



# Autopilot Servo Installation Guide

## RV6 Roll

*This product is not approved for installation in type certificated aircraft*

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## SERVO MOUNTING INSTRUCTIONS – RV-6 FUSELAGE ROLL KIT

Kit Contents		
Dynon Part #	QTY	Part Description
100836-000	2	Large Male Rod End
100866-000	1	RV6 Roll Bracket
100867-000	1	RV6 Roll Plate
100966-005	1	Aluminum Pushrod Tube - 7.5"
100975-002	2	AN315-4R Jam Nut
100976-007	4	AN365-832A Nylon Insert Locknut
100976-011	2	AN365-1032A Nylon Insert Locknut
100977-000	2	AN970-3 Large Flat Washer
100978-002	4	AN960-8 Small Flat Washer
100978-003	7	AN960-10 Small Flat Washer
100979-002	4	MS35333-39 #10 Internal Star Washer
100980-008	4	MS24693-50 Countersunk Machine Screw
100981-000	4	AN3H-3A Bolt - 3/8"
100981-005	1	AN3H-10A Bolt - 1"
100981-014	1	AN3H-21A Bolt - 2 1/8"
100982-002	1	Aluminum Spacer - 0.600"

The RV-6 fuselage roll servo mounting kit includes a mounting bracket, strengthening plate, pushrod linkage, and all of the required fasteners to mount the servo and properly link it to the aircraft control system. All Dynon-supplied parts are illustrated in dark grey to distinguish them from existing aircraft hardware. Refer to the drawing to locate the servo mounting bracket in the aircraft. Dynon currently supports a fuselage-only roll install for the RV6. The bracket and servo can be installed under either the pilot or passenger seat.

Decide whether the bracket will be installed using the recommended method of securing through the floor (fuselage skin) or bolting to the rib. The alternate rib fastening method requires the installer to supply additional fasteners. Dynon has supplied a strengthening plate that will sandwich the aircraft skin when installed in the recommended manner. Use the bracket as a template for drilling and refer to the drawing for dimensions. Rivet nuts can be attached to the bracket, or simply use the supplied MS24693-50 screws through AN960-8 flat washers and AN365-832A lock nuts as illustrated. This installation method should place the fuselage skin holes and plate underneath the landing gear fairing in an RV6A.

With the bracket in place, the servo can be installed. We recommended that all 4 of the AN3H-3A bolts be installed with the MS35333-39 star washers and AN960-10 flat washers to secure the servo to the bracket. All AN bolts supplied by Dynon have drilled heads for use with safety wire.

With the servo installed, the linkage needs to be assembled. Refer to the illustration and follow proper rod end installation techniques. Screw at least half of the threads on each rod end into the push rod. To prevent the possibility of the servo arm going over-center, the servo arm must **not** travel more than a total of  $\pm 60^\circ$  from neutral throughout the control system's range of travel. The linkage should be installed as close to the Dynon recommendation as possible, as changes will affect geometry. Dynon suggests installing the linkage at the outer-most hole of the servo arm. Changing this location will affect servo torque output, servo arm travel, control surface resolution, and the amount of force required to shear the safety screw, and should only be changed if the installer has an understanding of these implications. See the diagram on the following page which illustrates the linear travel and available force for each mount point on long-arm servos.

Standard mounting of the linkage to the servo arm will include the AN3H-10A bolt, AN970-3 large diameter flat washer (for capturing the rod end bearing), 2 AN960-10 flat washers on each side of the servo arm itself, and the AN365-1032A lock nut. The other end of the linkage will require the same type of stack-up, but will need the included .600" spacer and longer bolt to clear the existing push tube. Some trimming around push tube holes in ribs may be required over full travel to clear the supplied linkage.

The distance between the servo arm and the control system attachment point must allow for the angle between the servo arm and the push rod to be at approximately  $90^\circ$  when the controls are at neutral. Use the adjustability in the rod ends to achieve this, and then tighten the jam nuts to lock the rod ends in place. **The illustrations show the control stick, linkage, and arm at one end of the range of motion for clarity when viewing the servo part stack-up.**

Installers should always keep in mind the range of motion of the servo. Total servo arm travel is limited, but verify the arm/linkage do not interfere with anything during the full motion of the control stick. The built-in control stops of the aircraft will limit the servo arm travel when installed correctly. We recommend the use of the optional Range of Motion Limiting Bracket, supplied with the servo to eliminate the chance of the servo arm going over-center. This bracket should not be used as a normal stop; the aircraft's built-in stops should always be the primary range limit.

Your servo(s) and AP74/76 (if ordered) came with a CD containing the latest documentation for all Dynon products (also available at [dynonavionics.com](http://dynonavionics.com)). Please read through that documentation to understand the wiring and configuration process for your Autopilot system. We also maintain a collaborative set of this documentation, which is often updated with new information by both Dynon and fellow builders. Visit [wiki.dynonavionics.com](http://wiki.dynonavionics.com) to view and contribute to the latest version of these documents.

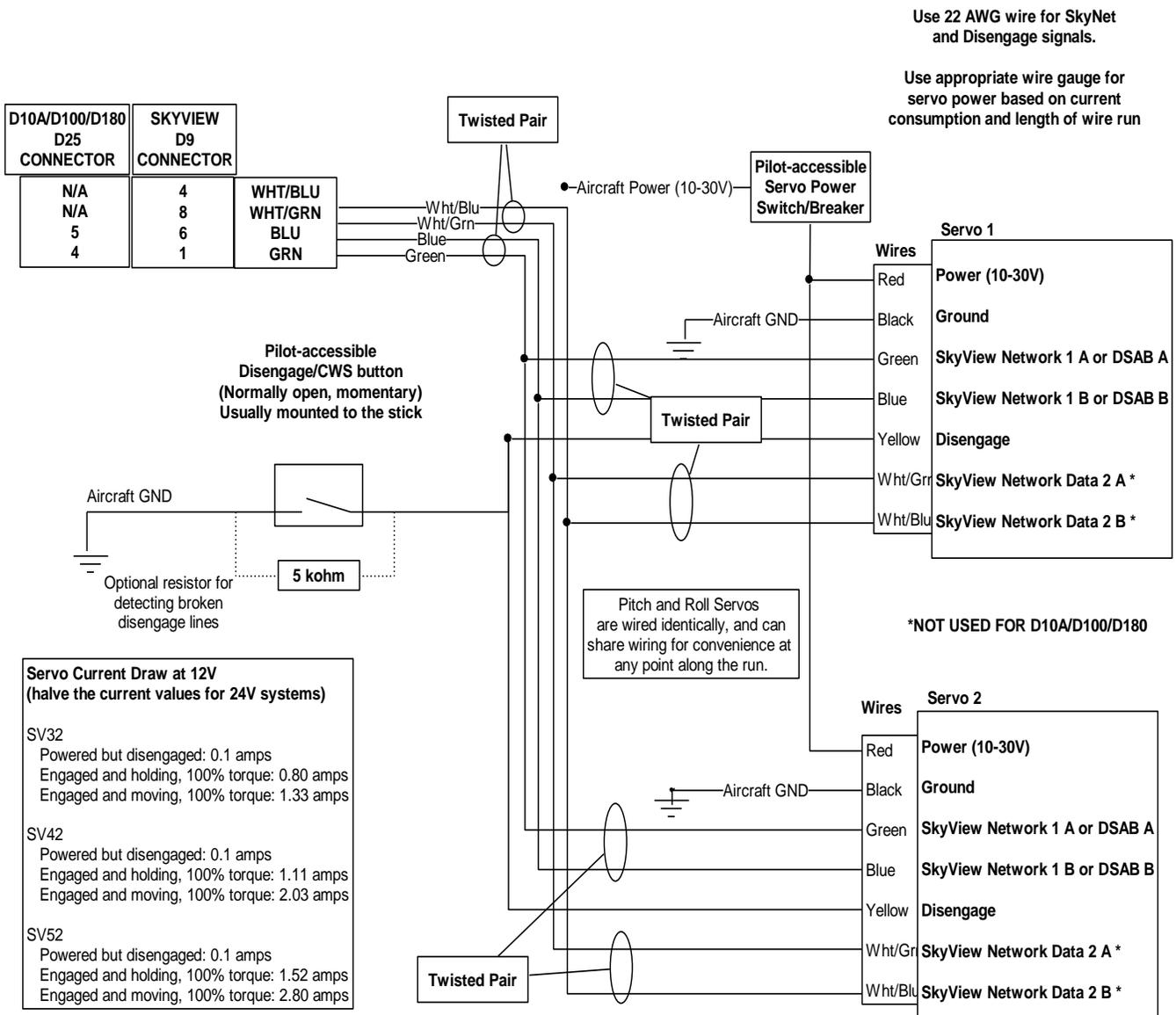
You can also visit [forum.dynonavionics.com](http://forum.dynonavionics.com) to discuss and share installation notes, pictures, and suggestions with other builders.



**Neglecting to properly install and/or use Dynon autopilot hardware may result in failures which could cause loss of aircraft control resulting in aircraft damage, personal injury or death.**

## Wiring Overview

The following diagram provides an overview of the autopilot-specific wiring installation. For the complete set of wiring and configuration instructions, please see the latest Installation Guide for your Dynon EFIS product. For a SkyView system please reference the **Autopilot Servo Installation, Configuration, and Calibration** chapter of your SkyView System Installation guide. For EFIS-D10A, EFIS-D100 or FlightDEK-D180 please reference the **Autopilot Installation and Configuration** chapter of each respective Installation Guide.

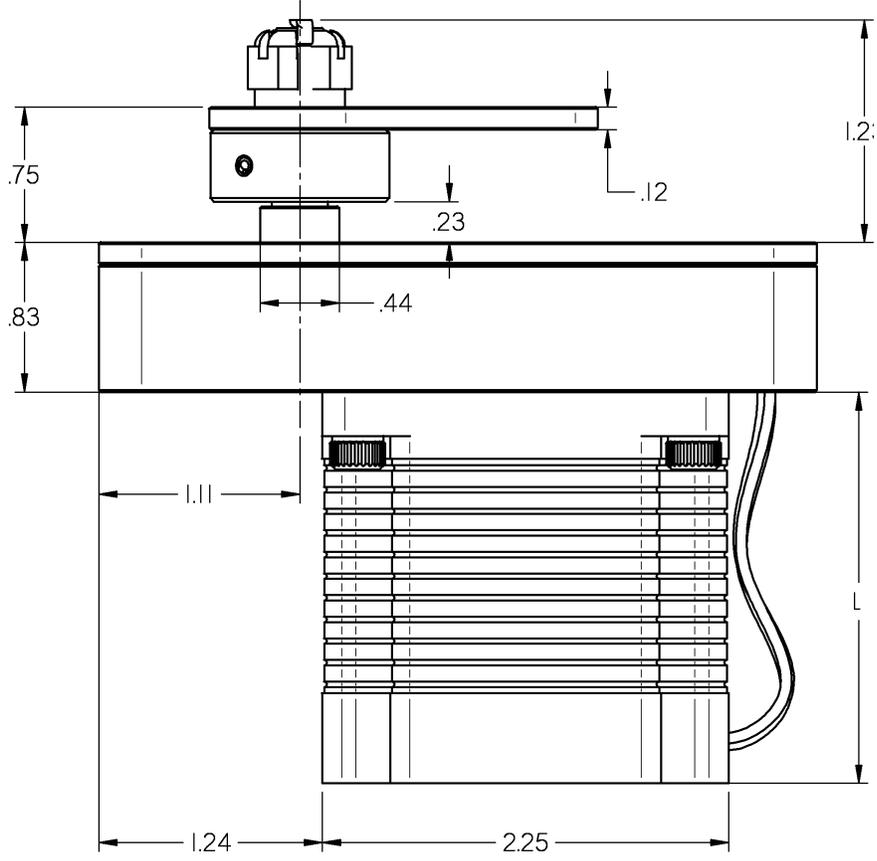
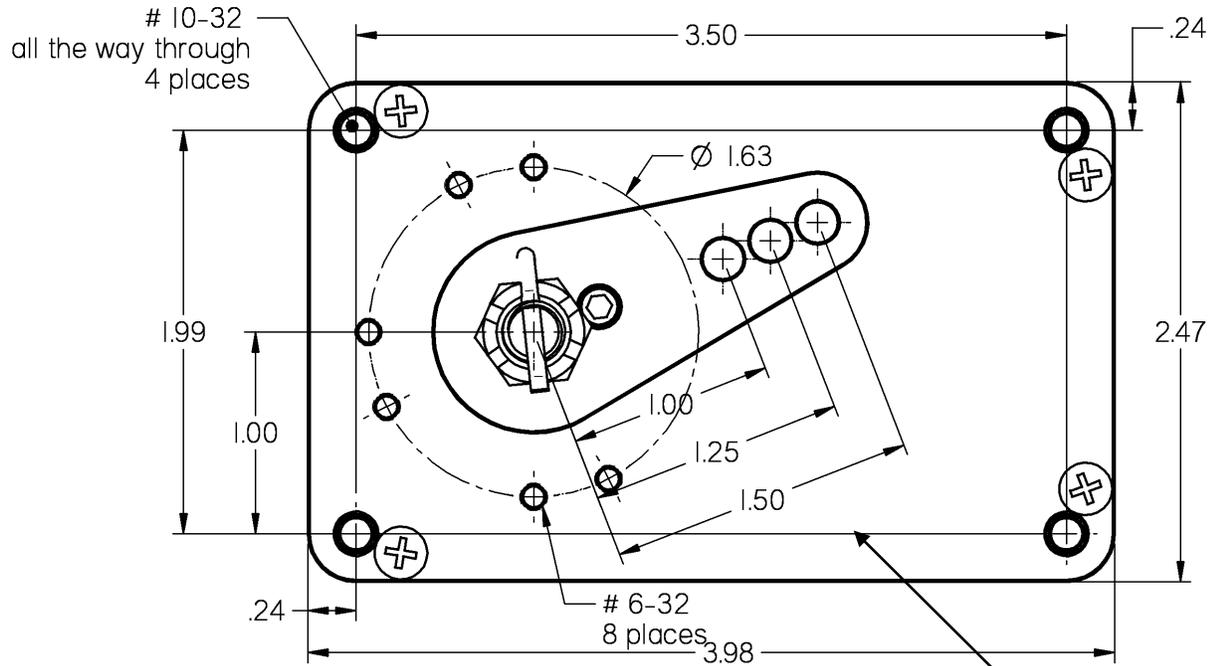


Servo Current Draw at 12V (halve the current values for 24V systems)	
SV32	Powered but disengaged: 0.1 amps Engaged and holding, 100% torque: 0.80 amps Engaged and moving, 100% torque: 1.33 amps
SV42	Powered but disengaged: 0.1 amps Engaged and holding, 100% torque: 1.11 amps Engaged and moving, 100% torque: 2.03 amps
SV52	Powered but disengaged: 0.1 amps Engaged and holding, 100% torque: 1.52 amps Engaged and moving, 100% torque: 2.80 amps



### Servo Dimensions

Use the following dimensions (in inches) for reference when planning and implementing your installation.



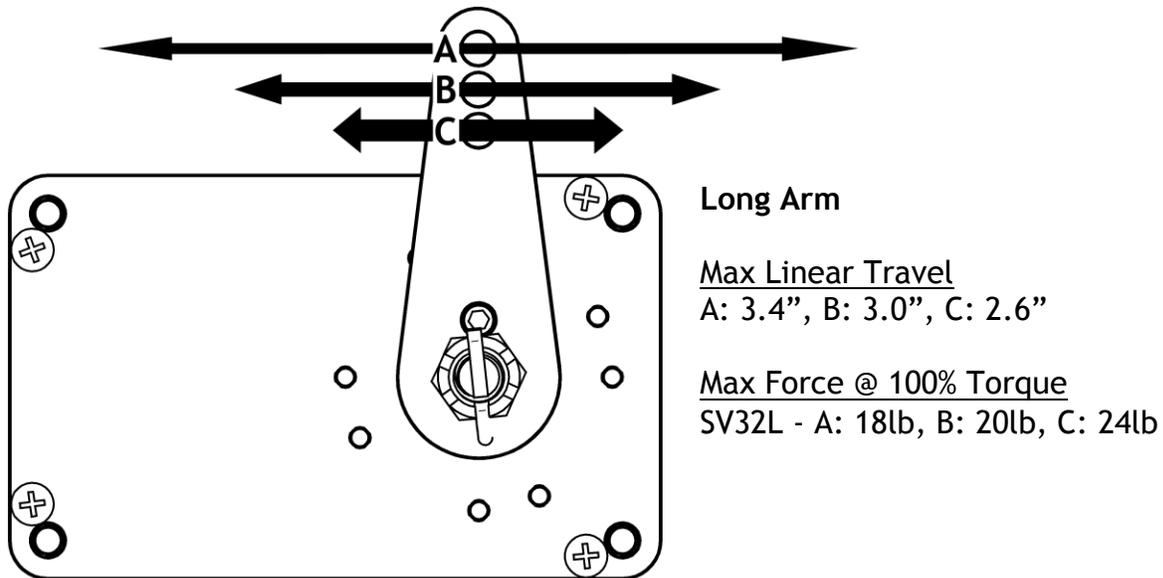
Long-arm variants  
(as used for RV-6  
Roll) have linkage  
mount holes at 1.5",  
1.75", and 2.0"

	L	Weight
SV32	2.17"	2 lb
SV42	3.10"	3 lb
SV52	4.02"	4 lb

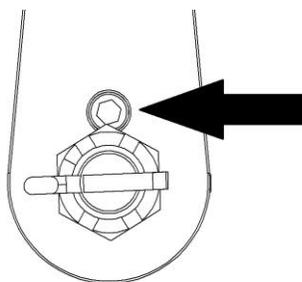
## Linkage mount position force and travel

The diagram below illustrates the maximum travel and force available at each linkage mounting point. As can be seen, the closer you mount the linkage to the shaft, the more force the servo can deliver. However, this also means the travel of the arm is shorter. Again, ensure that the servo arm is nowhere near going over-center throughout the entire range of the control system.

Position A should be used in most RV-6 roll installations. Modify mount position with caution and take all precautions to ensure that a near over center condition cannot occur.

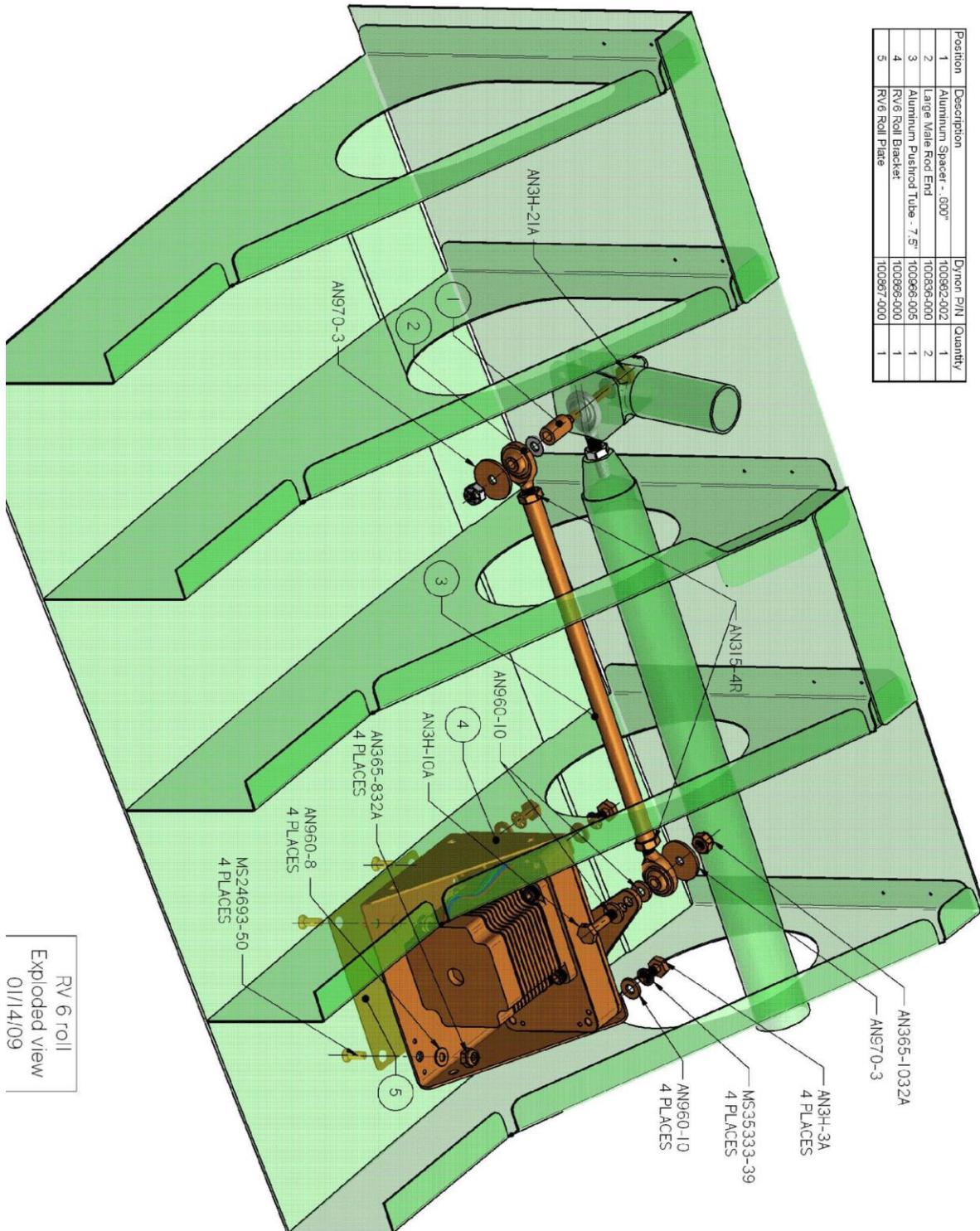


- ! The autopilot safety shear screw should NEVER be removed or adjusted during this operation. If the shear screw has broken and needs replacement, there is specific documentation available for this purpose at <http://docs.dynonavionics.com>.



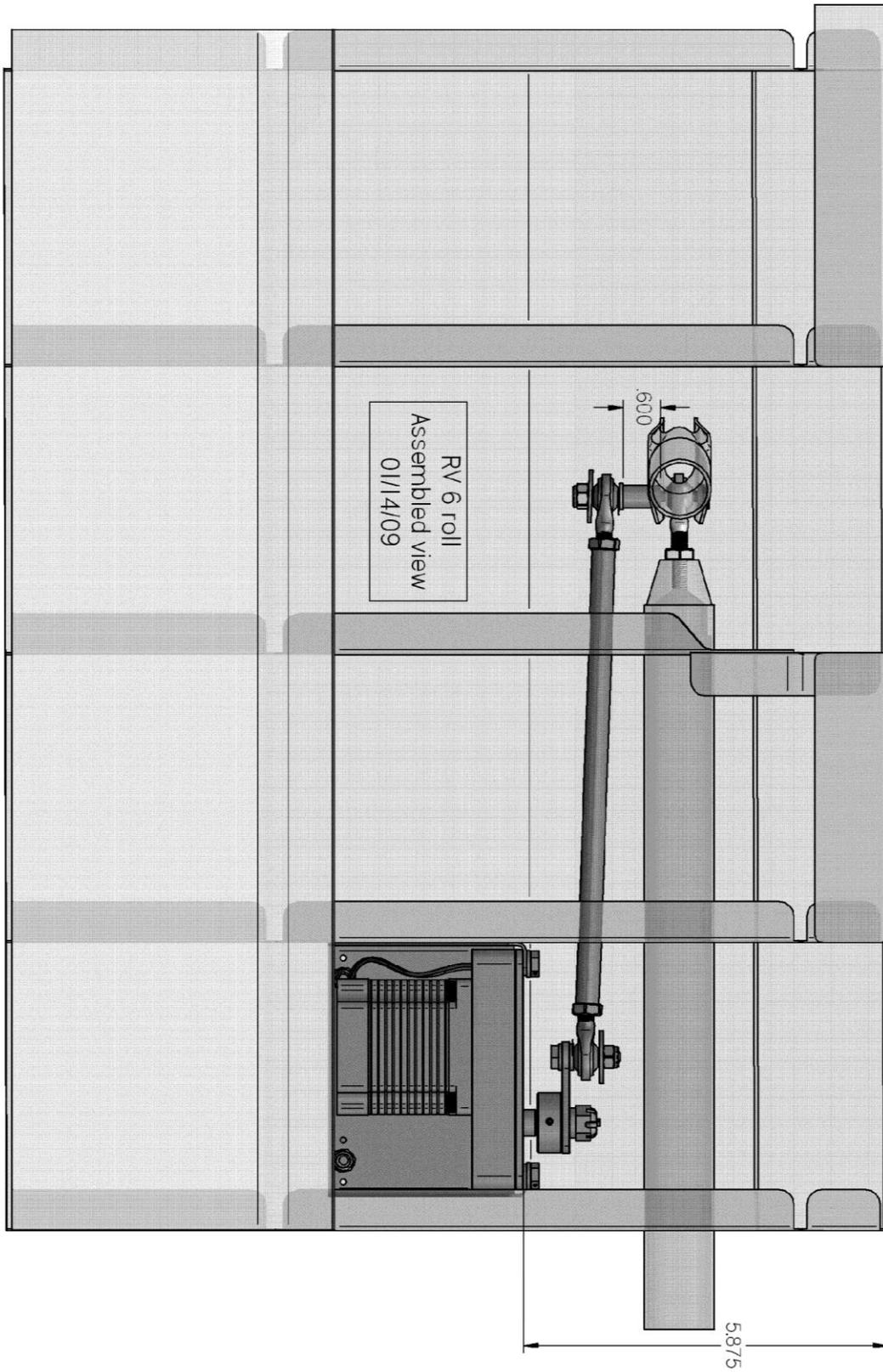
## Mounting drawings

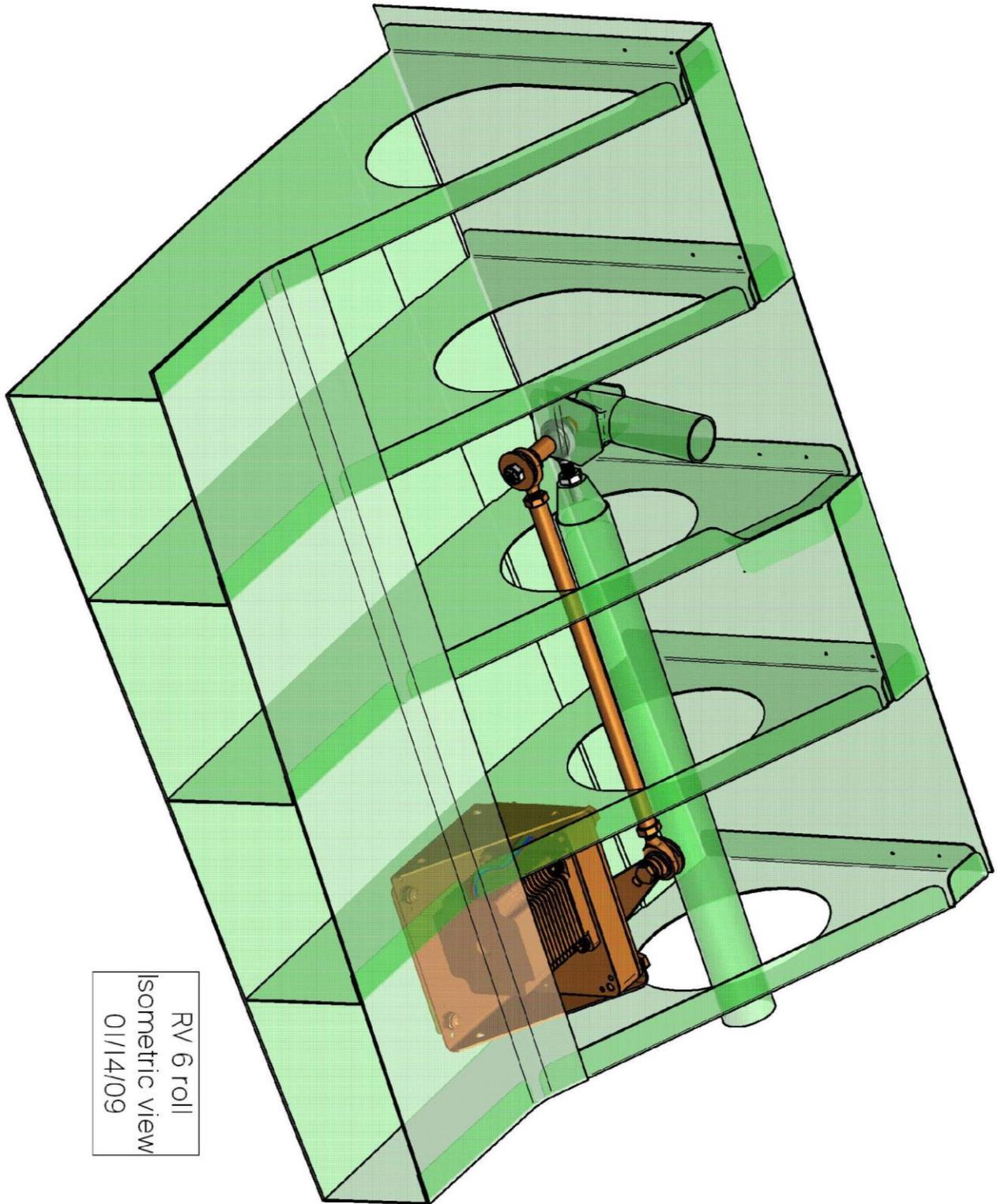
The following pages provide detailed views of the mounting and assembly of the servo and this kit.



Position	Description	Dynon P/N	Quantity
1	Aluminum Spacer - .000"	100962-002	1
2	Large Walle Rod End	100896-000	2
3	Aluminum Pushrod Tube - .75"	100966-005	1
4	RV6 Roll Bracket	100966-000	1
5	RV6 Roll Plate	100967-000	1

RV 6 roll  
Exploded view  
01/14/09





RV 6 roll  
Isometric view  
01/14/09