

AA-5 SERIES
MAINTENANCE MANUAL

CHAPTER 22

AUTOPILOT

TABLE OF CONTENTS

<u>NUMBER</u>		<u>PAGE</u>
22-0	AUTOPILOT	
	Description	1
	General	1
22-1-1	AUTOPILOT SYSTEM	
	Description/Operation	1
	Century I	1
	Century IIB	1
	Maintenance Practices	201
	Roll Servo - Removal/Installation	201

AUTOPILOT - DESCRIPTION

1. General

The Grumman American AA-5, AA-5A and AA-5B utilizes an Edo-Aire Mitchell Century I or Century IIB Autopilot as optional equipment.

The Edo-Aire Mitchell Century I is a light weight all electronic stabilization system contained in two compact units.

The panel mounted unit contains a pictorial turn and bank stabilizer electronics, optional tracker electronics, turn command control, roll trim control and tracker switching. The roll servo motor is the other unit and it is mounted in the cabin beneath the console.

The roll servo incorporates a fail safe engage and disengage mechanism to provide complete control freedom upon disengagement. Engagement and disengagement is controlled by a panel mounted stabilizer master switch.

In addition to these switches, safety override features permit the pilot to override the system at any time without damage to the servo or aircraft controls.

The Edo-Aire Mitchell Century IIB is a light weight automatic flight system utilizing an advanced electronic design for maximum performance and utility. Operating on the versatile 5000 cycle audio frequency, the Century IIB represents a design concept in which the conventional follow-up or control position feedback signals are replaced by solid state analytical computers. In addition to providing a more stable and adaptable platform, the new system can cope with uneven fuel loads without the usual directional errors.

Roll responses are time controlled for human-like control action and smooth heading changes.

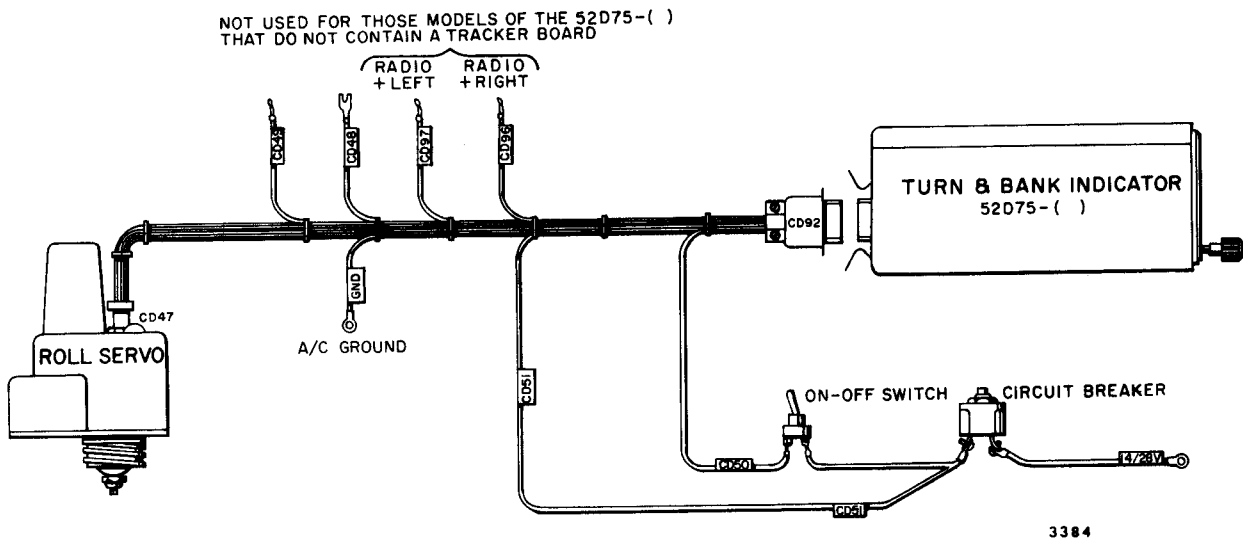
This chapter will consist of block diagrams, (Figures 1 and 2) wiring diagrams, (Figures 3 through 5) and the removal/installation of the roll servo (Figure 6) used on the Century I and Century IIB Autopilot. For details on the autopilot, refer to the applicable Edo-Aire Mitchell manual.

**AA-5 SERIES
MAINTENANCE MANUAL**

AUTOPILOT SYSTEM - DESCRIPTION/OPERATION

For information concerning the description and operation of the Century I and IIB Autopilot, refer to the applicable Edo-Aire Mitchell manual.

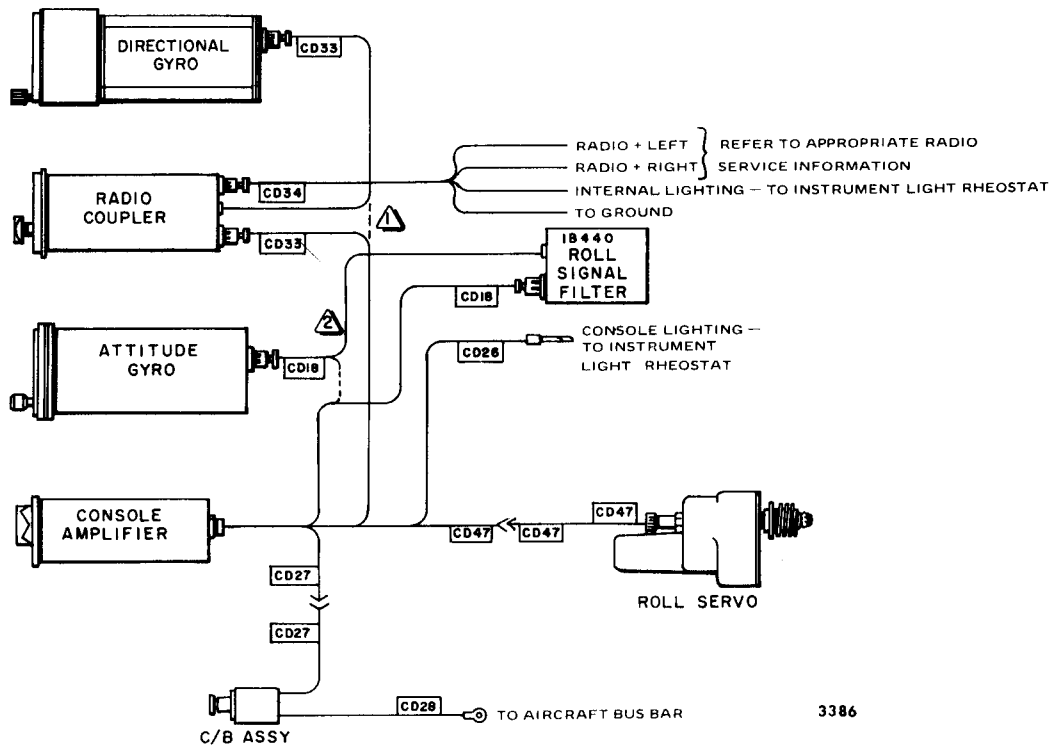
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MAINTENANCE MANUAL**



3384

Century I Autopilot - Block Diagram
Figure 1

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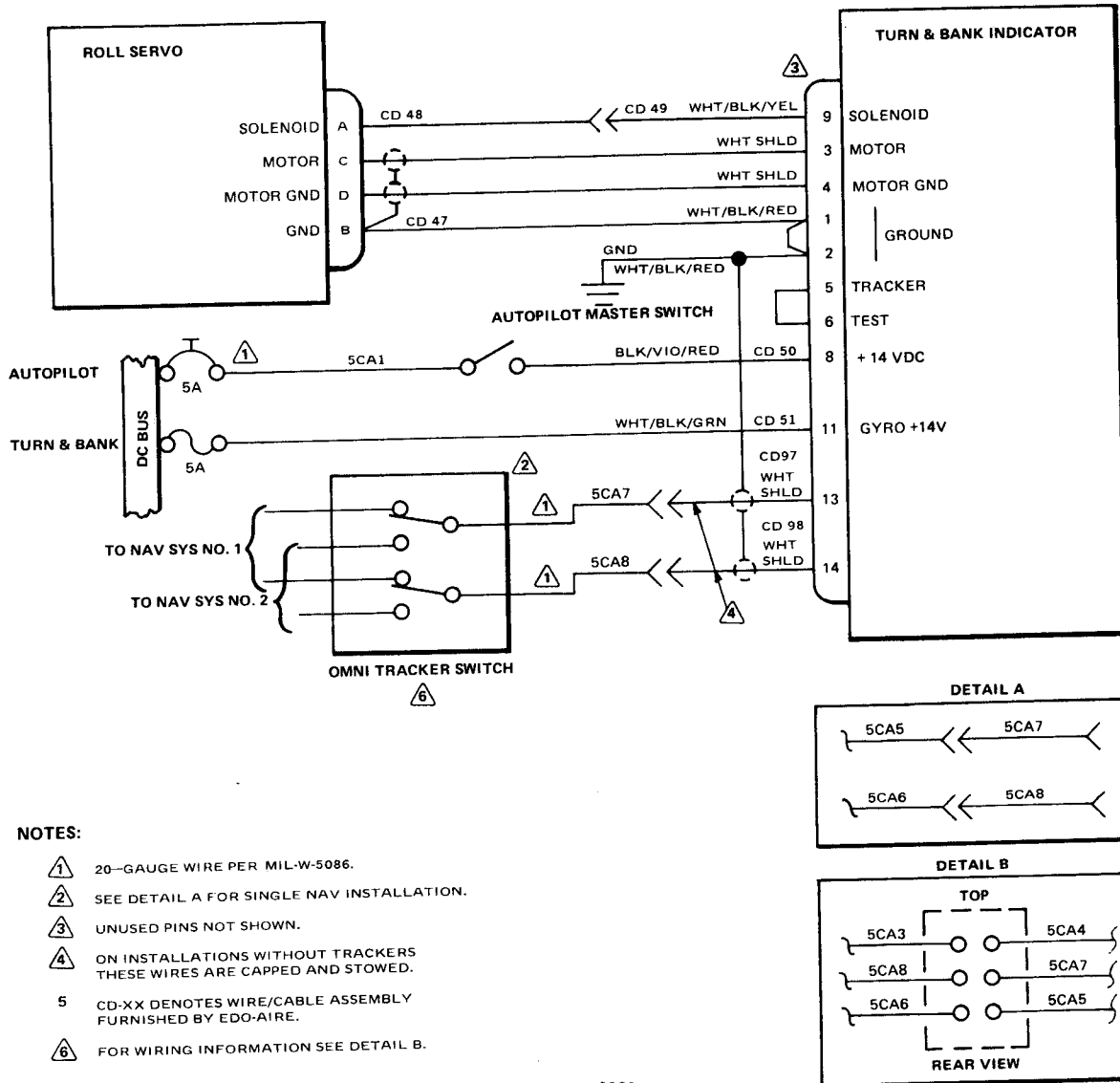
3386

Century IIB Autopilot - Block Diagram
Figure 2

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EDO-AIRE AUTOPILOT

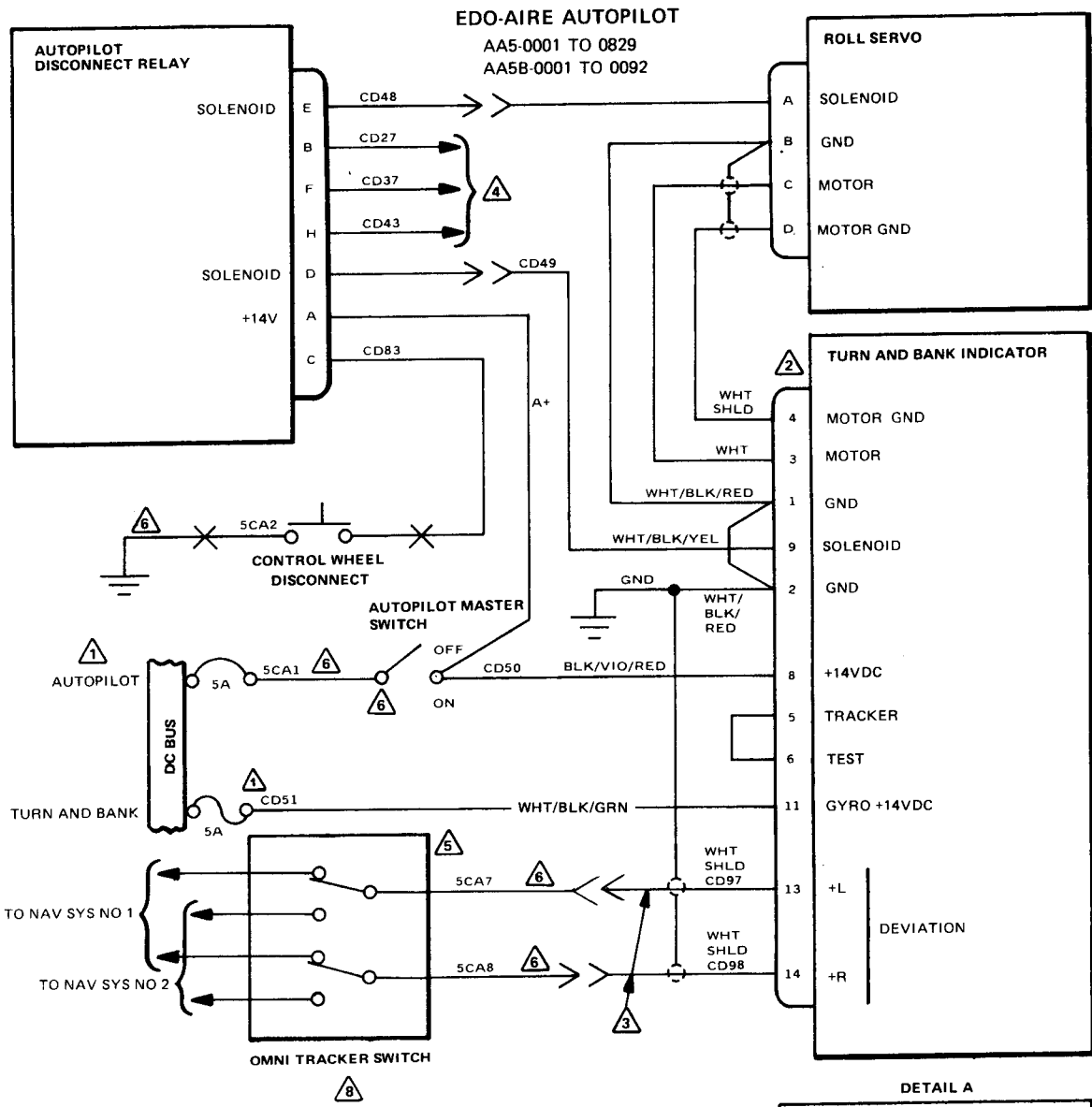
AA5-0830 AND SUBSEQUENT
AA5A-0001 AND SUBSEQUENT
AA5B-0093 AND SUBSEQUENT



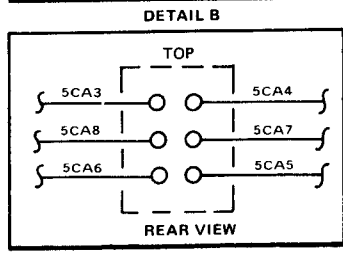
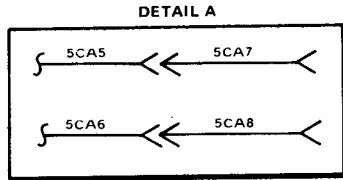
3385

Century I Autopilot - Wiring Diagram
Figure 3

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- NOTES**
- 1 ON AA5-0001 TO 0405, THIS WIRE REPLACES 5CA1 AND AUTOPILOT CIRCUIT BREAKER
 - 2 UNUSED PINS NOT SHOWN
 - 3 ON AIRCRAFT WITHOUT TRACKERS THESE WIRES ARE CAPPED AND STOWED
 - 4 THESE WIRES ARE CAPPED AND STOWED
 - 5 SEE DETAIL A FOR SINGLE NAV INSTALLATION
 - 6 20 GAUGE WIRE PER MIL-W-5086
 - 7 CD-XX DENOTES WIRE/CABLE ASSEMBLY FURNISHED BY EDO-AIRE
 - 8 FOR WIRING INFORMATION SEE DETAIL B

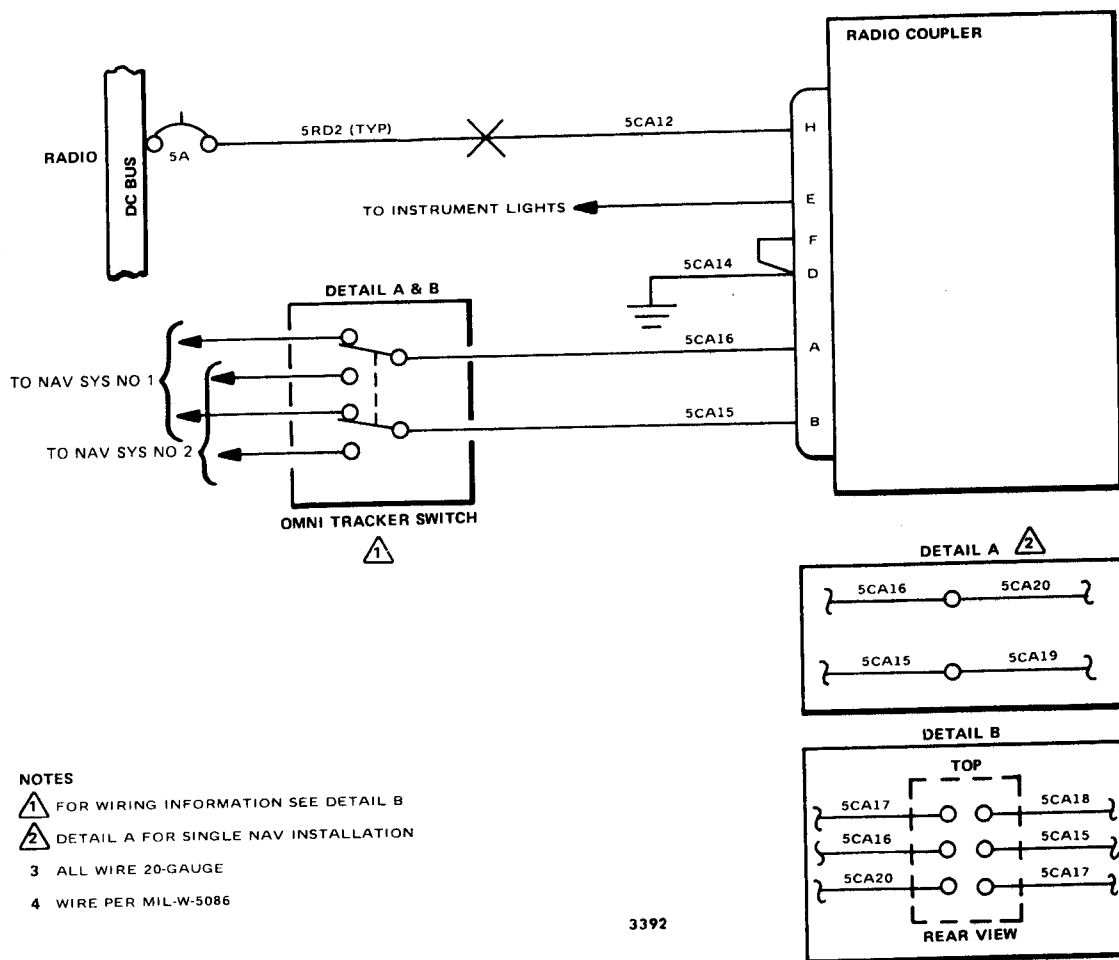


**Century IIB Autopilot Wiring Diagram
Figure 4**

3391

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EDO-AIRE CENTURY IIB AUTOPILOT-NAV INTERFACE



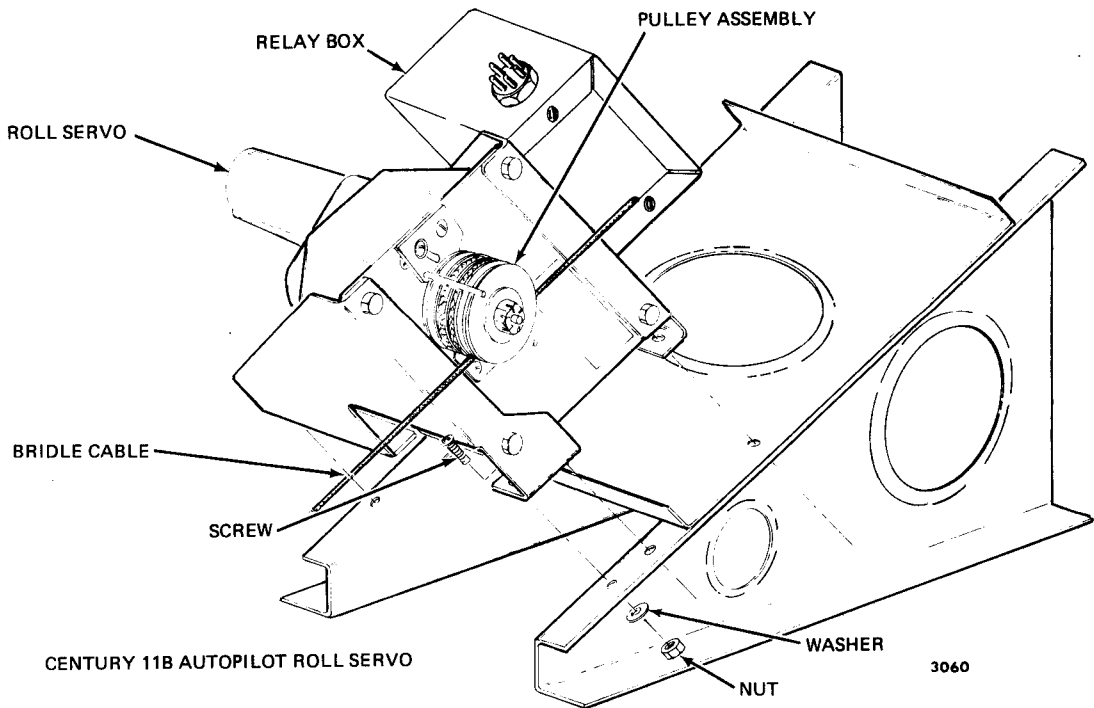
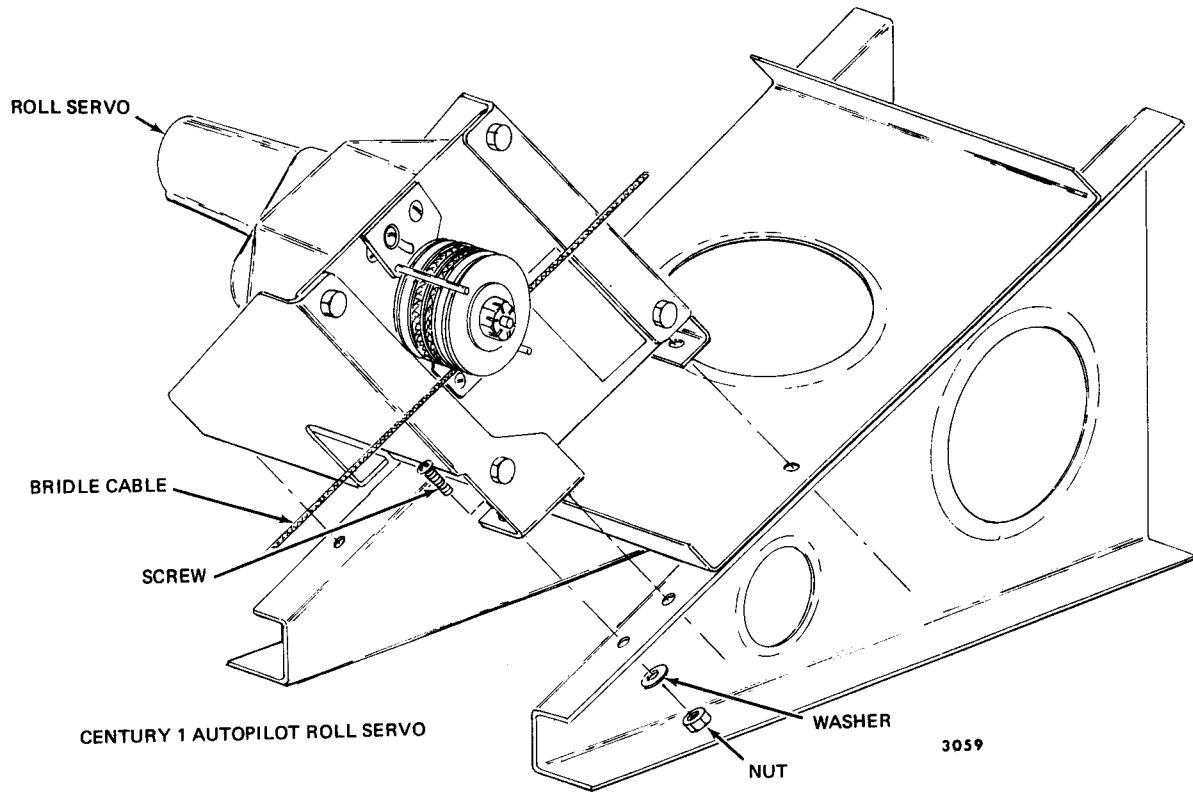
NOTES

- 1 FOR WIRING INFORMATION SEE DETAIL B
- 2 DETAIL A FOR SINGLE NAV INSTALLATION
- 3 ALL WIRE 20-GAUGE
- 4 WIRE PER MIL-W-5086

3392

**Century IIB Autopilot - NAV Interface Wiring Diagram
Figure 5**

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MAINTENANCE MANUAL



Roll Servo Removal - Installation
Figure 6

AUTOPILOT SYSTEM – MAINTENANCE PRACTICES

1. Roll Servo – Removal/Installation

A. Roll Servo – Removal (See Figure 6.)

- (1) Gain access to the cover end of the yoke support bracket by removing the Royalite pedestal side panels.
- (2) Loosen the cable guards on the servo and position away from capstan,
- (3) Loosen cable clamp bolts and remove from aileron cable.
- (4) Disconnect electrical connector from servo.
- (5) Remove attaching hardware and remove servo assembly from yoke support bracket.

B. Roll Servo – Installation (See Figure 6.)

- (1) Place servo assembly on the yoke support bracket and install attaching hardware.
- (2) Loosen the cable guards on the servo. Rotate the capstan so that the bridle cable pin hole is just forward of bottom cable guard, approximately 160 degrees from top cable guard. Position the bridle cable so that the long end of cable (from pin) is aft and parallel to the aileron cable. Insert the bridle cable pin into the capstan hole and tighten setscrews.

NOTE: Aileron cable should be clean and free from excessive oil or grease at points where cable clamp attachment is made.

- (3) With the aileron control in neutral position, wrap the short end of the bridle cable around the capstan 330 degrees. This will bring the cable forward. Attach the bridle cable to the aileron cable with one cable clamp.

NOTE: Move aileron control to the left stop (full travel). In this position the aft end of the forward cable clamp should clear the forward lower servo mount bolt by 1/8 inch to 1/4 inch. If this clearance is not provided, reposition cable clamps as necessary to provide clearance. Exercise aileron control, check for binding or other interference.

- (4) Wrap the long end of the bridle cable approximately 390 degrees aft around the capstan. Attach bridle cable to aileron cable using one cable clamp.
- (5) Torque cable clamp bolts to 55 ± 5 inch-pounds with a minimum of 0.005 inch measured between clamp halves after torquing. Cable tension should be the same as the aileron primary cable tension.
- (6) Position the cable guards within 1/32 inch of the capstan OD and tighten.
- (7) Rotate aileron through full travel and check for any binding or restriction of bridle cable or clamps that may contribute to unsafe conditions.

C. Adjust Cable Tension

- (1) Adjust aileron cable tension to 30 ± 2 pounds. Adjust bridle cable tension same as aileron cable $\pm 20\%$.
- (2) An alternate method of adjusting bridle cable tension is with aileron in neutral position, adjust bridle cable tension so that a pull of 10 ± 1 pound, using a calibrated spring scale attached at a point 1 inch aft of the forward cable clamp, will deflect the cable $3/8 \pm 1/16$ inch.