

 **Falcon50** Customer information bulletin

FALCON 50
A.T.A CHAPTER 22

C.I.B.#50100
NOVEMBER, 1988

SPERRY SPZ600 AUTO PILOT

The purpose of this C.I.B. is to assist you in locating the correct pitch and roll cable tensions for the SPZ600 auto pilot.

For Falcon Jet Corporation completions utilizing the Sperry SPZ600 auto pilot, use the Sperry document number EB7001667.

To order this document, please contact your local Sperry representative.

TECHNICAL SUPPORT DEPARTMENT

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1. SCOPE

This engineering bulletin covers the installation design requirements for the Automatic Flight Control System and the Stability Augmentation System. The design and installation of the system shall comply with the applicable FAA and aircraft manufacturers specifications.

WARNING

THIS DOCUMENT IS INSTALLATION CRITICAL WITH RESPECT TO THE CLEARANCE BETWEEN THE KEEPER PINS AND THE DRUM BRACKET DESCRIBED ON PAGE 2 OF THIS DOCUMENT.

NOTE

This document is incomplete without the outline drawings listed in Table 1.

2. SYSTEM DESCRIPTION

All of the components of the system are listed Table 1. Each system component has a numerical reference designation assigned which is used throughout this document to identify the unit or its mating connector. This designation number is tabulated by component in Table 1.

3. MECHANICAL INSTALLATION DESIGN

- 3.1 Servo Drive and Bracket. The Servo Drive, Part No. 4015373-VAR and Servo Bracket, Part No. 4015374-VAR are used as an assembly to control the elevator and aileron surface.

NOTE

Autopilot performance is dependent on a good servo actuator installation. Not following these minimum requirements can compromise system performance. Any deviation in the requirements of this section should be reviewed with Sperry Engineering.

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5 THE PART NUMBER OF THE DUAL SERVO DRUM AND BRACKET BEING
10 INSTALLED IN THE AIRCRAFT IS CONSIDERED INSTALLATION CRITICAL.
15 THIS PART NUMBER IS SPECIFIED FOR EACH AXIS. A BALL DETENT
20 CLUTCH IN EACH BRACKET IS ADJUSTED TO OPERATE WITH A SPECIFIC
25 SERVO MOTOR AND DRIVE. THE DASH NUMBER OF THE SERVO MOTOR AND
30 DRIVE (PN 4015373-VAR) AND THE SERVO BRACKET (PN 4015374-VAR)
35 WILL ALWAYS BE THE SAME. FOR EXAMPLE, SERVO DRIVE,
40 PN 4015373-905, WOULD BE USED WITH SERVO BRACKET,
45 PN 4015374-905.

Caution

5 TO ASSURE THAT THE CABLE CANNOT JAM BETWEEN THE DRUM AND
10 KEEPERS, THE DISTANCE BETWEEN THE KEEPERS AND DRUM SHALL
15 BE MEASURED AFTER THE KEEPERS AND RETAINING PLATE ARE
20 INSTALLED. THE DISTANCE BETWEEN THE DRUM AND KEEPERS SHALL
25 NOT EXCEED .040 IN. THE 3/32 INCH CABLE DIAMETER SHALL BE
30 VERIFIED. THESE ARE CRITICAL INSTALLATION REQUIREMENTS.

30 3.1.1 Rigging. The servo drive assembly is installed in parallel with the
35 aircraft linkage with 3/32 inch aircraft control cables as shown in
40 figure 3.1.

The recommended cable is 3/32 inch diameter corrosion resistant 7 X 19
per MIL-C-5424.

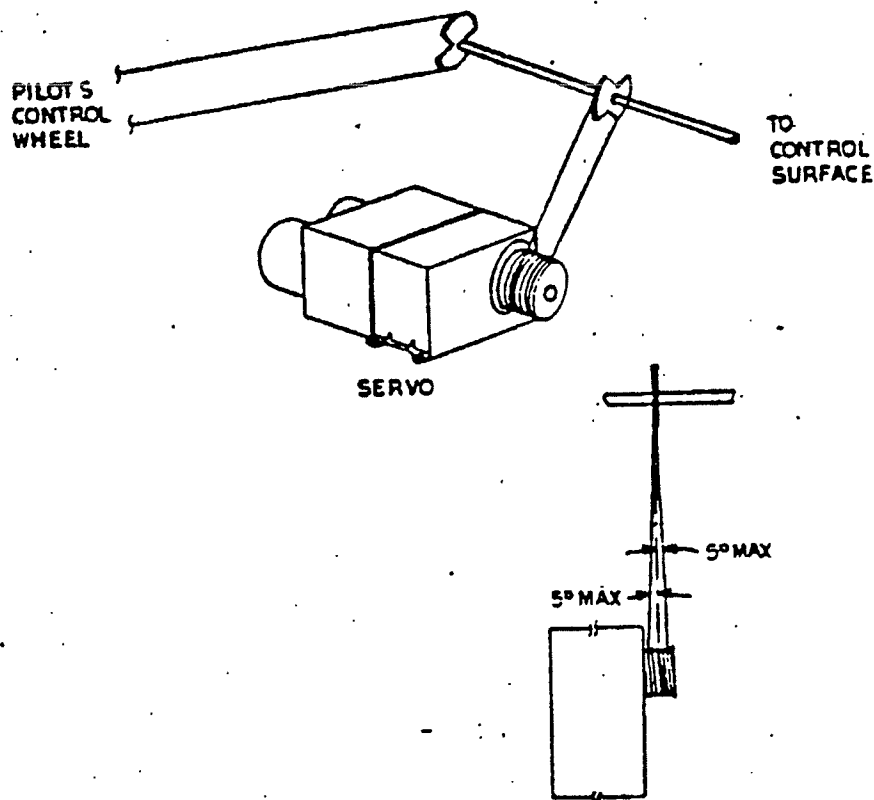
- 40 a. Maximum angle between the servo cables and the centerline of the
45 Quadrant and the servo drum must not exceed 5° as shown in Figure
3-1.
- b. Distance between the control surface and drum must be kept at a
minimum to reduce backlash. Backlash between the drum and surface
must never exceed 1/2 degree of surface and preferably be less than
1/4 degree of surface.
- c. Control surface breakout friction at the servo drum shall not exceed
10% of the servo stall torque.

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- d. The gear ratio between the servo drum and surface should be 5 to 1 or greater.

3.1.2 Servo Mounting. After the rigging requirements have been met, servo-mount design can be completed and a stress analysis of the servo-mount installation made to satisfy FAA requirements.

- a. The structural design of the servos allows a maximum load of 500 pounds to be applied to the drum at any cable angle. This includes servo stall torque, cable tension and pilot induced loads.
- b. The location of each actuator shall leave sufficient clearance to permit removal of the servo drive and electrical connector as described in the servo outline drawing listed in Table 1:



Elev And Ail Servo Drive Rigging
Figure 3-1

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- c. Cable tension shall be 30 ± 5 lbs.
- d. Servo polarities. The direction of drum rotation is defined in Drawing No. 4015373.
- e. Location. The servo location shall be free from excessive moisture accumulation and water dripping. If this is not feasible the unit shall be protected by a water repellent shield.
- f. Cable Keepers. Two of the four cable keepers shall be located on the servo bracket at the points of cable tangency to the drum. The other two shall be located at 90° from the first two. The retaining plate shall be screwed and safety wired on.

3.2 Flight Director Computer, PN 4018369-905

This unit shall be mounted on a Mounting Tray, Sperry Part No. 4011646. The computer shall not be subject to more than 1.0 g vibration level. If the vibration level is greater than 1.0 g in the area the computer is to be mounted, it shall be mounted on vibration isolators to reduce the level to 1.0 g or less.

A minimum of one inch clearance shall be provided between the top, back and front of the computer and any adjacent equipment to insure adequate thermal isolation. For optimum service life the computer shall be installed in a location where the ambient air temperature is between -20°C and $+40^\circ\text{C}$.

3.3 AP/FD Mode Selector, PN 4018368-905 (-907 with TERM GARDIAN)

This unit is designed to be mounted in the instrument panel in the cockpit. The outline drawing illustrates mounting requirements.

3.4 Autopilot Computer, PN 4029377-903

This unit shall be mounted on a Mounting Tray, Sperry Part No. 4032057-1 or equivalent (Barry PN 404-50-X068). The computer shall not be subject to more than 1.0 g vibration level. If the vibration level is greater than 1.0 g in the area the computer is to be mounted, it shall be mounted on vibration isolators to reduce the level to 1.0 g or less.

3.5 Autopilot Engage Controller, PN 4018639-904

The unit shall be mounted in the cockpit for convenient operation by the pilot and copilot. The unit is designed to mount in accordance with MS25213.



SECURITY NOTATION

SUPPLEMENTS

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