

## GARMIN YAW SERVO UNIT - REMOVAL/INSTALLATION (Airplanes with GSM 86 Servo Mounts)

### 1. General

- A. This section gives the removal and installation procedures for the yaw servo unit for airplanes that have GSM 86 servo mounts.
- B. The GSA 80 and the GSM 86 are components of the Garmin GFC 700 Auto Pilot System. The GSA 80 is connected to the GSM 86 Servo Mount to form a single servo unit. Refer to Figure 401. Because of the design of the servo unit the servo portion (GSA 80) can be removed from the capstan (GSM 86) without the need to de-rig the aircraft control cables. The yaw servo unit is located aft of the rear compartment wall.

**CAUTION:** When removing and/or replacing a GFC 700 component make sure that the aircraft power is off. Disconnect auxiliary power supplies.

### 2. GSA 80 Autopilot Yaw Servo Removal/Installation

- A. Remove the GSA 80 Auto Pilot Yaw Servo (Refer to Figure 401).
  - (1) Remove external electrical power from the airplane.
  - (2) Make sure that the BATTERY switch (SC005), found on the circuit breaker switch panel, is set to the OFF position.
  - (3) Set the EXTERNAL POWER switch (SC006), found on the circuit breaker switch panel, to the OFF position.
  - (4) Disengage the A/P SERVOS & A/P DISC and A/P CONT circuit breakers found on the left circuit breaker panel.
  - (5) Remove the Rear Compartment Wall. Refer to Chapter 25, Rear Compartment Wall - Maintenance Practices.
  - (6) Remove the GSA 80 yaw servo as follows:
    - (a) Disconnect the yaw servo electrical connector (PT301)
    - (b) Remove the bolts and washers that attach the servo to the servo mount
    - (c) Remove the servo from the servo mount.

**NOTE:** If the servo is removed for an extended time a cover can be installed on the servo mount to prevent contamination of the unit.

**CAUTION:** Do not use solvents to clean the output gear.

- (7) Remove excess grease buildup from the single servo output gear using a lint-free cloth.

**NOTE:** It is not necessary to remove all of the grease from the output gear, only the excess grease.

- (8) If necessary use a brush or other applicator and apply a thin coat of grease to the servo output gear. Use Aeroshell 33 MS (preferred) or Aeroshell 17 grease.

- B. Install the GSA 80 Yaw Servo (Refer to Figure 401).

- (1) If necessary remove the cover from the servo mount.
- (2) Carefully put the GSA 80 yaw servo in its correct position on the GSM 86 servo mount.
  - (a) Make sure that you align the servo mount gears and the servo gears correctly.
- (3) Install the bolts and washers that attach the servo to the servo mount.
  - (a) Torque bolts to 35.0 inch-pounds, +5.0 or -5.0 inch-pounds (3.95 N-m, 0.56 or -0.56 N-m)
- (4) Visually inspect the connectors to make sure that there are no bent or damaged pins.
  - (a) Repair any damage.
- (5) Connect the servo electrical connector.
- (6) Operate the controls through full travel and make sure that no binding or restriction occurs.
- (7) Install the Rear Compartment Wall. Refer to Chapter 25, Rear Compartment Wall - Maintenance Practices.
- (8) Make sure that the primary control cables tension is correct before checking or adjusting bridle cable tension. Refer to Chapter 27, Rudder - Maintenance Practices, Rudder System Rigging.
- (9) Make sure that the yaw servo bridle cable tension is 20 pounds, +2 or -2 pounds.
- (10) If the bridle cable tension is not correct do the steps that follow:
  - (a) Make sure that the rudder is in the neutral position.
  - (b) Make sure that the swagged ball on the yaw bridle cable is positioned on the forward side of the yaw servo

drum, centered between the two forward yaw servo attachment bolts.

- (c) If either end of the bridle cable is slack, loosen the clamp at that end and move it away from the servo until the cable is no longer slack.
- (d) Torque the three screws on each bridle cable clamp to 25 to 30 inch-pounds.
- (e) Remove the turnbuckle clips and use the turnbuckle to set the yaw bridle cable tension to 20 pounds +5 or -5 pounds.
- (f) Install the turnbuckle clips on the turnbuckle.
- (11) Install the Rear Compartment Wall. Refer to Chapter 25, Rear Compartment Wall - Maintenance Practices.
- (12) Engage the A/P SERVOS & A/P DISC and A/P CONT circuit breakers found on the cockpit circuit breaker panel.
- (13) Load G1000 baseline software/configuration and certification gains to the YAW servo. Refer to Chapter 34 Garmin G1000 Integrated Avionics System - Adjustment/Test, G1000 Baseline Software/Configuration Load.
- (14) Do an operation check of the yaw servo. Refer to Garmin GFC 700 Automatic Flight Control System (AFCS) - Adjustment/Test, YAW Servo Operational Check.

### 3. GSM 86 Yaw Servo Mount Removal/Installation

#### A. Remove the GSM 86 Yaw Servo Mount (Refer to Figure 401).

- (1) Remove the GSA 80 yaw servo. Refer to the GSA 80 Yaw Servo Removal procedure in this section.
- (2) Remove the yaw servo mount.
  - (a) Remove the tension from the bridle cable.
    - 1 Remove the clips from the bridle cable turnbuckle.
    - 2 Loosen the turnbuckle.
    - 3 Disconnect the turnbuckle ends.
  - (b) At the bridle cable end installed in the clamp block loosen the clamp block screws.
    - 1 Remove the bridle cable end from the clamp block.
  - (c) If necessary remove the bridle cable from the capstan.
    - 1 Remove the screws that attach the capstan cover and pins to the mount.
 

**NOTE:** Before you remove the cable retention pins record the installation position of each of the pins on the mount.
    - 2 Remove the capstan cover and pins.
    - 3 Record how the cable is installed on the capstan.
    - 4 Remove the cable from the capstan.
  - (d) Remove the four bolts that attach the mount to the servo mount bracket.
  - (e) Remove the servo mount from the airplane.

**NOTE:** If the servo mount is removed for an extended time a cover can be installed on the servo mount to prevent contamination of the unit.

#### B. Install the GSM 86 Yaw Servo Mount (Refer to Figure 401).

- (1) Install the yaw servo mount.
  - (a) Carefully the yaw servo mount in its correct position on the servo mount bracket.
    - 1 Install the four bolts that attach the servo mount to the servo mount bracket.
    - 2 Torque the bolts to 35 inch-pounds, +5.0 or -5.0 inch-pounds (3.95 N-m, +0.56 or -0.56 N-m).
- (2) Install the yaw servo bridle cable.
  - (a) Make sure that the rudder and bell crank are in the neutral position.
  - (b) Wind the bridle cable around the servo drum approximately as shown. Refer to Figure 401.
- (3) If necessary install the capstan cover.
  - (a) Put each of the cable retention pins in one of the correct positions on the servo mount as follows:
    - A, C, F and J.

- (b) Put the capstan cover in its correct position on the mount retention pins.
- (c) Install the screws that attach the capstan cover through the retention pins to the servo mount.
  - 1 Torque the screws to 10.0 inch-pounds +2.0 or -2.0 (1.12 N-m +.226 or -.226).
- (4) Make sure that the primary control cables tension is correct before checking or adjusting bridle cable tension. Refer to Chapter 27 Rudder - Maintenance Practices, Rudder System Rigging.
- (5) Install the bridle cable end in the clamp block.
  - (a) Torque the three screws on the clamp block to 25.0 to 30.0 inch-pounds (2.82 to 3.38 N-m).
- (6) Connect the two ends of the turnbuckle.
  - (a) Tighten the bridle cable tension to 20.0 pounds, +5.0 or -5.0 pounds (88.9 N +22.2 to -22.2 N).
- (7) Install the servo. Refer to the GSA 80 Yaw Servo Installation procedure in this section.
- (8) Engage the A/P SERVOS & A/P DISC and A/P CONT circuit breakers found on the cockpit circuit breaker panel.
- (9) Connect external electrical power to the aircraft.
- (10) Do a check of the servo mount slip clutch. Refer to GSM Servo Slip Clutch Check.

**NOTE:**     **The GSM 86 slip clutch is not adjustable once manufactured. If the servo mount is not serviceable you must replace it.**

Figure 401 : Sheet 1 : Yaw Servo Unit Installation

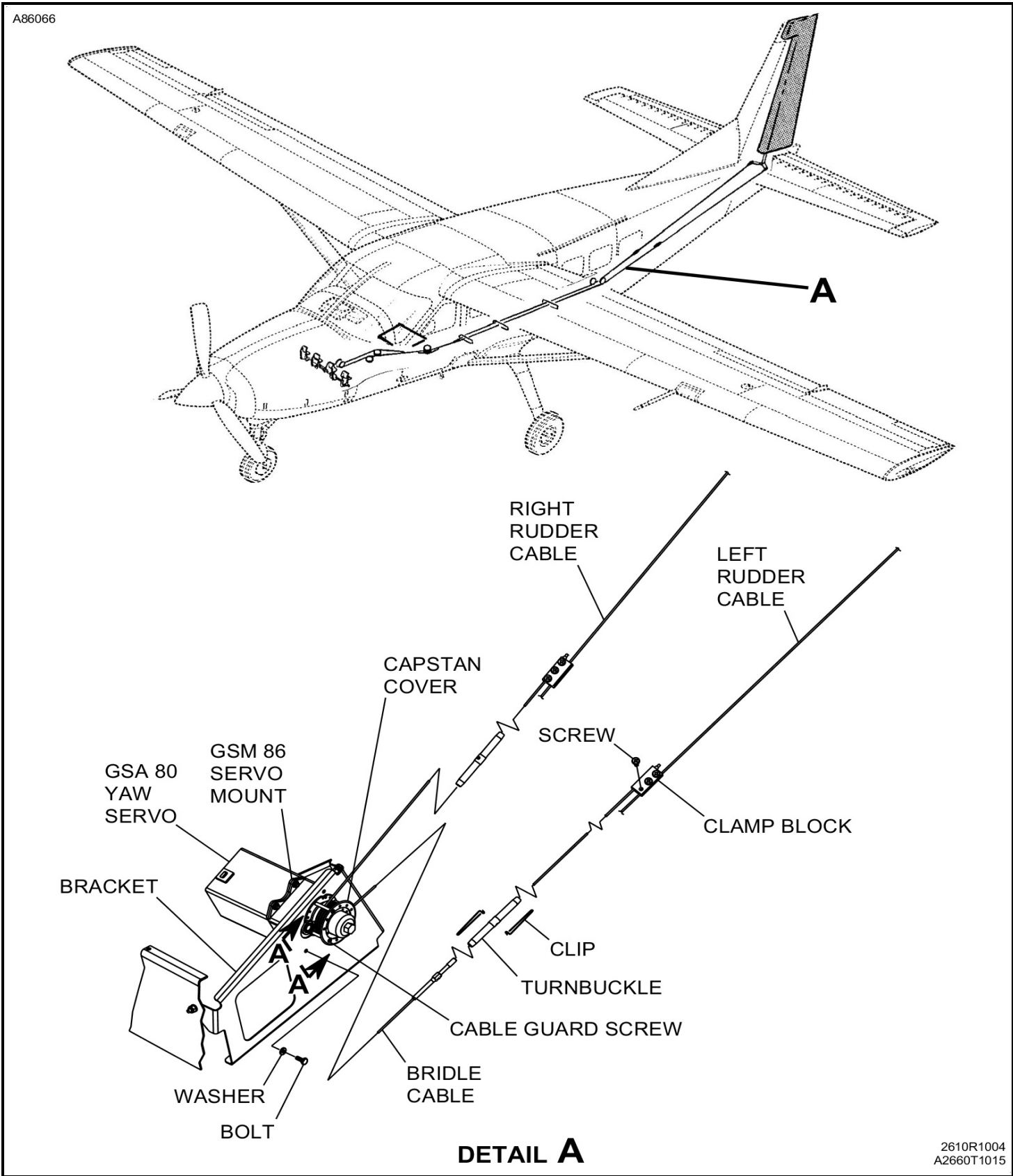


Figure 401 : Sheet 2 : Yaw Servo Unit Installation

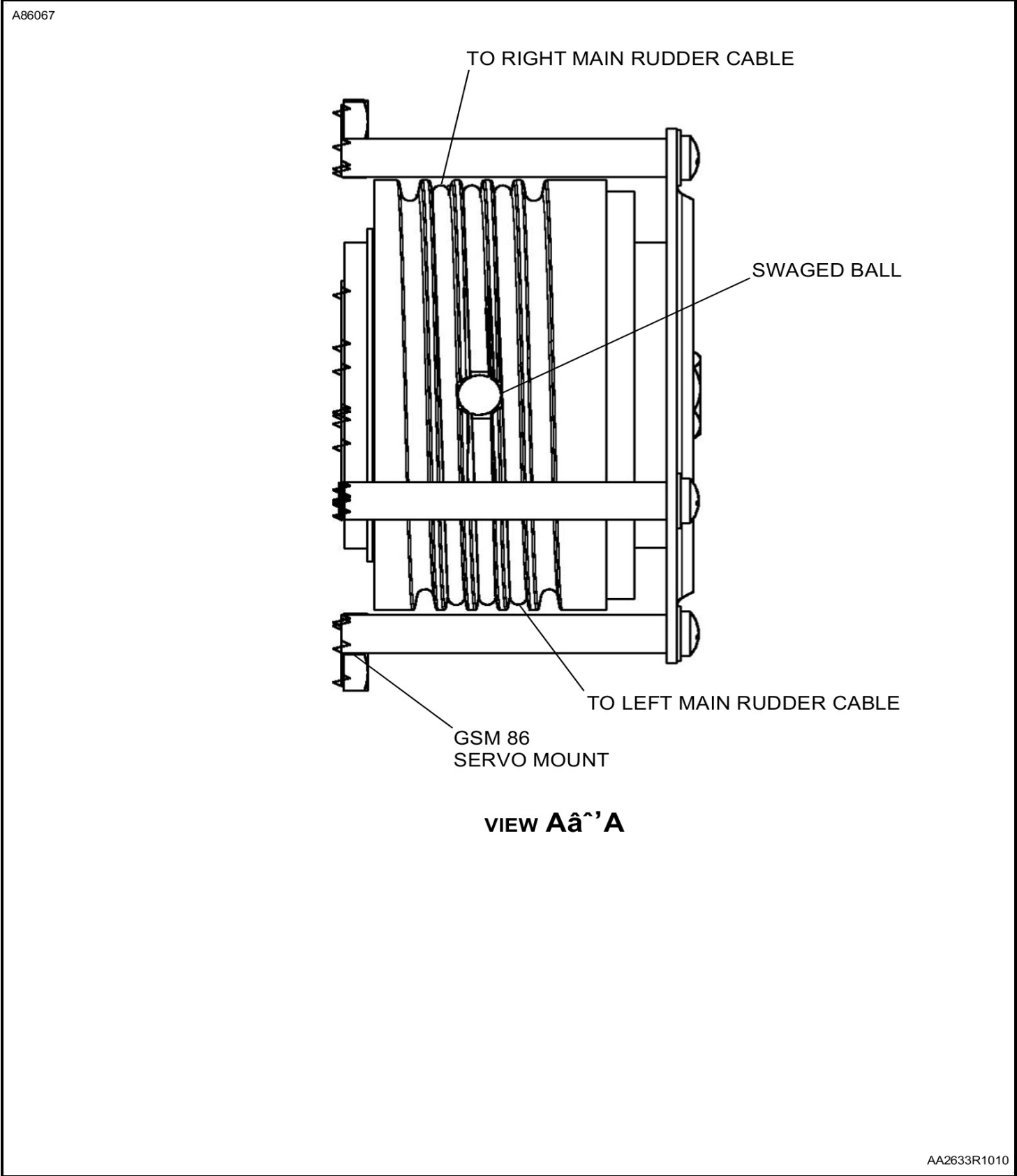
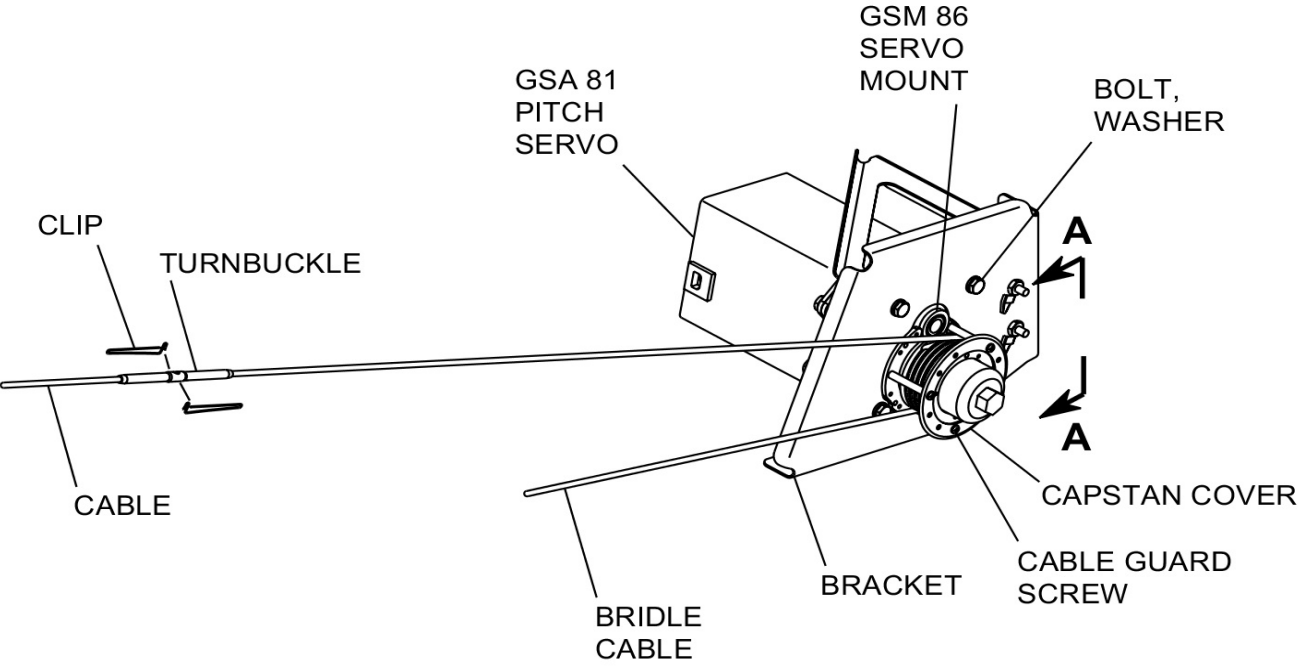
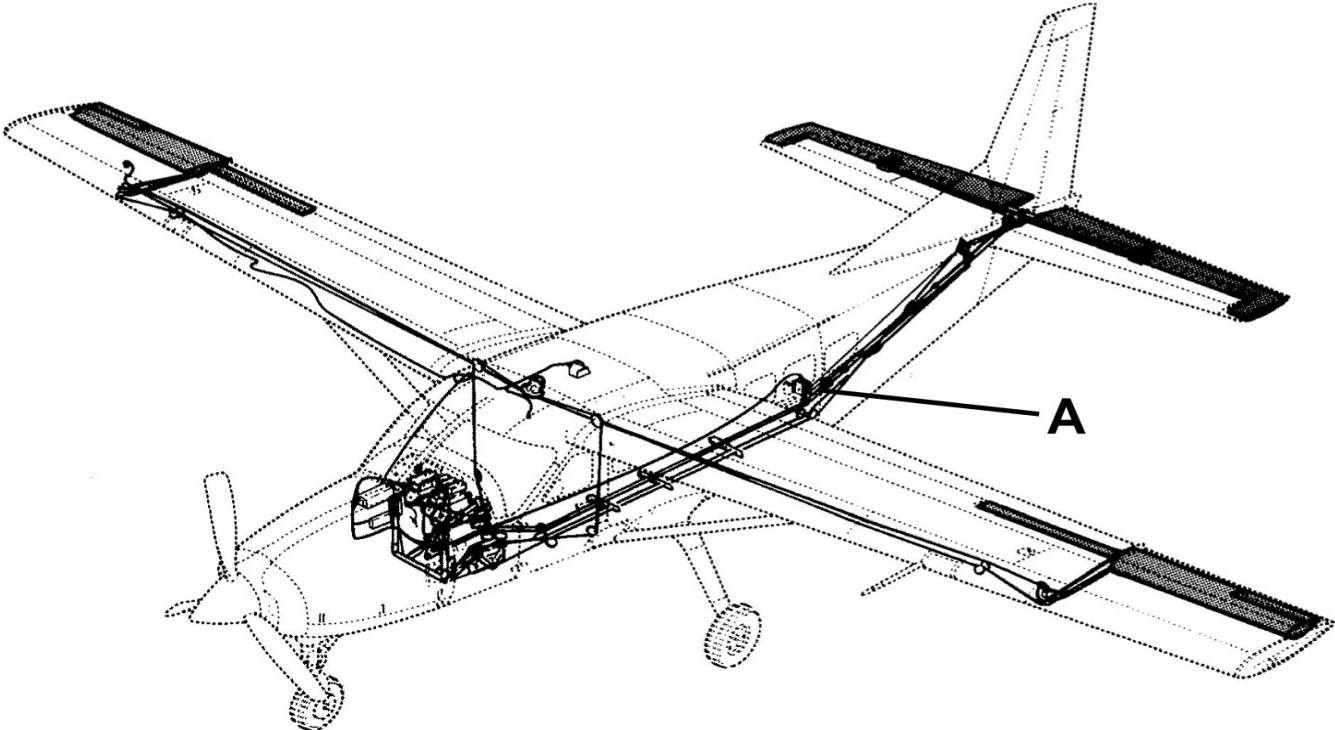


Figure 401 : Sheet 1 : Autopilot Pitch Servo Unit Installation

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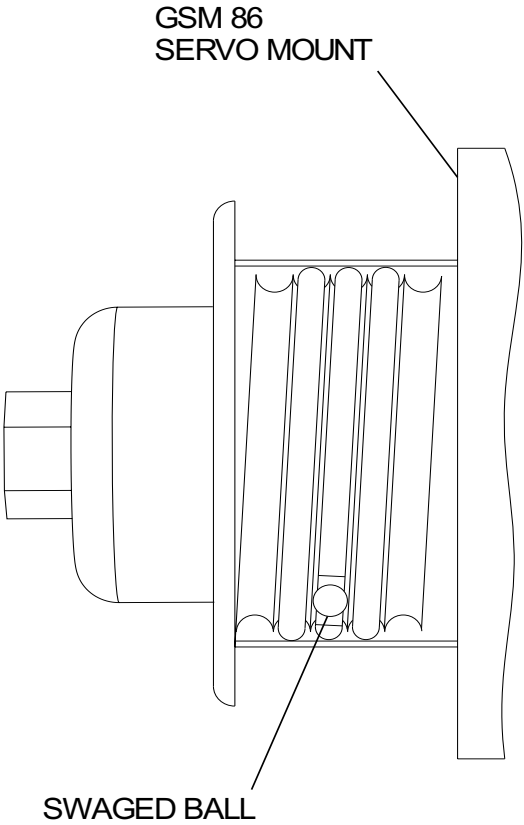
DETAIL A



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Figure 401 : Sheet 2 : Autopilot Pitch Servo Unit Installation

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**VIEW A-A**

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