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

1. General

A. This section gives the removal and installation procedures for the roll 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 roll servo unit is located below the copilot seat.

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 Roll Servo Removal/Installation

A. Remove the GSA 80 Roll 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 copilot's seat. Refer to Chapter 25, Flight Compartment - Maintenance Practices.

(6) Remove access panel 232DR. Refer to Chapter 6, Access/Inspection Plates - Description and Operation.

(7) Remove the GSA 80 roll servo as follows:

(a) Disconnect the servo electrical connector (PF303)

(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.

(8) 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.

(9) 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 Roll Servo (Refer to Figure 401).

(1) If necessary remove the cover from the servo mount.

(2) Carefully put the GSA 80 roll 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 the bolts to 35 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) Engage the A/P SERVOS & A/P DISC and A/P CONT circuit breakers found on the cockpit circuit breaker panel.

(8) Load G1000 baseline software/configuration and certification gains to the roll servo. Refer to Chapter 34 Garmin G1000 Integrated Avionics System - Adjustment/Test, G1000 Baseline Software/Configuration Load.

(9) Do an operation check of the roll servo. Refer to Garmin GFC 700 Autopilot - Adjustment/Test, Roll Servo Operational Check.

(10) Install the access panel 232DR. Refer to Chapter 6, Access Plates and Plates Identification - Description and

Operation.

(11) Install the copilot's seat. Refer to Chapter 25, Flight Compartment - Maintenance Practices.

3. GSM 86 Roll Servo Mount Removal/Installation

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

(1) Remove the GSA 80 roll servo. Refer to the GSA 80 Roll Servo Removal procedure in this section.

(2) Remove the roll servo mount.

(a) Remove the tension from the bridle cable.

(b) Loosen the clamp block screws at the clamp block end of the bridle cable.

1 Remove the bridle cable from the clamp blocks.

(c) If necessary, remove the bridle cable from the capstan.

1 Remove the screws that attach the cover fairlead guard assembly and the assembly to the mount.

2 Remove the cover and assembly from the mount.

3 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.

4 Remove the capstan cover and pins.

5 Record how the cable is installed on the capstan.

6 Remove the cable from the capstan.

(d) Remove the four bolts that attach the mount to the servo mount bracket.

(e) Remove the roll servo mount with the bridle cable.

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 Roll Servo Mount (Refer to Figure 401).

(1) Install the servo mount.

(a) Carefully put the roll 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 35 inch-pounds +5.0 or -5.0 inch-pounds (3.95 N-m +0.56 or -0.56 N-m).

(2) Install the roll servo bridle cable.

(a) Make sure that the aileron 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) Install the capstan cover.

(a) Put each of the cable retention pins in one of the correct positions on the servo mount as follows:

- B, D, J, G, and L.

(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 +0.22 or -0.22).

(4) Install the fairlead guard assembly.

(a) Put the fairlead guard assembly in its correct position on the mount.

(b) Put the guard assembly cover in its correct position on the guard assembly.

(c) Install the screws that attach the guard assembly and cover to the mount.

(5) Make sure that the primary control cables tension is correct before checking or adjusting bridle cable tension (Refer to Chapter 27, Aileron and Control Column - Maintenance Practices, Rigging Aileron System).

(6) Do the steps that follow to adjust the bridle cable tension:

(a) Remove panel 232AC (refer to Chapter 6, Access Plates and Plates Identification - Description and Operation).

(b) Set the control wheels with the ailerons in the neutral position.

(c) Put a bar across the control wheels and tape the bar to the control wheels.

NOTE: The bar connects the wheels and locks them in the neutral position.

(d) Make sure that the roll servo drum is oriented with the swagged ball on the roll bridle cable at the 12 o'clock position.

(e) 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.

(f) Torque the three screws on the right bridle clamp to 25.0 to 30.0 inch-pounds (2.82 to 3.38 N-m).

(g) Loosen the left bridle clamp just enough to allow it to move.

(h) Hold and pull the left bridle cable clamp until the bridle cable tension is 12.0 pounds, +2.0 or -2.0 pounds (53.3 N +8.8 to -8.8 N).

1 Torque the three screws on the left bridle cable clamp to 25.0 to 30.0 inch-pounds (2.82 to 3.38 N-m).

(i) Remove the bar from the control wheels.

(j) Install panel 232AC (refer to Chapter 6, Access Plates and Plates Identification - Description and Operation).

(7) Install the GSA 80 roll servo. Refer to the GSA 80 Roll 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 : Roll Servo Unit Installation

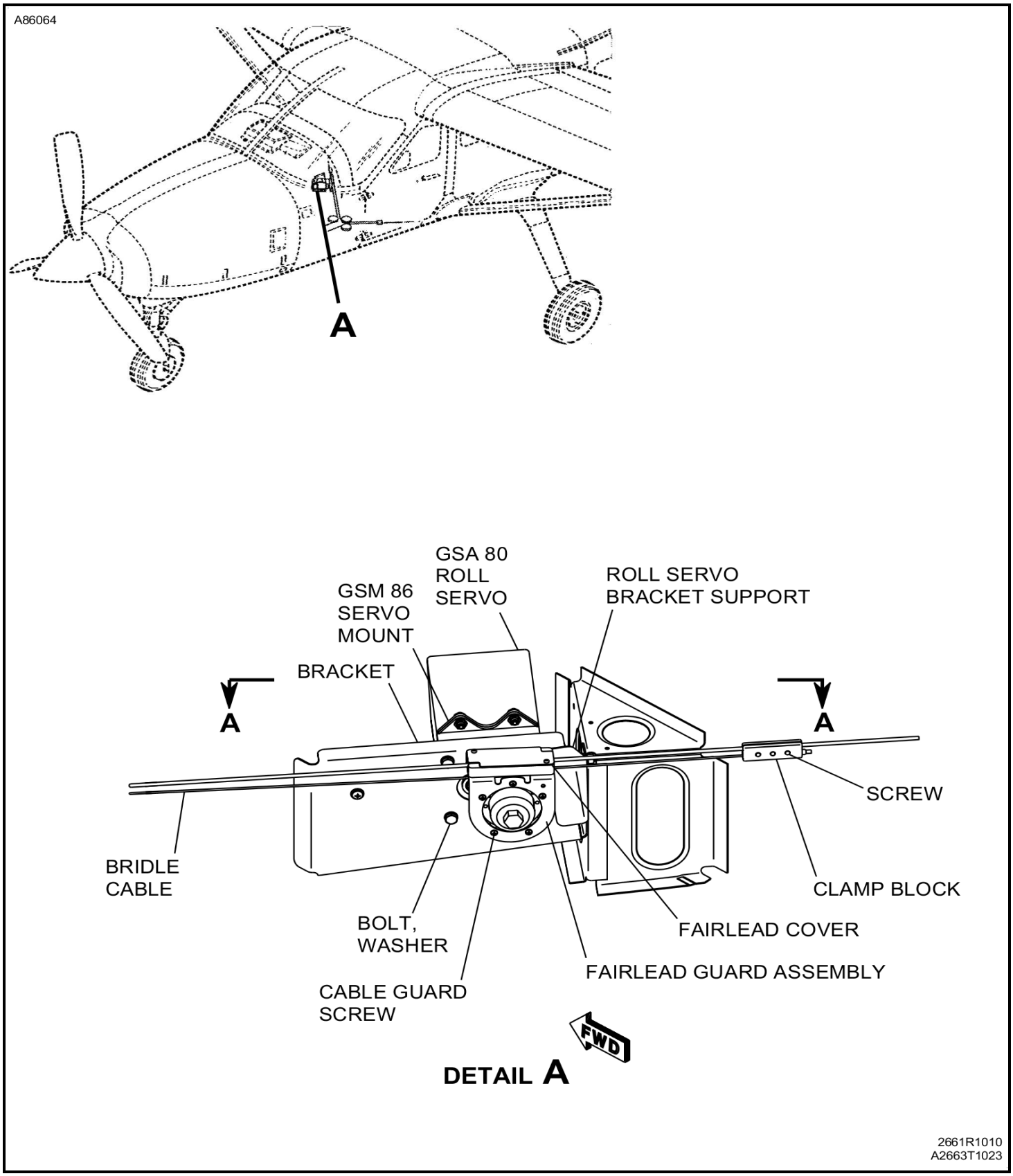

Figure 401 : Sheet 2 : Roll Servo Unit Installation

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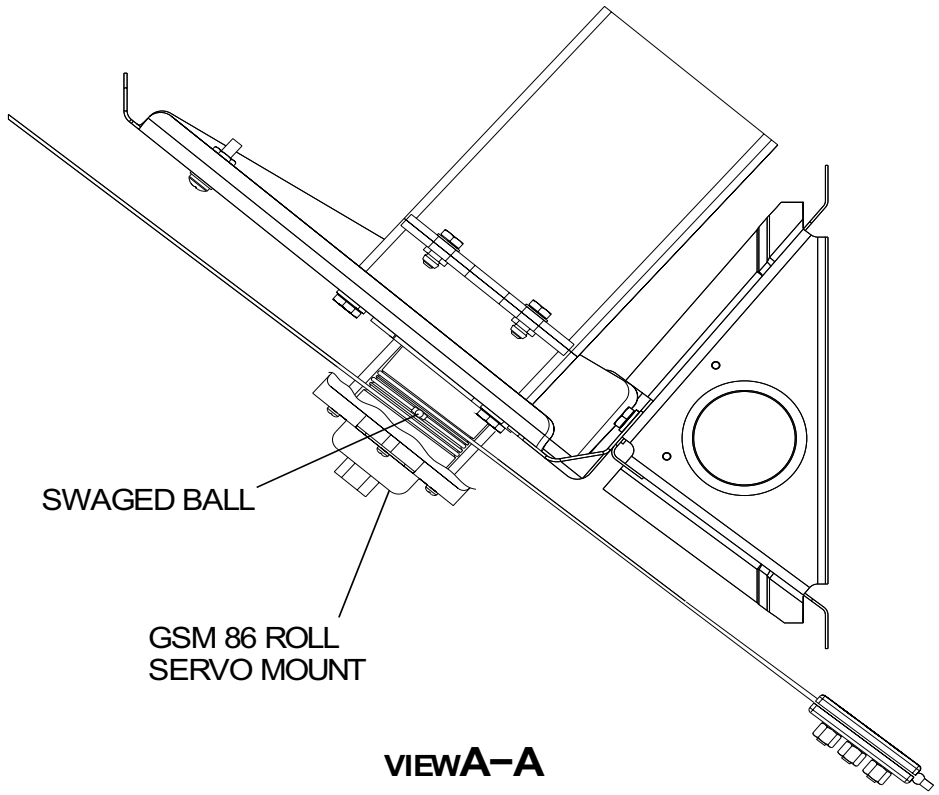

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NOTE: FAIRLEAD GUARD ASSEMBLY AND COVER REMOVED FOR CLARITY.

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Figure 401 : Sheet 1 : Autopilot Pitch Servo Unit Installation

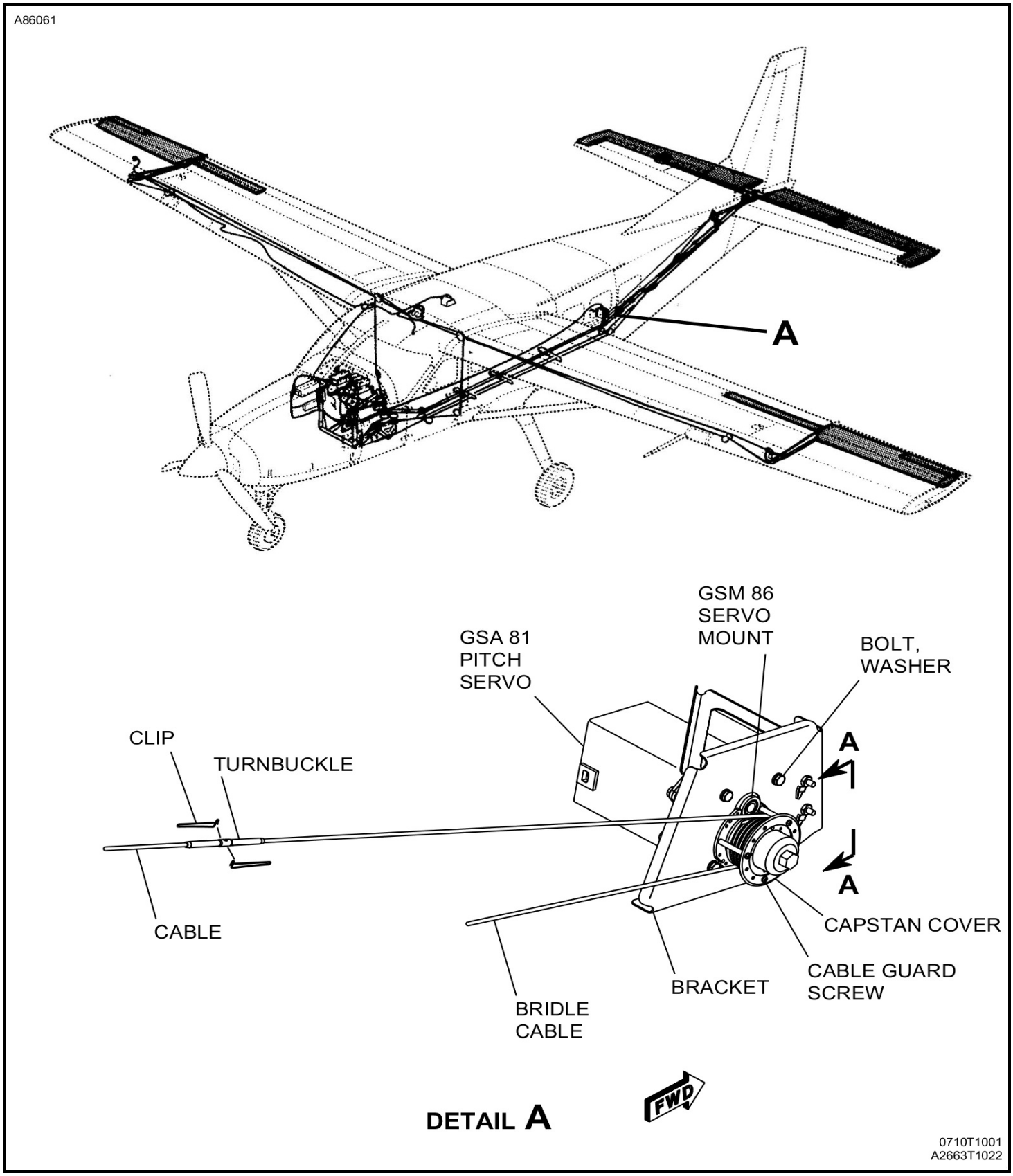

Figure 401 : Sheet 2 : Autopilot Pitch Servo Unit Installation

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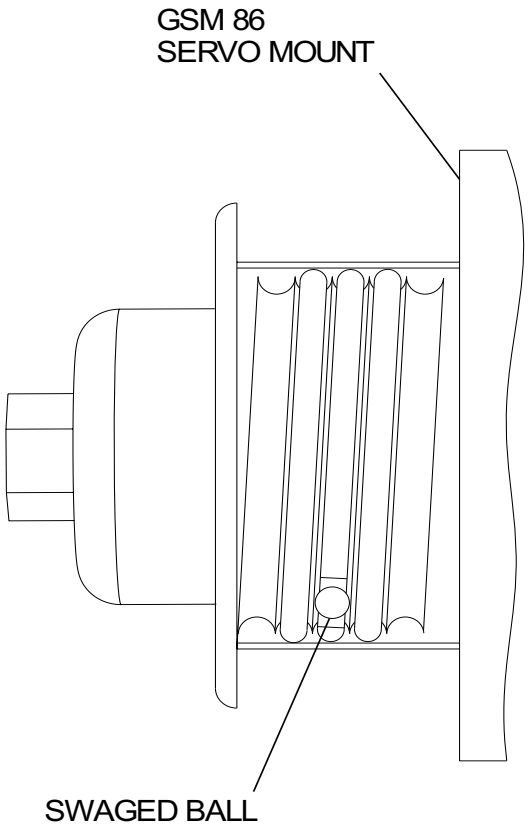

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