

# Executive Wings Inc.

(813) 648-1648  
FAX (813) 644-0757

LAKELAND MUNICIPAL AIRPORT • 3480 DRANE FIELD ROAD • LAKELAND, FLORIDA 33811  
A Tennyson Ent. Company, Ottumwa, IA

## TITLE - Hartzell Four Blade Propeller Assembly Installation

### 1. Planning Information

#### A. Effectivity

##### Model

Cessna 441

##### Equipped With

Garrett TPE331-8 Series Engines  
Garrett TPE331-10N Series Engines

#### B. Description

The following procedures provide instruction for the installation of the Hartzell Model HC-E4N-5A & -5B/E8051K four blade propeller along with the associated de-ice equipment.

#### C. Approval

FAA-DER Approved

#### D. Material Information

<u>Part Number</u>	<u>Quantity</u>	<u>Description</u>
67-815-2*	1	DE-ICE INSTALLATION KIT
865558-26**	2	CAM ASSEMBLY
..897602-1**	2	CAM
..AN123471**	8	RIVETS
HC-E4N-5A or -5B/E8051K	2	PROPELLER ASSEMBLIES
PRP909-8	2	O-RING
B-3339-1	16	PROPELLER MOUNT BOLTS
A-2048-2	16	WASHERS
D-5319	2	SPINNER ASSEMBLY
3103328-1	2	SEAL PLUG
S9413-032	2	O-RING
S9413-112	2	O-RING

\*Refer to Drawing EW/HART E092-01 DW for Parts List.

\*\*Used to rework P/N 869130-13 Propeller Pitch Control to P/N 869130-30 and/or P/N: 865558-15 Cam Assy. to P/N:865558-26. See Appendix A or B as req'd.

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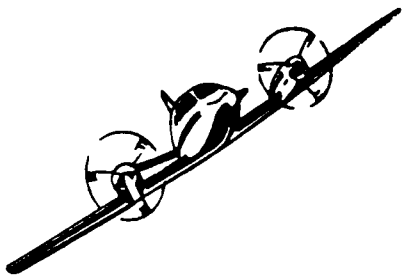
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## 1. Planning information (continued)

### E. Weight and balance information:

1. This change adds 15.6 lbs. to aircraft previously equipped with Hartzell propellers.
2. This change adds 44 lbs. to aircraft previously equipped with McCauley propellers.
3. Flight manual supplement contains further details and is required to be inserted in the current aircraft flight manual.

## 2. Accomplishment Instructions

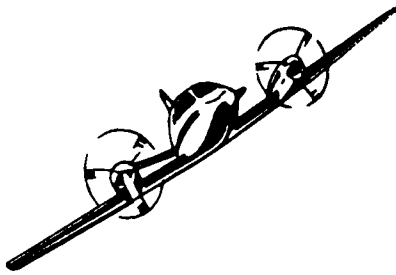
### A. Propeller Installation

1. Remove existing propeller following the instructions given in the Cessna 441 Maintenance Manual.
2. Install seal plug P/N 3103328-1. (If the aircraft was previously equipped with Hartzell propellers, remove the existing seal plug P/N 866563-1.)
3. Make sure the propeller hub flange and the engine flange are clean.
4. Line up the mounting holes in the propeller hub flange with the mounting holes in the engine flange paying attention to the dowels in the engine flange.
5. Install oil seal P/N PRP909-8 on engine flange.

WARNING: USE ONLY PROPELLER MOUNTING BOLT PART NUMBER B-3339-1 ON THIS INSTALLATION.

CAUTION: MAKE SURE THAT COMPLETE AND TRUE SURFACE CONTACT IS ESTABLISHED BETWEEN THE PROPELLER HUB FLANGE AND THE ENGINE FLANGE.

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## A. Propeller Installation Cont.

6. Apply approved anti-seize compound to the threaded surfaces of the propeller mounting bolts.

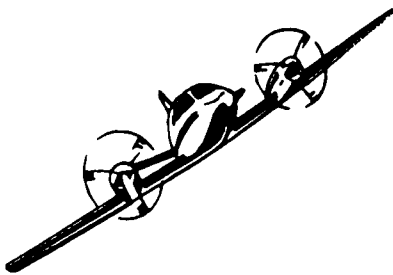
NOTE: Any version of mounting bolt washer part number A-2048-2 may be used (or re-used) with the B-3339-1 mounting bolt. The versions of washer A-2048-2 which have been produced to date can be identified visually by characteristics shown in figure 1.

7. Install the mounting bolts with washers through the engine flange and into the propeller hub flange.
8. Use a calibrated torque wrench with special adapter, Figure 2, to torque all mounting bolts in the sequence and steps shown in Figure 3.
9. Safety all mounting bolts in an airworthy manner with 0.032 inch minimum diameter stainless steel wire.
10. Install beta tube P/N 866533-3 or 897478-1 and set flight idle blade angle to eight (8) degrees following the procedures outlined in the Cessna 441 Maintenance Manual.
11. Check blade track to a limit of +/- 1/16 inch.

## B. Propeller Pitch Control

1. Remove the propeller pitch control P/N 869130-13.
  - a. With Beta tube removed, disconnect the oil pressure tube assembly from propeller pitch control assembly.
  - b. Disconnect controls linkage assembly to propeller pitch control assembly.
  - c. Rotate propeller pitch control assembly shaft lever fully counterclockwise.
  - d. Remove bolts, washers and propeller pitch control assembly from engine.

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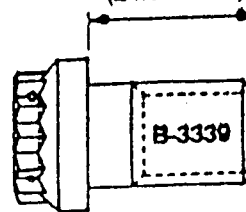
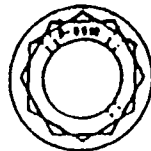
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Part number is stamped on mounting bolt head in location shown.

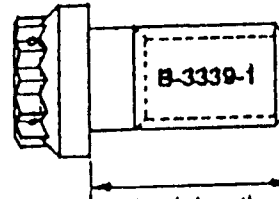
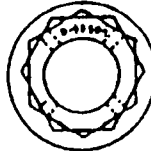
Threaded surface length  
0.720 inch (18.288 mm)

Shank length  
0.970 inch  
(24.638 mm)

B-3339  
is used on steel  
hub propellers  
only



B-3339-1 is used  
on the "P" and "N"  
flange four-blade  
turbine propellers.

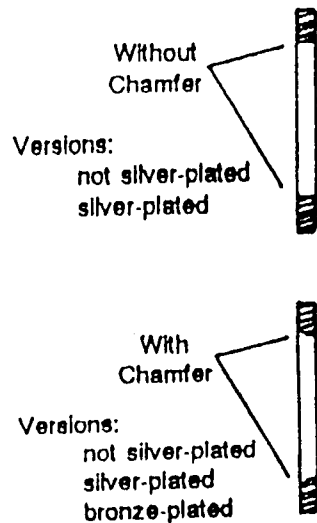


Use B-3347 on "A" and "B" flange propellers.

Shank length  
1.150 inches  
(2.921 cm)

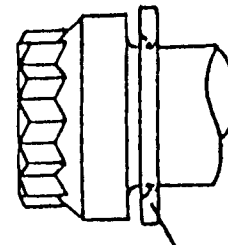
NOTE: B-3347 shank length  
is 1.400 inches  
(3.556 cm)

Threaded surface length  
0.900 inch (22.860 mm)



NOTE: Size of chamfer varies from washer to washer. This condition is acceptable.

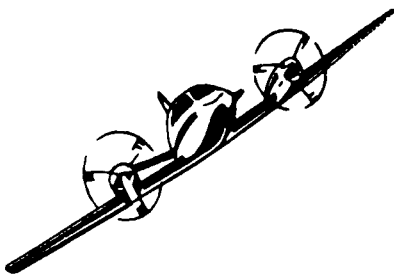
Slight Radius  
Results from  
Stamping  
Operation



Chamfer of Washer Must  
Face Bolt Head at  
Installation

Propeller Assembly Mounting Bolt and Washer Identifications  
Figure 1

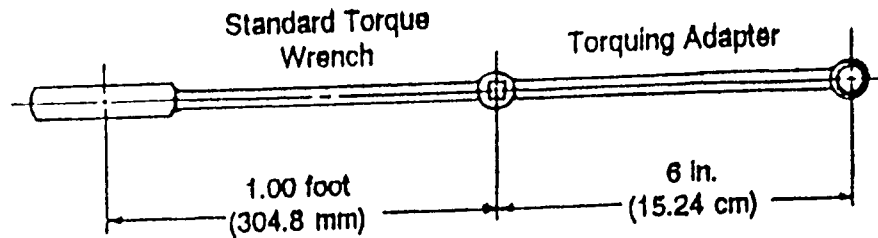
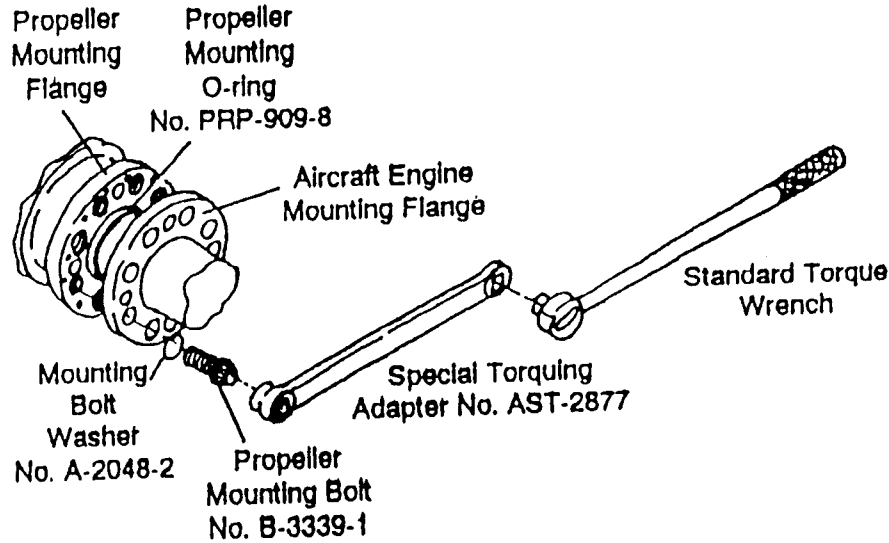
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When an adapter is used with a torque wrench, use the following equation to determine torque value:

$$\frac{(\text{actual torque required}) \times (\text{torque wrench length})}{(\text{torque wrench length}) + (\text{length of adapter})} = \frac{\text{torque wrench reading}}{\text{to achieve required actual torque}}$$

EXAMPLE:

$$\frac{100 \text{ lb-ft} \times 1 \text{ ft}}{1 \text{ ft} + 6 \text{ in.}} = \frac{66.7 \text{ lb-ft}}{901 \text{ N}\cdot\text{m}}$$

reading on torque wrench with 9 inch (22.86 cm) adapter for actual torque of 100 lb-ft (136 N·m)

Using Special Torquing Adapter (AST-2877)  
with Standard Torque Wrench  
to Torque Propeller Mounting Bolts  
Figure 2

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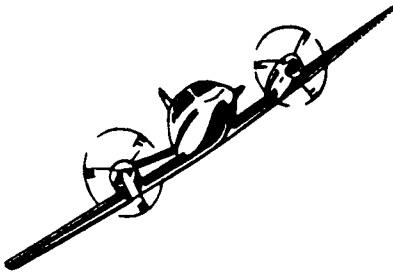
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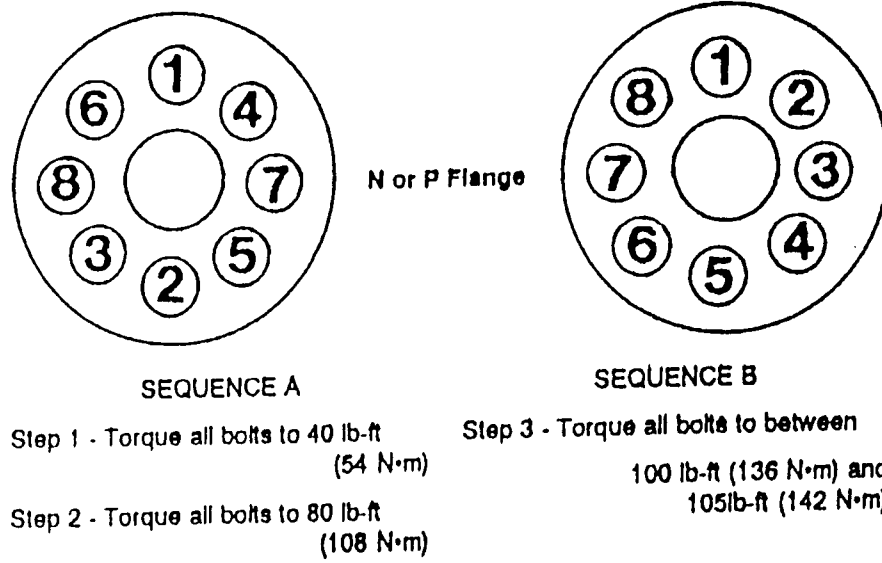
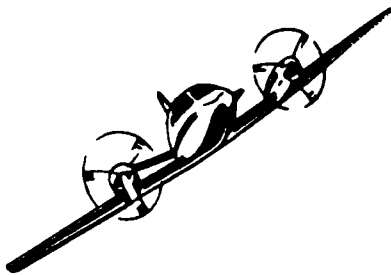


Figure 3

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## 2. Install propeller pitch control P/N 869130-30.

- a. Rotate propeller pitch control assembly shaft fully counterclockwise.
- b. Apply a thin coat of grease (DC-111 silicone) to gasket.
- c. Install and secure propeller pitch control assembly and gasket with washers and bolts. Tighten bolts (15, 25) to a torque value of 80 inch-pounds.

## 3. Rig propeller pitch control.

- a. Rotate propeller pitch control pointer clockwise (CW) to full reverse position.
- b. Verify that pointer on propeller pitch control points to 0 +/- 1 degree. Insert rig pin.

NOTE: If pointer on propeller pitch control does not point to 0 +/-1 degree, perform control linkage rigging IAW Garrett TPE 331-8 Maintenance Manual P/N 72-00-13 section 76-10-01.

- c. Verify that pointer on manual fuel valve shaft on top of fuel control unit indicates 0 to +3 degrees.
- d. Remove rig pin.
- e. Rotate the propeller pitch control pointer counterclockwise (CCW) to flight idle position. Insert rig pin.
- f. Verify that pointer on propeller pitch control points to 40 +/-1 degree.
- g. Verify that pointer on manual fuel valve shaft on top of fuel control unit indicates 40 +/-3 degrees.
- h. Remove rig pin.
- i. Rotate the propeller pitch control pointer counterclockwise (CCW) to maximum power position. Hold pointer against the stop.

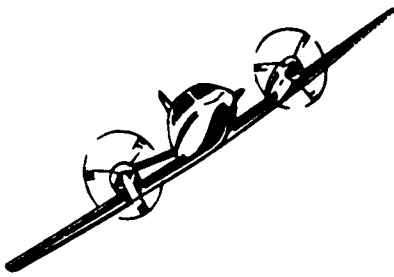
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### 3. Rig propeller pitch control. cont'd

- j. Verify that pointer on propeller pitch control points to 100 +/- 3 degrees.
- k. Verify that pointer on manual fuel valve shaft on top of fuel control unit indicates 100 +/- 3 degrees.


### C. Propeller De-Ice System

#### 1. Change brush block assembly.

- a. Remove shroud from front of engine.
- b. Remove brush block and bracket from engine.
- c. Tie back and cap wire number H9B14 (inboard) on left engine and H4B14 (outboard) on right engine.
- d. Install mounting bracket P/N 3E2223 in same position as old mounting bracket.
- e. Install brush block P/N 3E2090-2 using two (2) screws MS51957-50, two (2) nuts MS21045, and four (4) washers AN960C8. Use shims P/N 1E1157 as necessary to center the brush block to the slip rings. Follow the alignment instructions found on drawing EW/HART E092-01 DW.
- f. Attach wires to the brush blocks following the wiring diagram on drawing EW/HART E092-01 DW.
- g. Install shroud onto front of engine making any small modifications necessary to assure wire and brush block clearance.

#### 2. Cockpit wiring and components change.

- a. Gain access to the propeller de-ice timers.
- b. Remove both existing de-ice timers and install timer P/N 3E1964-3 in existing mounting bracket.

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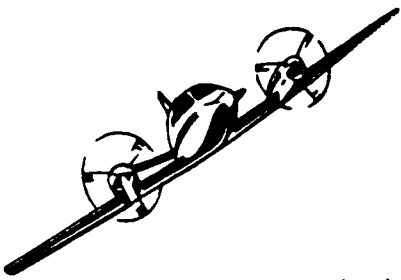
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## 2. Cockpit wiring and components change. cont'd

- c. Remove wire number H4A14 from pin "C" of right connector and cap and tie back.
- d. Remove wire number H11A14 from pin "C" of left connector and install it in pin "F" of right connector. Tie back securely the left connector.
- e. Attach the right connector to the timer.
- f. Reinstall access panels.
- g. Gain access to the propeller de-ice control switches.
- h. Remove the left switch and cap and tie back the wires.
- i. Remove the right switch and install switch P/N 2E1900-1, plug the hole left from the left switch.
- j. Gain access to the propeller de-ice ammeters.
- k. Remove both ammeters. Tie back and cap the wires that were attached to the left ammeter.
- l. Install ammeter P/N 3E1872-3 and shunt P/N MS91586-1.
- m. Plug hole left by the left ammeter.
- n. Replace access panels and other items removed for access to the switches and ammeters.
- o. Reidentify the switch: Propeller
- p. Reidentify the ammeter: Propeller De-Ice.

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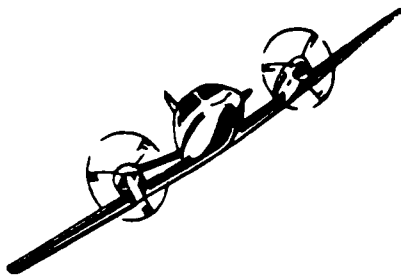
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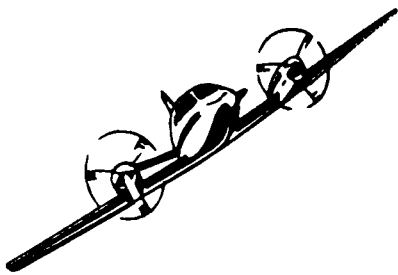
## APPENDIX A

- A. Rework propeller pitch control assembly P/N 869130-13 to P/N 869130-30.
1. Disassemble propeller pitch control assembly. Refer to figure 4.
    - a. Remove screws (10), washers (15), cover (25) and gasket (35).
    - b. Remove cam assembly P/N 865558-1 (40) and sleeve bearing (45).
  2. Reassemble and reidentify propeller pitch control.
    - a. Coat all internal surfaces of propeller pitch control body with approved engine oil.
    - b. Position bearing on shaft of cam assembly P/N 865558-26. Insert cam assembly and bearing into body until sleeve guide is positioned in slot of the cam assembly.
    - c. Install gasket and cover onto body and secure with washers and screws. Tighten screws (10) to a torque value of 25 inch-pounds.
    - d. Check propeller pitch control assembly operation by rotating shaft assembly to check for freedom of movement. Shaft shall rotate freely with no binding or rough spots. Sleeve assembly shall extend and retract smoothly as shaft assembly is rotated. Torque required to rotate shaft assembly to within 0.010 inch of full travel shall be 1 to 7 inch-pounds.
    - e. Re-identify the propeller pitch control by obliterating the existing part number and stamping part number 869130-30.

NOTE: Time-since-new and Time-since-overhaul will remain as before with time tracking by component serial number.

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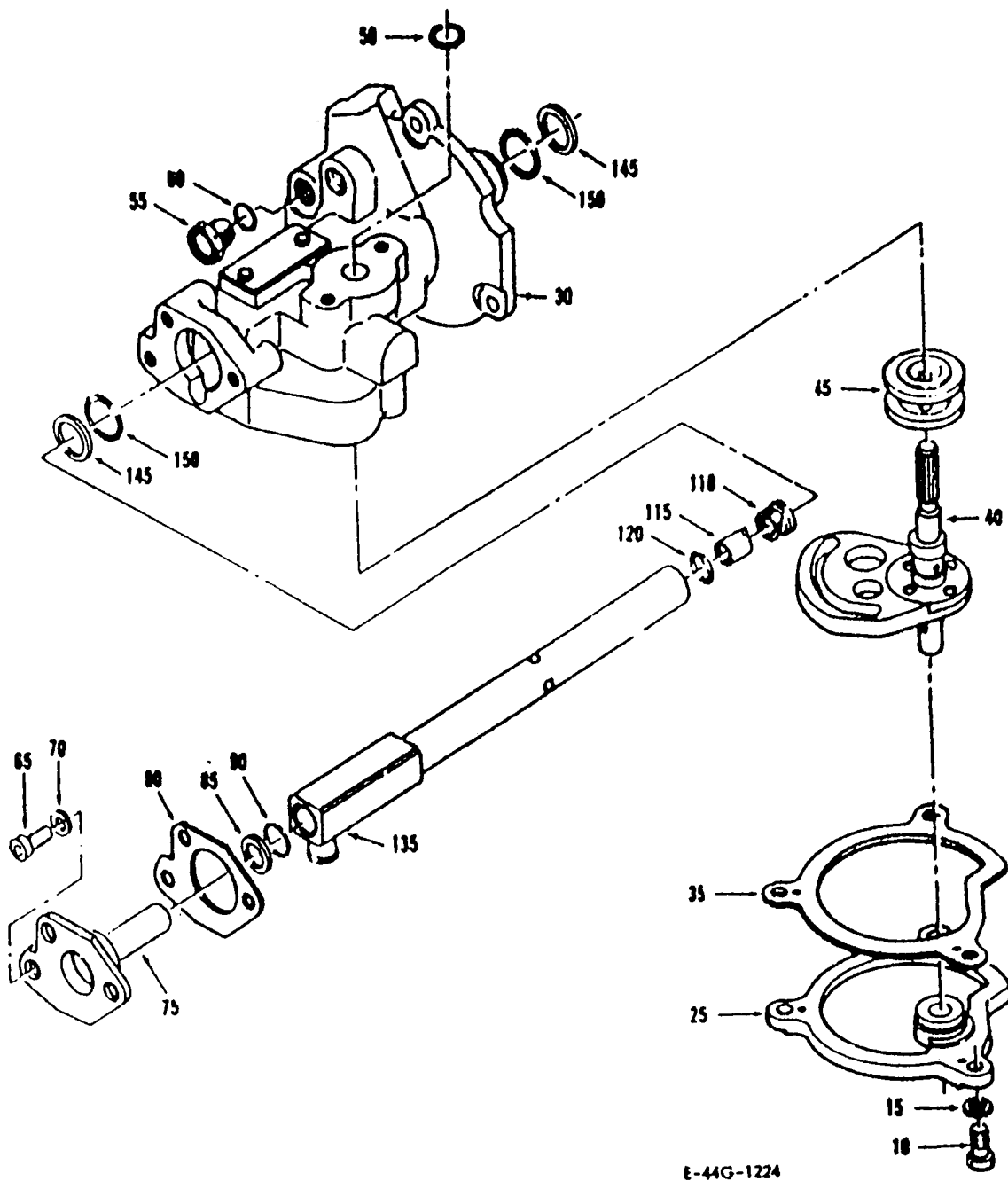
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Appendix A



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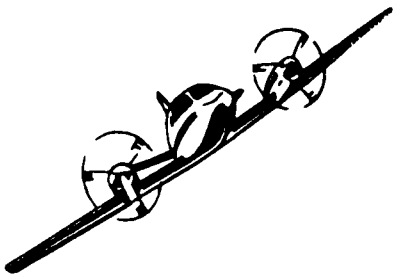


E-44G-1224

- |       |                |     |          |      |            |
|-------|----------------|-----|----------|------|------------|
| R 10. | SCREW          | 55. | PLUG     | 110. | RETAINER   |
| R 15. | WASHER         | 60. | PACKING  | 115. | VALVE SEAT |
| R 25. | COVER          | 65. | SCREW    | 120. | PACKING    |
| R 30. | BODY           | 70. | WASHER   | 135. | SLEEVE     |
| R 35. | GASKET         | 75. | RETAINER | 145. | WASHER     |
| R 40. | CAM ASSY       | 80. | GASKET   | 150. | PACKING    |
| R 45. | SLEEVE BEARING | 85. | WASHER   |      |            |
| R 50. | PACKING        | 90. | PACKING  |      |            |

Propeller Pitch Control Assembly  
Figure 4

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## APPENDIX B

- A. Rework propeller pitch control cam assembly P/N 865558-15 to P/N 865558-26.
1. Disassemble propeller pitch control cam assembly.
    - a. Remove rivets holding cam to shaft.
    - b. Remove cam P/N 869384-1 from shaft.
  2. Reassemble propeller pitch control cam assembly.
    - a. Locate cam P/N 897602-1 on shaft.
    - b. Install four (4) rivets P/N AN123471 attaching the cam to the shaft.
    - c. Drive rivets IAW methods described in AC43.13-1A.

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Appendix B