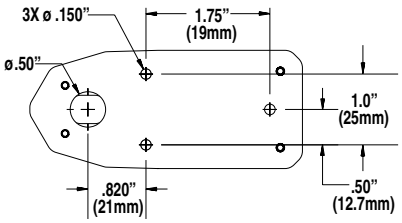
AMECA Certified Testing Laboratory Results



Mounting Pattern



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ORION™650 SERIES

FAR SPEC

FAA/TSO-C96a & TSO-C30c Pending

Whelen Engineering is proud to introduce the ***NEW*** ORION650 Series of FAA/TSO approved LED aviation lighting. Incorporating the latest state-of-the-art LED Technology available in an all-inclusive package, the ORION650 series eliminates the need for external flasher boxes. Flush mountable for a wide variety of applications with minimal integration and easily retrofitable to the Whelen legacy strobe products. The ORION650 series is quite simply the brightest form of LED Anti-collision and Position lighting available.

ORION™650 Position/Anti-Collision Lighthead

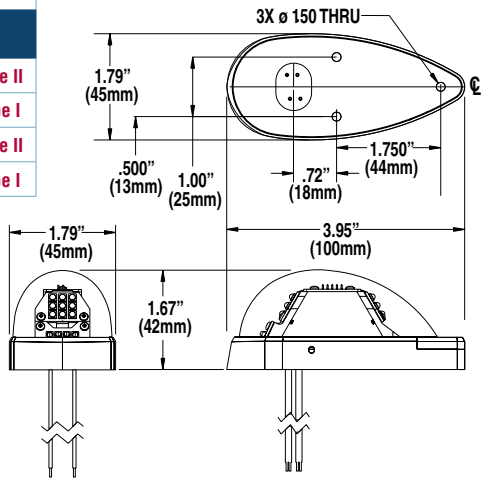
All LED self-contained wingtip mounted Position/Anti-Collision system. Eliminates the need for external power supplies and reduces current draw and provides thousands of hours of operation.

- **Fully FAA/TSO-C96a & TSO-C30c Approved**
- **FAR SPEC Certified**
- **Replaceable hard coated polycarbonate lens to maintain maximum light output**
- **Aerodynamic design without sacrificing light output**
- **Exceeds FAA minimum intensity requirements for maximum visibility and increased safety of flight**
- **Environmentally tested and certified to RTCA/DO-160G standards**

Drawing #	Weight	Dimensions H x W x L	Current Draw 12V / 28V	Position LED colors	Anti-Collision LED color	Lenses
90725	.26 lbs. (118gm)	See dimension drawing	0.30 / 0.15 Amps Position 0.70 / 0.35 Amps Avg. ACL	Red (left) and Green (right)	Aviation White	Clear Hardcoated Polycarbonate

Model #	Part #	Description	Approvals (Pending)
OR6501G	01-0790725-01	Wingtip PTA Green, 12 V	FAA TSO-C96a Class III / TSO-C30c Type II
OR6501R	01-0790725-02	Wingtip PTA Red, 12 V	FAA TSO-C96a Class III / TSO-C30c Type I
OR6502G	01-0790725-11	Wingtip PTA Green, 28 V	FAA TSO-C96a Class III / TSO-C30c Type II
OR6502R	01-0790725-12	Wingtip PTA Red, 28 V	FAA TSO-C96a Class III / TSO-C30c Type I

Dimensions



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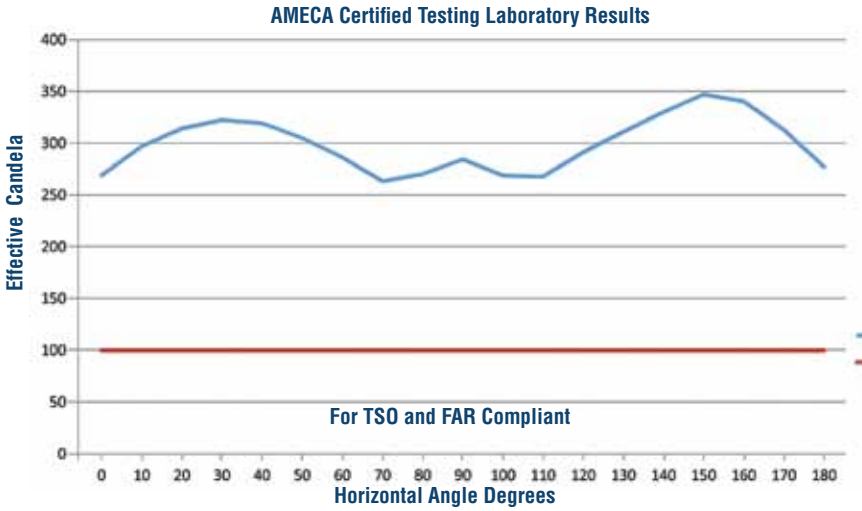
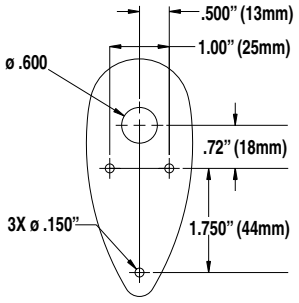


Mounting Pattern



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ORION™500 SERIES

Whelen Engineering is proud to introduce the ***NEW*** ORION500 Series of FAA/TSO approved LED aviation lighting. Incorporating the latest state-of-the-art LED Technology available in an all-inclusive package, the ORION500 series eliminates the need for external flasher boxes. Flush mountable for a wide variety of applications with minimal integration and easily retrofitable to the Whelen legacy strobe products. The ORION500 series is quite simply the brightest form of LED Anti-collision and Position lighting available.

FAR SPEC

FAA/TSO-C96a & TSO-C30c Pending

ORION™500 Position/Anti-Collision Lighthead

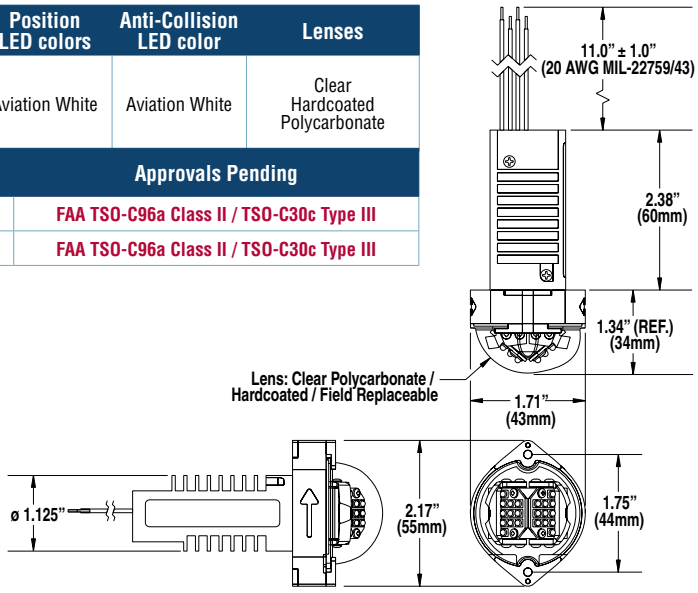
All LED self-contained tail mounted Position/Anti-Collision system. Eliminates the need for external power supplies and reduces current draw and provides thousands of hours of operation.

- **Fully FAA/TSO-C96a & TSO-C30c Approved**
- **FAR SPEC Certified**
- **Replaceable hard coated polycarbonate lens to maintain maximum light output**
- **Aerodynamic design without sacrificing light output**
- **Exceeds FAA minimum intensity requirements for maximum visibility and increased safety of flight**
- **Environmentally tested and certified to RTCA/DO-160G standards**

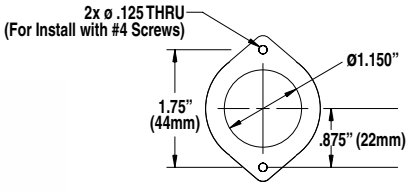
Drawing #	Weight	Dimensions H x W x L	Current Draw 12V / 28V	Position LED colors	Anti-Collision LED color	Lenses
71774	0.28 lbs (127gm)	See dimension drawing	0.20 / 0.10 Amp (Position) 0.38 / 0.19 Amp (Anti-Collision)	Aviation White	Aviation White	Clear Hardcoated Polycarbonate

Model #	Part #	Description	Approvals Pending
OR5001V	01-0771774V01	Tail PTA Light White, 12 V	FAA TSO-C96a Class II / TSO-C30c Type III
OR5002V	01-0771774V02	Tail PTA Light White, 28 V	FAA TSO-C96a Class II / TSO-C30c Type III

Dimensions



Mounting Pattern



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ORION™ SERIES CROSSOVER CHART

Legacy Product Part Number	Legacy Product Model Number	Mounting Location	ORION REPLACEMENT MODEL NUMBER	ORION SERIES PICTORAL VIEW
01-0770054-01	A650PG28	Within Faring	ORION6502GE / ORION6502RE *NOTE Not to be mounted on exterior of aircraft	 ORION650E Series
01-0770054-03	A650PR28			
01-0771110-03	7111003			
01-0771110-04	7111004			
01-0770001-42	W1285PG28			
01-0770001-52	W1285PR28			
01-0771105-03	7110503			
01-0771105-04	7110504			
01-0770054-00	A650PG14	Within Faring	ORION6501GE / ORION6501RE *NOTE Not to be mounted on exterior of aircraft	
01-0770054-02	A650PR14			
01-0771110-01	7111001			
01-0771110-02	7111002			
01-0770001-41	W1285PG14			
01-0770001-51	W1285PR14			
01-0771105-01	7110501			
01-0771105-02	7110502			
01-0770054-01	A650PG28	Wingtip Mounted	ORION6502G/ ORION6502R	 ORION650 Series
01-0770054-03	A650PR28			
01-0771110-03	7111003			
01-0771110-04	7111004			
01-0770001-42	W1285PG28			
01-0770001-52	W1285PR28			
01-0771105-03	7110503			
01-0771105-04	7110504			
01-0770054-00	A650PG14	Wingtip Mounted	ORION6501G/ ORION6501R	
01-0770054-02	A650PR14			
01-0771110-01	7111001			
01-0771110-02	7111002			
01-0770001-41	W128514			
01-0770001-51	W128514			
01-0771105-01	7110501			
01-0771105-02	7110502			
01-0790006-03	A600PR28	Wingtip Mounted	ORION6002G/ ORION6002R	 ORION600 Series
01-0790006-01	A600PG28			
01-0790340-03	9034003			
01-0790340-04	9034004			
01-0790006-00	A600PR14	Wingtip Mounted	ORION6001G/ ORION6001R	
01-0790006-02	A600PG14			
01-0790340-01	9034001			
01-0790340-02	9034002			
01-0770024-00	A500AV14	Tail Mounted	ORION5001V	 ORION500 Series
01-0770034-00	A555AV14			
01-0770024-01	A500AV28	Tail Mounted	ORION5002V	
01-0770034-01	A555AV28			

NOTE: Any highlighted **RED ITEMS** will require extra wiring for Anti-Collision function of Orion Series

Warranty, Service & Repair Station

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