



# Autopilot Servo Installation Guide

## **RV7, RV8, RV10, Roll**

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

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## SERVO MOUNTING INSTRUCTIONS – RV-7/8/10 RIGHT WING ROLL KIT

Kit Contents		
Dynon Part #	QTY	Part Description
100836-000	2	Large Male Rod End
100870-001	1	RV7,8,9,10 Right Roll Bracket
100872-001	1	RV7,8,9,10 Right Support Bracket
100966-008	1	Aluminum Pushrod Tube - 3.0"
100975-002	2	AN315-4R Jam Nut
100976-011	2	AN365-1032A Nylon Insert Locknut
100977-000	3	AN970-3 Large Flat Washer
100978-003	5	AN960-10 Small Flat Washer
100979-002	3	MS35333-39 #10 Internal Star Washer
100981-000	3	AN3H-3A Bolt - 3/8"
100981-005	1	AN3H-10A Bolt - 1"
100981-012	1	AN3H-17A Bolt - 1 7/8"
100982-004	1	Aluminum Spacer - 0.875"

The RV-7/8/10 right wing roll servo mounting kit includes a right wing mounting bracket, right wing support bracket, pushrod linkage, and most of the required fasteners to mount the servo and properly link it to the aircraft control system. All Dynon-supplied parts are illustrated darker to distinguish them from existing aircraft hardware. The lower bell crank support bracket must be removed to install the supplied servo mounting bracket. Fasteners used to secure the existing brackets will be re-used to install the new Dynon brackets. It is up to the installer to determine if these fasteners are suitable for re-use (not available from Dynon). With the mounting brackets loosened/removed it is an ideal time to drill the aileron bell-crank bracket per the dimensions in the illustration if required.

The bracket that will replace the existing aircraft bracket is made of 4130 steel and has an anti-corrosion finish applied. It has been designed to meet or exceed the original bracket in strength and corrosion resistance. Install the Dynon-supplied lower servo mounting bracket in place with the previously removed original fasteners and install the bell-crank pivot bolt as it was in the original installation.

Optional Limiting Bracket Installation: Use of the limiting bracket is **optional** and should be considered an extra method of security. The bracket was designed to limit the travel of the servo arm in extreme cases to avoid actuator over-centering. If the limiting bracket is to be used it must be installed on the servo prior to the servo being installed in the mounting bracket. Refer to drawing and limiting bracket installation instructions.

Bracket and Servo Installation: With the bracket in place, install the 2 AN3H-3A bolts, MS35333-39 star washers, and AN960-10 flat washers to secure the servo to the bracket per the drawing, noting the orientation of the servo output arm. All AN bolts supplied by Dynon have drilled heads for use with safety wire.

Install the support bracket to the other side of the servo using the same bolt stack-up. Secure it to the upper bell crank support bracket using the existing fastener. With the servo in place, torque all fasteners back to original installation specifications and add safety wire where needed.

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 +/-60° 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 standard-arm servos.

Thread both large rod ends with jam nuts into the supplied 3.0" tube. 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), AN960-10 flat washer, and the AN365-1032A lock nut. The other end of the linkage will require the same type of stack-up, with the addition of 1 AN970-3 large washer, the 0.875" spacer and longer AN3H-17A bolt to secure to the drilled aileron bell crank bracket.

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° 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. 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.

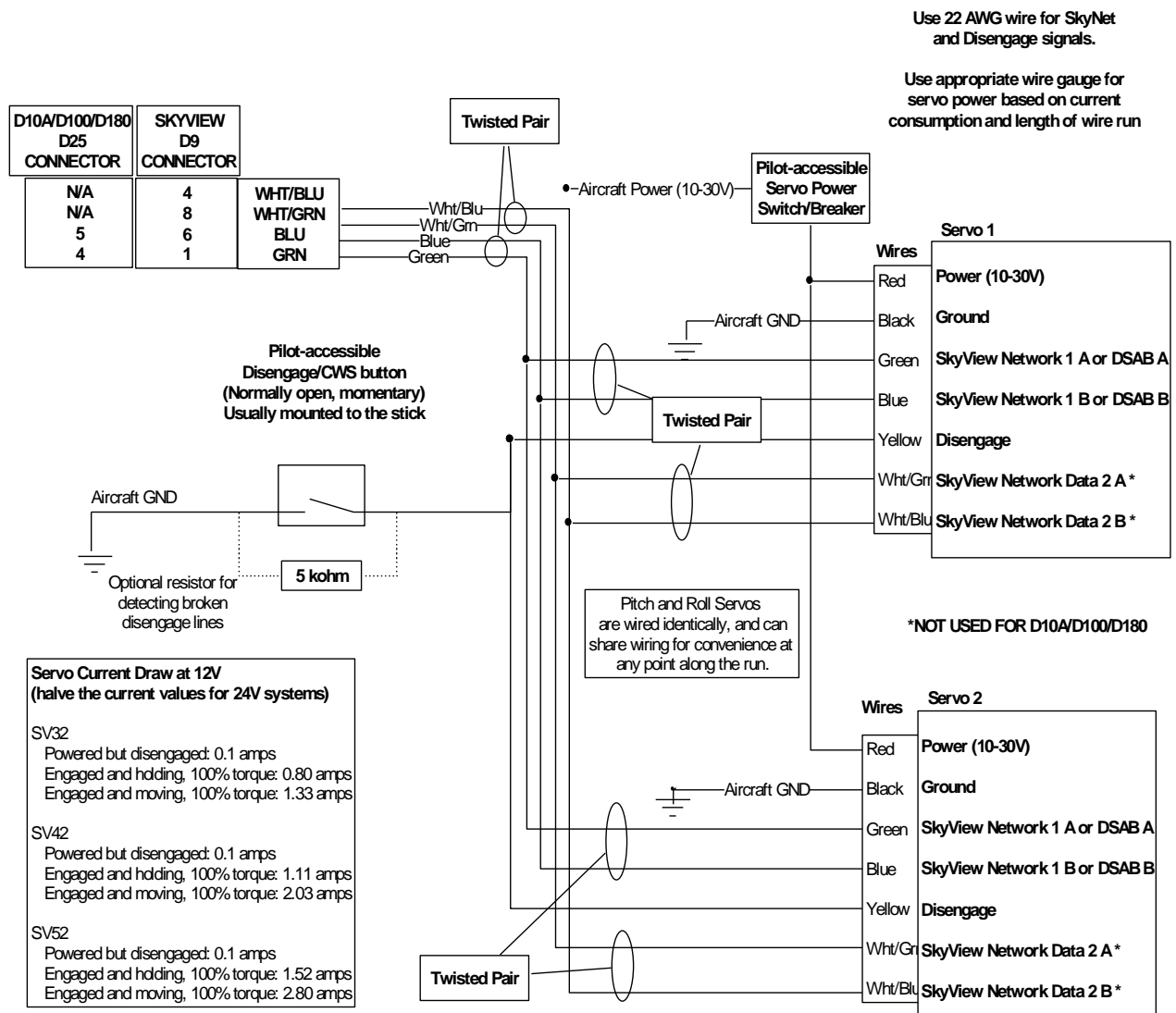
You can also visit [forum.dynonavionics.com](http://forum.dynonavionics.com) to discuss and share installation notes, pictures, and suggestions with other builders.



**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

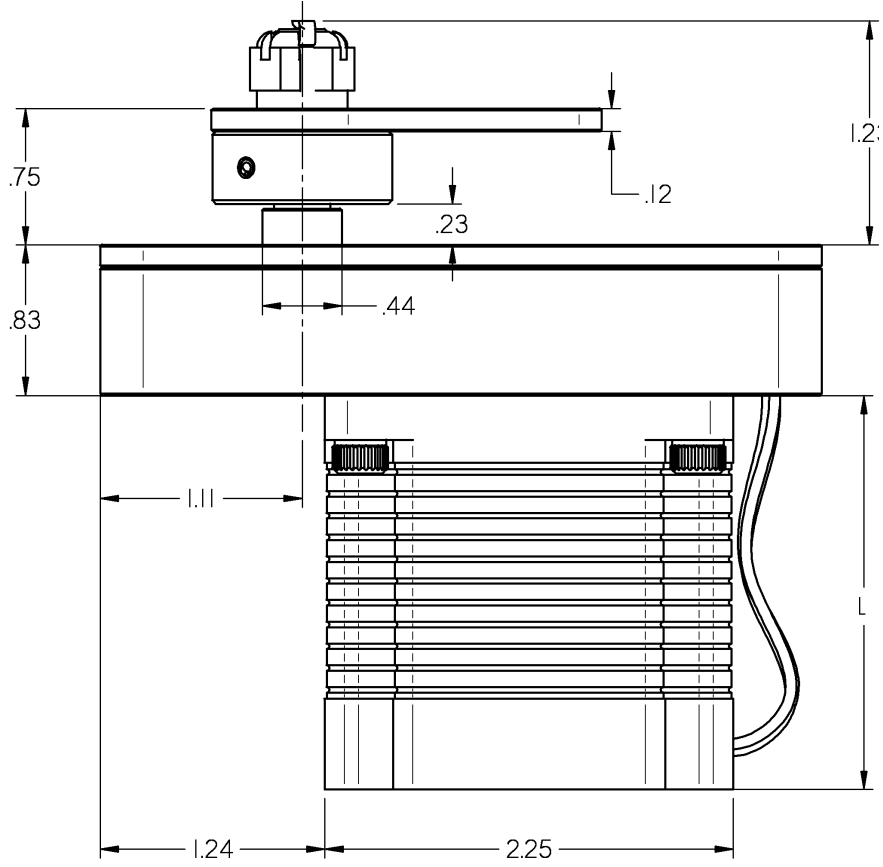
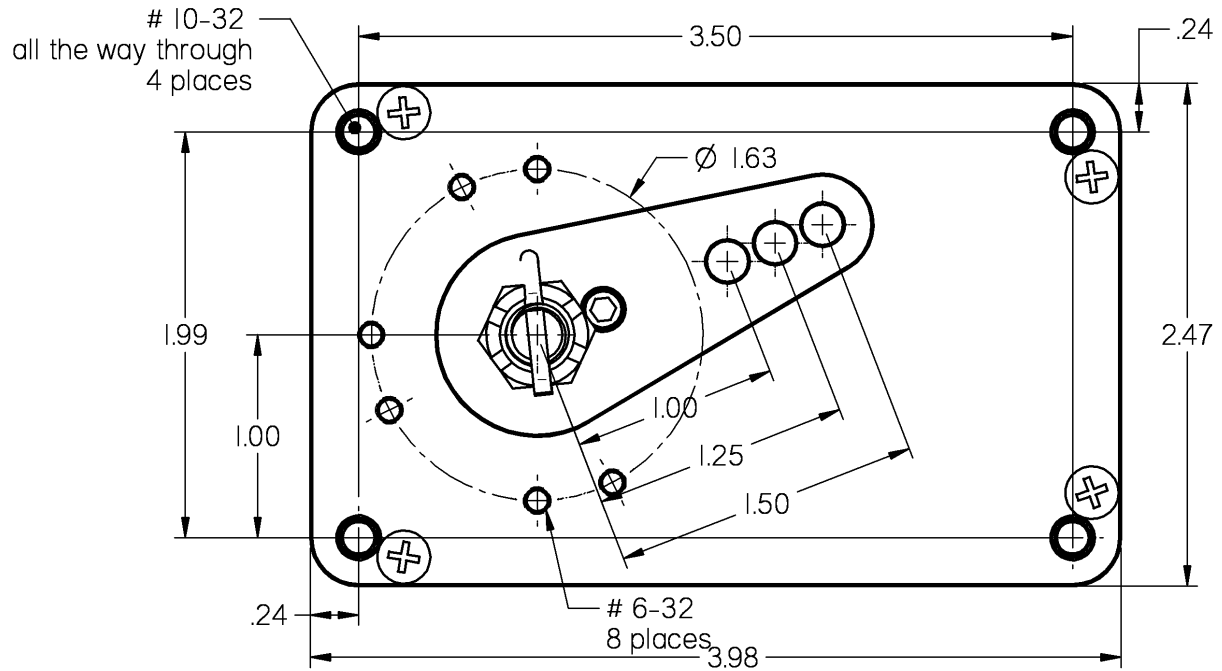
The following diagram provides an overview of the autopilot-specific wiring installation. For the complete set of wiring and configuration instructions, please see the latest Installation Guide for your Dynon EFIS product. For a SkyView system please reference the **Autopilot Servo Installation, Configuration, 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 Dimensions

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



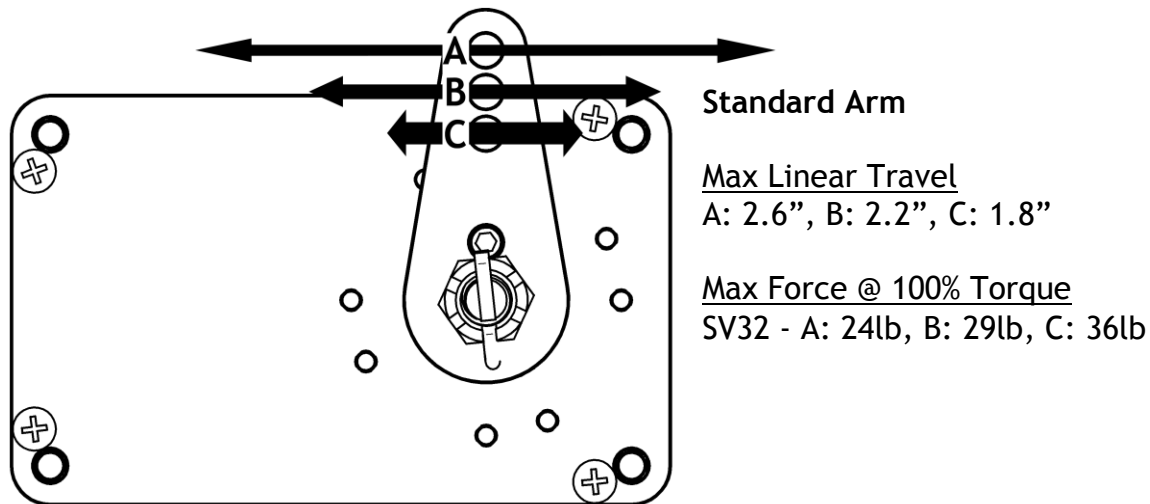
Long-arm variants (not needed in most installations) have linkage mount holes at 1.5", 1.75", and 2.0"

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

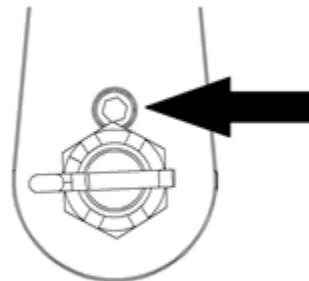
## Linkage mount position force and travel

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-7/8/10 roll installations. Modify mount position with caution and take all precautions to ensure that a near over center condition cannot occur



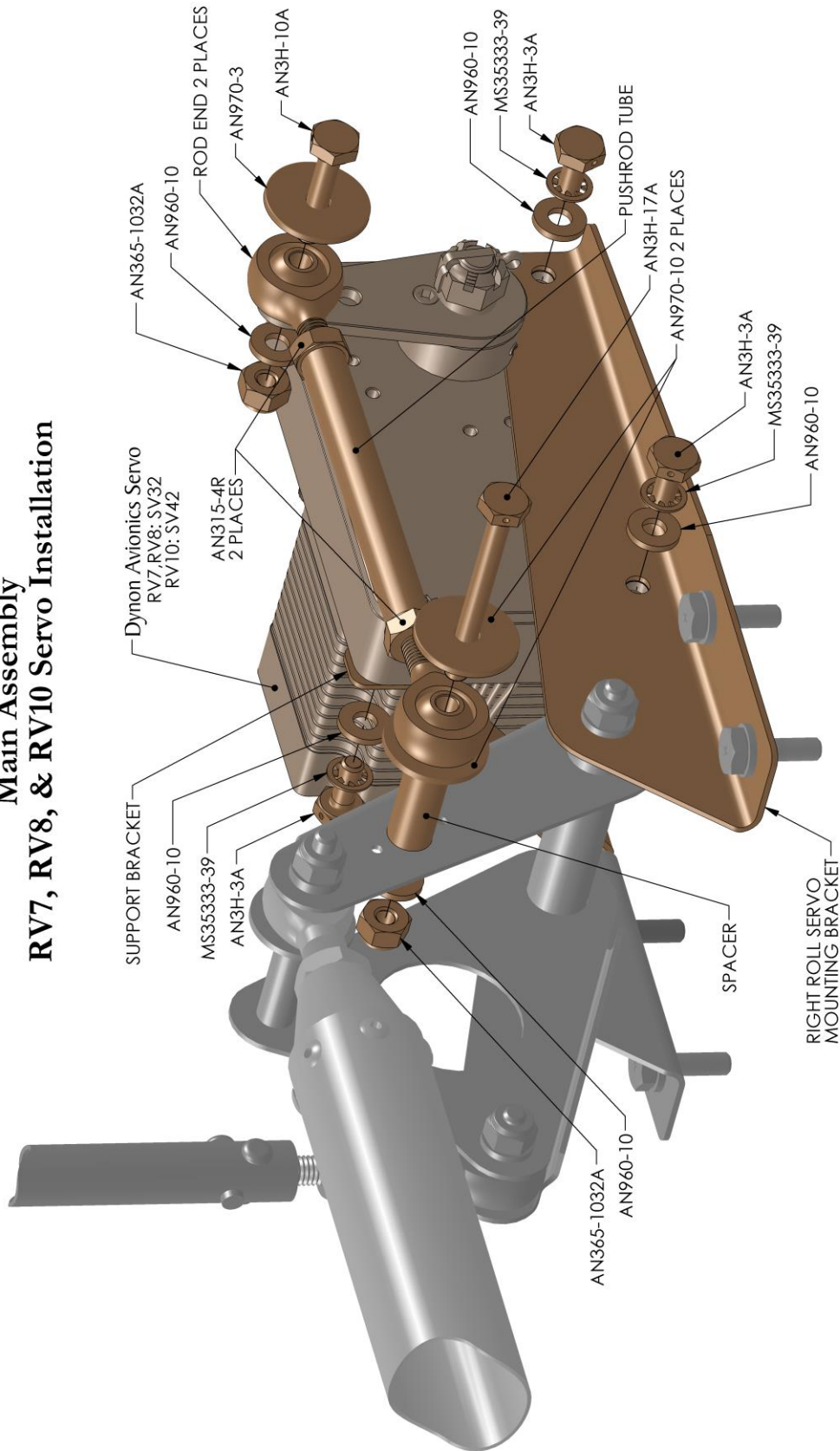
- ⚠ The autopilot safety shear screw should NEVER be removed or adjusted during this operation. If the shear screw has broken and needs replacement, there is specific documentation available for this purpose at <http://docs.dynonavionics.com>.



## Mounting Drawings

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

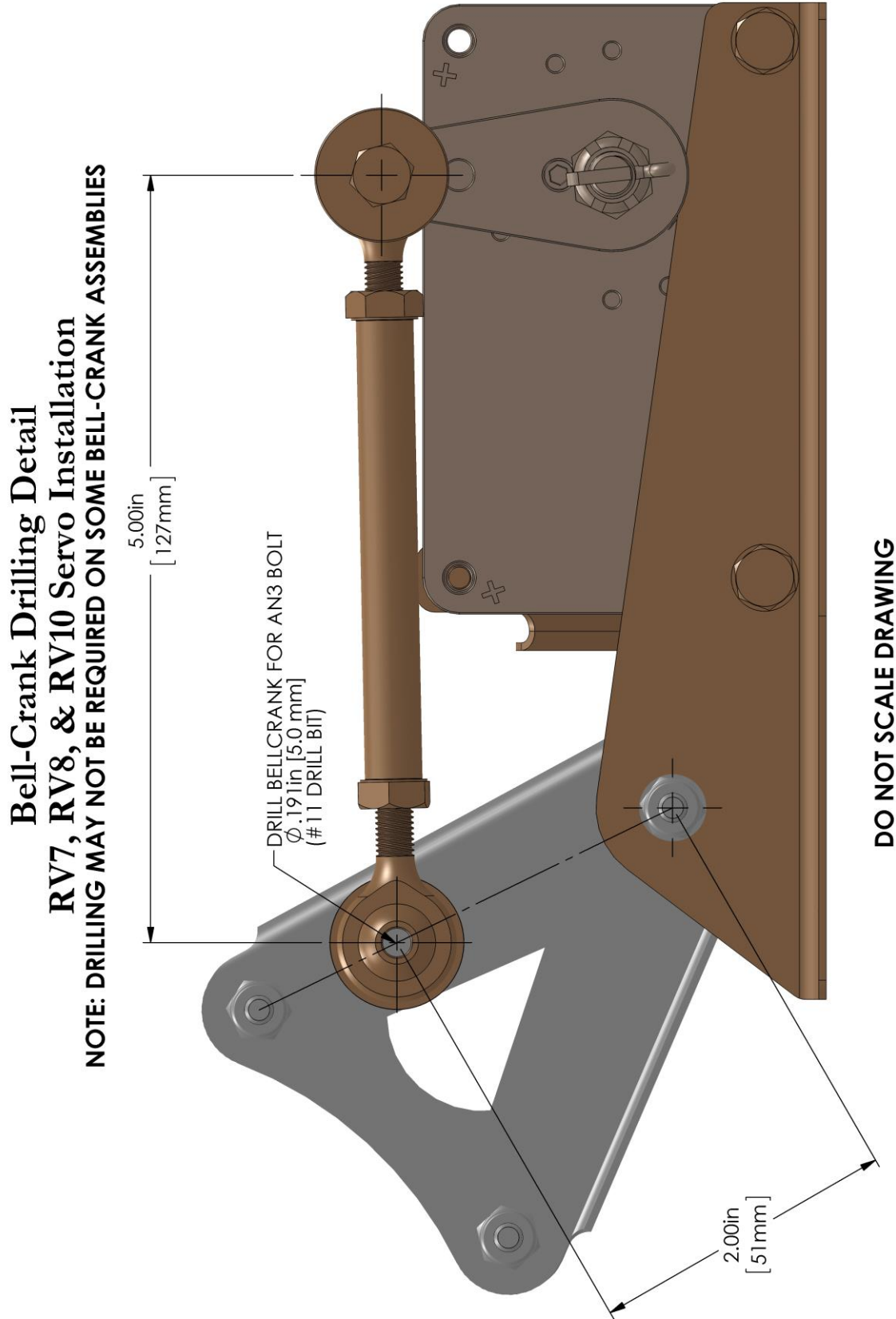
# Main Assembly RV7, RV8, & RV10 Servo Installation



**DO NOT SCALE DRAWING**







## Limiting Bracket Installation Detail RV7, RV8, & RV10 Servo Installation

**NOTE: LIMITING BRACKET MUST BE  
INSTALLED PRIOR TO INSTALLING  
SERVO IN MOUNTING BRACKET**

