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# MANUAL REVISION TRANSMITTAL

## MANUAL 118F (61-10-18)
## Steel Hub Turbine Propeller Maintenance Manual

## REVISION 36 dated February 2024

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NOTE 1: Record the removal of a Temporary Revision on the Record of Temporary Revisions pages in this manual.

NOTE 2: When the manual revision has been inserted in the manual, record the information required on the Record of Revisions pages in this manual.

NOTE 3: Pages distributed in this revision may include pages from previous revisions if they are on the opposite side of revised pages. This is done as a convenience to those users who wish to print a two-sided copy of the new revision.

This page may be discarded after proper filing of the revision.

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**Manual No. 118F**
**61-10-18**
**Revision 36**
**February 2024**

# STEEL HUB TURBINE PROPELLER OVERHAUL MANUAL

| Three Blade | Four Blade |
|---|---|
| HC-A3VF-7( ) | HC-B4MP-3( ) |
| HC-A3MVF-7( ) | HC-B4TN-3( ) |
| HC-B3MN-3( ) | HC-B4TW-3 |
| HC-B3MN-5( ) | HC-B4MN-5( ) |
| HC-B3TN-2( ) | HC-B4TN-5( ) |
| HC-B3TN-3( ) | |
| HC-B3TW-3( ) | |
| HC-B3TN-5( ) | |
| HC-B3TF-7( ) | |

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## REVISION 36 HIGHLIGHTS

Revision 36, dated February 2024, incorporates the following:

Front matter (Cover, Revision Highlights, etc.), has been revised to match this revision.

Minor language/format changes and renumbering, if applicable are marked with a revision bar, but are not listed below.

- DISASSEMBLY
  - Revised the Item Number for counterweights (800), hex head bolts (9050), and counterweight slugs (9040), where applicable
- REPAIR
  - Revised Table 6-5, "Conversion Kit B-3682"
  - Revised the section, "Conversion of Propeller Model HC-A3(MV,V)F-7 to HC-A3(MV,V)F-7B"
- ASSEMBLY
  - Revised the section, "General"
  - Revised the section, "Assembling Clamp and Counterweight"
- FITS AND CLEARANCES
  - Revised the section, "Torque Values"
  - Revised Table 8-1, "Torque Values"
  - Revised Figure 8-2, "Blade Play"
  - Revised the section, "Blade Tolerances"
- ILLUSTRATED PARTS LIST
  - Revised the Item Number for hex head bolts (9050), where applicable
  - Revised HC-B3TN-(3AEY, 3AFY, 3NY) Propeller Assembly
  - Added washer B-7624 as an alternate for washer 109514, where applicable

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# REVISION 36 HIGHLIGHTS

1. Introduction

   A. General

      (1) This is a list of current revisions that have been issued against this manual. Please compare to the RECORD OF REVISIONS page to make sure that all revisions have been added to the manual.

   B. Components

      (1) Revision No. indicates the revisions incorporated in this manual.

      (2) Issue Date is the date of the revision.

      (3) Comments indicates the level of the revision.

         (a) New Issue is a new manual distribution. The manual is distributed in its entirety. All the revision dates are the same and no change bars are used.

         (b) Reissue is a revision to an existing manual that includes major content and/or major format changes. The manual is distributed in its entirety. All the revision dates are the same and no change bars are used.

         (c) Major Revision is a revision to an existing manual that includes major content or minor format changes over a large portion of the manual. The manual is distributed in its entirety. All the revision dates are the same, but change bars are used to indicate the changes incorporated in the latest revision of the manual.

         (d) Minor Revision is a revision to an existing manual that includes minor content changes to the manual. Only the revised pages of the manual are distributed. Each page retains the date and the change bars associated with the last revision to that page.

| Revision No. | Issue Date | Comments |
|---|---|---|
| Rev. 7 | Oct/99 | Minor Revision |
| Rev. 8 | July/00 | Minor Revision |
| Rev. 9 | Dec/00 | Minor Revision |
| Rev. 10 | Mar/01 | Minor Revision |
| Rev. 11 | Oct/01 | Major Revision |
| Rev. 12 | Apr/02 | Minor Revision |
| Rev. 13 | Jan/03 | Minor Revision |
| Rev. 14 | Apr/03 | Minor Revision |
| Rev. 15 | Nov/03 | Minor Revision |
| Rev. 16 | Nov/03 | Minor Revision |
| Rev. 17 | Jun/04 | Minor Revision |
| Rev. 18 | Aug/04 | Minor Revision |
| Rev. 19 | Dec/06 | Minor Revision |
| Rev. 20 | Oct/07 | Minor Revision |
| Rev. 21 | Aug/09 | Minor Revision |
| Rev. 22 | Aug/11 | Minor Revision |
| Rev. 23 | Jan/14 | Major Revision |
| Rev. 24 | May/14 | Minor Revision |
| Rev. 25 | Apr/15 | Minor Revision |
| Rev. 26 | Apr/16 | Minor Revision |
| Rev. 27 | Aug/17 | Minor Revision |
| Rev. 28 | Aug/18 | Minor Revision |
| Rev. 29 | Nov/19 | Minor Revision |
| Rev. 30 | Dec/20 | Minor Revision |
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| Rev. 32 | Sep/22 | Minor Revision |
| Rev. 33 | Nov/22 | Minor Revision |
| Rev. 34 | Apr/23 | Major Revision |
| Rev. 35 | Aug/23 | Minor Revision |
| Rev. 36 | Feb/24 | Minor Revision |

## RECORD OF REVISIONS

This is a record of revisions inserted into this manual.
Revision 34 includes all prior revisions.

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| 34 | Apr/23 | Apr/23 | HPI |
| 35 | Aug/23 | Aug/23 | HPI |
| 36 | Feb/24 | Feb/24 | Hartzell |
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Update this page to show all temporary revisions inserted into this manual.
Revision 34 includes all prior temporary revisions, up to and including TR-030.

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# SERVICE DOCUMENT LIST

CAUTION 1: DO NOT USE OBSOLETE OR OUTDATED INFORMATION. PERFORM ALL INSPECTIONS OR WORK IN ACCORDANCE WITH THE MOST RECENT REVISION OF THE SERVICE DOCUMENT. INFORMATION CONTAINED IN A SERVICE DOCUMENT MAY BE SIGNIFICANTLY CHANGED FROM EARLIER REVISIONS. FAILURE TO COMPLY WITH INFORMATION CONTAINED IN A SERVICE DOCUMENT OR THE USE OF OBSOLETE INFORMATION MAY CREATE AN UNSAFE CONDITION THAT MAY RESULT IN DEATH, SERIOUS BODILY INJURY, AND/OR SUBSTANTIAL PROPERTY DAMAGE.

CAUTION 2: THE INFORMATION FOR THE DOCUMENTS LISTED INDICATES THE REVISION LEVEL AND DATE AT THE TIME THAT THE DOCUMENT WAS INITIALLY INCORPORATED INTO THIS MANUAL. INFORMATION CONTAINED IN A SERVICE DOCUMENT MAY BE SIGNIFICANTLY CHANGED FROM EARLIER REVISIONS. REFER TO THE APPLICABLE SERVICE DOCUMENT INDEX FOR THE MOST RECENT REVISION LEVEL OF THE SERVICE DOCUMENT.

| Service Document Number | Incorporation Rev./Date |
|---|---|
| **Service Bulletins:** | |
| SB 106B | Rev. 4 Oct/97 |
| SB 128A | Rev. 14 Apr/03 |
| SB 132 | Rev. 4 Oct/97 |
| SB 141 | Rev. 4 Oct/97 |
| SB 143B | Rev. 4 Oct/97 |
| SB 147 | Rev. 4 Oct/97 |
| SB 153 | Rev. 4 Oct/97 |
| SB 153S1 | Rev. 4 Oct/97 |
| SB 156 | Rev. 4 Oct/97 |
| SB 173 | Rev. 4 Oct/97 |
| SB 175 | Rev. 4 Oct/97 |
| SB 177 | Rev. 4 Oct/97 |
| SB A182A | Rev. 4 Oct/97 |
| SB A183A | Rev. 4 Oct/97 |
| SB A186 | Rev. 4 Oct/97 |
| SB A188 | Rev. 4 Oct/97 |
| SB A196A | Rev. 4 Oct/97 |

| Service Document Number | Incorporation Rev./Date |
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| HC-SB-61-285 | Rev. 19 Dec/06 |
| HC-SB-61-294 | Rev. 23 Jan/14 |
| HC-SB-61-324 | Rev. 23 Jan/14 |
| HC-SB-61-363 | Rev. 26 Apr/16 |
| HC-SB-61-370 | Rev. 27 Aug/17 |
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| Service Document Number | Incorporation Rev./Date |
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| **Service Letters:** | |
| SL 61T | Rev. 4 Oct/97 |
| SL 131A | Rev. 6 Jun/99 |
| SL 148A | Rev. 4 Oct/97 |
| SL 152A | Rev. 4 Oct/97 |
| SL 159 | Rev. 4 Oct/97 |
| HC-SL-61-173 | Rev. 4 Oct/97 |
| HC-SL-61-177 | Rev. 4 Oct/97 |
| SL 216 | Rev. 12 Apr/02 |
| HC-SL-61-256 | Rev. 19 Dec/06 |
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| HC-SL-61-258 | Rev. 19 Dec/06 |
| HC-SL-61-351 | Rev. 26 Apr/16 |
| HC-SL-61-367 | Rev. 30 Dec/20 |
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| **Service Advisories:** | |
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| SA 23 | Rev. 4 Oct/97 |
| SA 45 | Rev. 4 Oct/97 |
| SA 52 | Rev. 4 Oct/97 |
| SA 72 | Rev. 4 Oct/97 |
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| **Service Instructions:** | |
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| SI 143A | Rev. 4 Oct/97 |
| SI 145A | Rev. 4 Oct/97 |
| SI 146 | Rev. 4 Oct/97 |
| SI 147 | Rev. 4 Oct/97 |
| SI 151 | Rev. 4 Oct/97 |
| SI 158 | Rev. 4 Oct/97 |
| SI 160 | Rev. 4 Oct/97 |
| SI 166 | Rev. 4 Oct/97 |
| SI 182B | Rev. 4 Oct/97 |
| SI 183 | Rev. 4 Oct/97 |
| SI 185 | Rev. 4 Oct/97 |
| SI 190 | Rev. 4 Oct/97 |
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# AIRWORTHINESS LIMITATIONS

1. Airworthiness Limitations

   A. Life Limits

      (1) Certain component parts, as well as the entire propeller, may have specific life limits established by the FAA. Such limits require replacement after a specific number of hours of use.

      (2) For airworthiness limitations information, refer to the applicable Hartzell Propeller Inc. Owner's Manual 139 (61-00-39) or Owner's Manual 146 (61-00-46).

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1. General (Rev. 1)

   A. Statement of Purpose

      (1) This manual has been reviewed and accepted by the FAA. Additionally, this manual contains data that has been approved in a manner acceptable to the FAA Administrator.

      (2) This manual provides maintenance and overhaul procedures for use in propeller repair stations by personnel that are trained and experienced with Hartzell Propeller Inc. products.

         (a) This manual does not provide complete information for an inexperienced technician to attempt propeller overhaul without supervision.

      (3) This manual is intended to be the primary source of maintenance and overhaul information for the applicable Hartzell propeller/component models.

         (a) Propeller models addressed in this manual may be Type Certificated by the FAA, or may be experimental. Experimental parts must not be installed on a Type Certificated propeller. Always use the current illustrated parts list for the assembly of any propeller. Always refer to the aircraft Type Certificate (TC) or Supplemental Type Certificate (STC) to determine installation eligibility of any propeller. If installation eligibility is not identifiable, an additional installation approval, such as FAA form 337 field approval or Supplemental Type Certificate may be required. If in doubt, contact Hartzell Propeller Inc. Product Support.

         (b) Information published in Service Bulletins, Service Letters, Service Advisories, and Service Instructions may supersede information published in this manual. The reader must consult active Service Bulletins, Service Letters, Service Advisories, and Service Instructions for information that may not yet have been incorporated into the latest revision of this manual.

      (4) This manual makes reference to other Hartzell Propeller Inc. manuals that provide important details for procedures such as anodizing, penetrant inspection, and overhaul procedures for steel hubs.

      (5) Where possible, this manual is written in the format specified by ATA iSpec 2200.

B. Item References

(1) Item references throughout the text in this manual refer to item numbers in the Illustrated Parts List chapter of this manual. The item numbers appear in parentheses directly following the part name. Only the item base number will appear in the text of the manual. Item base numbers and the alpha variants of the base numbers will appear in the illustrated parts list. There are two reasons for the use of alpha variants:

(a) A part may be superseded, replaced, or obsoleted by another part. For example, the pitch change block unit (105733) that is item 320 was superseded by the pitch change block unit (105733-1) that is item 320A.

(b) An Illustrated Parts List may contain multiple configurations. Effectivity codes are used to distinguish different part numbers within the same list. For example, one configuration may use a piston (B-2419) that is item 80, yet another configuration uses a piston (104256) that is item 80A. Effectivity codes are very important in the determination of parts in a given configuration.

2. Reference Publications

A. Hartzell Propeller Inc. Publications

(1) Information published in Service Bulletins, Service Letters, Service Advisories, and Service Instructions may supersede information published in this manual. The reader must consult active Service Bulletins, Service Letters, Service Advisories, and Service Instructions for information that may have not yet been incorporated into the latest revision of this manual.

(2) In addition to this manual, one or more of the following publications are required for information regarding specific recommendations and procedures to maintain propeller assemblies.

| Manual No. (ATA No.) | Available at www.hartzellprop.com | Hartzell Propeller Inc. Manual Title |
|---|---|---|
| n/a | n/a | Active Service Bulletins, Service Letters, Service Instructions, and Service Advisories |
| Manual 127 (61-16-27) | Yes | Metal Spinner Maintenance Manual |
| Manual 133C (61-13-33) | - | Aluminum Blade Overhaul Manual |
| Manual 135F (61-13-35) | - | Composite Blade Overhaul Manual |
| Manual 139 (61-00-39) | Yes | Owner's Manual and Logbook for Steel Hub Turbine Propellers with Aluminum Blades |
| Manual 146 (61-00-46) | Yes | Owner's Manual and Logbook for Steel Hub Turbine Propeller Models with Composite Blades |
| Manual 148 (61-16-48) | Yes | Composite Spinner Maintenance Manual |
| Manual 159 (61-02-59) | Yes | Application Guide |
| Manual 165A (61-00-65) | Yes | Illustrated Tool and Equipment Manual |
| Manual 180 (30-61-80) | Yes | Propeller Ice Protection System Manual |
| Manual 202A (61-01-02) | Vol. 7, Yes, Vol. 11, Yes | Standard Practices Manual, Volumes 1 through 11 |

B. Vendor Publications

None.

3. Personnel Requirements (Rev. 1)

   A. Service and Maintenance Procedures in this Manual

      (1) Personnel performing the service and maintenance procedures in this manual are expected to have the required equipment/tooling, training, and certifications (when required by the applicable Aviation Authority) to accomplish the work in a safe and airworthy manner.

      (2) Compliance to the applicable regulatory requirements established by the Federal Aviation Administration (FAA) or international equivalent, is mandatory for anyone performing or accepting responsibility for any inspection and/or repair and/or overhaul of any Hartzell Propeller Inc. product.

         (a) Maintenance records must be kept in accordance with the requirements established by the Federal Aviation Administration (FAA) or international equivalent.

         (b) Refer to Federal Aviation Regulation (FAR) Part 43 for additional information about general aviation maintenance requirements.

4. Special Tooling and Consumable Materials (Rev. 1)

   A. Special Tooling

      (1) Special tooling may be required for procedures in this manual. For further tooling information, refer to Hartzell Propeller Inc. Illustrated Tool and Equipment Manual 165A (61-00-65).

         (a) Tooling reference numbers appear with the prefix “TE” directly following the tool name to which they apply. For example, a template that is reference number 133 will appear as: template TE133.

   B. Consumable Materials

      (1) Consumable materials are referenced in certain sections throughout this manual. Specific approved materials are listed in the Consumable Materials chapter of Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02).

         (a) Consumable material reference numbers appear with the prefix “CM” directly following the material to which they apply. For example, an adhesive that is reference number 16 will appear as: adhesive CM16. Only the material(s) specified can be used.

5. Safe Handling of Paints and Chemicals (Rev.1)

   A. Instructions for Use

      (1) Always use caution when handling or being exposed to paints and/or chemicals during propeller overhaul and/or maintenance procedures.

      (2) Before using paint or chemicals, always read the manufacturer's label on the container(s) and follow specified instructions and procedures for storage, preparation, mixing, and/or application.

      (3) Refer to the product's Material Safety Data Sheet (MSDS) for detailed information about physical properties, health, and physical hazards of any paint or chemical.

6. Calendar Limits and Long Term Storage (Rev. 2)

   A. Calendar Limits

      (1) The effects of exposure to the environment over a period of time create a need for propeller overhaul regardless of flight time.

      (2) A calendar limit between overhauls is specified in Hartzell Propeller Inc. Service Letter HC-SL-61-61Y.

      (3) Experience has shown that special care, such as keeping an aircraft in a hangar, is not sufficient to permit extension of the calendar limit.

      (4) The start date for the calendar limit is when the propeller is first installed on an engine.

      (5) The calendar limit is not interrupted by subsequent removal and/or storage.

      (6) The start date for the calendar limit must not be confused with the warranty start date, that is with certain exceptions, the date of installation by the first retail customer.

   B. Long Term Storage

      (1) Propellers that have been in storage have additional inspection requirements before installation. Refer to the Packaging and Storage chapter of Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02).

7. Component Life and Overhaul (Rev. 2)

WARNING: CERTAIN PROPELLER COMPONENTS USED IN NON-AVIATION APPLICATIONS ARE MARKED WITH DIFFERENT PART NUMBERS TO DISTINGUISH THEM FROM COMPONENTS USED IN AVIATION APPLICATIONS. DO NOT ALTER THE PART NUMBERS SHOWN ON PARTS DESIGNATED FOR NON-AVIATION APPLICATIONS OR OTHERWISE APPLY THOSE PARTS FOR USE ON AVIATION APPLICATIONS.

A. Component Life

(1) Component life is expressed in terms of hours of service (Time Since New, TSN) and in terms of hours of service since overhaul (Time Since Overhaul, TSO).

NOTE: TSN/TSO is considered as the time accumulated between rotation and landing, i.e., flight time.

(2) Time Since New (TSN) and Time Since Overhaul (TSO) records for the propeller hub and blades must be maintained in the propeller logbook.

(3) Both TSN and TSO are necessary for defining the life of the component. Certain components or in some cases an entire propeller, may be "life limited", which means that they must be replaced after a specified period of use (TSN).

(a) It is a regulatory requirement that a record of the Time Since New (TSN) be maintained for all life limited parts.

(b) Refer to the Airworthiness Limitations chapter in the applicable Hartzell Propeller Inc. Owner's Manual for a list of life limited components.

(4) When a component or assembly undergoes an overhaul, the TSO is returned to zero hours.

(a) Time Since New (TSN) can never be returned to zero.

(b) Repair without overhaul does not affect TSO or TSN.

(5) Blades and hubs are sometimes replaced while in service or at overhaul.

(a) Maintaining separate TSN and TSO histories for a replacement hub or blade is required.

(b) Hub replacement

1 If the hub is replaced, the replacement hub serial number must be recorded (the entry signed and dated) in the propeller logbook.

2 The propeller will be identified with the serial number of the replacement hub.

NOTE: Propeller assembly serial numbers are impression stamped on the hub. For stamping information, refer to the Parts Identification and Marking chapter of Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02).

3 The TSN and TSO of the replacement hub must be recorded and maintained in the propeller logbook.

4 If tracking any component(s) other than the hub/blades, maintain these TSN/TSO records separately in the propeller logbook.

NOTE: Hub replacement does not affect the TSN/TSO of any other propeller components.

B. Overhaul

(1) Overhaul is the periodic disassembly, cleaning, inspecting, repairing as necessary, reassembling, and testing in accordance with approved standards and technical data approved by Hartzell Propeller Inc.

(2) The overhaul interval is based on hours of service, i.e., flight time, or on calendar time.

(a) Overhaul intervals are specified in Hartzell Propeller Inc. Service Letter HC-SL-61-61Y.

(b) At such specified periods, the propeller hub assembly and the blade assemblies must be completely disassembled and inspected for cracks, wear, corrosion, and other unusual or abnormal conditions.

(3) Overhaul must be completed in accordance with the latest revision of the applicable component maintenance manual and other publications applicable to, or referenced in, the component maintenance manual.

(a) Parts that are not replaced at overhaul must be inspected in accordance with the check criteria in the applicable Hartzell Propeller Inc. component maintenance manual.

(b) Parts that must be replaced at overhaul are identified by a "Y" in the O/H column of the Illustrated Parts List in the applicable Hartzell Propeller Inc. component maintenance manual.

(4) The information in this manual supersedes data in all previously published revisions of this manual.

8. Damage/Repair Types (Rev. 1)

A. Airworthy/Unairworthy Damage

(1) Airworthy damage is a specific condition to a propeller component that is within the airworthy damage limits specified in the applicable Hartzell Propeller Inc. component maintenance manual.

(a) Airworthy damage does not affect the safety or flight characteristics of the propeller and conforms to its type design.

(b) Airworthy damage does not require repair before further flight, but should be repaired as soon as possible to prevent degradation of the damage.

(2) Unairworthy damage is a specific condition to a propeller component that exceeds the airworthy damage limits specified in the applicable Hartzell Propeller Inc. component maintenance manual.

(a) Unairworthy damage can affect the safety or flight characteristics of the propeller and does not conform to its type design.

(b) Unairworthy damage must be repaired before the propeller is returned to service.

B. Minor/Major Repair

(1) Minor Repair

(a) Minor repair is that which may be done safely in the field by a certified aircraft mechanic.

1 For serviceable limits and repair criteria for Hartzell propeller components, refer to the applicable Hartzell Propeller Inc. component maintenance manual.

(2) Major Repair

(a) Major repair cannot be done by elementary operations.

(b) Major repair work must be accepted by an individual that is certified by the Federal Aviation Administration (FAA) or international equivalent.

1 Hartzell recommends that individuals performing major repairs also have a Factory Training Certificate from Hartzell Propeller Inc.

2 The repair station must meet facility, tooling, and personnel requirements and is required to participate in Hartzell Propeller Inc. Sample Programs as defined in the Approved Facilities chapter of Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02).

9. Propeller Critical Parts (Rev. 1)

A. Propeller Critical Parts

(1) Procedures in this manual may involve Propeller Critical Parts (PCP).

(a) These procedures have been substantiated based on Engineering analysis that expects this product will be operated and maintained using the procedures and inspections provided in the Instructions for Continued Airworthiness (ICA) for this product.

(b) Refer to the Illustrated Parts List chapter in the applicable Hartzell Propeller Inc. maintenance manual to identify the Propeller Critical Parts.

(2) Numerous propeller system parts can produce a propeller Major or Hazardous effect, even though those parts may not be considered as Propeller Critical Parts.

(a) The operating and maintenance procedures and inspections provided in the ICA for this product are, therefore, expected to be accomplished for all propeller system parts.

10. Warranty Service (Rev. 1)

A. Warranty Claims

(1) If you believe you have a warranty claim, contact the Hartzell Propeller Inc. Product Support Department to request a *Warranty Application* form. Complete this form and return it to Hartzell Product Support for evaluation **before proceeding with repair or inspection work**. Upon receipt of this form, the Hartzell Product Support Department will provide instructions on how to proceed.

(a) For Hartzell Propeller Inc. Product Support Department contact information, refer to the “Contact Information” section in this chapter.

11. Hartzell Propeller Inc. Contact Information (Rev. 2)

A. Product Support Department

(1) Contact the Product Support Department of Hartzell Propeller Inc. about any maintenance problems or to request information not included in this publication.

NOTE: When calling from outside the United States, dial (001) before dialing the telephone numbers below.

(a) Hartzell Propeller Inc. Product Support may be reached during business hours (8:00 a.m. through 5:00 p.m., United States Eastern Time) at (937) 778-4379 or at (800) 942-7767, toll free from the United States and Canada.

(b) Hartzell Propeller Inc. Product Support can also be reached by fax at (937) 778-4215, and by e-mail at techsupport@hartzellprop.com.

(c) After business hours, you may leave a message on our 24 hour product support line at (937) 778-4376 or at (800) 942-7767, toll free from the United States and Canada.

1 A technical representative will contact you during normal business hours.

2 Urgent AOG support is also available 24 hours per day, seven days per week via this message service.

(d) Additional information is available on the Hartzell Propeller Inc. website at www.hartzellprop.com.

B. Technical Publications Department

(1) For Hartzell Propeller Inc. service literature and revisions, contact:

Hartzell Propeller Inc.
Attn: Technical Publications Department
One Propeller Place
Piqua, Ohio 45356-2634 U.S.A.

Telephone: 937.778.4200
Fax: 937.778.4215
E-mail: manuals@hartzellprop.com

C. Recommended Facilities

(1) Hartzell Propeller Inc. recommends using Hartzell-approved distributors and repair facilities for the purchase, repair, and overhaul of Hartzell propeller assemblies or components.

(2) Information about the Hartzell Propeller Inc. worldwide network of aftermarket distributors and approved repair facilities is available on the Hartzell website at www.hartzellprop.com.

12. Definitions (Rev. 4)

A basic understanding of the following terms will assist in maintaining and operating Hartzell Propeller Inc. propeller systems.

| Term | Definition |
|---|---|
| Annealed | Softening of material due to overexposure to heat |
| Aviation Certified | Intended for FAA or international equivalent type certificated aircraft applications. A TC and PC number must be stamped on the hub, and a PC number must be stamped on blades. |
| Aviation Experimental | Intended for aircraft/propeller applications not certified by the FAA or international equivalent. Products marked with an “X” at or near the end of the model number or part number are not certified by the FAA or international equivalent and are not intended to use on certificated aircraft. |
| Beta Operation | A mode of pitch control that is directed by the pilot rather than by the propeller governor |
| Beta Range | Blade angles between low pitch and maximum reverse blade angle |
| Beta System | Parts and/or equipment related to operation (manual control) of propeller blade angle between low pitch blade angle and full reverse blade angle |
| Blade Angle | Measurement of blade airfoil location described as the angle between the blade airfoil and the surface described by propeller rotation |
| Blade Centerline | An imaginary reference line through the length of a blade around which the blade rotates |
| Blade Station | Refers to a location on an individual blade for blade inspection purposes. It is a measurement from the blade “zero” station to a location on a blade, used to apply blade specification data in blade overhaul manuals.<br>Note: Do not confuse *blade station* with *reference blade radius*; they may not originate at the same location. |
| Blemish | An imperfection with visible attributes, but having no impact on safety or utility |
| Brinelling | A depression caused by failure of the material in compression |

| Term | Definition |
|---|---|
| Bulge | An outward curve or bend |
| Camber | The surface of the blade that is directed toward the front of the aircraft. It is the low pressure, or suction, side of the blade. The camber side is convex in shape over the entire length of the blade. |
| Chord | A straight line distance between the leading and trailing edges of an airfoil |
| Chordwise | A direction that is generally from the leading edge to the trailing edge of an airfoil |
| Co-bonded | The act of bonding a composite laminate and simultaneously curing it to some other prepared surface |
| Composite Material | Kevlar®, carbon, or fiberglass fibers bound together with, or encapsulated within an epoxy resin |
| Compression Rolling | A process that provides improved strength and resistance to fatigue |
| Constant Force | A force that is always present in some degree when the propeller is operating |
| Constant Speed | A propeller system that employs a governing device to maintain a selected engine RPM |
| Corrosion (Aluminum) | The chemical or electrochemical attack by an acid or alkaline that reacts with the protective oxide layer and results in damage of the base aluminum. Part failure can occur from corrosion due to loss of structural aluminum converted to corrosion product, pitting, a rough etched surface finish, and other strength reduction damage caused by corrosion. |
| Corrosion (Steel) | Typically, an electrochemical process that requires the simultaneous presence of iron (component of steel), moisture and oxygen. The iron is the reducing agent (gives up electrons) while the oxygen is the oxidizing agent (gains electrons). Iron or an iron alloy such as steel is oxidized in the presence of moisture and oxygen to produce rust. Corrosion is accelerated in the presence of salty water or acid rain. Part failure can occur from corrosion due to loss of structural steel converted to corrosion product, pitting, a rough etched surface finish and other strength reduction damage caused by corrosion. |

| Term | Definition |
|---|---|
| Corrosion Product (Aluminum) | A white or dull gray powdery material that has an increased volume appearance (compared to non-corroded aluminum). Corrosion product is not to be confused with damage left in the base aluminum such as pits, worm holes, and etched surface finish. |
| Corrosion Product (Steel) | When iron or an iron alloy such as steel corrodes, a corrosion product known as rust is formed. Rust is an iron oxide which is reddish in appearance and occupies approximately six times the volume of the original material. Rust is flakey and crumbly and has no structural integrity. Rust is permeable to air and water, therefore the interior metallic iron (steel) beneath a rust layer continues to corrode. Corrosion product is not to be confused with damage left in the base steel such as pits and etched surface finish. |
| Crack | Irregularly shaped separation within a material, sometimes visible as a narrow opening at the surface |
| Debond | Separation of two materials that were originally bonded together in a separate operation |
| Defect | An imperfection that affects safety or utility |
| Delamination | Internal separation of the layers of composite material |
| Dent | The permanent deflection of the cross section that is visible on both sides with no visible change in cross sectional thickness |
| Depression | Surface area where the material has been compressed but not removed |
| Distortion | Alteration of the original shape or size of a component |
| Edge Alignment | Distance from the blade centerline to the leading edge of the blade |
| Erosion | Gradual wearing away or deterioration due to action of the elements |
| Exposure | Leaving material open to action of the elements |

| Term | Definition |
|---|---|
| Face | The surface of the blade that is directed toward the rear of the aircraft. The face side is the high pressure, or thrusting, side of the blade. The blade airfoil sections are normally cambered or curved such that the face side of the blade may be flat or even concave in the midblade and tip region. |
| Face Alignment | Distance from the blade centerline to the highest point on the face side perpendicular to the chord line |
| Feathering | The capability of blades to be rotated parallel to the relative wind, thus reducing aerodynamic drag |
| Fraying | A raveling or shredding of material |
| Fretting | Damage that develops when relative motion of small displacement takes place between contacting parts, wearing away the surface |
| Galling | To fret or wear away by friction |
| Gouge | Surface area where material has been removed |
| Hazardous Propeller Effect | The hazardous propeller effects are defined in Title 14 CFR section 35.15(g)(1) |
| Horizontal Balance | Balance between the blade tip and the center of the hub |
| Impact Damage | Damage that occurs when the propeller blade or hub assembly strikes, or is struck by, an object while in flight or on the ground |
| Inboard | Toward the butt of the blade |
| Intergranular Corrosion | Corrosion that attacks along the grain boundaries of metal alloys |
| Jog | A term used to describe movement up/down, left/right, or on/off in short incremental motions |
| Laminate | To unite composite material by using a bonding material, usually with pressure and heat |
| Lengthwise | A direction that is generally parallel to the pitch axis |
| Loose Material | Material that is no longer fixed or fully attached |
| Low Pitch | The lowest blade angle attainable by the governor for constant speed operation |

| Term | Definition |
|---|---|
| Major Propeller Effect | The major propeller effects are defined in Title 14 CFR section 35.15(g)(2) |
| Minor Deformation | Deformed material not associated with a crack or missing material less than 10 percent of the leading edge radius or no more than 0.080 inch (2.03 mm) deep |
| Monocoque | A type of construction in which the outer skin carries all or a major part of the load |
| Nick | Removal of paint and possibly a small amount of material |
| Non-Aviation Certified | Intended for non-aircraft application, such as Hovercraft or Wing in Ground Effect (WIG) applications. These products are certificated by an authority other than FAA. The hub and blades will be stamped with an identification that is different from, but comparable to TC and PC. |
| Non-Aviation Experimental | Intended for non-aircraft application, such as Hovercraft or Wing-In-Ground effect (WIG) applications. Products marked with an “X” at or near the end of the model number or part number are not certified by any authority and are not intended for use on certificated craft. |
| Onspeed | Condition in which the RPM selected by the pilot through the propeller control/condition lever and the actual engine (propeller) RPM are equal |
| Open Circuit | Connection of high or infinite resistance between points in a circuit which are normally lower |
| Outboard | Toward the tip of the blade |
| Overhaul | The periodic disassembly, inspection, repair, refinish, and reassembly of a propeller assembly to maintain airworthiness |
| Overspeed | Condition in which the RPM of the propeller or engine exceeds predetermined maximum limits; the condition in which the engine (propeller) RPM is higher than the RPM selected by the pilot through the propeller control/condition lever |
| Pitch | Same as “Blade Angle” |
| Pitting | Formation of a number of small, irregularly shaped cavities in surface material caused by corrosion or wear |

| Term | Definition |
|---|---|
| Pitting (Linear) | The configuration of the majority of pits forming a pattern in the shape of a line |
| Porosity | An aggregation of microvoids. See “voids” |
| Propeller Critical Parts | A part on the propeller whose primary failure can result in a hazardous propeller effect, as determined by the safety analysis required by Title 14 CFR section 35.15 |
| Reference Blade Radius | Refers to the propeller reference blade radius in an assembled propeller, e.g., 30-inch radius. A measurement from the propeller hub centerline to a point on a blade, used for blade angle measurement in an assembled propeller. An adhesive stripe (blade angle reference tape CM160) is usually located at the reference blade radius location.<br>Note: Do not confuse *reference blade radius* with *blade station*; they may not originate at the same point. |
| Reversing | The capability of rotating blades to a position to generate reverse thrust to slow the aircraft or back up |
| Scratch | Same as “Nick” |
| Short Circuit | Connection of low resistance between points on a circuit between which the resistance is normally much greater |
| Shot Peening | Process where steel shot is impinged on a surface to create compressive surface stress, that provides improved strength and resistance to fatigue |
| Single Acting | Hydraulically actuated propeller that utilizes a single oil supply for pitch control |
| Split | Delamination of blade extending to the blade surface, normally found near the trailing edge or tip |
| Station Line | See "Blade Station" |
| Synchronizing | Adjusting the RPM of all the propellers of a multi-engine aircraft to the same RPM |
| Synchrophasing | A form of propeller sychronization in which not only the RPM of the engines (propellers) are held constant, but also the position of the propellers in relation to each other |
| Ticking | A series of parallel marks or scratches running circumferentially around the diameter of the blade |

| Term | Definition |
|---|---|
| Track | In an assembled propeller, a measurement of the location of the blade tip with respect to the plane of rotation, used to verify face alignment and to compare blade tip location with respect to the locations of the other blades in the assembly |
| Trailing Edge | The aft edge of an airfoil over which the air passes last |
| Trimline | Factory terminology referring to where the part was trimmed to length |
| Underspeed | The condition in which the actual engine (propeller) RPM is lower than the RPM selected by the pilot through the propeller control/condition lever |
| Unidirectional Material | A composite material in which the fibers are substantially oriented in the same direction |
| Variable Force | A force that may be applied or removed during propeller operation |
| Vertical Balance | Balance between the leading and trailing edges of a two-blade propeller with the blades positioned vertically |
| Voids | Air or gas that has been trapped and cured into a laminate |
| Windmilling | The rotation of an aircraft propeller caused by air flowing through it while the engine is not producing power |
| Woven Fabric | A material constructed by interlacing fiber to form a fabric pattern |
| Wrinkle (aluminum blade) | A wavy appearance caused by high and low material displacement |
| Wrinkle (composite blade) | Overlap or fold within the material |

13. Abbreviations (Rev. 2)

| Abbreviation | Term |
|---|---|
| AD | Airworthiness Directives |
| AMM | Aircraft Maintenance Manual |
| AOG | Aircraft on Ground |
| AR | As Required |
| ATA | Air Transport Association |
| CSU | Constant Speed Unit |
| FAA | Federal Aviation Administration |
| FH | Flight Hour |
| FM | Flight Manual |
| FMS | Flight Manual Supplement |
| FT-Lb | Foot-Pound |
| HMI | Human Machine Interface |
| ICA | Instructions for Continued Airworthiness |
| ID | Inside Diameter |
| In-Lb | Inch-Pound |
| IPL | Illustrated Parts List |
| IPS | Inches Per Second |
| kPa | Kilopascals |
| Lb(s) | Pound(s) |
| Max. | Maximum |
| Min. | Minimum |
| MIL-X-XXX | Military Specification |
| MPI | Major Periodic Inspection (Overhaul) |
| MS | Military Standard |
| MSDS | Material Safety Data Sheet |
| N | Newtons |

| Abbreviation | Term |
|---|---|
| N/A | Not Applicable |
| NAS | National Aerospace Standards |
| NASM | National Aerospace Standards, Military |
| NDT | Nondestructive Testing |
| NIST | National Institute of Standards and Technology |
| N•m | Newton-Meters |
| OD | Outside Diameter |
| OPT | Optional |
| PC | Production Certificate |
| PCP | Propeller Critical Part |
| PLC | Programmable Logic Controller |
| PMB | Plastic Media Blasting (Cleaning) |
| POH | Pilot's Operating Handbook |
| PSI | Pounds per Square Inch |
| RF | Reference |
| RPM | Revolutions per Minute |
| SAE | Society of Automotive Engineers |
| STC | Supplemental Type Certificate |
| TBO | Time Between Overhaul |
| TC | Type Certificate |
| TSI | Time Since Inspection |
| TSN | Time Since New |
| TSO | Time Since Overhaul |
| UID | Unique Identification |
| WIG | Wing-In-Ground-Effect |

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## DESCRIPTION AND OPERATION - CONTENTS



## LIST OF FIGURES

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1. General (Rev. 2)

   A. Propeller/Blade Model Designation

      (1) Hartzell Propeller Inc. uses a model number designation system to identify specific propeller and blade assemblies. The propeller model number and blade model number are separated by a slash ( / ).

         (a) Example: *propeller model number / blade model number*

      (2) The propeller model number is impression stamped on the propeller hub.

         (a) For additional information about the propeller model number designation system, refer to the applicable Hartzell Propeller Inc. owner's manual.

      (3) The blade model number is impression stamped on the butt end of the blade, and also identified by a label on the cylinder.

         (a) For additional information about the model number designation system for composite blades, refer to Hartzell Propeller Inc. Composite Blade Overhaul Manual 135F (61-13-35).

         (b) For additional information about the model number designation system for aluminum blades, refer to Hartzell Propeller Inc. Aluminum Blade Overhaul Manual 133C (61-13-33).

2. Operation

A. Constant Speed Non-Feathering With Counterweights

(1) Constant speed non-feathering assemblies with counterweights use oil pressure to decrease the blade angle and centrifugal force on the counterweights to increase the blade angle.

(2) When the engine speed drops below the RPM for which the governor is set, the force of the speeder spring overcomes the rotational force of the governor flyweights. The flyweights tilt inward and lower the pilot valve, which allows governor oil to increase pressure on the propeller piston, moving the piston outward. The action of the piston decreases the blade angle and allows the engine to return to the on-speed setting.

(3) When the engine speed increases above the RPM for which the governor is set, the governor flyweights overcome the force of the speeder spring. The governor flyweights tilt outward and raise the pilot valve which allows governor oil pressure to decrease. Centrifugal force acting on the counterweights increases the blade angle and allows the engine to return to the on-speed setting.

(4) The -1 steel hub turbine propeller models are constant speed non-feathering with counterweights.

B. Constant Speed Feathering

(1) Constant speed feathering assemblies use oil pressure to decrease the blade angle. A combination of counterweights and the feathering spring are used to increase the blade angle.

(2) Feathering is accomplished by releasing the governor oil pressure. When the feathering mechanism is activated, the governor pilot valve raises the lift rod and allows governor oil to be ported from the propeller. The combined force of the counterweights and feathering spring moves the blades to the feather position.

(3) The time necessary to feather the propeller is dependant on the size of the oil passage from the propeller to the engine and the force exerted by the spring and counterweights. The feathering process is normally accomplished within three to ten seconds.

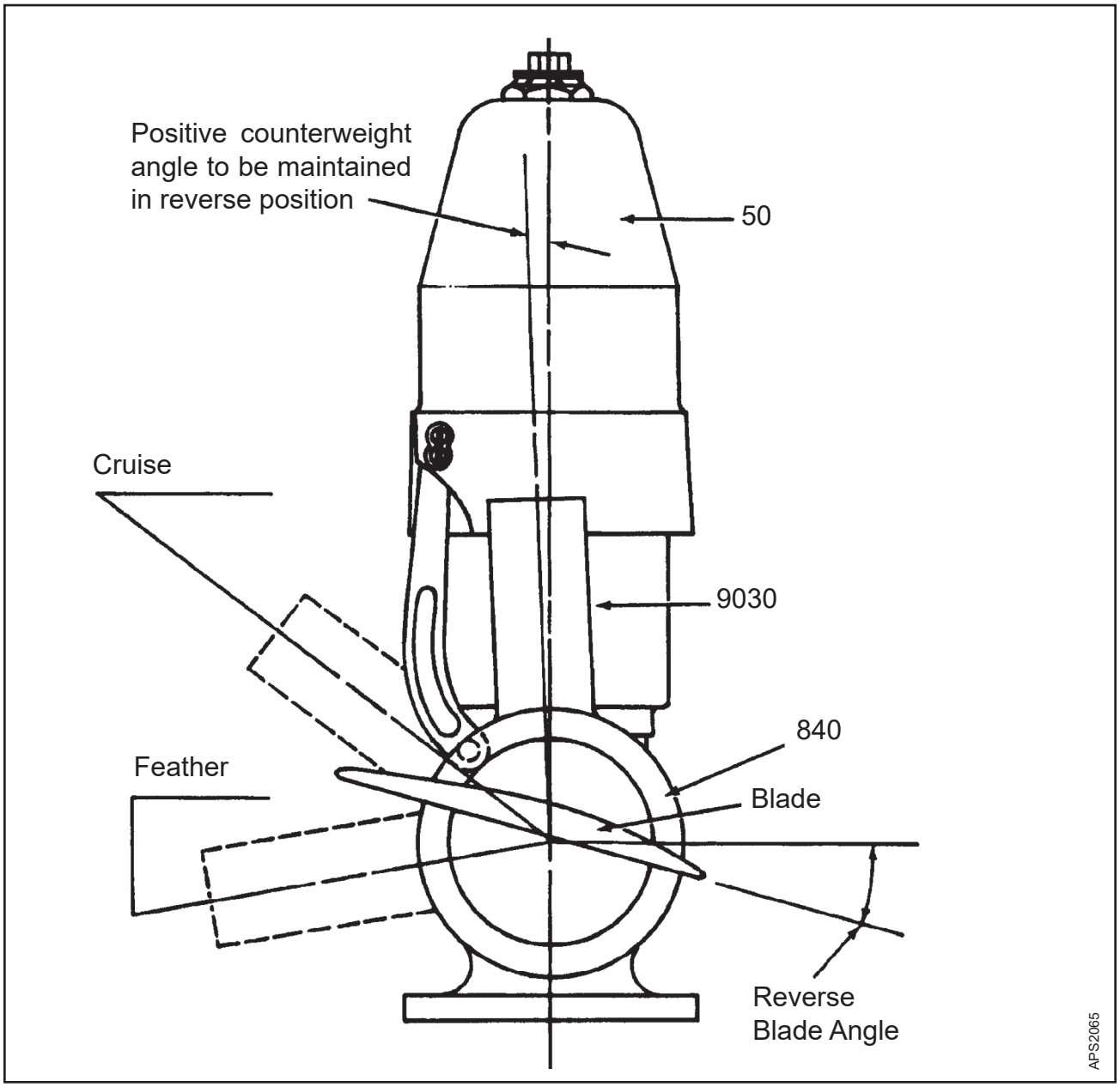
(4) Unfeathering the propeller is accomplished by repositioning the governor control to the normal flight range. The engine is restarted and after several revolutions the governor increases oil pressure and moves the blades out of the feather position.

(5) The -2 steel hub turbine propeller models are constant speed feathering.

C. Constant Speed Reversing

(1) Constant speed reversing assemblies are feathering propellers that allow increased blade angle travel into the reverse pitch range. Refer to Figure 1. Also, a hydraulic low pitch stop is introduced.

(2) The hydraulic low pitch stop prevents the pitch from entering the reverse range unless commanded. This unit consists of a beta valve that eliminates governor oil to the propeller when the pitch reaches the low position. The beta valve is actuated by a linkage connected to the piston.




**Counterweight and Blade Location on a Steel Hub Assembly in Reverse Pitch**
**Figure 1**

(3) The -3, -5, and -7 steel hub turbine propeller models are constant speed feathering and reversing.

(a) The beta feedback linkage for the -3 model is external to the propeller hub. Linear motion is transmitted from the rotating hub to the fixed engine by the collar and carbon block assembly.

(b) The beta feedback linkage for the -5 and -7 models has a beta tube mounted concentric with the propeller shaft that serves as an oil passage.

3. Model Designation System

A. Propeller Model Designation

(1) Hartzell Propeller Inc. uses a model number designation system to identify specific propeller and blade assemblies. An example model number would be HC-B5MP-3A/M10282A+6, with the slash mark separating the propeller designation from the blade designation.

(2) The propeller model number is impression stamped on the propeller hub. The blade model number is impression stamped on the butt end of the blade, as well as identified by a label on the cylinder.

(3) For additional information about the model designation system, refer to Hartzell Propeller Inc. Application Guide Manual 159 (61-02-59) or the applicable owner's manual.

B. Blade Shank Designation

(1) For more information about blade shank designs, refer to Hartzell Propeller Inc. Aluminum Blade Overhaul Manual 133C (61-13-33) or Composite Blade Overhaul Manual 135F (61-13-35).

C. Conversion From V-shank to MV-shank

(1) V-shank models, which have double-shoulder configuration, have additional repetitive inspections required by Airworthiness Directive 97-18-02.

(2) MV-shank models, which have a single-shoulder configuration, are not affected by the Airworthiness Directive.

(3) V-shank blades can be converted to MV-shank to avoid the inspections required by the Airworthiness Directive.

(a) After conversion, the propeller model number changes to reflect the conversion. For example, HC-A3VF-7/V8433N becomes HC-A3MVF-7/MV8433N.

## TESTING AND FAULT ISOLATION - CONTENTS



## LIST OF ILLUSTRATIONS

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1. Troubleshooting Guide

CAUTION: INSTRUCTIONS AND PROCEDURES IN THIS CHAPTER MAY INVOLVE PROPELLER CRITICAL PARTS. REFER TO THE INTRODUCTION CHAPTER OF THIS MANUAL FOR INFORMATION ABOUT PROPELLER CRITICAL PARTS. REFER TO THE ILLUSTRATED PARTS LIST IN THIS MANUAL FOR IDENTIFICATION OF PROPELLER CRITICAL PARTS.

The purpose of this chapter is to isolate probable causes and suggest remedies for common propeller service problems. In all cases, the remedy for a problem should follow the procedures detailed in the applicable section of this manual.

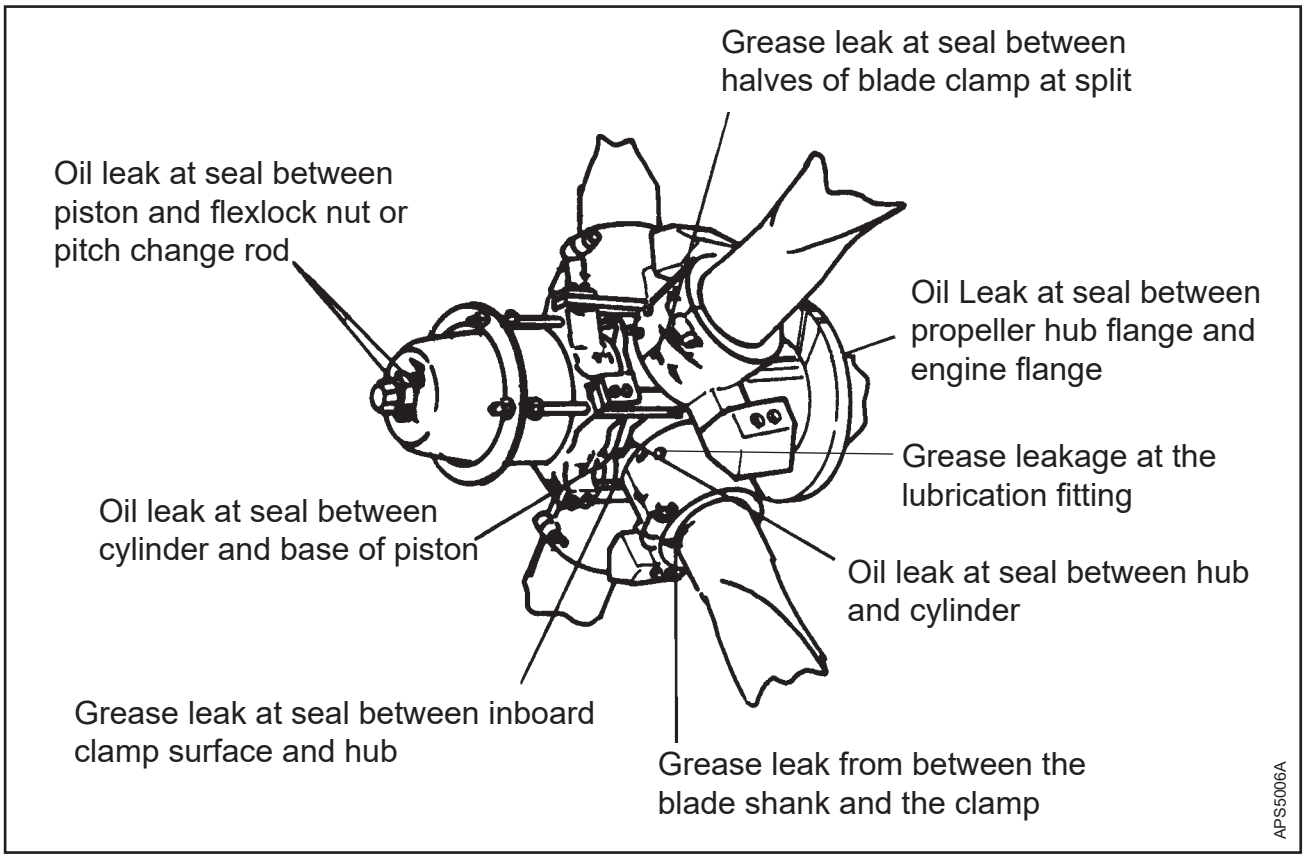
| Problem | Probable Cause | Remedy |
|---|---|---|
| A. Excessive Friction in Hub Mechanism | Lack of blade thrust bearing lubrication. | Add approved grease to the blade clamp lubrication fittings in accordance with Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02). |
| | Piston O-ring is causing excessive friction. | Replace the piston O-ring. |
| | Piston phenolic bushing is scraping against the wall of the cylinder. | Visually examine the ID of the phenolic bushing. Refer to the serviceable limits in the Check chapter of this manual. |
| | | Visually examine the roundness of the bushing. Follow replacement procedure, if necessary. |
| | | Visually examine the OD of the cylinder. Refer to the dimensional limits in accordance with the Chromium Replating chapter of Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02). Follow the cylinder replacement procedure, if necessary. |
| | | Remove any evidence of wear or chafing on the cylinder. Follow the repair procedure, or replace if necessary. |

## TROUBLESHOOTING GUIDE

| Problem | Probable Cause | Remedy |
|---|---|---|
| A. Excessive Friction in Hub Mechanism, continued | Blade O-ring is not allowing the clamp and blade to rotate freely on the hub. | Disconnect the blade clamp from the piston by removing the piston link pin. The clamp and blade should rotate on the hub with light to moderate hand pressure. If not, replace the C-3317-232 blade O-ring with a C-3317-231 O-ring. If there is still friction, replace the O-ring with a C-3317-230 O-ring. |
| | Balls in the blade split-bearing are unusually rough, corroded, or chipped. | Replace the blade split-bearing assembly. |
| | Insufficient clearance between various moving parts in the pitch change mechanism. | Check moving parts individually for interference, and establish correct clearances as specified in this manual. |
| | The pilot tube has slipped out slightly and is rubbing hard against the end of the cavity in the blade. | Follow the "Disassembly" procedure for the hub unit to expose the hub arm and pilot tubes.<br>Inspect each pilot tube for wear and length of protrusion from the hub arm, as specified in Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02). Replace the pilot tube, as required. |
| B. Failure to Feather | Excessive Friction in moving parts. | Refer to problem A. "Excessive Friction in Hub Mechanism". |
| | Feathering spring is broken. | Replace the feathering spring. |
| C. Failure to Change Pitch (Sluggish RPM change to increase or decrease) | Excessive friction in moving parts. | Refer to problem A. "Excessive Friction in the Hub Mechanism" and problem B. "Failure to Feather".<br>NOTE: Isolate the friction in each blade by uncoupling the piston from each link arm and testing each blade individually before disassembling the propeller. |
| | Oil passages are not clear and open. | Inspect the hydraulic system. |

## TROUBLESHOOTING GUIDE

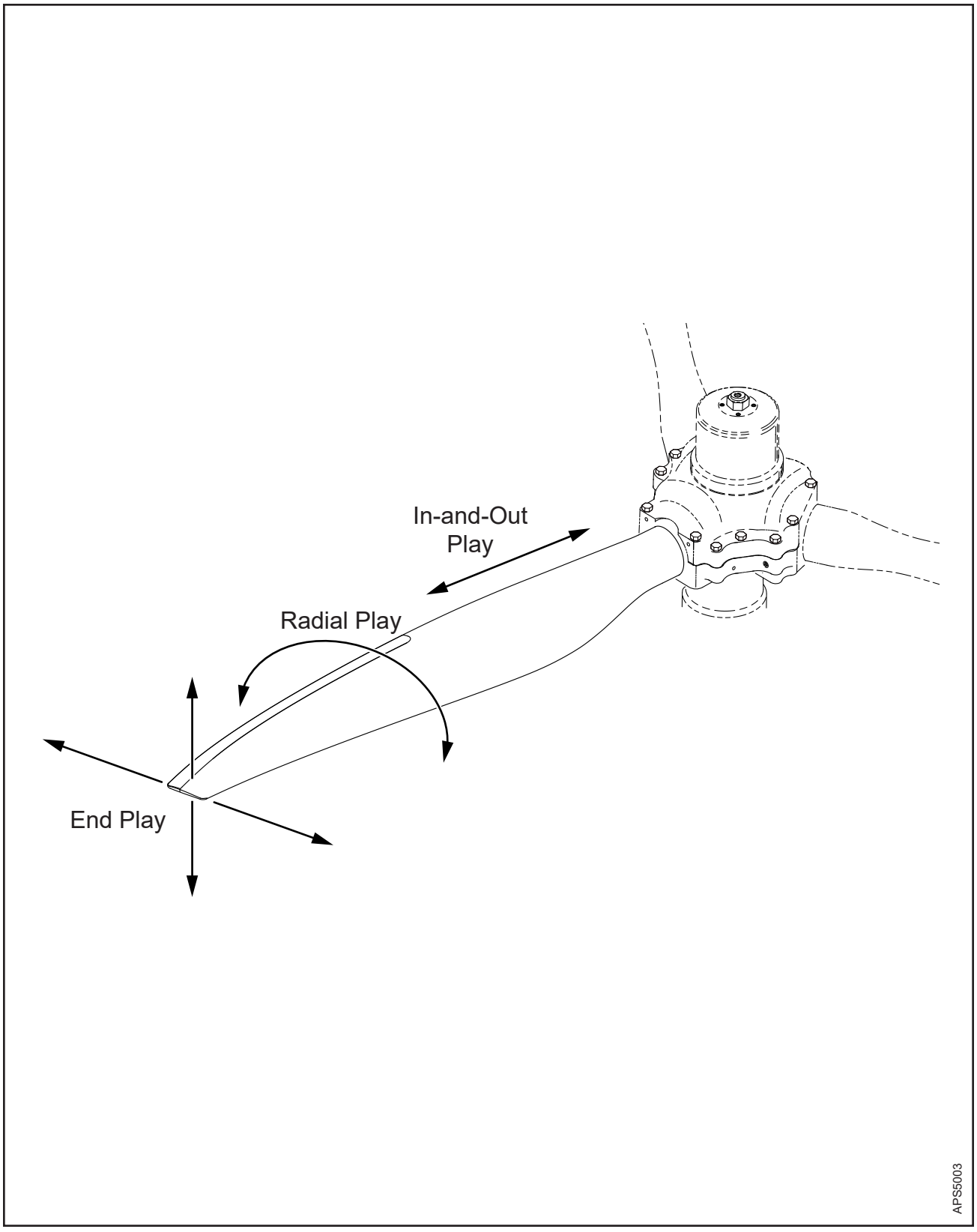
| Problem | Probable Cause | Remedy |
|---|---|---|
| D. Surging RPM or Torque | Excessive friction in the pitch change mechanism. | Refer to problem A. "Excessive Friction in the Hub Mechanism". |
| | Air is trapped in the propeller actuating piston or in the engine shaft. | The engine should have a provision for allowing trapped air to escape from the hydraulic system during one-half of the pitch cycle. |
| | | Before each flight, exercise the propeller by changing pitch or feathering. |
| | The socket head cap screw in the guide collar is too tight. | Loosen the socket head cap screw to the minimum torque. |
| E. Propeller Windmills in Excess of Airframe Manufacturer's Specifications | Incorrect feather blade angle. | Refer to the section, "Setting Feather Angle of Blades" in the Assembly chapter of this manual. |




**Checking for Oil and Grease Leaks**
**Figure 1-1**

## TROUBLESHOOTING GUIDE

| Problem | Probable Cause | Remedy |
|---|---|---|
| F. Oil Leakage<br>Refer to Figure 1-1. | Faulty O-ring between the propeller hub and the engine. | Remove the propeller from the engine and inspect the O-ring and surfaces it seals. Replace defective O-ring. |
| | Faulty O-ring seal between the piston and cylinder. | Remove the piston and inspect the O-ring and surfaces it seals. Replace defective O-ring.<br>Replace or repair the cylinder if its surface is scratched or gouged in the area where the O-ring slides. |
| | Faulty O-ring seal between the piston and the pitch change rod. | Remove the piston and inspect the O-ring and surfaces it seals. Replace defective O-ring. |
| | Felt seal is displaced, improperly torqued, or loose lubrication fitting. | Replace the felt seal. |
| | Faulty O-ring seal between the hub and cylinder. | Disassemble the propeller and inspect the O-ring and the surfaces it seals. Replace defective O-ring.<br>When replacing the O-ring, use approved hydraulic sealant adhesive CM134 on the O-ring groove of the hub at the top of the cylinder mounting threads. |
| | Faulty Piston (oil leaks through the wall of the piston). | Replace the piston. |




**Checking Blade Play**
**Figure 1-2**

## TROUBLESHOOTING GUIDE

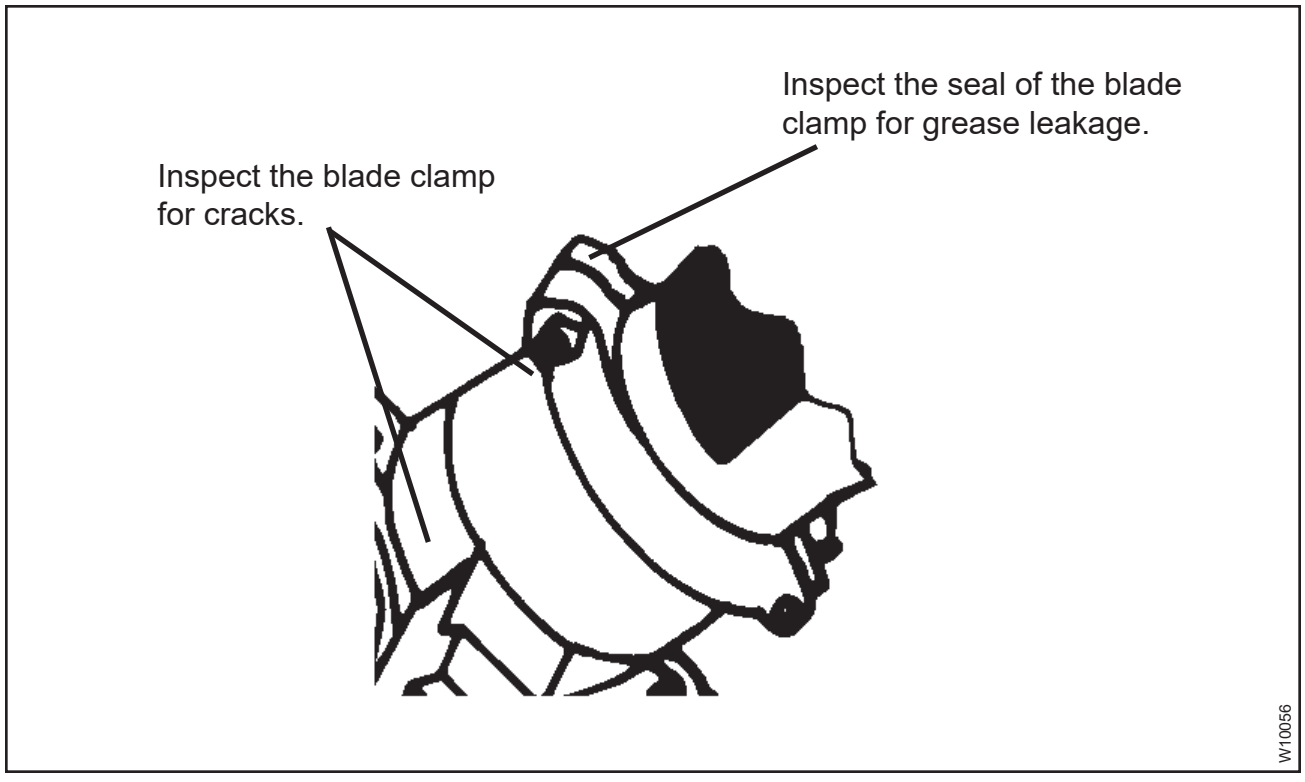
| Problem | Probable Cause | Remedy |
|---|---|---|
| G. Grease Leakage<br>Refer to Figure 1-1.<br>NOTE: The blade clamp/split-bearing is the only source for grease leakage. | Improperly torqued or loose lubrication fitting. | Torque the lubrication fitting in accordance with the Torque Values table in the Installation and Removal chapter of Hartzell Propeller Inc. Owner's Manual 139 (61-00-39). |
| | Defective lubrication fitting. | Replace defective lubrication fitting.<br>Replace missing lubrication fitting caps. |
| | Grease leaks past the blade clamp half seal gaskets. | Remove the blade clamp bolts and replace the gaskets, sealant CM93, and gasket compound CM46. |
| | Grease leaks from between the blade and clamp. | Remove the blade clamp. Add approved gasket compound CM46 in the radius of the blade. Replace clamp sealant CM93 and the blade clamp-half seal gasket, if necessary. |
| | Defective O-ring between the blade clamp and hub (leaks when propeller is stopped). | Disassemble the blade clamp and inspect the O-ring and surfaces it seals. Replace defective O-ring. |
| H. End Play (Leading Edge to Trailing Edge) in the Blade<br>Refer to Figure 1-2. | Hub pilot tube is worn or blade alignment bearings are worn. | Refer to Table 8-2, "Blade Tolerances" in the Fits and Clearances chapter of this manual for leading edge to trailing edge play limits.<br>Inspect the pilot tube and blade alignment bearings for wear or damage and replace as necessary. |
| I. End Play (Fore-and-Aft) in the Blade<br>Refer to Figure 1-2. | Hub pilot tube is worn or blade alignment bearings are worn. | Refer to Table 8-2, "Blade Tolerances" in the Fits and Clearances chapter of this manual for fore-and-aft play limits.<br>Inspect the pilot tube and blade alignment bearings for wear or damage and replace as necessary. |

## TROUBLESHOOTING GUIDE

| Problem | Probable Cause | Remedy |
|---|---|---|
| J. In-and-Out Play in the Blade<br>Refer to Figure 1-2. | Excessive wear to blade thrust split bearing or balls. | Refer to Table 8-2, "Blade Tolerances" in the Fits and Clearances chapter of this manual for in-and-out play limits.<br>Disassemble the propeller and replace parts as necessary. |
| K. Blades Not Tracking | Ground strike damage. | Refer to the appropriate blade overhaul manual for repair or replacement procedure.<br>Refer to the Special Inspections chapter of Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02). |
| | Hub pilot tube(s) distorted. | Do the pilot tube replacement procedure. Refer to the Steel Hub Overhaul chapter of Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02). |
| | Blade face(s) out of alignment. | Refer to the applicable blade overhaul manual for repair or replacement procedure. |
| L. Radial Play in the Blade<br>Refer to Figure 1-2. | Wear in link arm screw hole or pin hole. | Refer to Table 8-2, "Blade Tolerances" in the Fits and Clearances chapter of this manual for radial play limits. |
| M. Blade Slippage in Blade Clamp | Not enough clamping action. | Increase clamping action as necessary. Refer to the Clamp Overhaul chapter of Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02) for blade clamp rework. |

## TROUBLESHOOTING GUIDE

| | Problem | Probable Cause | Remedy |
|---|---|---|---|
| N. | Excessive Propeller Vibration<br>Refer to Figure 1-3. | Blade aerodynamic imbalance due to excessive differences in blade-to-blade angles. | Do the blade-to-blade angle checks at the set up blade radius, at a blade radius six inches inboard of the set up blade radius, and at a blade radius six inches outboard of the set up blade radius.<br>If any blade is consistently high or low at all three locations, rotate the blade(s) in the clamp(s) to minimize blade angle variance, and recheck the blade-to-blade angles. |
| | | Bent, cracked, or damaged blade. | Refer to the appropriate Hartzell Propeller Inc. Blade Overhaul manual. |
| | | Link arm holes are worn. | Inspect the link arm and replace as necessary. |




**Abnormal Vibration**
**Figure 1-3**

## TROUBLESHOOTING GUIDE

| Problem | Probable Cause | Remedy |
|---|---|---|
| N. Excessive Propeller Vibration, continued | Link arm is disconnected from the piston. | Threads in the link pin unit safety screw hole are worn or damaged. Repair threads. Refer to the Repair chapter of this manual. |
| | Blade slipped in clamp. | Inspect blade-to-blade angles. Reset angles in accordance with the Assembly chapter of this manual. |
| | Cracked blade clamp (grease leaking from a seemingly solid surface). | Inspect the blade clamp (visual, magnetic particle, etc.) and replace defective part. |
| | Cracked or damaged hub. | Refer to the Steel Hub Overhaul chapter of Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02). |

2. Lightning Strike on Hub or Blade (Rev. 2)

A. Before Further Flight

(1) In the event of a propeller lightning strike, an inspection is required before further flight.

(a) A lightning strike on the propeller usually leaves arcing damage on the hub or blade, as evidence of where it entered or left the propeller.

(b) Refer to the Special Inspections chapter of Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02) for lightning strike inspection criteria.

## AUTOMATIC TEST REQUIREMENTS (NOT APPLICABLE) (Rev. 1)

NOTE: In accordance with ATA iSpec 2200 specification this space is reserved for automatic test requirements. Such requirements are not applicable to the Hartzell Propeller Inc. propellers included in this manual.

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## DISASSEMBLY - CONTENTS



## LIST OF FIGURES

LIST OF FIGURES, CONTINUED

WARNING: ADHESIVES AND SOLVENTS ARE FLAMMABLE AND TOXIC TO THE SKIN, EYES, AND RESPIRATORY TRACT. SKIN AND EYE PROTECTION ARE REQUIRED. AVOID PROLONGED CONTACT AND BREATHING OF VAPORS. USE SOLVENT RESISTANT GLOVES TO MINIMIZE SKIN CONTACT AND WEAR SAFETY GLASSES FOR EYE PROTECTION. USE IN A WELL VENTILATED AREA AWAY FROM SPARKS AND FLAME. READ AND OBSERVE ALL WARNING LABELS.

CAUTION: INSTRUCTIONS AND PROCEDURES IN THIS CHAPTER MAY INVOLVE PROPELLER CRITICAL PARTS. REFER TO THE INTRODUCTION CHAPTER OF THIS MANUAL FOR INFORMATION ABOUT PROPELLER CRITICAL PARTS. REFER TO THE ILLUSTRATED PARTS LIST IN THIS MANUAL FOR IDENTIFICATION OF PROPELLER CRITICAL PARTS.

1. Important Information (Rev. 3)

A. Removing the Propeller

(1) Remove the propeller from the aircraft in accordance with the applicable Hartzell Propeller Inc. Owner's manual.

B. Record Serial Numbers/Blade Location Before Disassembly

(1) Make a record of the serial number and model number of the hub, blades, and any other serial-numbered parts and compare with the data in the propeller logbook.

(a) For the location of the serial number on the hub, refer to the Parts Identification and Marking chapter of Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02).

CAUTION 1: DO NOT ETCH, SCRIBE, PUNCH MARK, OR SIMILARLY IDENTIFY PARTS IN ANY MANNER THAT MAY BE HARMFUL TO THE STRENGTH OR FUNCTION OF THE PROPELLER.

CAUTION 2: GRAPHITE ("LEAD") PENCIL MARKS WILL CAUSE CORROSION. ALL MARKS MADE ON PARTS MUST BE MADE WITH A CRAYON OR SOFT, NON-GRAPHITE PENCIL SUCH AS CM162.

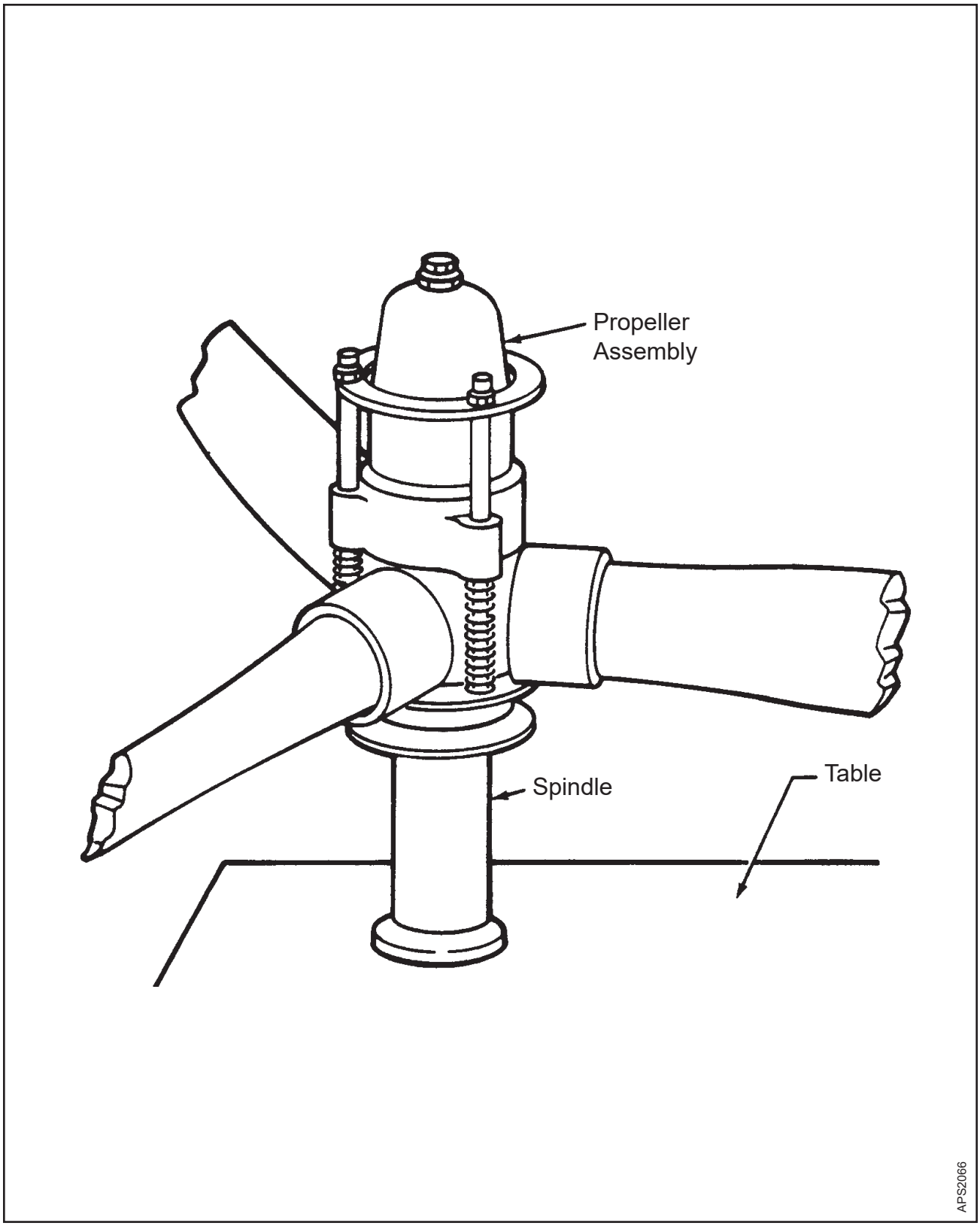
(2) Before disassembly, use a crayon or soft, non-graphite pencil such as CM162 to number the blades counterclockwise from the propeller serial number impression stamped on the propeller hub unit.

(a) Make a record of each blade serial number and the hub socket/arm from which it was removed.

C. Ice Protection System (if applicable)

(1) If the propeller is equipped with an ice protection system supplied by Hartzell, refer to Hartzell Propeller Inc. Ice Protection System Manual 180 (30-61-80) for technical information about the applicable ice protection system:

(2) If the propeller is equipped with an ice protection system not supplied by Hartzell Propeller Inc., refer to the applicable TC or STC holder's Instructions for Continued Airworthiness (ICA) for technical information about the applicable ice protection system.




**Steel Hub Assembly Mounted on the Propeller Assembly Table**
**Figure 3-1**

WARNING: THE USE OF BLADE PADDLES TO MOVE BLADES CAN RESULT IN THE OVERLOAD AND DAMAGE OF THE BLADE PITCH CHANGE MECHANISM. THIS DAMAGE IS NOT REPAIRABLE AND CAN RESULT IN SEPARATION BETWEEN THE BLADE AND THE PITCH CHANGE MECHANISM, CAUSING LOSS OF PITCH CONTROL DURING FLIGHT.

CAUTION 1: INSTRUCTIONS AND PROCEDURES IN THIS CHAPTER MAY INVOLVE PROPELLER CRITICAL PARTS. REFER TO THE INTRODUCTION CHAPTER OF THIS MANUAL FOR INFORMATION ABOUT PROPELLER CRITICAL PARTS. REFER TO THE ILLUSTRATED PARTS LIST IN THIS MANUAL FOR IDENTIFICATION OF PROPELLER CRITICAL PARTS.

CAUTION 2: USE COMPRESSED AIR THAT HAS BEEN FILTERED FOR MOISTURE, OR NITROGEN TO ACTUATE THE PROPELLERS.

CAUTION 3: DO NOT USE MORE THAN 200 PSI (13.78 BARS) OF PRESSURE WHEN ACTUATING PROPELLERS INCLUDED IN THIS MANUAL.

CAUTION 4: USE SUFFICIENT PRESSURE TO MAKE SURE THAT THE PROPELLER ACTUATES AGAINST EACH POSITIVE STOP.

2. Propeller Disassembly

A. Disassembly of Propeller Models HC-B3TN-2( )
Refer to the applicable Illustrated Parts List exploded view.

(1) Bulkhead Removal

(a) Remove and discard the nuts, washers, and hex head bolts (870) that attach the bulkhead to the spinner mounting plate (380).

(b) Mount the propeller assembly on the rotatable fixture on the propeller assembly table. Refer to Figure 3-1.

CAUTION: DO NOT PERMIT THE PITCH CHANGE ROD TO TURN WHILE THE NUT IS BEING REMOVED.

(c) Using a 1-7/16 inch wrench and a 5/8 inch socket wrench, remove and discard the large self-locking nut (10) on the end of the pitch change rod (1410). Refer to Figure 3-2.

CAUTION: DO NOT USE A BLADE PADDLE TO TURN THE BLADES.

(d) Turn blades by hand from feather or high pitch to the lowest pitch attainable. Do not use blade paddle.

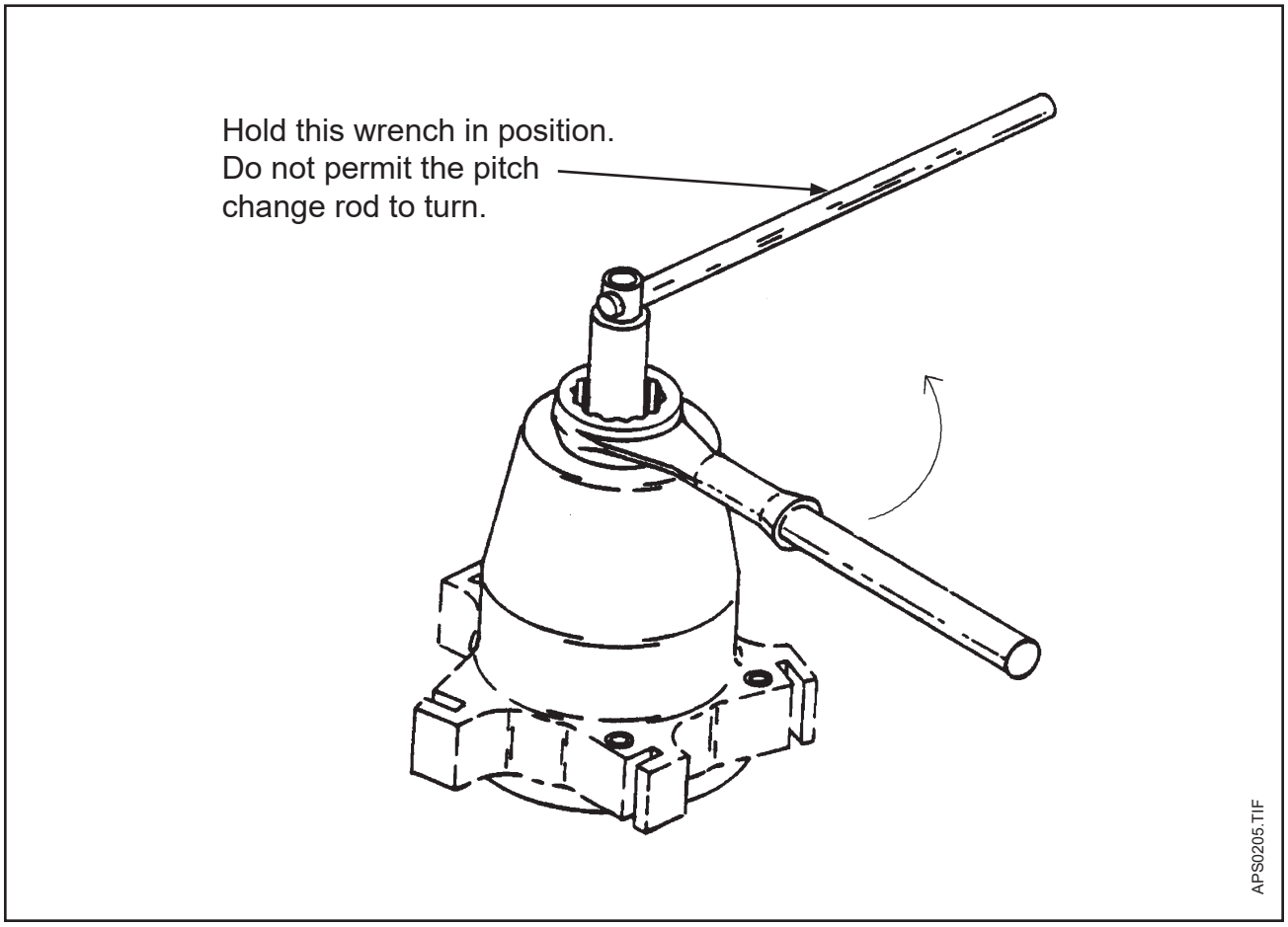
(e) Remove and discard all link pin units (80) and safety screws (90).

(f) Disconnect and remove the link arms (70) from the piston unit (50).

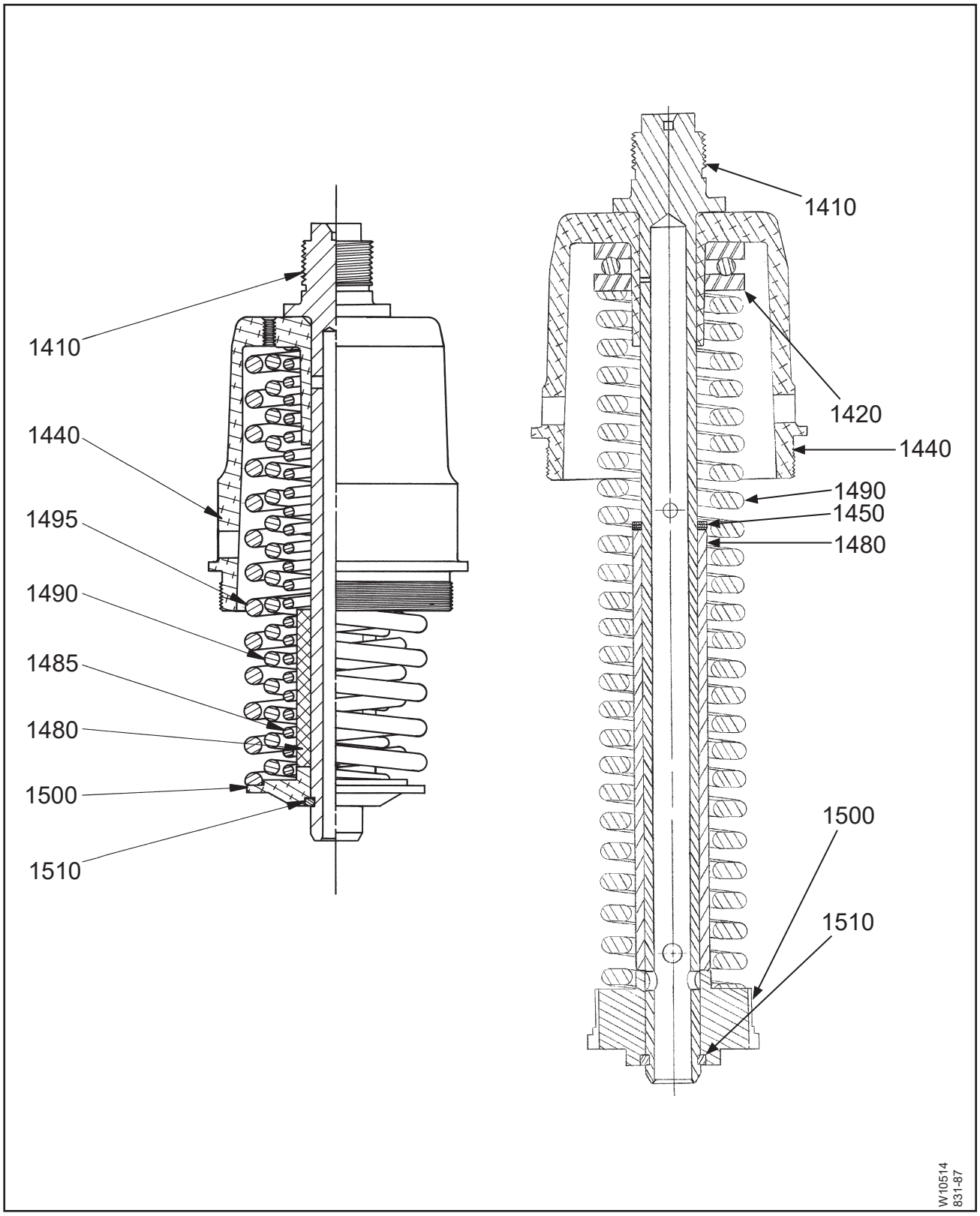
(g) Remove the piston unit (50).

(h) Remove and discard the piston O-ring (160) and the piston dust seal (170).

(i) Remove and discard the pitch change rod O-ring (150).




**Removing Self-locking Nut**
**Figure 3-2**




**Examples of a Feathering Spring Assembly**
**Figure 3-3**

WARNING: THE FEATHERING SPRING ASSEMBLY IS PRELOADED TO APPROXIMATELY 1000 POUNDS (454 KG) FORCE. USE EXTREME CAUTION WHEN REMOVING IT FROM THE PROPELLER.

(2) Feathering Spring Disassembly
Refer to Figure 3-3.

NOTE: Refer to applicable spring assembly illustration in the Illustrated Parts List chapter of this manual.

(a) Remove and discard the feathering stop screws (180).

(b) Remove the safety wire from the spring retainer cup.

(c) Using spanner wrench TE148 or locally procured strap wrench, unscrew the spring retainer cup (1440).

(d) Remove the feathering spring assembly, and use the bench top fixture TE59 or equivalent, to compress the spring for disassembly.

(e) Remove and discard the split keeper (1510).

(f) Permit the feathering spring assembly to expand to its unloaded length and remove it from the special fixture.

(g) Remove the rear spring retainer (1500).

(h) Remove rear spring support, as applicable.

(i) Remove the feathering compression spring(s) (1490 or 1485, 1490, and 1495).

(j) Remove the spring spacer tube (1480).

(k) Remove spring spacers (1450), as applicable.

1 If the spacer is a sleeve, keep and use it again.

2 If washers are used as a spacer:

a Make a record of the number of washers that were used

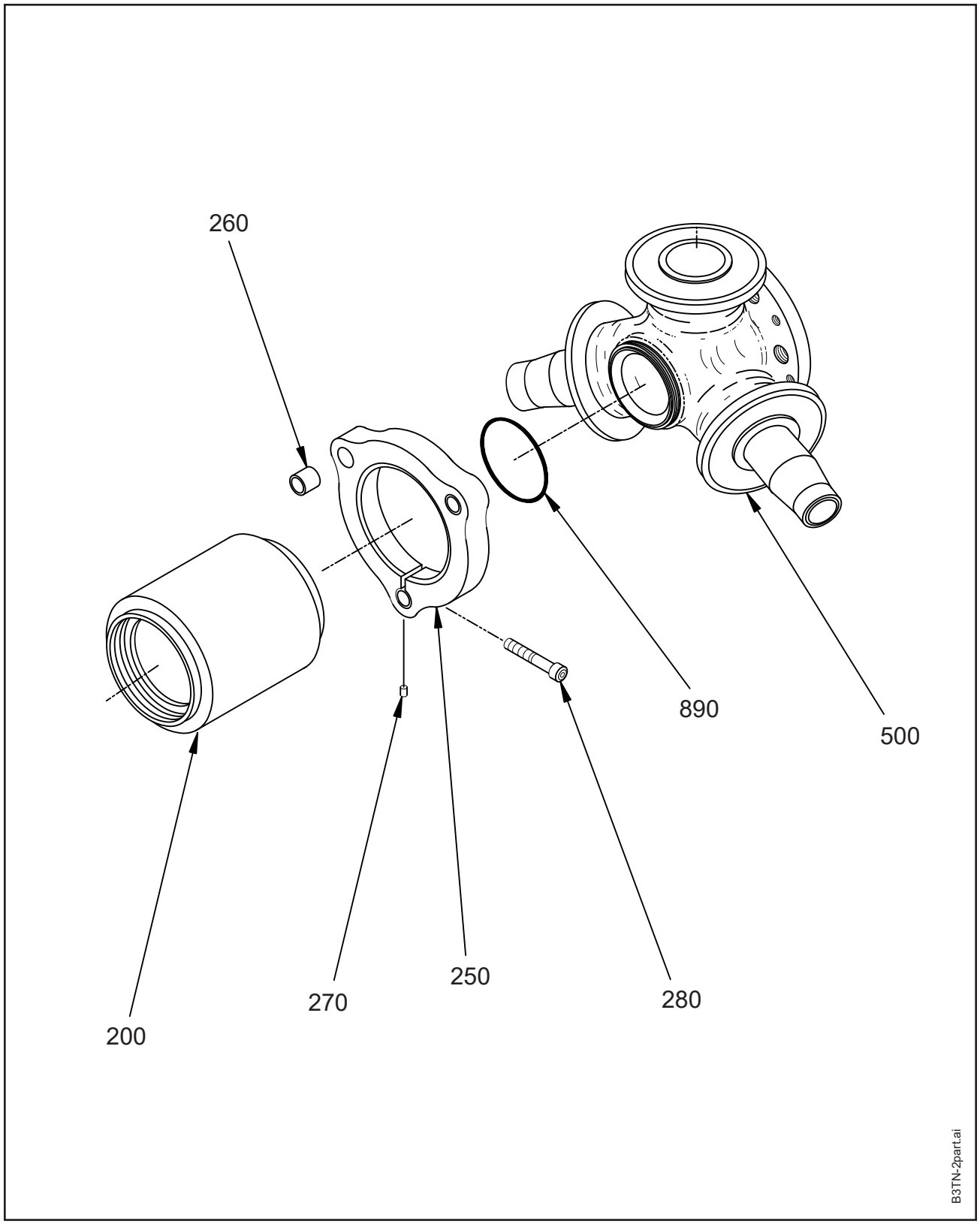
b Discard the washers

c Replace the washers with the same number of new washers

(l) Remove the spring retainer cup (1440), as applicable.

(m) Remove the ball thrust bearing (1420), as applicable.

(n) Remove the pitch change rod (1410).




**Cylinder and Guide Collar**
**Figure 3-4**

(3) Cylinder and Guide Collar Unit Disassembly

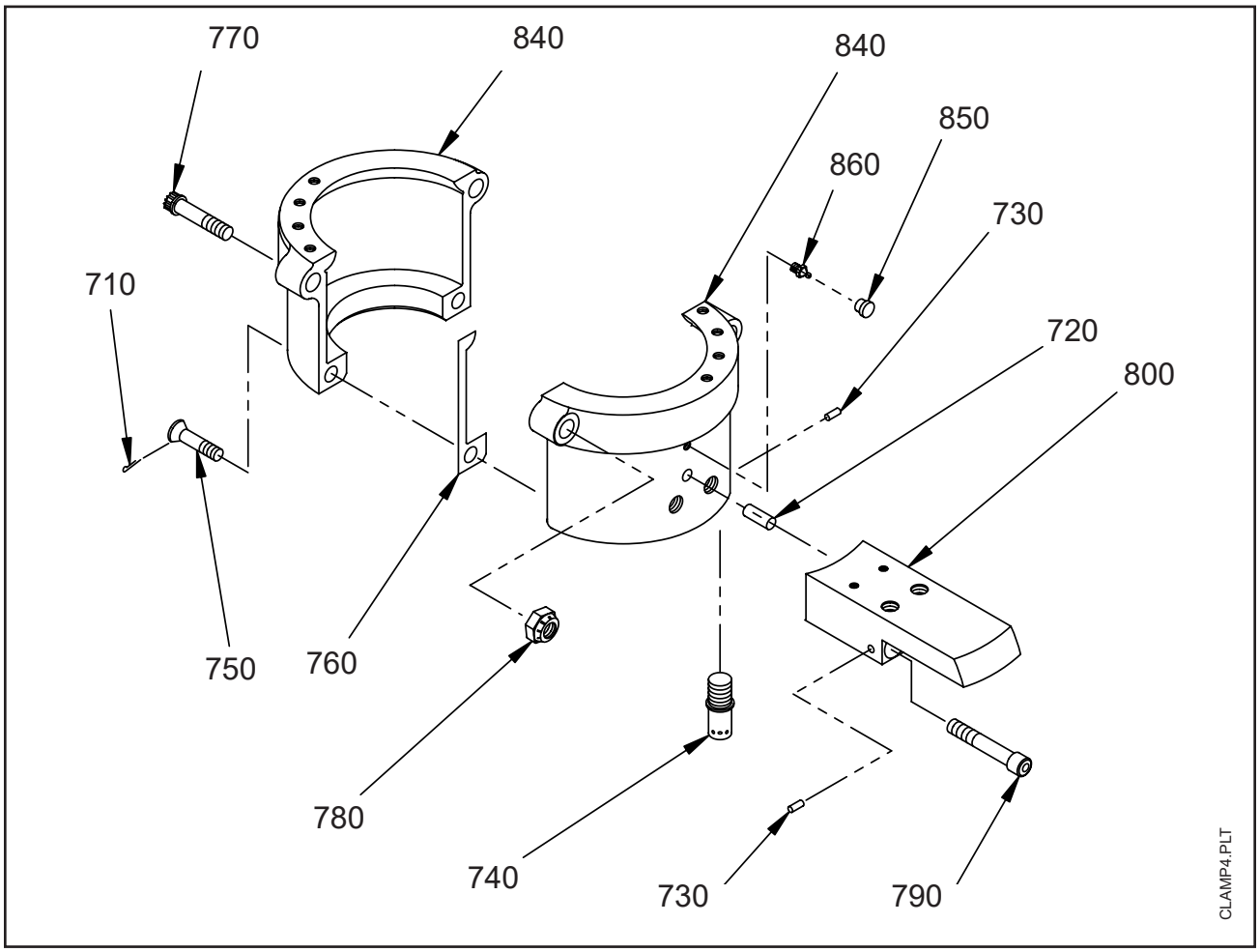
(a) Remove and discard the socket head cap screw (280) inside the guide collar unit (240). Refer to Figure 3-4.

CAUTION: UNSCREW THE CYLINDER SLOWLY AND CAREFULLY TO AVOID DAMAGE TO THE THREADS.

(b) Use a square bar of appropriate size, one inch wide (25.4 mm), to fit into the slot in the top of the cylinder (200) and serve as a wrench to slowly unscrew the cylinder from the hub (500). Remove the cylinder from the hub (500).

(c) Remove the guide collar unit (240).

(d) Remove and discard the cylinder O-ring (890).




**Clamp Assembly**
**Figure 3-5**

(4) Clamp and Counterweight Disassembly
Refer to Figure 3-5.

(a) Use a round bottom metal stamp or electric pencil and identify clamp serial number on each corresponding counterweight (800).

(b) Remove and discard all outboard clamp bolts (770) and nuts (780).

(c) Remove and discard all inboard clamp socket screws (750) and cotter pins (710) or safety wire.

(d) Remove all clamp halves (840) from the hub arms.

1 For information about clamp inspection and repair, refer to the Clamp Overhaul chapter of Hartzell Propeller Standard Practices Manual 202A (61-01-02).

(e) Remove and discard the clamp gaskets (760).

(f) Remove all balance weights (640) and attaching screws, where applicable.

1 Discard the screws.

(g) Remove and discard all lubrication fittings (860) and lubrication fitting caps (850).

(h) Remove and discard the hex head bolts (9050) from the counterweight slugs (9040), where applicable.

1 Remove the counterweight slugs (9040).

(i) Disengage the link arms (70) from the link screws (740) by removing the cotter pin (670) from the link screws (740).

(j) Discard the link screws (740).

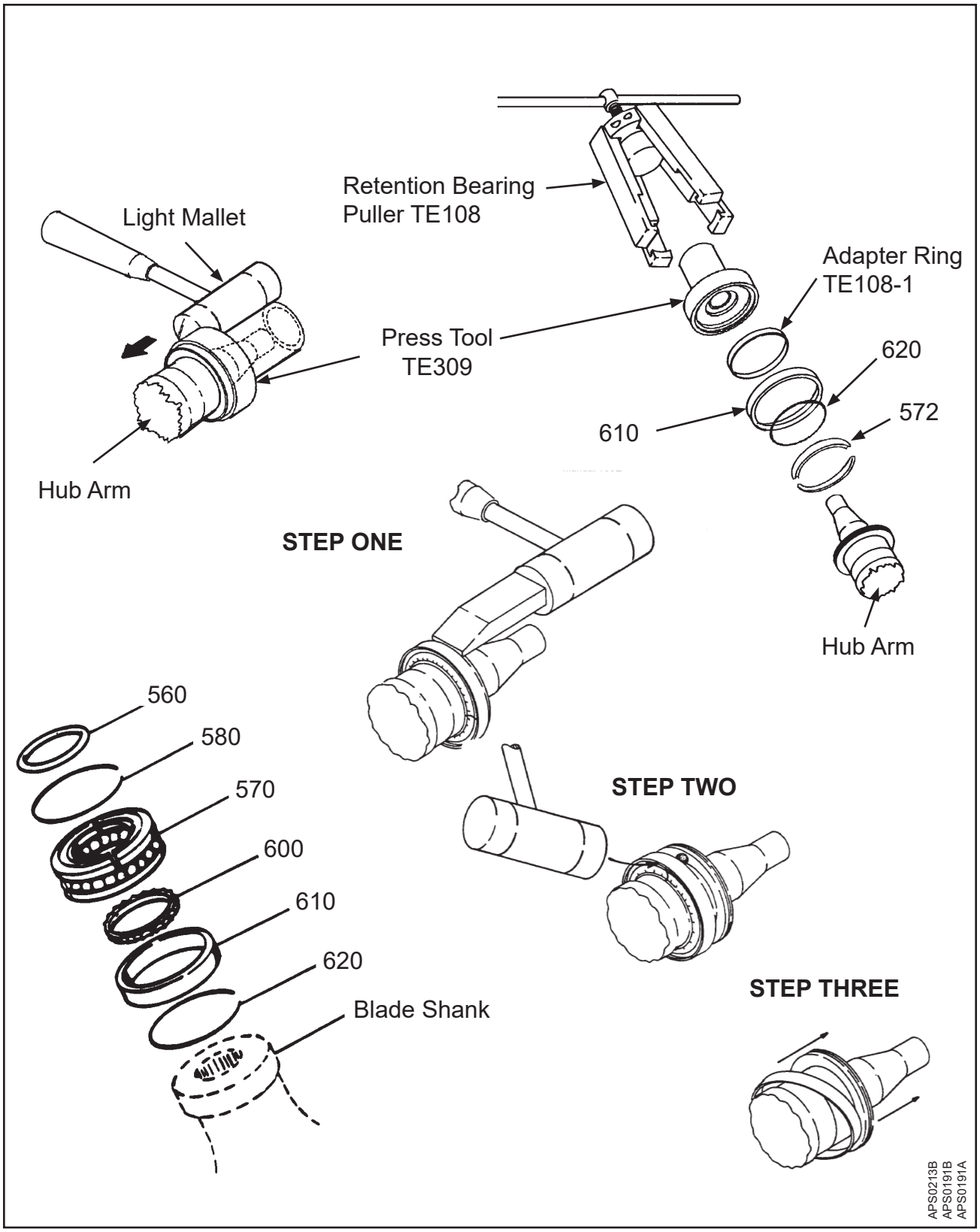
(k) Discard the link screw sleeves (230).

(l) Discard the cotter pins (670).

(m) Remove each blade assembly from the hub (500).

1 Make a record of each blade serial number and its matching hub arm and clamp.

2 If possible, install each blade assembly on the same hub arm from which it was removed.




**Removal of an A-1852 Bearing Retaining Ring**
**Figure 3-6**

(5) Blade and Flange Mounting Parts Disassembly

(a) Beginning with blade position number one, remove and discard the bearing wire retainer (580) from its groove in the hub-side race (571) of the blade retention bearing (570).

(b) Remove the two halves of the hub-side race (571).

(c) Remove and discard the ball spacer (600) and bearing balls (590).

(d) Clip, remove, and discard the blade O-ring (560).

(e) Remove the bearing retaining ring (610). Refer to Figure 3-6, Step One.

1 Option 1: Using a mallet and TE309, drive the bearing retaining ring (610) inboard over the shoulder of the hub arm.

2 Option 2: Using a mallet and soft punch at several positions on the outboard edge of the bearing retaining ring (610), drive the ring inboard over the shoulder of the hub arm.

(f) Remove and discard the wire ring retainer (620) that had been covered by the bearing retaining ring (610).

(g) Turn the halves of the blade-side race (572) so the split is at the top. Refer to Figure 3-6, Step Two.

(h) At the split, put one of the bearing balls (590) between the blade-side race (572) and the inboard shoulder of the hub arm.

(i) Using a soft mallet, lightly tap the inboard top edge of the bearing retaining ring (610) to release the split outboard race from the bearing retaining ring (610).

(j) Remove the halves of the race as they become separated from the bearing retaining ring (610).

(k) Tilt the bearing retaining ring (610) inboard approximately 45 degrees and remove the bearing retaining ring (610) by sliding it outboard over the shoulder of the hub arm. Refer to Figure 3-6, Step Three.

(6) Hub Unit Disassembly

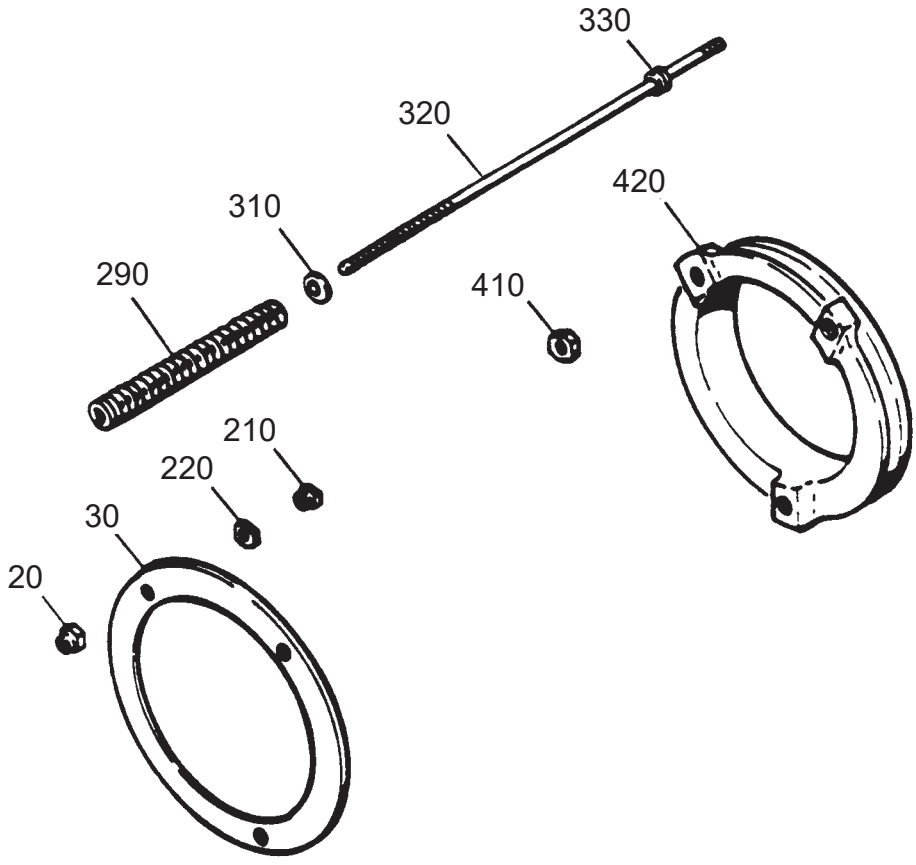
(a) Remove the safety wire from the hex head bolts (360) that attach the spinner mounting plate (380) to the hub unit (500).

(b) Remove and discard the hex head bolts (360).

(c) Remove the spinner mounting plate (380).

(d) For additional hub unit overhaul instructions, refer to the Steel Hub Overhaul chapter of Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02).

Disassembly of the HC-B3TN-2( ) propeller is now complete.




**Beta System**
**Figure 3-7**

B. Disassembly of Propeller Models HC-B(3,4)(MN,TN,TW,MP)-3( )
Refer to the applicable Illustrated Parts List exploded view.

CAUTION: MAKE SURE THE PROPELLER IS IN THE FEATHERED POSITION BEFORE BEGINNING DISASSEMBLY PROCEDURES.

(1) Spinner Bulkhead and Piston Disassembly

(a) Remove and discard the elastic nuts (20) that keep the propeller beta rod support ring (30) in position. Refer to Figure 3-7.

(b) Remove the rod support ring (30).

(c) Remove and discard the propeller beta rod check nuts (220).

(d) Loosen the jam nuts (410) that attach the beta rods (320) to the beta ring (420).

CAUTION: DURING REMOVAL OF BETA RODS, BE CAREFUL NOT TO COCK THE BETA RING AND DAMAGE THE THREADS. TURN RODS OUT OF THE BETA RING TWO TURNS AT A TIME.

(e) Turn the beta rods out of the beta ring, two turns at a time, and remove the beta ring.

(f) Remove and discard the nuts, washers, and fasteners (870) that attach the spinner bulkhead to the spinner mounting plate (380).

(g) If applicable, remove the start lock units (1010) from the spinner mounting plate (380).

(h) Remove the spinner bulkhead.

(i) Install the propeller assembly on the rotatable fixture on the propeller assembly table. Refer to Figure 3-1.

1 Mounting propeller model HC-B(3,4)( )W-3( ) only

NOTE: The spacer (455) must be attached to the hub flange for installation of the propeller on the rotatable fixture of the assembly table.

a If the spacer (455) is not attached to the hub flange, install the spacer in accordance with the "Special Case: When the Blades Have Been Removed for Shipping" section in the Assembly chapter of this manual.

b Install the hub on the rotatable fixture TE125 of the assembly table TE129.

CAUTION: DO NOT USE LOCKING NUTS ON THE MOUNTING STUDS TO SECURE THE HUB TO THE ROTATABLE FIXTURE. REPEATED TORQUE/DRAG WILL WEAKEN THE EPOXY BOND ON THE MOUNTING STUDS, RESULTING POSSIBLE STUD-TO-HUB BOND FAILURE.

c Install non-locking, 9/16-18UNF-3 nuts on the mounting studs (435) to secure the hub to the rotatable fixture.

2 Mounting propeller models -3, -5, and -7 *except* HC-B(3,4)( )W-3( )

a Install the hub on the rotatable fixture TE125 on the assembly table TE129.

(j) Remove and discard the jam nut (410) on the end of each beta rod.

1 Remove and discard the self-locking nut (210) from the opposite end of each beta rod.

CAUTION: DO NOT PERMIT THE PITCH CHANGE ROD TO TURN WHILE THE NUT IS BEING REMOVED.

(k) Use a 1-7/16 inch wrench and a 5/8 inch socket wrench to remove and discard the large self-locking nut (10) on the end of the pitch change rod (1410). Refer to Figure 3-2.

CAUTION: DO NOT USE A BLADE PADDLE TO TURN THE BLADES.

(l) Turn the blades by hand from feather to reverse.

(m) Remove and discard all link pin units (80) and safety screws (90).

(n) Disconnect the link arms (70) from the piston unit (50).

(o) Remove the piston unit (50).

(p) Remove and discard the feathering stop screws (190) from the piston with external feather screws.

(q) Remove and discard the piston O-ring (160) and the piston dust seal (170).

(r) Remove and discard the pitch change rod O-ring (150).

(2) Start Lock Unit Disassembly
Refer to Figure 3-8

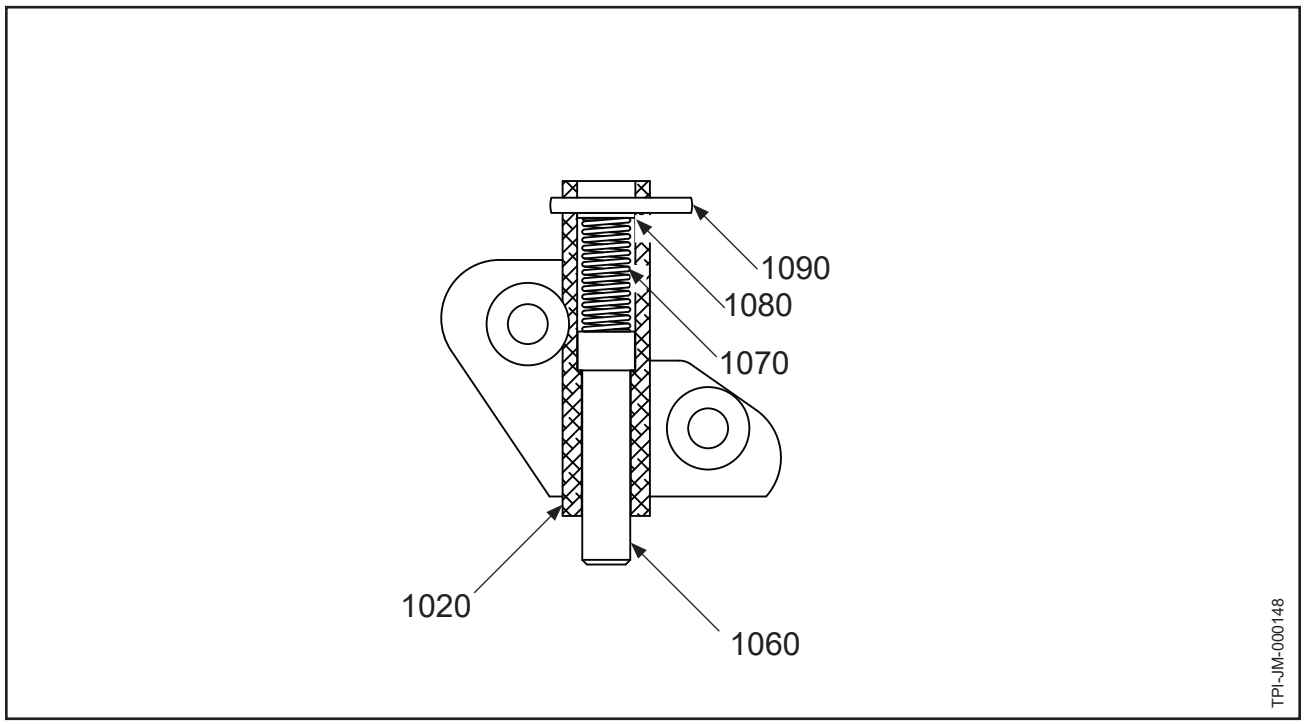
WARNING: THE COMPRESSION SPRING (1070) IS COMPRESSED AND WILL BE RELEASED WHEN THE COTTER PIN (1090) IS REMOVED.

(a) Remove and discard the cotter pin (1090) from the start lock bracket (1020).

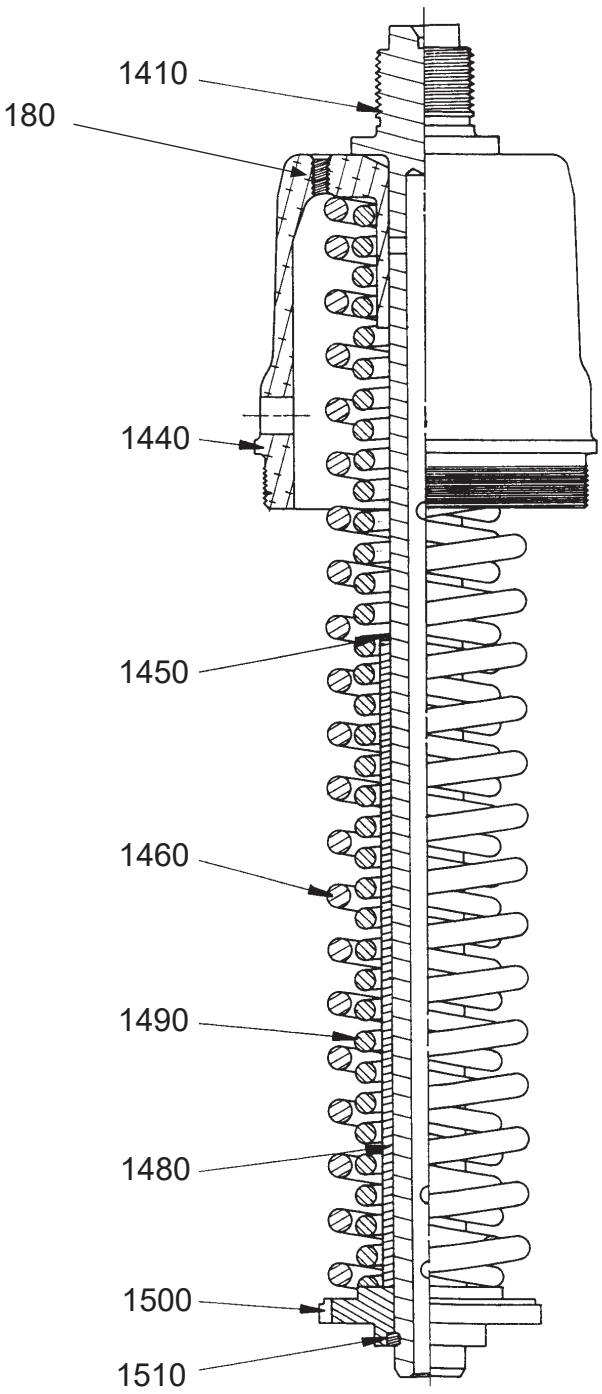
(b) Remove the washer (1080) from the start lock bracket (1020).

(c) Remove and discard the compression spring (1070) from the start lock bracket (1020).

(d) Remove the pin (1060) from the start lock bracket (1020).




**Example of a Start Lock Unit**
**Figure 3-8**




**Example of a Spring Assembly**
**Figure 3-9**

(3) Feathering Spring Disassembly
Refer to Figure 3-9.

WARNING: THE FEATHERING SPRING ASSEMBLY IS PRELOADED TO APPROXIMATELY 1000 POUNDS FORCE. USE EXTREME CAUTION WHEN REMOVING IT FROM THE PROPELLER.

(a) Remove and discard the feathering stop screws (180), if applicable.

NOTE: This step **only** applies to those models with screws on the retainer cup. Refer to the applicable assembly illustration in the Illustrated Parts List.

(b) Remove the safety wire from the spring retainer cup, and use a spanner wrench TE148 or locally procured strap wrench to unscrew the spring retainer cup.

(c) Remove the feathering spring assembly.

1 Using the bench top fixture TE59 or equivalent, compress the spring for disassembly.

(d) Remove and discard the split keeper (1510).

(e) Remove the rear spring retainer (1500), as applicable.

(f) Remove the feathering compression spring(s) (1460, 1490).

(g) Remove the spring spacer tube (1480).

(h) Remove the spring spacers (1450), where applicable.

1 If the spacer is a sleeve, keep and use it again.

2 If washers are used as a spacer,

a Make a record of the number of washers that were used

b Discard the washers

c Replace the washers with the same number of new washers

(i) Remove the front spring retainer cup (1440), as applicable.

(j) Remove the ball thrust bearing (1420), where applicable.

(k) Remove the pitch change rod (1410).

(4) Cylinder and Guide Collar Unit Disassembly

(a) Remove and discard the self-locking socket head cap screw (280) in the side of the guide collar unit (240). Refer to Figure 3-4.

WARNING: THE CYLINDER IS RETAINING THE BETA SPRINGS UNDER LOAD. THE CYLINDER AND GUIDE COLLAR WILL "POP UP" VERY ABRUPTLY WHEN DISENGAGED FROM HUB.

CAUTION: UNSCREW THE CYLINDER SLOWLY AND CAREFULLY TO AVOID DAMAGING THE THREADS OR BENDING THE BETA RODS.

(b) Use a square-bar of applicable size, one inch (25.4 mm) wide to fit into the slot in the top of the cylinder (200) and operate as a wrench to slowly unscrew the cylinder from the hub unit (500).

1 Remove the cylinder from the hub unit.

(c) Remove the guide collar unit from the beta rod assemblies.

(d) Remove and discard the cylinder O-ring (890).

1 Remove the support ring (880), if applicable.

(e) Release, remove, and discard the beta return springs (290).

(f) Remove the propeller beta rods (320) from the spinner mounting plate (380).

(g) Remove the beta spring retainers (310) and retainer rings (330).

(5) Clamp Removal
Refer to Figure 3-5.

(a) Using a round bottom metal stamp or an electric pencil, put the clamp serial number on each corresponding counterweight (800).

(b) Remove and discard all outboard clamp bolts (770) and nuts (780).

(c) Remove and discard all inboard clamp socket screws (750) and cotter pins (710) or safety wire.

(d) Remove all clamp-halves (840) from the hub arms.

1 For information about clamp inspection and repair, refer to the Clamp Overhaul chapter of Hartzell Propeller Standard Practices Manual 202A (61-01-02).

(e) Remove and discard the clamp gaskets (760).

(f) Remove all balance weights (640) and attaching screws, where applicable.

1 Discard the screws.

(g) Remove and discard all lubrication fittings (860) and lubrication fitting caps (850).

(h) Remove and discard the hex head bolts (9050) from the counterweight slugs (9040), where applicable.

1 Remove the counterweight slugs (9040).

(i) Disengage the link arms (70) from the link screws (740) by removing the cotter pin (670) from the link screws (740).

(j) Discard the link screws (740), link screw sleeves (230), and cotter pins (670).

CAUTION: IF POSSIBLE, REINSTALL EACH BLADE ASSEMBLY ON THE SAME HUB ARM FROM WHICH IT WAS REMOVED. RECORD ON PAPER EACH BLADE SERIAL NUMBER AND ITS MATCHING HUB ARM AND CLAMP.

(k) Remove each blade assembly from the hub (500).

(6) Blade and Flange Mounting Parts Disassembly

(a) Beginning with blade number one, remove and discard the bearing wire retainer (580) from its groove in the hub-side race (571) of the blade retention bearing (570).

(b) Remove the two halves of the hub-side race (571).

(c) Remove and discard the ball spacer (600) and bearing balls (590).

(d) Clip, remove, and discard the blade O-ring (560).

(e) Remove the bearing retaining ring (610). Refer to Figure 3-6, Step One.

1 Option 1: Using a mallet and TE309, drive the bearing retaining ring (610) inboard over the shoulder of the hub arm.

2 Option 2: Using a mallet and soft punch, at several positions on the outboard edge of the bearing retaining ring (610), drive the ring inboard over the shoulder of the hub arm.

(f) Remove and discard the bearing wire ring (620) that had been covered by the bearing retaining ring (610).

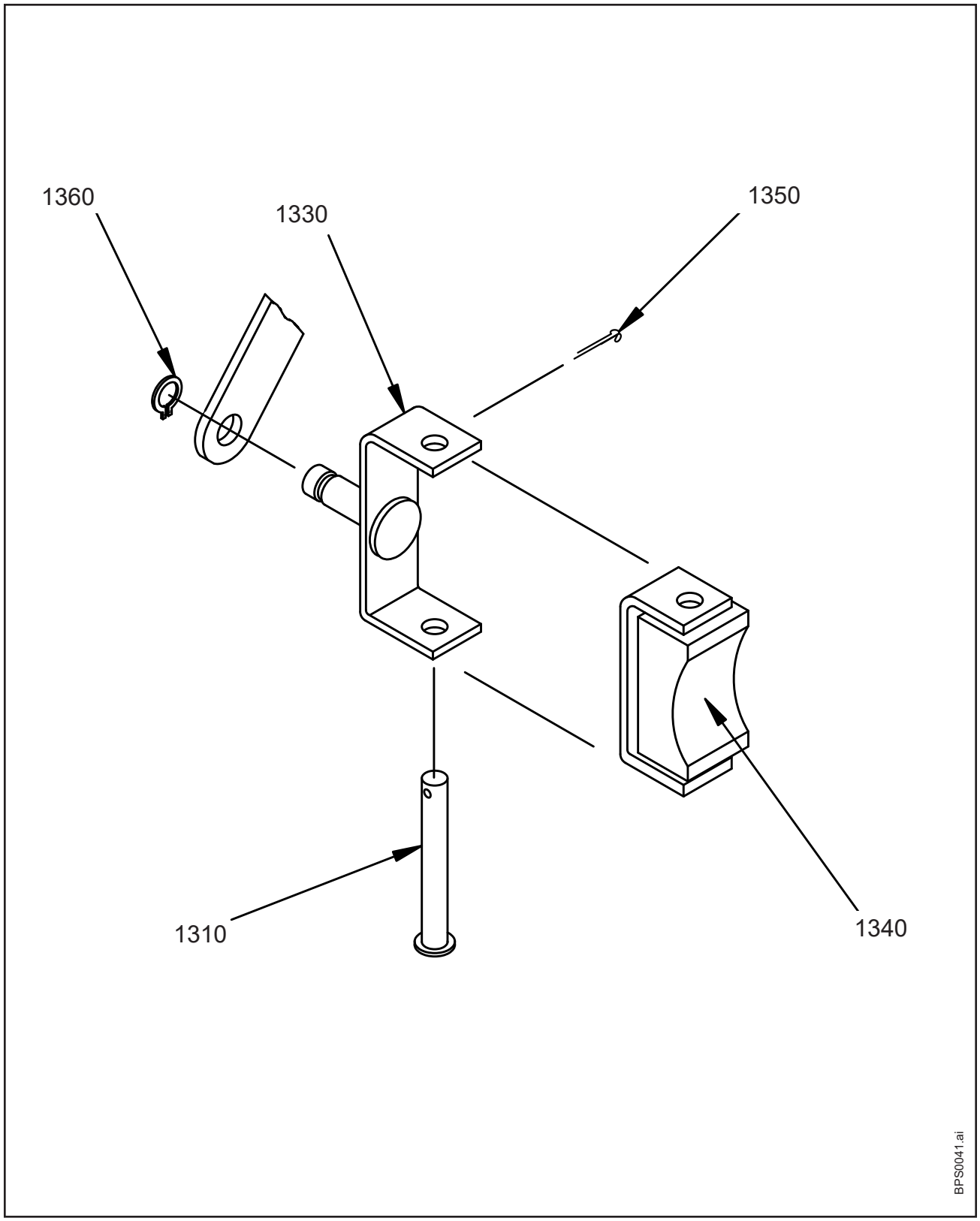
(g) Turn the halves of the blade-side race (572) so the split is at the top. Refer to Figure 3-6, Step Two.

(h) At the split, put one of the bearing balls (590) between the blade-side race (572) and the inboard shoulder of the hub arm.

(i) Using a soft mallet, lightly tap the inboard top edge of the bearing retaining ring (610) to release the blade-side race (572) from the bearing retaining ring (610).

(j) Remove the halves of the race as they become separated from the bearing retaining ring (610).

(k) Tilt the bearing retaining ring (610) inboard approximately 45 degrees, and remove the bearing retaining ring (610) by sliding it outboard over the shoulder of the hub arm. Refer to Figure 3-6, Step 3.




**Carbon Block Assembly**
**Figure 3-10**

(7) Carbon Block Disassembly.
Refer to Figure 3-10.

(a) Remove the snap ring (1360) from the attached aircraft part.

(b) Remove the yoke unit (1330).

(c) Remove and discard the cotter pin (1350).

(d) Remove the clevis pin (1310).

(e) Remove and discard the carbon block unit (1340).

(8) Spinner Unit Disassembly

(a) Remove the safety wire from the hex head bolts (360) and socket head cap screws (365) that attach the spinner mounting plate (380) to the hub unit (500).

(b) If applicable, remove the safety wire from the hex head bolts (361) that attach the spinner mounting plate (380) to the hub unit (500).

(c) Remove and discard the hex head bolts (360) and socket head cap screws (365).

(d) If applicable, remove and discard the hex head bolts (361).

(e) Remove the spinner mounting plate (380).

(f) Remove and discard the snap rings (390).

(g) Remove the guide lugs (340). For information concerning guide lug bushing replacement, refer to Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02).

(h) Remove the hub from the rotatable fixture of the assembly table.

(i) For propeller model HC-B(3,4)( )W-3( ) only:

1 Remove and discard the two flat countersunk head screws (465) from the spacer (455), if applicable.

2 Remove the spacer (455) with O-ring (405) from the propeller flange.

a Discard the O-ring (405).

3 Remove the two dowel pins (456) from the spacer.

(j) For mounting stud removal and hub unit overhaul instructions, refer to the Steel Hub Overhaul chapter of Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02).

Disassembly of the HC-B(3,4)(MN,TN,TW,MP)-3( ) propeller is now complete.

C. Disassembly of Propeller Models HC-B(3,4)(MN,TN)-5( )
Refer to the applicable Illustrated Parts List exploded view.

(1) Bulkhead Removal

(a) Remove and discard the nuts, washers, and hex head bolts (870) which attach the bulkhead to the spinner mounting plate (380).

(2) Start Lock Removal and Propeller Disassembly

(a) If applicable, remove the start locks from the spinner mounting plate.

(b) Mount the propeller assembly on the rotatable fixture on the propeller assembly table, as shown in Figure 3-1.

CAUTION: DO NOT PERMIT THE PITCH CHANGE ROD TO TURN WHILE THE NUT IS BEING REMOVED.

(c) Use a 1-13/16 inch wrench and a one-inch (25.4 mm) socket wrench to remove and discard the large self-locking nut (10) on the end of the pitch change rod (1410). Refer to Figure 3-2.

CAUTION: DO NOT USE A BLADE PADDLE TO TURN THE BLADES.

(d) Turn the blades by hand from feather to reverse.

(e) Remove and discard all link pin units (80) and safety screws (90).

(f) Disconnect and remove the link arms (70) from the piston unit (50).

(g) Remove the piston unit (50).

(h) Remove and discard the piston O-ring (160) and the piston dust seal (170).

(i) Remove and discard the pitch change rod O-ring (150).

(3) Start Lock Disassembly
Refer to Figure 3-11.

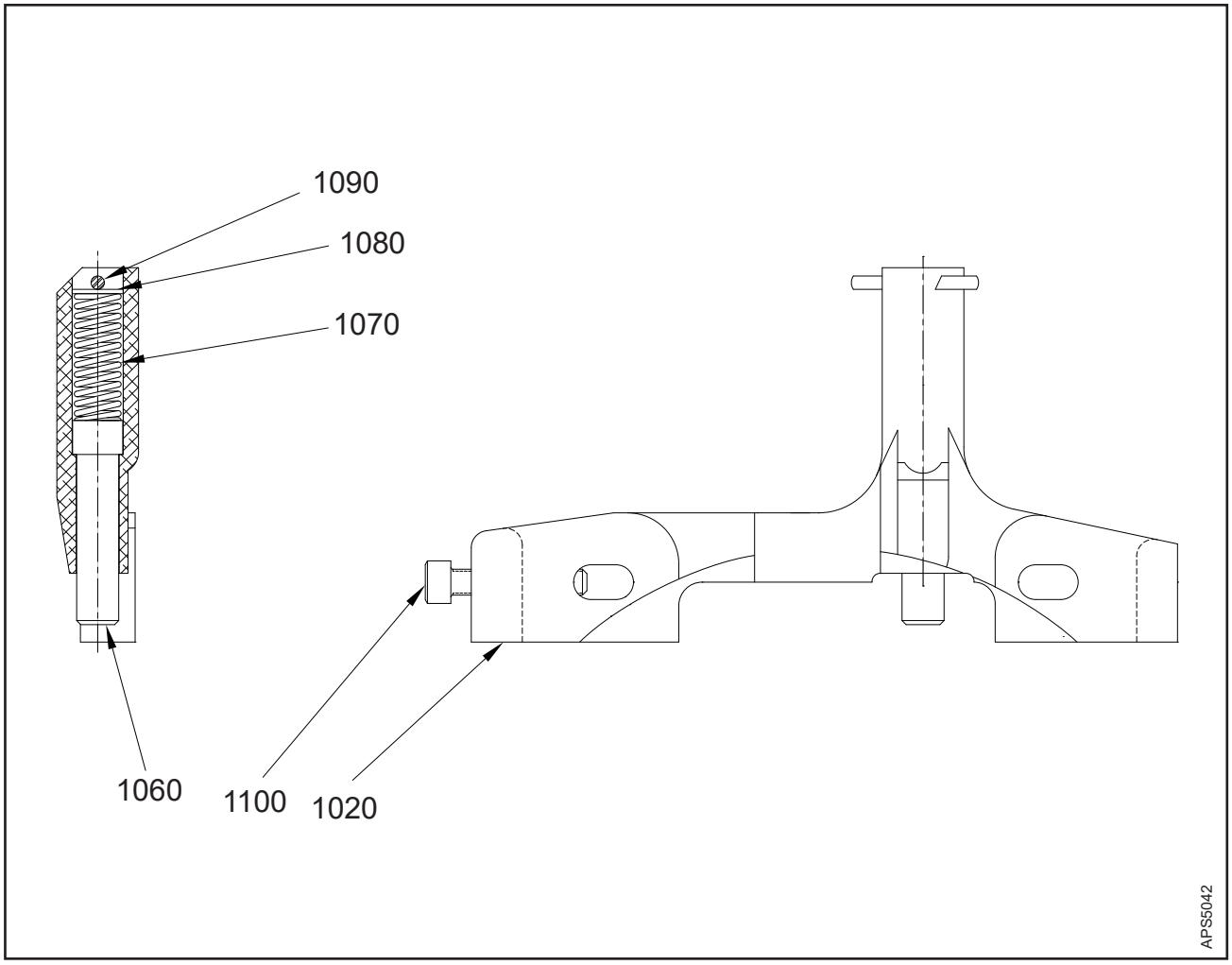
WARNING: THE SPRING (1070) IS COMPRESSED AND WILL BE RELEASED WHEN THE COTTER PIN (1060) IS REMOVED.

(a) Remove and discard the cotter pin (1060) from the start lock bracket (1020).

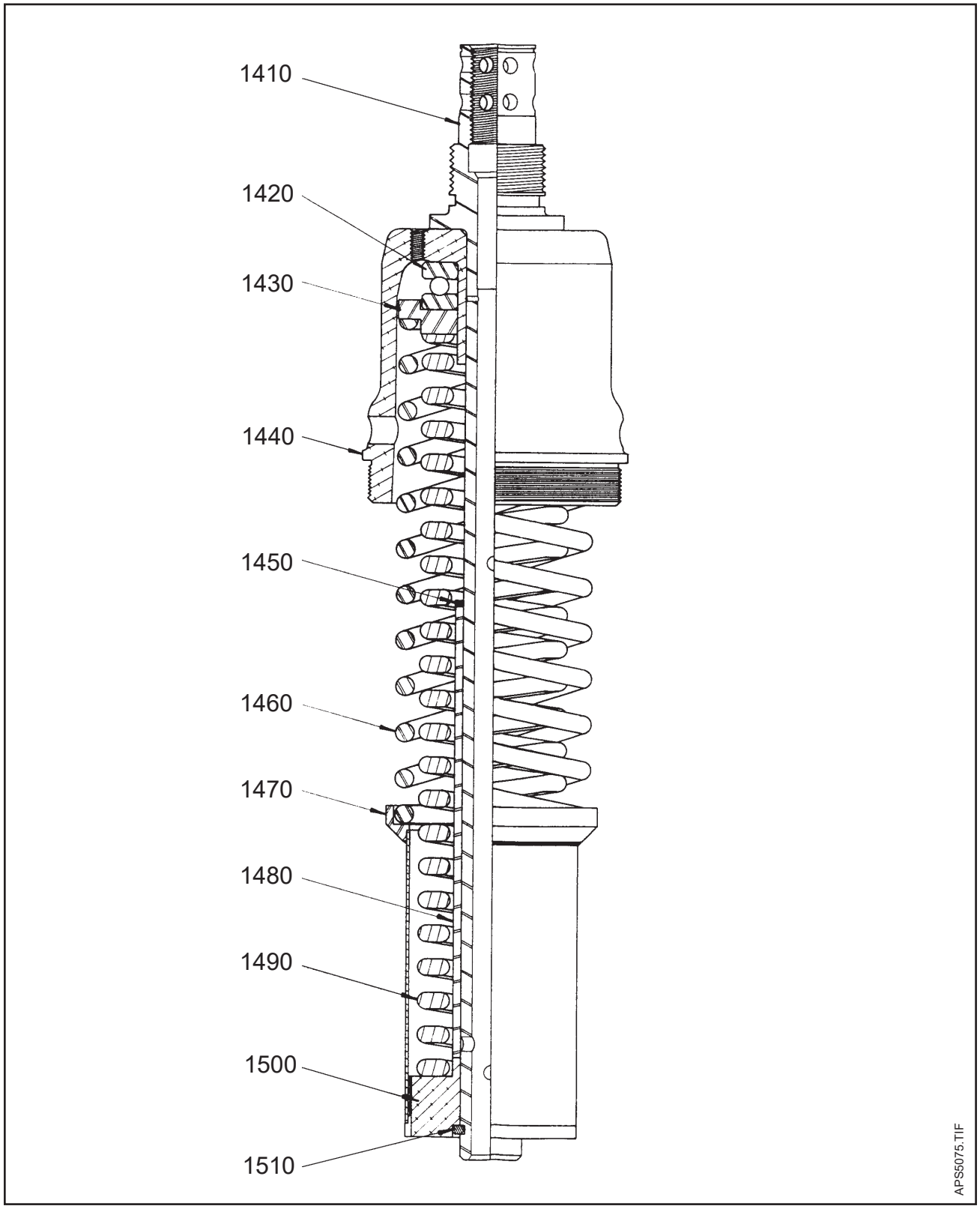
(b) Remove and discard the washer (1080) from the start lock bracket (1020).

(c) Remove and discard the spring (1070) from the start lock bracket (1020).

(d) Remove the pin (1060) from the start lock bracket (1020).




**Example of a Start Lock Unit**
**Figure 3-11**




**Example of a Spring Assembly**
**Figure 3-12**

WARNING: THE FEATHERING SPRING ASSEMBLY IS PRELOADED TO APPROXIMATELY 1000 POUNDS FORCE. USE EXTREME CAUTION WHEN REMOVING IT FROM THE PROPELLER.

(4) Feathering Spring Disassembly

(a) Remove and discard the feathering stop screws (180).

1 Refer Figure 3-12 or the applicable spring assembly illustration in the Illustrated Parts List chapter of this manual.

(b) Remove the safety wire from the spring retainer cup, and use spanner wrench TE148 or locally procured strap wrench to unscrew the spring retainer cup.

(c) Remove the feathering spring assembly, and use the bench top fixture TE59 or equivalent to compress the spring for disassembly.

(d) Remove and discard the split rear retainer.

(e) Permit the feathering spring assembly to expand to its unloaded length, and remove it from the special fixture.

(f) Remove the rear spring retainer (1500).

(g) Remove the countersunk washer (1520), as applicable.

(h) Remove the feathering compression spring(s) (1460) (1490).

(i) Remove the spring spacer tube (1480).

(j) Remove the spring spacers (1450), as applicable.

1 If the spacer is a sleeve, keep and use it again.

2 If washers are used as a spacer:

a Make a record of the number of washers that were used

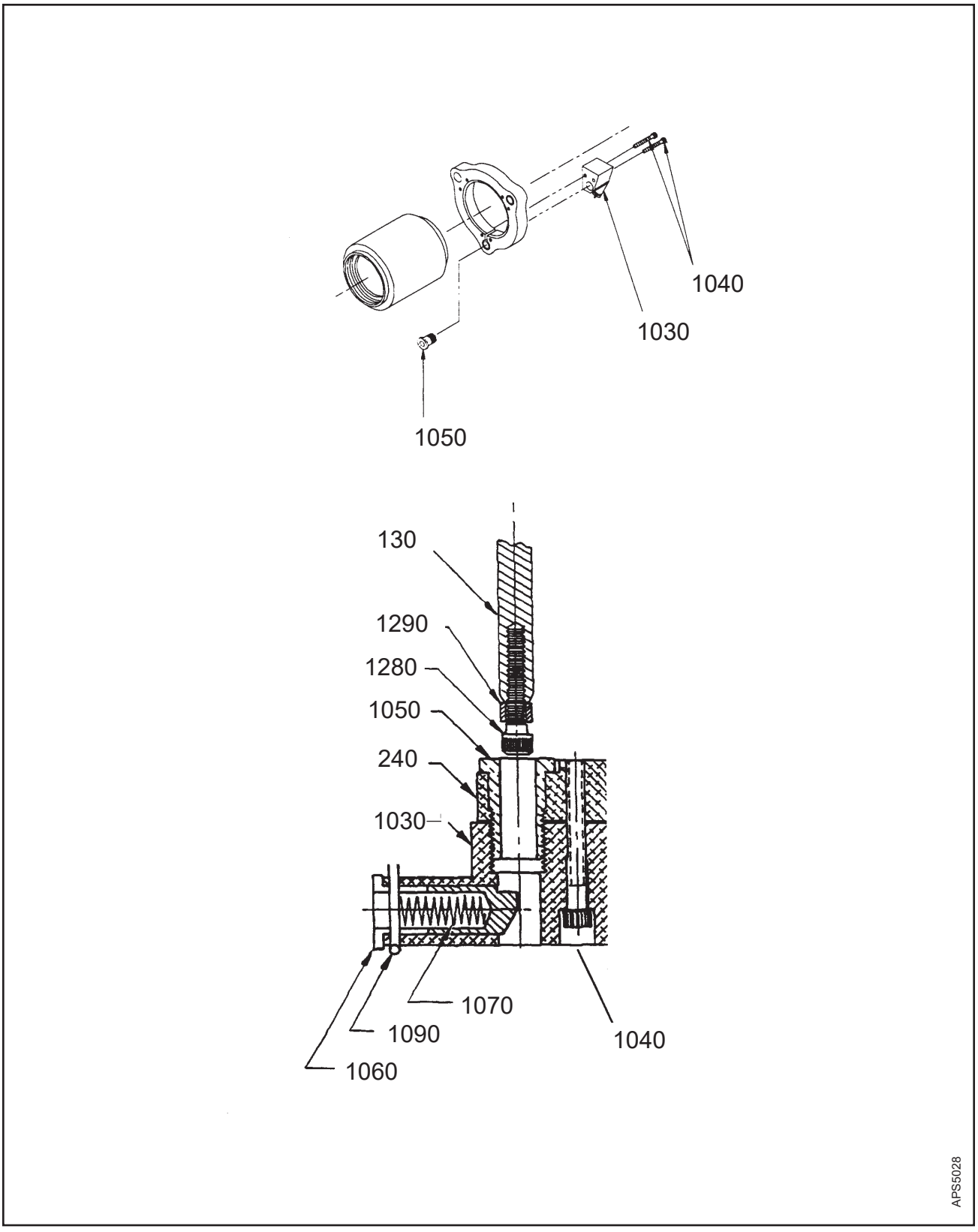
b Discard the washers

c Replace the washers with the same number of new washers

(k) Remove the front spring retainer cup (1440), as applicable.

(l) Remove the ball thrust bearing (1420), as applicable.

(m) Remove the pitch change rod (1410).




**Assembly with the Start Lock Unit Attached to the Guide Collar**
**Figure 3-13**

(5) Cylinder and Guide Collar Unit Disassembly

NOTE: Some -5( ) models do not have a collar assembly.

(a) Remove and discard the socket head cap screw (280) inside the guide collar unit (240). Refer to Figure 3-4.

CAUTION: UNSCREW THE CYLINDER SLOWLY AND CAREFULLY TO AVOID DAMAGE TO THE THREADS.

(b) Use a square bar of appropriate size, one inch wide (25.4 mm), to fit into the slot in the top of the cylinder (200) and operate as a wrench to slowly unscrew the cylinder from the hub unit (500).

(c) Remove the guide collar unit (240).

(d) This step applies to -5 propeller models that have the start lock units attached to the guide collar unit (240). Refer to Figure 3-13.

1 If the start locks have a bronze bushing (1050), remove the bushing.

2 Remove and discard the screws (1040) that attach the start locks to the guide collar unit (240).

3 Remove the start locks from the guide collar unit (240).

CAUTION: THE SPRING (1070) WILL BE RELEASED WHEN THE COTTER PIN IS REMOVED.

4 Remove and discard the cotter pin (1090) at the end of each start lock assembly (1010).

5 Remove the start lock pin (1060) from each start lock housing (1030).

6 Remove and discard the spring (1070) from each start lock unit.

(e) Remove and discard the cylinder O-ring (890).

(6) Clamp Removal
Refer to Figure 3-5.

(a) Using a round bottom metal stamp or electric pencil, put the clamp serial number on each corresponding counterweight (800).

(b) Remove and discard all outboard clamp bolts (770) and nuts (780).

(c) Remove and discard all inboard clamp socket screws (750) and cotter pins (710) or safety wire.

(d) Remove all clamp halves (840) from the hub arms.

1 For information about clamp inspection and repair, refer to the Clamp Overhaul chapter of Hartzell Propeller Standard Practices Manual 202A (61-01-02).

(e) Remove and discard the clamp gaskets (760).

(f) Remove the start lock plates (1230) from the clamps, where applicable.

1 Remove the safety wire from the mounting bolts (1220).

2 Remove and discard the mounting bolts (1220).

(g) Visually examine the start lock plates (1230) for corrosion or damage.

1 Keep the start lock plates to use again if they are in good condition.

2 Discard and replace the start lock plates if they are corroded or damaged.

NOTE: Where possible, during assembly, each plate must be attached to the same clamp from which it was removed.

(h) Remove all balance weights (640) and attaching screws (630), where applicable.

1 Discard the screws (630).

(i) Remove and discard all lubrication fittings (860) and lubrication fitting caps (850).

(j) Remove and discard the hex head bolts (9050) from the counterweight slugs (9040), where applicable.

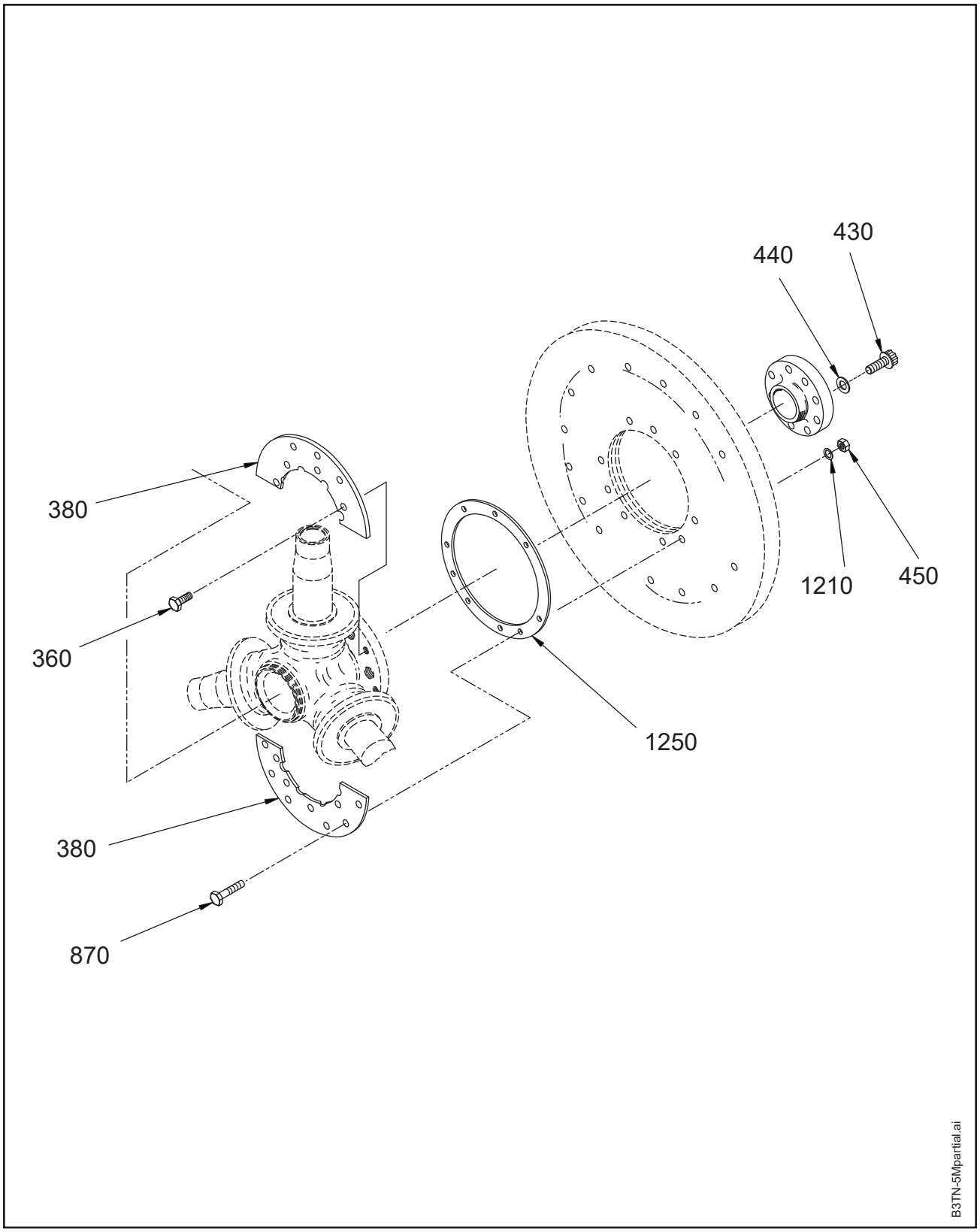
1 Remove the counterweight slugs (9040).

(k) Disengage the link arms (70) from the link screws (740) by removing the cotter pin (670) from the link screws.

(l) Discard the link screws (740), link screw sleeves (230) and cotter pins (670).

CAUTION: IF POSSIBLE, REINSTALL EACH BLADE ASSEMBLY ON THE SAME HUB ARM FROM WHICH IT WAS REMOVED. RECORD ON PAPER EACH BLADE SERIAL NUMBER AND ITS MATCHING HUB ARM AND CLAMP.

(m) Remove each blade assembly from the hub (500).




**Assembly with the Bulkhead on the Engine Side of the Spinner Mounting Plate**
**Figure 3-14**

(7) Blade and Flange Mounting Parts Disassembly

(a) Beginning with blade position number one, remove and discard the bearing wire retainer (580) from its groove in the hub-side race (571) of the blade retention bearing (570).

(b) Remove the two halves of the hub-side race (571).

(c) Remove and discard the ball spacer (600) and bearing balls (590).

(d) Clip, remove, and discard the blade O-ring (560).

(e) Remove the bearing retaining ring (610). Refer to Figure 3-6, Step One.

1 Option 1: Using a mallet and TE309, drive the bearing retaining ring (610) inboard over the shoulder of the hub arm.

2 Option 2: Using a mallet and soft punch at several positions on the outboard edge of the bearing retaining ring (610), drive the ring inboard over the shoulder of the hub arm.

(f) Remove and discard the bearing wire ring (620) that had been covered by the bearing retaining ring (610).

(g) Turn the halves of the blade-side race (572) so the split is at the top. Refer to Figure 3-6, Step Two.

(h) At the split, put one of the bearing balls (590) between the blade-side race (572) and inboard shoulder of the hub arm.

(i) Using a soft mallet, lightly tap the inboard top edge of the bearing retaining ring (610) to release the blade-side race (572) from the bearing retaining ring (610).

(j) Remove the halves of the race as they become separated from the bearing retaining ring (610).

(k) Tilt the bearing retaining ring (610) inboard approximately 45 degrees, and remove the bearing retaining ring by sliding it outboard over the shoulder of the hub arm. Refer to Figure 3-6, Step Three.

(8) Hub Unit Disassembly

NOTE: The following steps are applicable to propeller configurations shown in Figure 3-14.

(a) Remove and discard the hex head bolts (360) that attach the spinner mounting plate (380) to the hub unit (500).

(b) Remove the spinner mounting plate (380).

(c) For additional hub unit overhaul instructions, refer to the Steel Hub Overhaul chapter of Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02).

Disassembly of the HC-B(3,4)(MN,TN)-5( ) propeller is now complete.

D. Disassembly of Propeller Models HC-A3(V,MV)F-7( )
Refer to the applicable Illustrated Parts List exploded view.

(1) Bulkhead Removal

(a) Remove and discard the nuts (450), washer (460), and hex head bolts (870) that attach the bulkhead to the spinner mounting plate (380).

(b) Mount the propeller assembly on the rotatable fixture on the propeller assembly table, as shown in Figure 3-1.

(c) Use a 1-7/16 inch wrench and a 5/8 inch socket wrench to remove and discard the large self-locking nut (10) on the end of the pitch change rod (1410). Refer to Figure 3-2.

CAUTION: DO NOT USE A BLADE PADDLE TO TURN THE BLADES.

(d) Turn the blades by hand from feather to reverse.

(e) Remove the link pin units (80) and safety screws (90) from the piston unit (50).

(f) Remove and disconnect the link arms (70) from the piston unit (50).

(g) Remove the piston unit (50) from the cylinder unit (200).

(h) Remove and discard the piston O-ring (160), piston dust seal (170), and forward piston O-ring (1630) from the ID of the pitch change rod (1410).

(i) Remove and discard the pitch change rod O-ring (150) from the OD of the pitch change rod (1410).

WARNING: THE FEATHERING SPRING ASSEMBLY IS PRELOADED TO APPROXIMATELY 1000 POUNDS FORCE. USE EXTREME CAUTION WHEN REMOVING IT FROM THE PROPELLER.

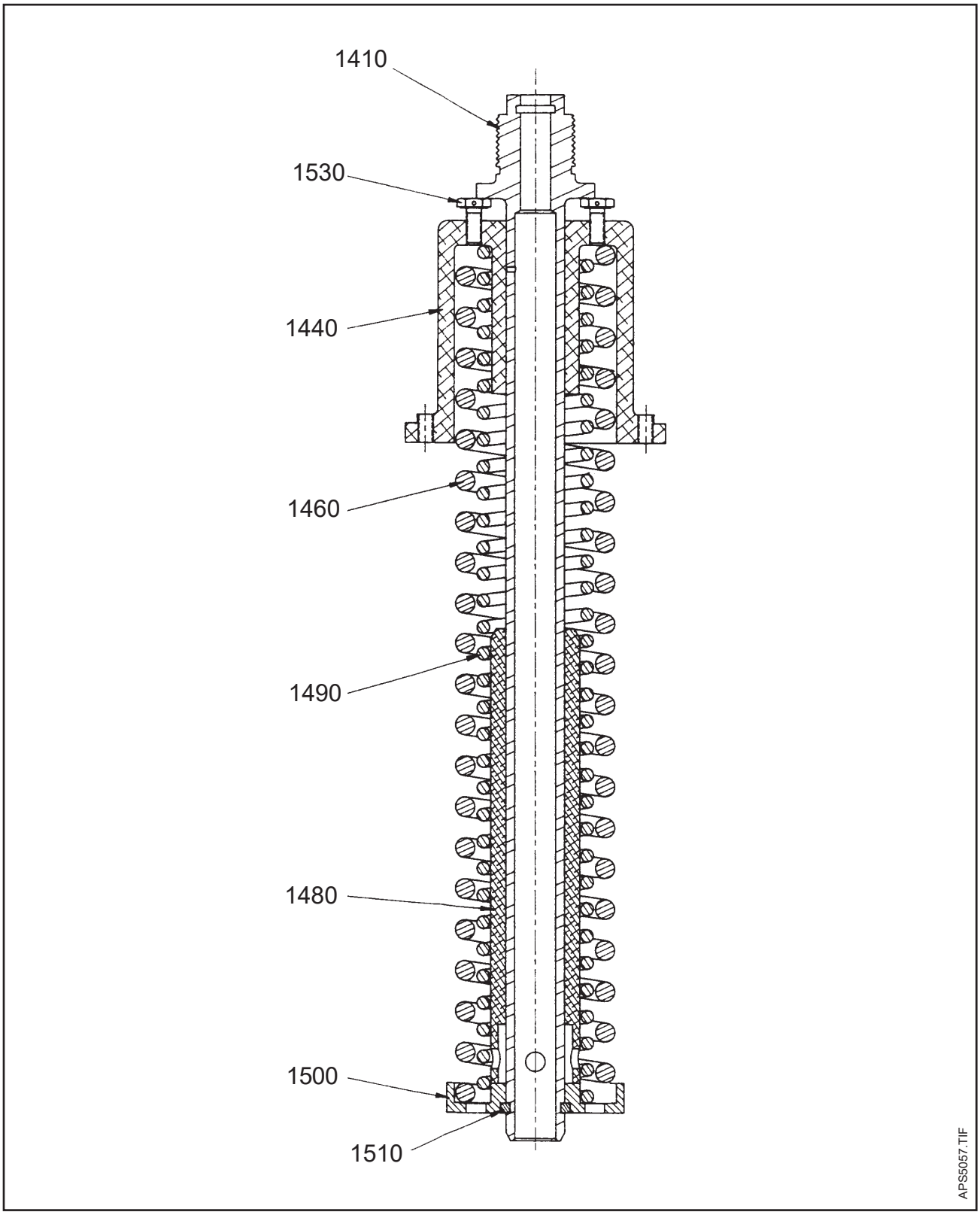
(j) Remove the spring assembly:

1 Remove the four screws (940) from the ring retention plate (950).

2 Remove the ring retention plate (950) and the split retainer (960).

NOTE: It may be necessary to gently tap the spring retainer cup to move the spring assembly into the cylinder so that the split retainer can be removed.

3 Remove the spring assembly (1400) from the cylinder.




**Example of a Feathering Spring**
**Figure 3-15**

(2) Feathering Spring Disassembly
Refer to Figure 3-15 or the applicable illustration in the Illustrated Parts List chapter in this manual.

(a) Remove and discard the hex head bolts (180).

(b) Use the bench top fixture TE59 or equivalent to compress the spring for disassembly.

(c) Remove and discard the split keeper (1510).

(d) Permit the feathering spring assembly to expand to its unloaded length, and remove it from the special fixture.

(e) Remove the rear spring retainer (1500).

(f) Remove the feathering compression springs (1460 and 1490).

(g) Remove the spring spacer tube (1480).

(h) Remove the pitch change rod (1410).

(3) Cylinder and Guide Collar Unit Disassembly

(a) Remove and discard the socket head cap screw (280) inside the guide collar unit (240). Refer to Figure 3-4.

CAUTION: UNSCREW THE CYLINDER SLOWLY AND CAREFULLY TO AVOID DAMAGE TO THE THREADS.

(b) Use a square bar of applicable size, one inch (25.4 mm) wide, to fit into the slot in the top of the cylinder (200) and operate as a wrench to slowly unscrew the cylinder from the hub unit (500).

(c) Remove the guide collar unit (240).

(d) Remove and discard the cylinder O-ring (890).

(4) Clamp Removal
Refer to Figure 3-5.

(a) Use a round bottom metal stamp or electric pencil and identify the clamp serial number on each corresponding counterweight (800).

(b) Remove and discard all outboard clamp bolts (770) and nuts (780).

(c) Remove and discard all inboard clamp socket screws (750) and cotter pins (710) or safety wire.

(d) Remove all clamp halves (840) from the hub arms.

1 For information about clamp inspection and repair, refer to the Clamp Overhaul chapter of Hartzell Propeller Standard Practices Manual 202A (61-01-02).

(e) Remove and discard clamp gaskets (760).

(f) Remove all balance weights (640) and attaching screws (630), where applicable.

1 Discard screws.

(g) Remove and discard all lubrication fittings (860) and lubrication fitting caps (850).

(h) Remove and discard the hex head bolts (9050) from the counterweight slugs (9040), where applicable.

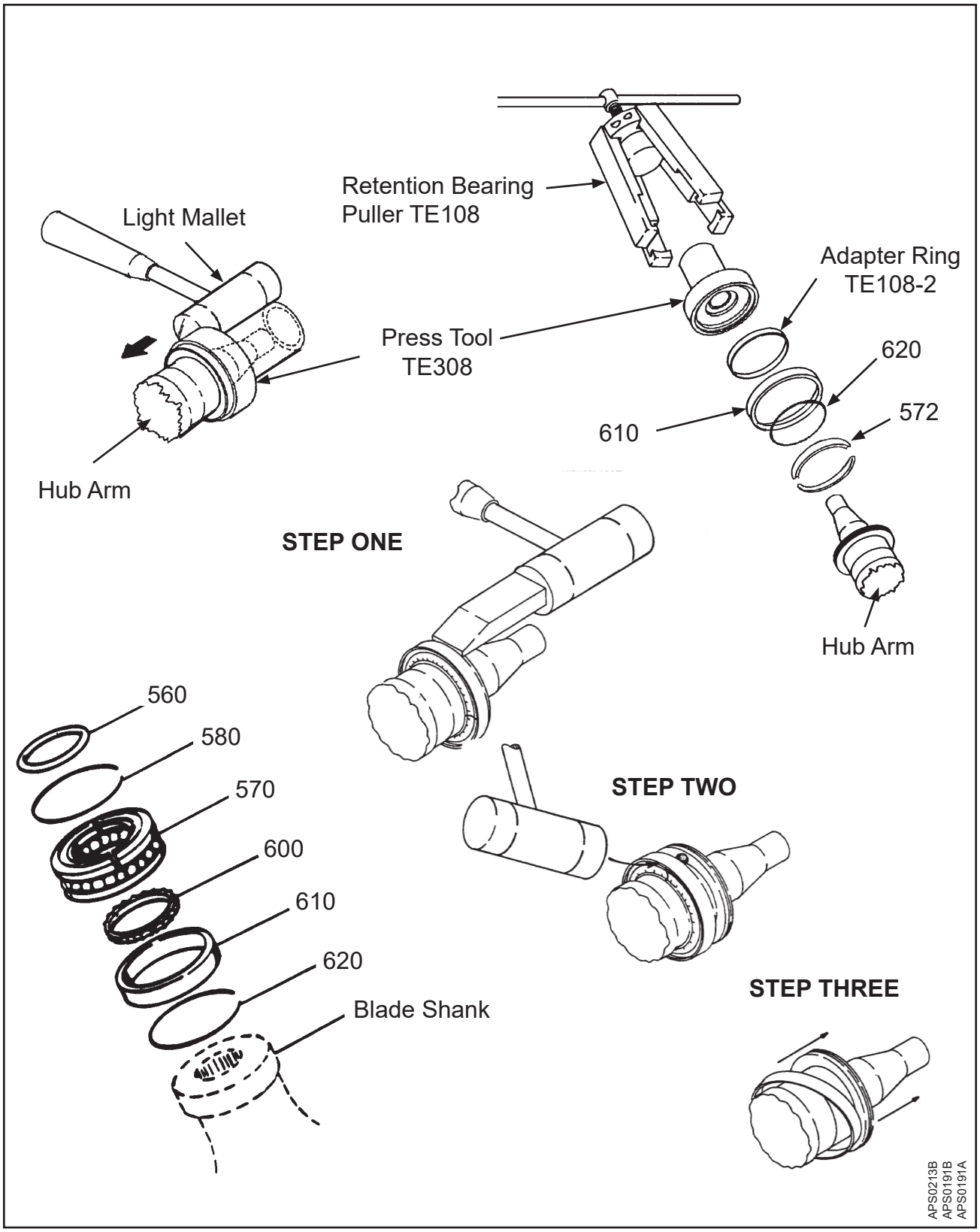
1 Remove the counterweight slugs (9040), as applicable.

(i) Disengage the link arms (70) from the link screws (740) by removing the cotter pin (670) from the link screws.

(j) Remove and discard link screws (740), link screw sleeves (230) and cotter pins (670).

CAUTION: IF POSSIBLE, REINSTALL EACH BLADE ASSEMBLY ON THE SAME HUB ARM FROM WHICH IT WAS REMOVED. RECORD ON PAPER EACH BLADE SERIAL NUMBER AND ITS MATCHING HUB ARM AND CLAMP.

(k) Remove each blade assembly from the hub unit (500).




**Removal of an A-972 Bearing Retaining Ring**
**Figure 3-16**

(5) Blade and Flange Mounting Parts Disassembly

(a) Beginning with blade position number one, remove and discard the bearing wire retainer (580) from its groove in the hub-side race (571) of the blade retention bearing (570).

(b) Remove the two halves of the hub-side race (571).

(c) Remove and discard the ball spacer (600) and bearing balls (590).

(d) Clip the blade O-ring (560).

(e) Remove and discard the blade O-ring (560).

(f) Remove the bearing retaining ring (610).
Refer to Figure 3-16, Step One.

1 Option 1: Using a mallet and TE308, drive the bearing retaining ring (610) inboard over the shoulder of the hub arm.

2 Option 2: Using a mallet and soft punch at several positions on the outboard edge of the bearing retaining ring (610), drive the ring inboard over the shoulder of the hub arm.

(g) Remove and discard the wire ring retainer (620) that had been covered by the bearing retaining ring (610).

(h) Turn the halves of the blade-side race (572) so the split is at the top. Refer to Figure 3-16, Step Two.

(i) At the split, put one of the bearing balls (590) between the blade-side race (572) and inboard shoulder of the hub arm.

(j) Using a soft mallet, lightly tap the inboard top edge of the bearing retaining ring (610) to release the split outboard race from the bearing retaining ring.

(k) Remove the halves of the race as they become separated from the bearing retaining ring.

(l) Tilt the bearing retaining ring (610) inboard approximately 45 degrees and remove the bearing retaining ring by sliding it outboard over the shoulder of the hub arm. Refer to Figure 3-16, Step Three.

(6) Hub Unit Disassembly

(a) Remove and discard the hex head bolts (360) that attach the spinner mounting plate (380) to the hub unit (500).

(b) Remove the spinner mounting plate (380).

(c) For additional hub unit overhaul instructions, refer to the Steel Hub Overhaul chapter of Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02).

Disassembly of the HC-A3(V,MV)F-7( ) propeller is now complete.

E. Disassembly of Propeller Models HC-B3TF-7(A)
Refer to the applicable Illustrated Parts List exploded view.

(1) Bulkhead Removal

(a) Remove and discard the nuts (450), washer (460), and hex head bolts (870) that attach the bulkhead to the spinner mounting plate (380).

(b) Mount the propeller assembly on the rotatable fixture on the propeller assembly table, as shown in Figure 3-1.

(c) Use a 1-7/16 inch wrench and a 5/8 inch socket wrench to remove and discard the large self-locking nut (10) on the end of the pitch change rod (1410). Refer to Figure 3-2.

CAUTION: DO NOT USE A BLADE PADDLE TO TURN THE BLADES.

(d) Turn the blades by hand from feather to reverse.

(e) Remove the link pin units (80) and safety screws (90) from the piston unit (50).

(f) Remove and disconnect the link arms (70) from the piston unit (50).

(g) Remove the piston unit (50) from the cylinder unit (200).

(h) Remove and discard the piston O-ring (160), piston dust seal (170), and forward piston O-ring (1630) from the ID of the pitch change rod (1410).

(i) Remove and discard the pitch change rod O-ring (150) from the OD of the pitch change rod (1410).

WARNING: THE FEATHERING SPRING ASSEMBLY IS PRELOADED TO APPROXIMATELY 1000 POUNDS FORCE. USE EXTREME CAUTION WHEN REMOVING IT FROM THE PROPELLER.

(j) Remove the spring assembly:

1 Remove the four screws (940) from the ring retention plate (950).

2 Remove the ring retention plate (950) and the split retainer (960).

NOTE: It may be necessary to gently tap the spring retainer cup to move the spring assembly into the cylinder so that the split retainer can be removed.

3 Remove the spring assembly (1400) from the cylinder.

(2) Feathering Spring Disassembly
Refer to Figure 3-15.

(a) Remove and discard the hex head bolts (180).

(b) Use the bench top fixture TE59 or equivalent to compress the spring for disassembly.

(c) Remove and discard the split keeper (1510).

(d) Permit the feathering spring assembly to expand to its unloaded length, and remove it from the special fixture.

(e) Remove the rear spring retainer (1500).

(f) Remove the feathering compression springs (1460 and 1490).

(g) Remove the spring spacer tube (1480).

(h) Remove the pitch change rod (1410).

(3) Cylinder and Guide Collar Unit Disassembly

(a) Remove and discard the socket head cap screw (280) inside the guide collar unit (240). Refer to Figure 3-4.

CAUTION: UNSCREW THE CYLINDER SLOWLY AND CAREFULLY TO AVOID DAMAGE TO THE THREADS.

(b) Use a square bar of applicable size, one inch (25.4 mm) wide, to fit into the slot in the top of the cylinder (200) and operate as a wrench to slowly unscrew the cylinder from the hub unit (500).

(c) Remove the guide collar unit (240).

(d) Remove and discard the cylinder O-ring (890).

(4) Clamp Removal
Refer to Figure 3-5.

(a) Use a round bottom metal stamp or electric pencil and identify the clamp serial number on each corresponding counterweight (800).

(b) Remove and discard all outboard clamp bolts (770) and nuts (780).

(c) Remove and discard all inboard clamp socket screws (750) and cotter pins (710) or safety wire.

(d) Remove all clamp halves (840) from the hub arms.

1 For information about clamp inspection and repair, refer to the Clamp Overhaul chapter of Hartzell Propeller Standard Practices Manual 202A (61-01-02).

(e) Remove and discard clamp gaskets (760).

(f) Remove all balance weights (640) and attaching screws (630), where applicable.

1 Discard screws.

(g) Remove and discard all lubrication fittings (860) and lubrication fitting caps (850).

(h) Remove and discard the hex head bolts (9050) from the counterweight slugs (9040), where applicable.

1 Remove the counterweight slugs (9040), as applicable.

(i) Disengage the link arms (70) from the link screws (740) by removing the cotter pin (670) from the link screws.

(j) Remove and discard link screws (740), link screw sleeves (230) and cotter pins (670).

CAUTION: IF POSSIBLE, REINSTALL EACH BLADE ASSEMBLY ON THE SAME HUB ARM FROM WHICH IT WAS REMOVED. RECORD ON PAPER EACH BLADE SERIAL NUMBER AND ITS MATCHING HUB ARM AND CLAMP.

(k) Remove each blade assembly from the hub unit (500).

(5) Blade and Flange Mounting Parts Disassembly.
Refer to Figure 3-6.

(a) Beginning with blade position number one, remove and discard the bearing wire retainer (580) from its groove in the hub-side race (571) of the blade retention bearing (570).

(b) Remove the two halves of the hub-side race (571).

(c) Remove and discard the ball spacer (600) and bearing balls (590).

(d) Clip the blade O-ring (560).

(e) Remove and discard the blade O-ring (560).

(f) Remove the bearing retaining ring (610).
Refer to Figure 3-6, Step One.

1 Option 1: Using a mallet and TE308, drive the bearing retaining ring (610) inboard over the shoulder of the hub arm.

2 Option 2: Using a mallet and soft punch at several positions on the outboard edge of the bearing retaining ring (610), drive the ring inboard over the shoulder of the hub arm.

(g) Remove and discard the wire ring retainer (620) that had been covered by the bearing retaining ring (610).

(h) Turn the halves of the blade-side race (572) so the split is at the top. Refer to Figure 3-6, Step Two.

(i) At the split, put one of the bearing balls (590) between the blade-side race (572) and inboard shoulder of the hub arm.

(j) Using a soft mallet, lightly tap the inboard top edge of the bearing retaining ring (610) to release the split outboard race from the bearing retaining ring.

(k) Remove the halves of the race as they become separated from the bearing retaining ring.

(l) Tilt the bearing retaining ring (610) inboard approximately 45 degrees and remove the bearing retaining ring by sliding it outboard over the shoulder of the hub arm. Refer to Figure 3-6, Step Three.

(6) Hub Unit Disassembly

(a) Remove and discard the hex head bolts (360) that attach the spinner mounting plate (380) to the hub unit (500).

(b) Remove the spinner mounting plate (380).

(c) For additional hub unit overhaul instructions, refer to the Steel Hub Overhaul chapter of Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02).

Disassembly of the HC-B3TF-7(A) propeller is now complete.

F. Disassembly of Propeller Models HC-B3TF-7AY
Refer to the applicable Illustrated Parts List exploded view.

(1) Bulkhead Removal

(a) Remove and discard the nuts (450), washers (365, 460), and hex head bolts (360, 870) that attach the bulkhead.

(2) Start Lock Removal and Propeller Disassembly

(a) Mount the propeller assembly on the rotatable fixture on the propeller assembly table, as shown in Figure 3-1.

CAUTION: DO NOT PERMIT THE PITCH CHANGE ROD TO TURN WHILE THE NUT IS BEING REMOVED.

(b) Use a 1-7/16 inch wrench and a 5/8 inch socket wrench to remove and discard the large self-locking nut (10) on the end of the pitch change rod (1410). Refer to Figure 3-2.

CAUTION: DO NOT USE A BLADE PADDLE TO TURN THE BLADES.

(c) Turn the blades by hand from feather to reverse.

(d) Remove the link pin units (80) and safety screws (90) from the piston unit (50).

(e) Disconnect and remove the link arms (70) from the piston unit (50).

(f) Remove the piston unit (50) from the cylinder unit (200).

(g) Remove and discard the piston O-ring (160), piston dust seal (170), and forward piston O-ring (1630) from the ID of the pitch change rod (1410).

(h) Remove and discard the pitch change rod O-ring (150) from the OD of the pitch change rod.

(i) Remove the spring assembly:

1 Remove the four screws (940) from the ring retention plate (950).

2 Remove the ring retention plate (950) and the split retainer (960).

NOTE: It may be necessary to gently tap the spring retainer cup to move the spring assembly into the cylinder so that the split retainer can be removed.

3 Remove the spring assembly (1400) from the cylinder.

(3) Start Lock Disassembly
Refer to Figure 3-17.

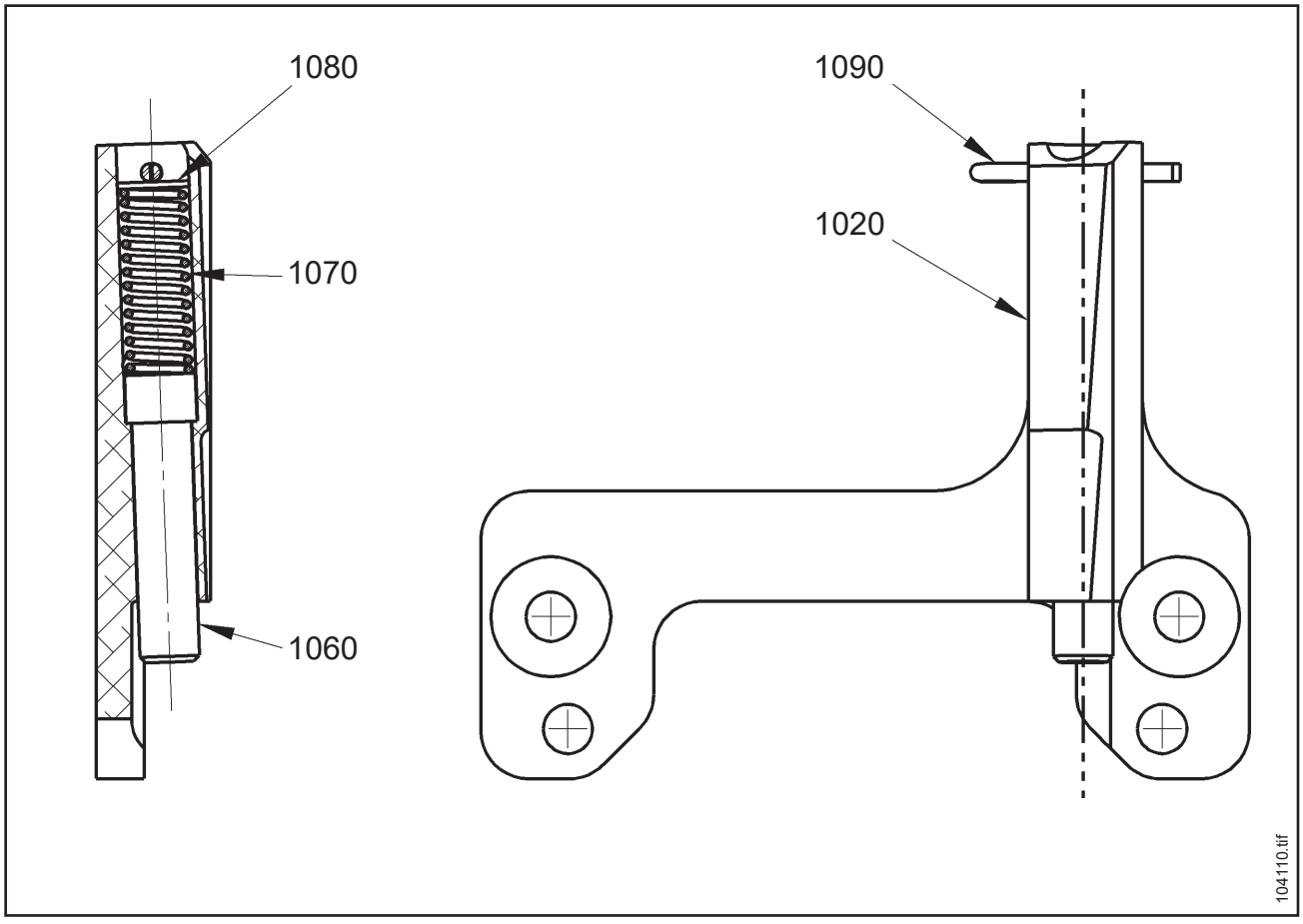
WARNING: THE SPRING (1070) IS COMPRESSED AND WILL BE RELEASED WHEN THE COTTER PIN (1090) IS REMOVED.

(a) Remove and discard the cotter pin (1060) from the start lock bracket (1020).

(b) Remove and discard the washer (1080) from the start lock bracket (1020).

(c) Remove and discard the spring (1070) from the start lock bracket (1020).

(d) Remove the pin (1060) from the start lock bracket (1020).




**Example of a Start Lock Unit**
**Figure 3-17**

WARNING: THE FEATHERING SPRING ASSEMBLY IS PRELOADED TO APPROXIMATELY 1000 POUNDS FORCE. USE EXTREME CAUTION WHEN REMOVING IT FROM THE PROPELLER.

(4) Feathering Spring Disassembly
Refer to Figure 3-15.

(a) Remove and discard the hex head bolts (180).

(b) Use the bench top fixture TE59 or equivalent to compress the spring for disassembly.

(c) Remove and discard the split keeper (1510).

(d) Permit the feathering spring assembly to expand to its unloaded length, and remove it from the special fixture.

(e) Remove the rear spring retainer (1500).

(f) Remove the feathering compression springs (1460 and 1490).

(g) Remove the spring spacer tube (1480).

(h) Remove the pitch change rod (1410).

(5) Cylinder and Guide Collar Unit Disassembly

(a) Remove and discard the socket head cap screw (280) inside the guide collar unit (240). Refer to Figure 3-4

CAUTION: UNSCREW THE CYLINDER SLOWLY AND CAREFULLY TO AVOID DAMAGE TO THE THREADS.

(b) Use a square bar of applicable size, one inch (25.4 mm) wide, to fit into the slot in the top of the cylinder (200) and operate as a wrench to slowly unscrew the cylinder from the hub unit (500).

(c) Remove the guide collar unit (240).

(d) Remove and discard the cylinder O-ring (890).

(6) Clamp Removal
Refer to Figure 3-5.

(a) Use a round bottom metal stamp or electric pencil and identify the clamp serial number on each corresponding counterweight (800).

(b) Remove and discard all outboard clamp bolts (770) and nuts (780).

(c) Remove and discard all inboard clamp socket screws (750) and cotter pins (710) or safety wire.

(d) Remove all clamp halves (840) from the hub arms.

1 For information about clamp inspection and repair, refer to the Clamp Overhaul chapter of Hartzell Propeller Standard Practices Manual 202A (61-01-02).

(e) Remove and discard clamp gaskets (760).

(f) Remove all balance weights (640) and attaching screws (630), where applicable.

1 Discard screws.

(g) Remove and discard all lubrication fittings (860) and lubrication fitting caps (850).

(h) Remove and discard the hex head bolts (9050) from the counterweight slugs (9040), where applicable.

1 Remove the counterweight slugs (9040), as applicable.

(i) Disengage the link arms (70) from the link screws (740) by removing the cotter pin (670) from the link screws.

(j) Remove and discard link screws (740), link screw sleeves (230) and cotter pins (670).

CAUTION: IF POSSIBLE, REINSTALL EACH BLADE ASSEMBLY ON THE SAME HUB ARM FROM WHICH IT WAS REMOVED. RECORD ON PAPER EACH BLADE SERIAL NUMBER AND ITS MATCHING HUB ARM AND CLAMP.

(k) Remove each blade assembly from the hub unit (500).

(7) Blade and Flange Mounting Parts Disassembly.
Refer to Figure 3-6.

(a) Beginning with blade position number one, remove and discard the bearing wire ring (580) from its groove in the hub-side race (571) of the blade split bearing (570).

(b) Remove the two halves of the hub-side race (571).

(c) Remove and discard the ball spacer (600) and bearing balls (590).

(d) Clip the blade O-ring (560).

(e) Remove and discard the blade O-ring (560).

(f) Remove the bearing retaining ring (610). Refer to Figure 3-6, Step One.

1 Option 1: Using a mallet and TE309, drive the bearing retaining ring (610) inboard over the shoulder of the hub arm.

2 Option 2: Using a mallet and soft punch at several positions on the outboard edge of the bearing retaining ring (610), drive the ring inboard over the shoulder of the hub arm.

(g) Remove and discard the bearing wire ring (620) that had been covered by the bearing retaining ring (610).

(h) Turn the halves of the blade-side race (572) so the split is at the top. Refer to Figure 3-6, Step Two.

(i) At the split, put one of the bearing balls (590) between the blade-side race (572) and inboard shoulder of the hub arm.

(j) Using a soft mallet, lightly tap the inboard top edge of the bearing retaining ring (610) to release the blade-side race (572) from the bearing retaining ring (610).

(k) Remove the halves of the blade-side race (572) as they become separated from the bearing retaining ring (610).

(l) Tilt the bearing retaining ring (610) inboard approximately 45 degrees and remove the bearing retaining ring (610) by sliding it outboard over the shoulder of the hub arm. Refer to Figure 3-6, Step Three.

(8) Hub Unit Disassembly

(a) Remove and discard the hex head bolts (360) that attach the spinner mounting plate (380) to the hub unit (500).

(b) Remove the spinner mounting plate (380).

(c) For additional hub unit overhaul instructions, refer to the Steel Hub Overhaul chapter of Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02).

Disassembly of the HC-B3TF-7AY propeller is now complete.

G. Disassembly of a Beta Valve
Refer to Figure 3-18.

(1) Beta Valve Rod End Disassembly - Engine Side

(a) Remove and discard the set screw (1880).

(b) Remove the rod end cap (1870).

(c) Remove the rod end fitting (1860).

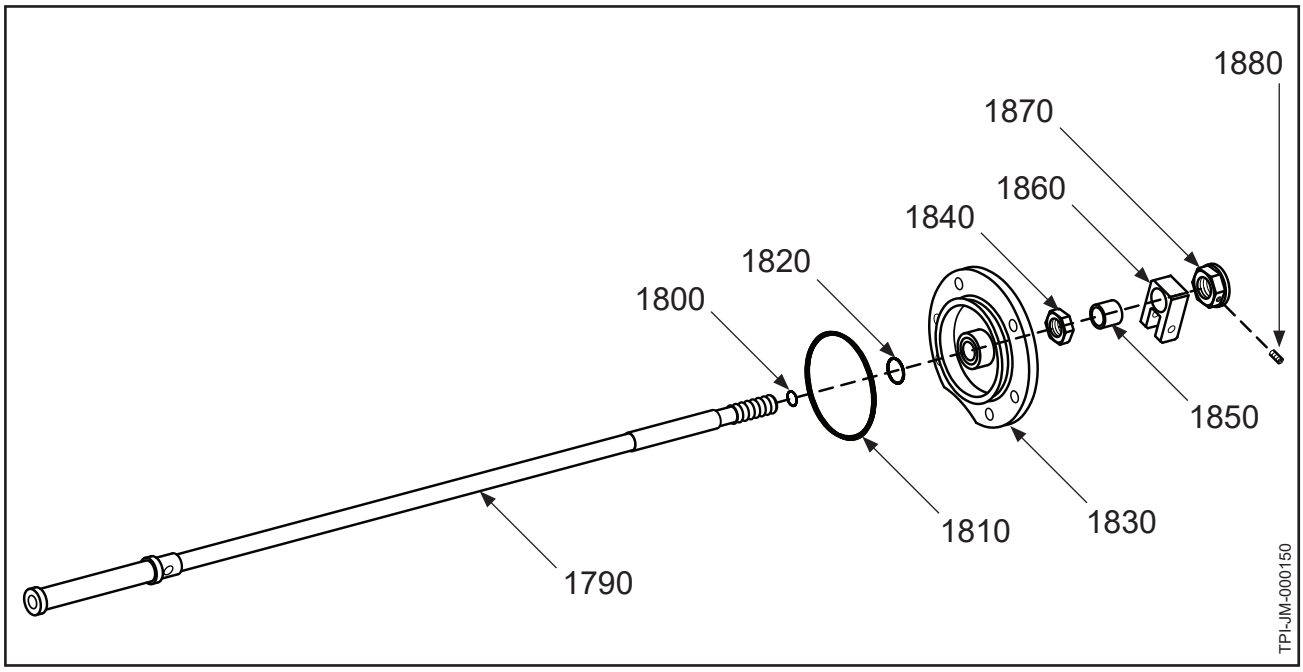
(d) Remove the valve bushing (1850).

(e) Remove and discard the jam nut (1840).

(f) Remove the engine cover (1830) that is around the beta valve spool (1790) from the engine.

(g) Remove and discard the O-rings from the OD (1810) and the ID (1820) of the engine cover (1830).

(h) Remove and discard the O-ring (1800) from the ID of the beta valve spool (1790).




**Beta Valve - Engine Side**
**Figure 3-18**

(2) Beta Valve Disassembly - Propeller Side
Refer to Figure 3-19.

(a) Before removing the propeller from the engine,

1 Remove and discard the self locking nut (1610).

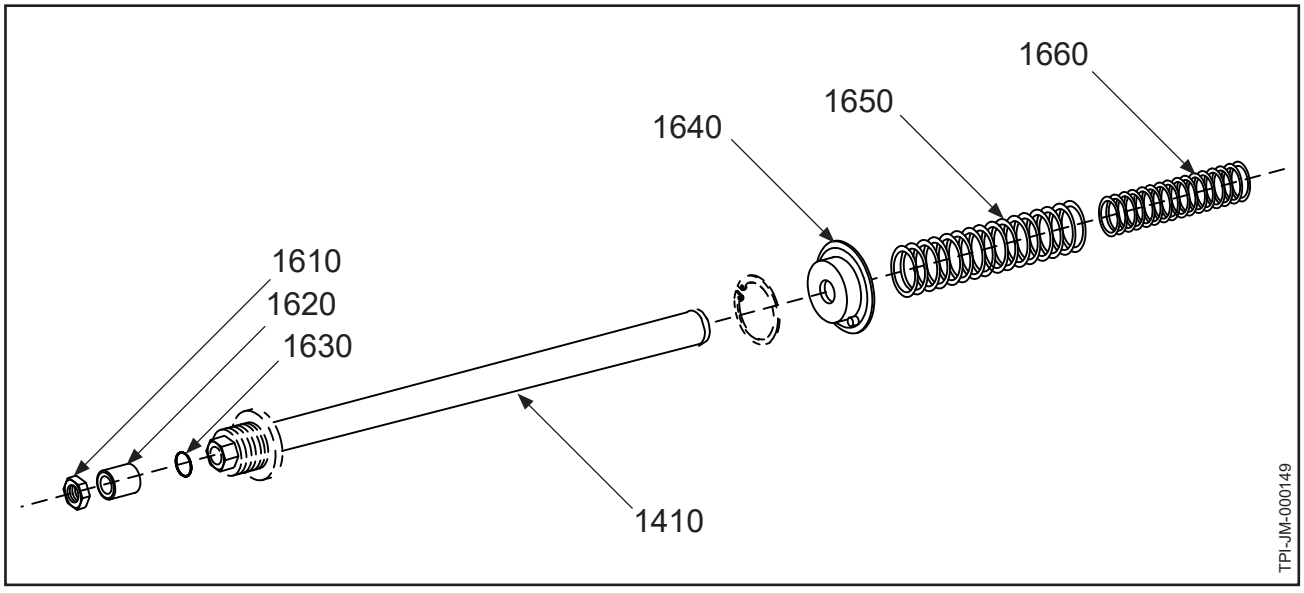
2 Remove the spacer (1620).

(b) After removing the propeller from the engine,

1 Remove and discard the O-ring (1630) from the propeller pitch change rod (1410).

2 Remove the engine manufactured supplied retaining ring to permit the removal of the beta spring retainer (1640).

3 Remove the outer compression spring (1650) and the inner compression spring (1660) from the inside of the engine shaft.



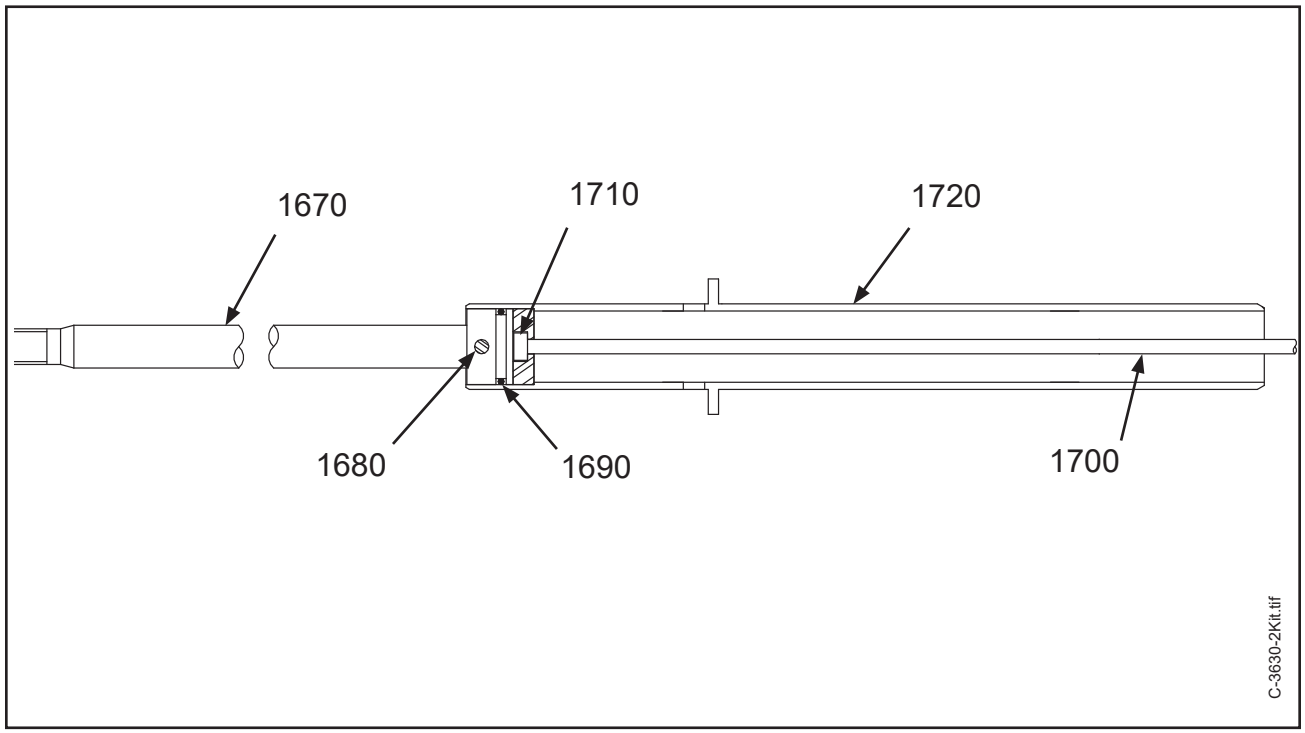

**Beta Valve - Propeller Side**
**Figure 3-19**

(3) Removal From Engine

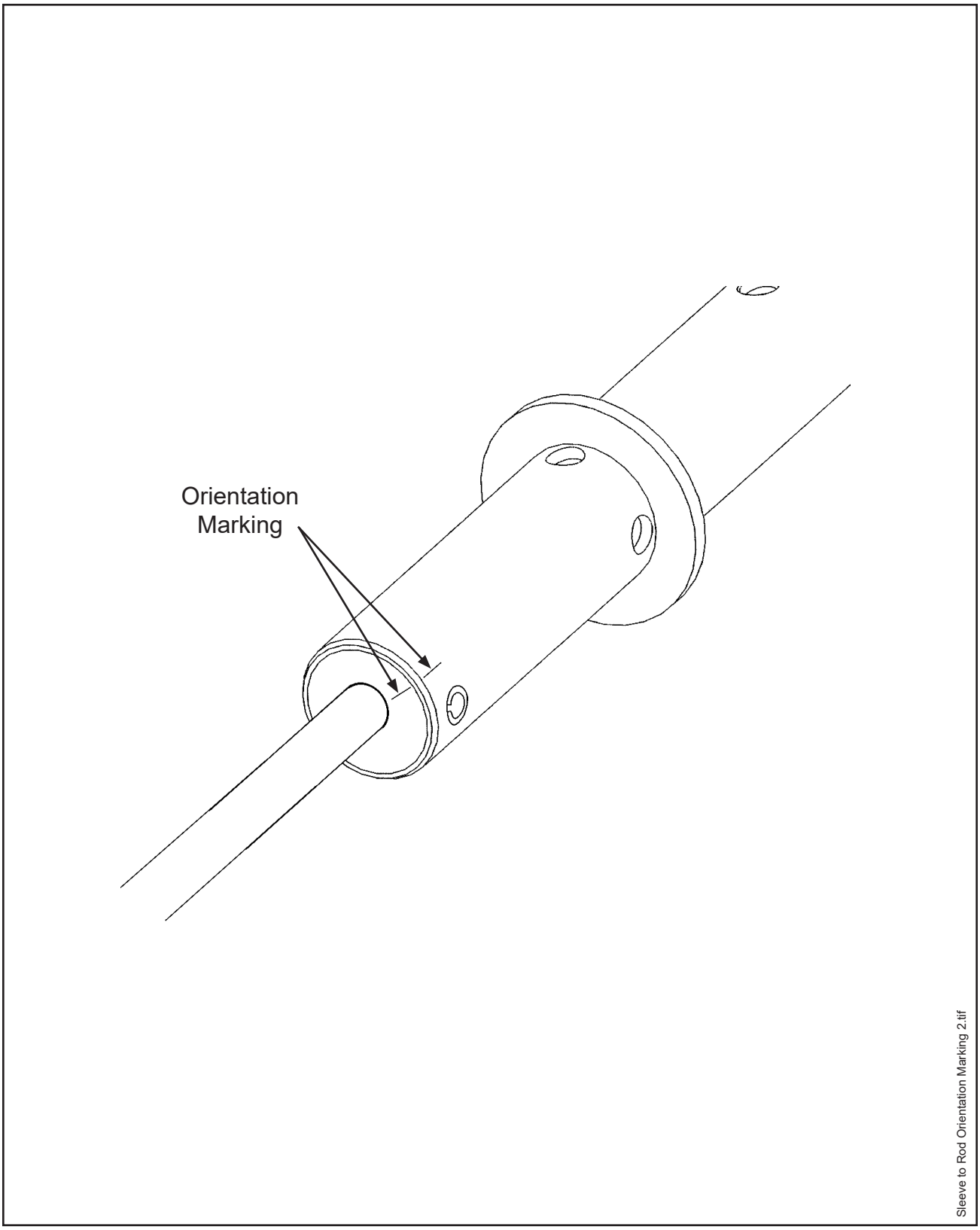
(a) Slide remaining beta valve assembly (C-3630-2KIT), including the beta valve spool (1790) through the engine shaft and exit the engine shaft on the propeller side of the engine shaft. Refer to Figure 3-20.

(b) Slide the beta valve spool (1790) out of the beta valve sleeve (1720) and off the end of the pitch unit indicator pin (1700).

NOTE: Item (1750) is a shouldered sleeve that is engine supplied and installed in the engine shaft. The purpose of item (1750) is to transfer oil from the holes in the engine shaft to the beta valve sleeve (1720). The shouldered sleeve (1750) is held by an engine manufacturer supplied retaining ring (1730). Two O-rings of the same size (1740) are installed in the inside diameter and two O-rings (1730) and (1760) are installed on the outside diameter. These four O-rings must be replaced in accordance with the engine manufacturers instructions. Refer to Figure 10-110.




**C-3630-2KIT**
**Figure 3-20**




**Orientation Markings**
**Figure 3-21**

(4) Beta Valve Spool Disassembly

CAUTION 1: THE ORIENTATION OF THE BETA ROD (1670) RELATIVE TO THE BETA VALVE SLEEVE (1720) DURING ASSEMBLY MUST BE HELD. IF NOT COMPLETED BEFORE, PERMANENTLY MARK BOTH PARTS WITH A VIBRO-PENCIL OR SCRATCHING DEVICE AS SHOWN IN FIGURE 3-21.

CAUTION 2: DO NOT IMPRESSION STAMP BECAUSE OF POSSIBLE UNACCEPTABLE DISTORTION.

CAUTION 3: WHEN DRILLING THE BETA VALVE SLEEVE (1720) AND THE BETA ROD (1670) TOGETHER, THE 0.125 INCH (3.17 MM) DIAMETER DRILL DOES NOT GO THROUGH THESE PARTS IN A STRAIGHT LINE. THUS, WHEN ASSEMBLING THE BETA VALVE SLEEVE (1720) AND THE BETA ROD (1670) BACK TOGETHER AGAIN, THE SAME ORIENTATION MUST BE HELD. IF NOT, THE BETA VALVE SLEEVE (1720) HOLES, THE BETA ROD (1670) HOLE EXIT, AND ENTRANCE LOCATIONS WILL NOT MATCH FOR INSTALLATION OF THE SPRING PIN (1680).

(a) Using a drill and a size No. 42 (0.0935 inch dia.) drill bit, drill the peened sides of the beta valve sleeve (1720) pin hole.

(b) Remove and discard the spring pin (1680).

CAUTION: DURING REMOVAL OF THE PITCH INDICATOR PIN FROM THE BETA VALVE SLEEVE, DO NOT FORCE THE COMPONENTS APART. MAKE SURE THE COMPONENTS ARE PROPERLY ALIGNED TO AVOID DAMAGE.

(c) Remove the beta rod (1670) from the beta valve sleeve (1720).

(d) Remove and discard the O-ring (1690) from the end of the beta rod (1670).

(e) Push the pitch unit indicator pin (1700) through the beta valve sleeve (1720) and the counterbored washer (1710).

(f) Pull the head of the reverse pitch unit indicator pin (1700) and remove it from the end of the beta valve sleeve (1720) and the counterbored washer (1710).

(g) Remove the counterbored washer (1710) from the beta valve sleeve (1720) if the counterbored washer (1710) did not already come out with the removed pitch unit indicator pin (1700).

CLEANING - CONTENTS

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1. Cleaning Procedures (Rev. 4)

A. General Cleaning

(1) Refer to the Cleaning chapter of Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02).

B. Cleaning Steel Parts for Magnetic Particle Inspection

(1) Refer to the Magnetic Particle Inspection chapter of Hartzell Propeller Inc. Standard Practices in Manual 202A (61-01-02).

C. Cleaning Steel Parts for Cadmium Replating Procedures

(1) Refer to the Cadmium Replating chapter of Hartzell Propeller Inc. Standard Practices in Manual 202A (61-01-02).

D. Cleaning Aluminum Parts for Penetrant Inspection

(1) Refer to the Penetrant Inspection chapter of Hartzell Propeller Inc. Standard Practices in Manual 202A (61-01-02).

E. Cleaning Titanium Parts for Penetrant Inspection

(1) Refer to the Penetrant Inspection chapter of Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02).

F. Cleaning Aluminum Parts for Chromic Acid Anodizing Procedures

(1) Refer to the Chromic Acid Anodizing chapter of Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02).

G. Cleaning Cylinder Threads (Propellers with screw-on cylinders only)

(1) It is preferable that the cylinder threads be cleaned only with solvent CM23; however, removal of sealant in the threaded area can be difficult.

CAUTION: DO NOT USE GLASS BEAD OR OTHER ABRASIVE CLEANING METHODS, AS THEY MAY CAUSE EXCESSIVE DAMAGE TO THE CYLINDER THREADS.

(2) Use plastic media in accordance with the Cleaning chapter of Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02) to remove the sealant from the cylinder threads.

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## CHECK - CONTENTS

CHECK - CONTENTS

## LIST OF FIGURES

## LIST OF FIGURES, CONTINUED



## LIST OF TABLES

1. Inspection Interval Requirements (Rev. 1)

   A. General

      (1) For information about life limited components and mandatory inspections, refer to the Airworthiness Limitations chapter of the applicable Hartzell Propeller Inc. owner's manual.

      (2) For overhaul periods of Hartzell Propeller Inc. propellers, refer to Hartzell Propeller Inc. Service Letter HC-SL-61-61Y.

2. Dimensional Inspection (Rev. 1)

   A. Diameter Measurements

      (1) When measuring the diameter of a part with a two point measuring instrument, take at least two measurements unless specified differently.

         (a) Obtaining a measurement outside the specified tolerance at any point of measurement is cause for retirement of the part when a minimum of two measurements are taken.

         (b) Alternately, take eight evenly spaced measurements, unless specified differently.

            1 Obtaining a measurement outside the specified tolerance on three or more measurements is cause for retirement of the part when eight measurements are taken (two of eight measurements may be out of specified tolerance).

            2 This alternate method may not be used to accept a diameter that has obvious damage beyond repairable (serviceable) limits.

      (2) When measuring the diameter of a part with a three point measuring instrument, take one measurement. A measurement outside the specified tolerance is cause for retirement of the part.

   B. Decimal Places

      (1) Inspect the part features to the number of decimal places specified. If three decimal places are specified, inspect the part to three decimal places only.

3. Inspection Criteria/Procedures (Rev. 3)

A. Propeller Components (Except for those listed separately in this section)

(1) Refer to Table 5-1, "Component Inspection Criteria" in this chapter.

B. Hubs

(1) Steel Hubs: Refer to the Steel Hub Overhaul chapter of Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02).

C. Blades

(1) Aluminum Blades: Refer to Hartzell Propeller Inc. Aluminum Blade Overhaul Manual 133C (61-13-33).

(2) Composite Blades: Refer to Hartzell Propeller Inc. Composite Blade Overhaul Manual 135F (61-13-35).

D. Blade Clamps

(1) Refer to the Blade Clamp Overhaul chapter of Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02).

E. Ice Protection Systems

(1) For ice protection systems supplied by Hartzell, refer to Hartzell Propeller Inc. Ice Protection System Manual 180 (30-61-80).

(2) For ice protection systems not supplied by Hartzell, refer to the applicable TC or STC holder’s Instructions for Continued Airworthiness (ICA).

F. Spinner Assemblies

(1) Metal Spinners: Refer to Hartzell Propeller Inc. Metal Spinner Maintenance Manual 127 (61-16-27).

(2) Composite Spinners: Refer to Hartzell Propeller Inc. Composite Spinner Maintenance Manual 148 (61-16-48).

G. Special Inspections (Lightning Strike, Foreign Object Strike, etc.)

(1) Refer to the Special Inspections chapter of Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02).

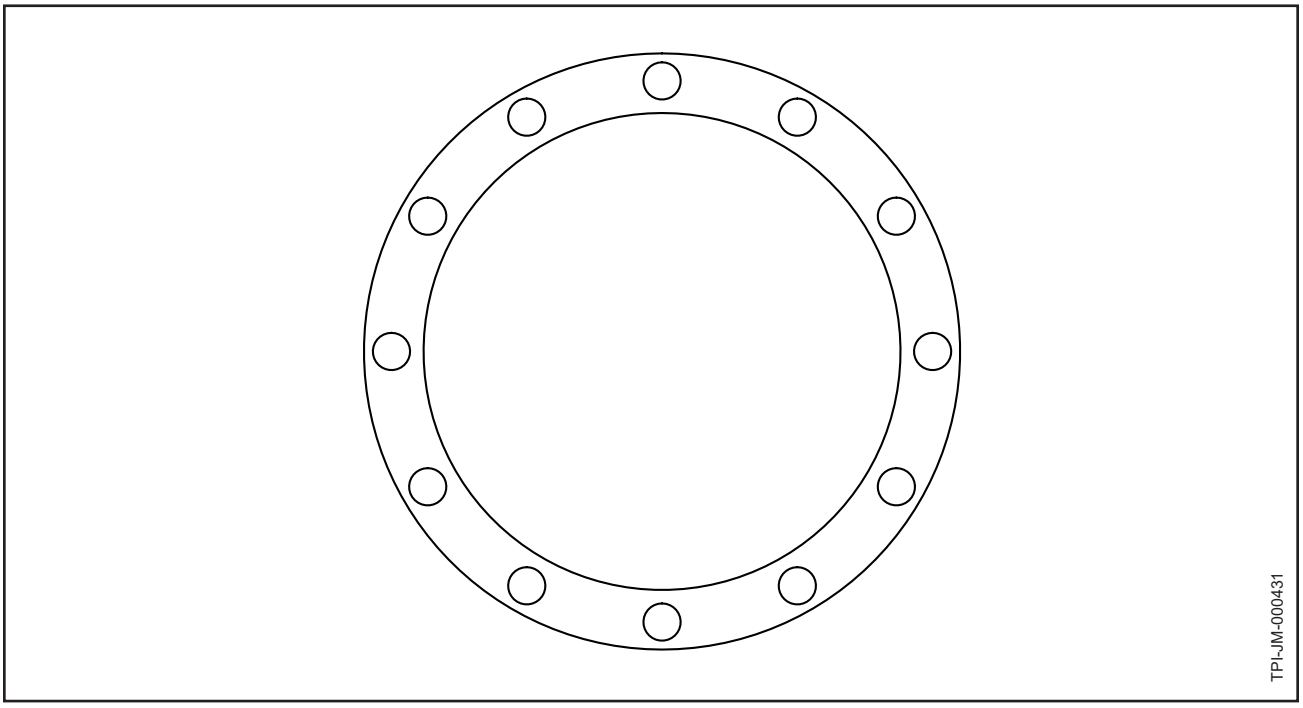
4. Propeller Component Checks

CAUTION: INSTRUCTIONS AND PROCEDURES IN THIS CHAPTER MAY INVOLVE PROPELLER CRITICAL PARTS. REFER TO THE INTRODUCTION CHAPTER OF THIS MANUAL FOR INFORMATION ABOUT PROPELLER CRITICAL PARTS. REFER TO THE ILLUSTRATED PARTS LIST IN THIS MANUAL FOR IDENTIFICATION OF PROPELLER CRITICAL PARTS.

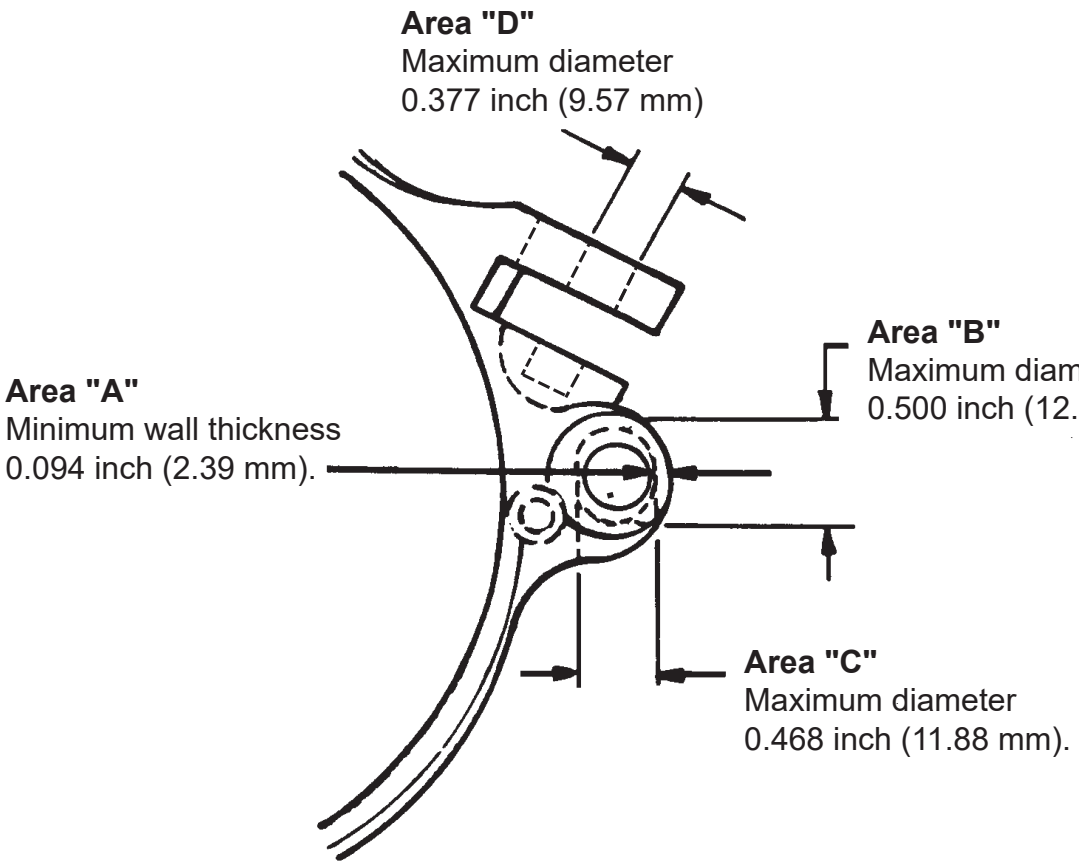
Refer to Table 5-1, "Component Inspection Criteria" in this chapter.

## Component Inspection Criteria
## Table 5-1

| Inspect | Serviceable Limits | Corrective Action |
|---|---|---|
| A. Beta Rod Support Ring (30)<br>Refer to Figure 5-1. | | |
| (1) Visually examine for corrosion product and pitting. | Corrosion product is not permitted.<br>The maximum permitted depth of pitting is 0.005 inch (0.12 mm) | Remove corrosion product using plastic media or very fine glass bead cleaning in accordance with the Cleaning chapter of Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02).<br>If pitting is deeper than the permitted serviceable limits, replace the beta rod support ring. |
| (2) Visually examine for anodize coverage. | Anodize must completely cover the beta rod support ring with the following exceptions are permitted:<br>Loss of anodize around each of the three holes caused by clamping nuts<br>Sparse and light random scratches. | Strip the remaining anodize coating and reanodize in accordance with the Chromic Acid Anodize chapter of Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02). |




**Beta Rod Support Ring**
**Figure 5-1**




| Part No. | Maximum ID | |
|---|---|---|
| | Inches | Millimeters |
| A-862 | 3.784 | 96.11 |
| A-862-1 | 4.286 | 108.86 |
| A-862-7 | 4.634 | 117.70 |

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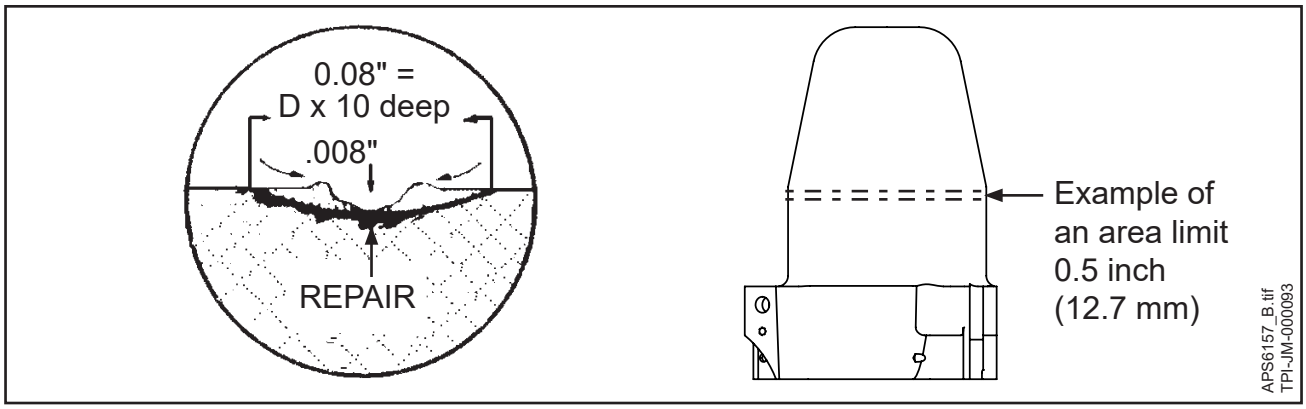
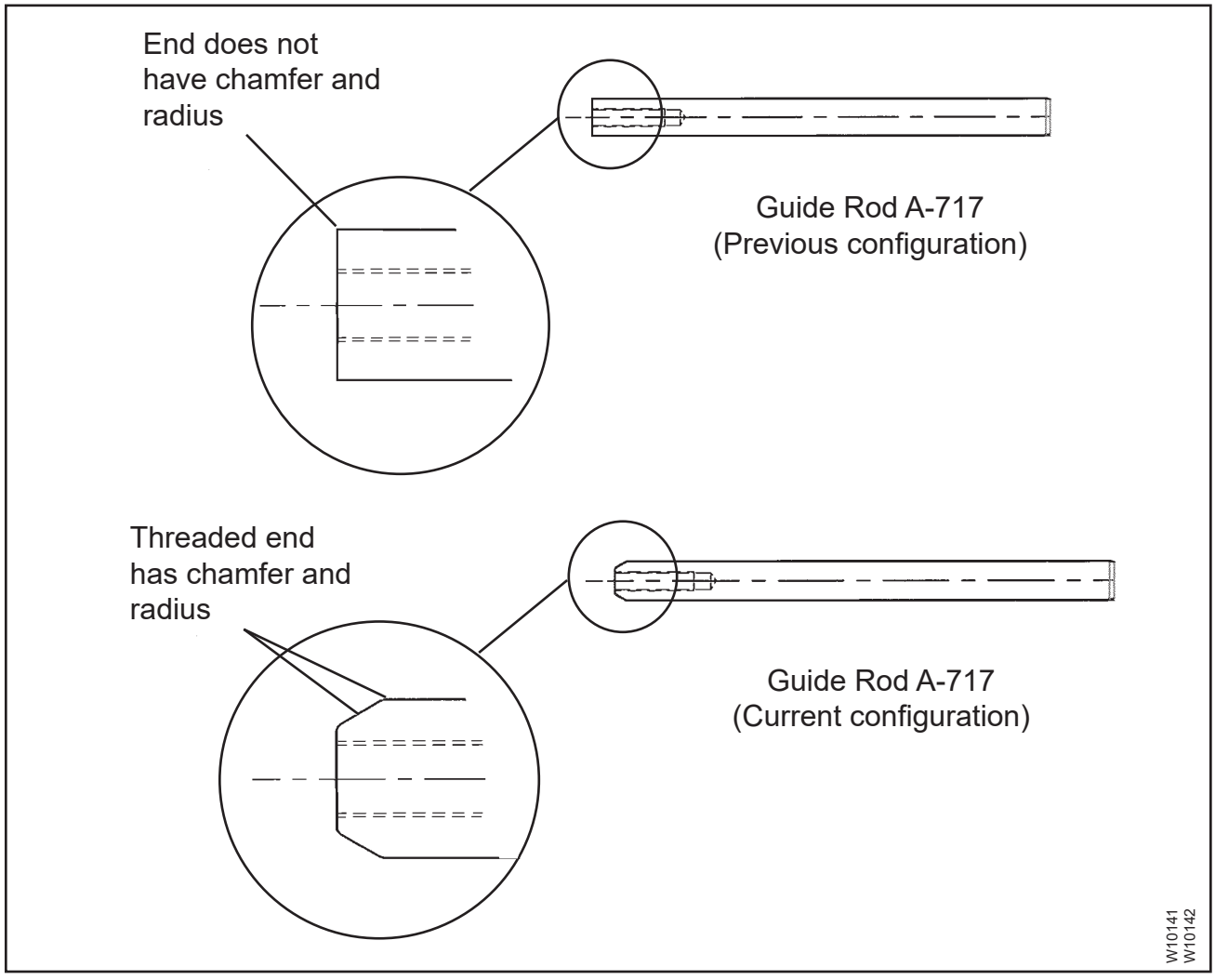
**Piston Bushing Wear Limits**

**Piston Inspection**
**Figure 5-2**




**External Piston Assembly Surface Inspection**
**Figure 5-3**




**Guide Rod A-717 Previous and Current Configurations**
**Figure 5-4**

## Component Inspection Criteria
## Table 5-1

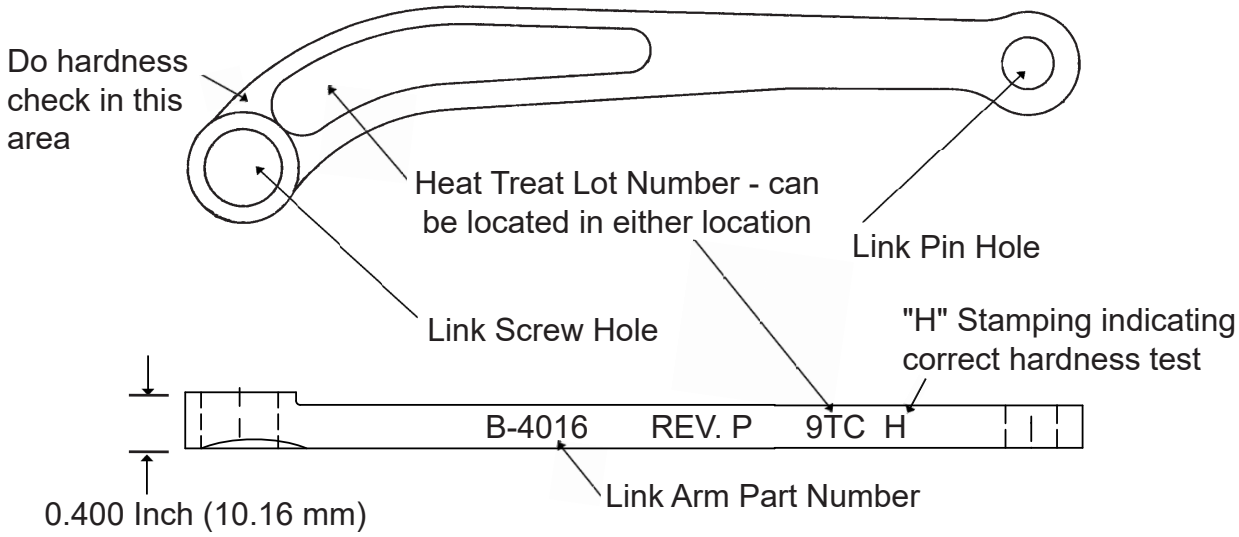
| | Inspect | Serviceable Limits | Corrective Action |
|---|---|---|---|
| B. | Piston Unit (50)<br>Refer to Figure 5-2. | | |
| (1) | Visually examine the threads of the link pin safety screw holes in the piston. | Worn threads can cause the link pin to disconnect from the piston. There must be at least three thread lengths in the piston link pin screw hole to hold the safety screw in position. | Repair threads in the link pin safety screw holes by using a thin walled insert. Refer to the Repair chapter of this manual. |
| (2) | Visually examine the ID of the plastic piston bushing for wear, damage, or corrosion product. | If there is wear, damage, or corrosion product, measure the ID of the plastic piston bushing. Refer to Figure 5-2 for applicable limits. | If the ID of the plastic piston bushing is greater than the permitted serviceable limits, replace the plastic piston bushing. Refer to the Repair chapter of this manual. |
| (3) | Visually examine the hole at the front of the piston for damage caused by inserting or removing the pitch change rod. | Damage must not cause interference with the sealing ability of the O-ring. | If the damage causes interference with the sealing ability of the O-ring, replace the piston. |
| (4) | Special Inspections for C-3021-( ) and C-2303-3( ) pistons: Measure the thickness of the piston lug wall in the area of the beta rod hole, Area "A". | Refer to Figure 5-2 for the minimum permitted wall thickness. | If the wall thickness is less than the permitted serviceable limits, replace the piston. |
| (5) | Measure the beta rod hole in Area "B" and Area "C". | Refer to Figure 5-2 for the maximum permitted beta rod hole dimensions. | If either measurement of the beta rod hole for Area "B" or Area "C" is greater than the maximum permitted serviceable limits, replace the piston. |
| (6) | Measure the piston link pin holes, Area "D". | The maximum permitted diameter of a piston link pin hole is 0.377 inch (9.57 mm). | If a link pin hole diameter is greater than the permitted serviceable limits, repair the hole in accordance with the Special Adhesive and Bonding Procedures chapter of Hartzell Propeller Inc. Standard Practices Manual 202A, (61-01-02). |

## Component Inspection Criteria
## Table 5-1

| | Inspect | Serviceable Limits | Corrective Action |
|---|---|---|---|
| B. | Piston Unit (50), continued<br>Refer to Figures 5-3 and 5-4. | | |
| (7) | Visually examine the outside surfaces of the piston assembly for corrosion product, pitting, scratches or damage | Corrosion product is not permitted.<br>The maximum permitted depth of pitting is 0.008 inch (0.20 mm) deep and 0.0625 inch (1.58 mm) diameter.<br>The maximum permitted depth of scratching and damage is 0.004 inch (0.10 mm).<br>Pushed up material is not permitted.<br>The area limit of pitting, scratching, and damage is 0.5 inch (12.7 mm) linearly around the circumference of the piston. Refer to Figure 5-3. | If pitting is greater than the serviceable limits, repair the outside surfaces of the piston assembly to a minimum diameter of the pitting depth x 10.<br>The maximum depth of repair for pitting is 0.008 inch (0.20 mm). Remove any pushed-up material by using an abrasive pad CM47 or equivalent.<br>If corrosion product, pitting, scratches or damage is greater than the serviceable limits or corrective action, replace the piston. Refer to Figure 5-3. |
| | | Pitting, scratches, or damage are not permitted to interfere with link pin attachment. | Repair is not permitted in the link pin attaching area.<br>If pitting, scratches, or damage are outside the serviceable limits the piston must be replaced. |
| (8) | A-717 piston guide rod that has a chamfer and radius on the threaded end. Installed in a C-3021-4 or C-3021-4L piston. Refer to Figure 5-4. | Scratches are permitted. Gouges are not permitted. | If there is a gouge, replace the piston guide rod in accordance with the Standard Repairs chapter of Hartzell Propeller Inc. Standard Practices Manual (61-01-02). |
| | NOTE: Some older C-3021-4 and -4L pistons can have A-717 guide rods that do not have a chamfer and radius on the threaded end. Propeller models HC-B3TN-5( ) that have the start lock attached to the 834-( ) guide collar unit can use only pistons that have a guide rod with a chamfer and radius. Propeller models HC-B3TN-5( ) that have the start lock attached to the bulkhead can use C-3021-4 and 4L pistons, which can have A-717 guide rods of either configuration or can have any combination of the two guide rod configurations. | | |
| (9) | Visually examine the felt seal groove side walls for pitting or damage. | The maximum permitted depth of pitting or damage is 0.003 inch (0.07 mm).<br>The maximum permitted diameter of an individual pit is 0.06 inch (1.5 mm).<br>Pin-point penetrant indications from pitting are permitted. | Using an abrasive pad CM47 or equivalent, polish to remove pitting or damage to a maximum depth of 0.006 inch (0.15 mm).<br>If pitting or damage is greater than the permitted serviceable limits or corrective action limits, replace the piston. |

## Component Inspection Criteria
## Table 5-1

| | Inspect | Serviceable Limits | Corrective Action |
|---|---|---|---|
| B. | Piston Unit (50), continued<br>Refer to Figures 5-2 thru 5-4. | | |
| (10) | Visually examine the O-ring groove side walls for pitting or damage. | A smooth surface finish is required.<br>Pitting or damage is not permitted. | Using an abrasive pad CM47 or equivalent, polish to remove pitting or damage to a maximum depth of 0.006 inch (0.15 mm).<br>If the pitting or damage is greater than the permitted serviceable limits or corrective action limits, replace the piston. |
| (11) | Visually examine the felt seal groove ID for pitting or damage. | The maximum permitted depth of pitting or damage is 0.005 inch (0.12 mm).<br>The maximum permitted diameter of an individual pit is 0.060 inch (1.50 mm).<br>Pin-point penetrant indications from pitting are permitted. | Using an abrasive pad CM47 or equivalent, polish to remove pitting or damage to a maximum depth of 0.010 inch (0.25 mm).<br>Localized repairs of pitting or damage are permitted up to a maximum depth of 0.015 inch (3.81 mm). A maximum of three localized repair sites are permitted. The maximum length of a localized repair site is 0.25 inch (6.3 mm). Each localized repair site may be the entire width of the felt seal groove.<br>If the pitting or damage is greater than the permitted serviceable limits or corrective action limits, replace the piston. |
| (12) | Visually examine the O-ring groove ID for pitting or damage. | A smooth surface finish is required.<br>Pitting or damage is not permitted. | Using an abrasive pad CM47 or equivalent, polish to remove pitting or damage to a maximum depth of 0.003 inch (0.07 mm).<br>If the pitting or damage is greater than the permitted serviceable limits or corrective action limits, replace the piston. |
| (13) | Penetrant inspect the piston in accordance with the Penetrant Inspection chapter of Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02). | A relevant indication is not permitted. | If there is a relevant indication, replace the piston. |



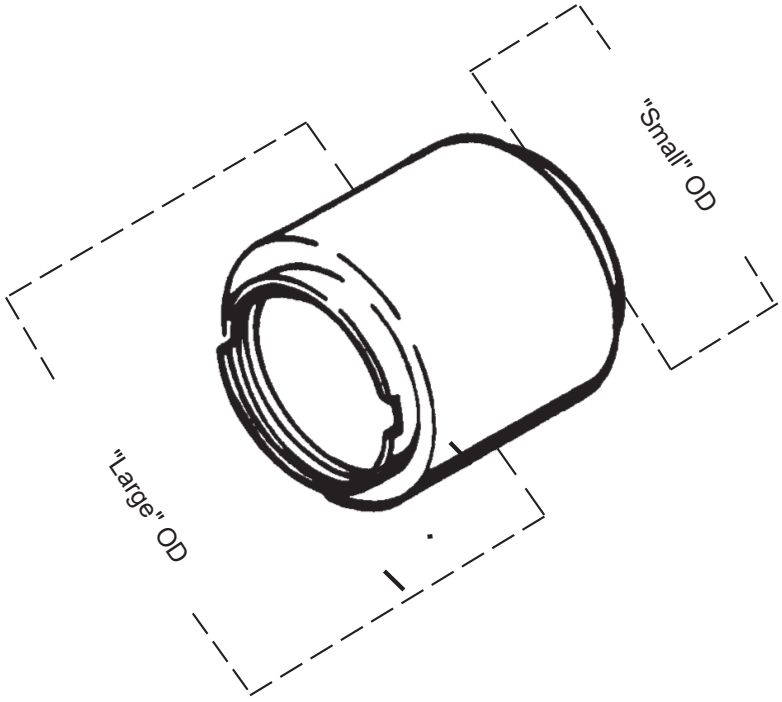

NOTE: B-1901 Link Arm shown.

APS2087
B-1901_AD.ai

**Link Arm**
**Figure 5-5**

## Component Inspection Criteria
## Table 5-1

| | Inspect | Serviceable Limits | Corrective Action |
|---|---|---|---|
| C. | Link Arm (70)<br>Refer to Figure 5-5. | | |
| | (1) Visually examine each link arm for twisting or distortion. | Twisting or distortion is not permitted. Flatness must be less than 0.015 inch (0.38 mm) from one hole to the other. | If there is twisting or distortion is greater than the permitted serviceable limits, replace the link arm. |
| | (2) Measure the ID of the link pin hole and link screw hole of each link arm. | The maximum permitted ID of the link pin hole is 0.3785 inch (9.613 mm).<br>The maximum permitted ID of the link screw hole is 0.5665 inch (14.389 mm). | If either ID is greater than the permitted serviceable limits, replace the link arm. |
| | (3) Measure the thickness of the end of the link arm, adjacent to the link screw hole. | The minimum permitted thickness for the end of the link arm is 0.400 inch (10.16 mm). | If the thickness is less than the permitted serviceable limits, replace the link arm. |
| | (4) Magnetic particle inspect the link arms in accordance with the Magnetic Particle Inspection chapter of Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02). | A relevant indication is not permitted. | If there is a relevant indication, replace the link arm. |
| | (5) Visually examine each link arm for wear to the cadmium plating. | Wear through the cadmium plating is not permitted. | Replate the link arm in accordance with the Cadmium Replating chapter of Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02). |
| | (6) B-4016(L) and B-1901(L) link arms only: Visually examine the link arm for the heat treat lot number 9TC. Refer to Figure 5-5 for the location of the heat treat lot number. | If the heat treat lot number is 9TC, the link arm HRC hardness must be within the range of Rockwell C value of 31 thru 37. | Perform an HRC hardness test. If the hardness is greater than a Rockwell C value of 37 or less than a Rockwell C value of 31, replace the link arm.<br>If the hardness is equal to or between the Rockwell C values of 31 thru 37, use a round bottom stamp to stamp an "H" following the heat treat lot number. Refer to Figure 5-5 for the location of the stamping. |




| Part Number | Minimum "Large" OD | Minimum "Small" OD |
|---|---|---|
| B-854-1 | 3.773 inches (95.84 mm) | 3.496 inches (88.80 mm) |
| B-1803-2 | 4.273 inches (108.54 mm) | 3.596 inches (91.34 mm) |
| B-1803-3 | 4.273 inches (108.54 mm) | 3.596 inches (91.34 mm) |
| B-1803-4 | 4.273 inches (108.54 mm) | 3.596 inches (91.34 mm) |
| B-3406 | 4.623 inches (117.43 mm) | 4.346 inches (110.39 mm) |

**Cylinder Dimensional Inspection Limits**
**Figure 5-6**

## Component Inspection Criteria
## Table 5-1

| | Inspect | Serviceable Limits | Corrective Action |
|---|---|---|---|
| D. | Cylinder (200)<br>Refer to Figure 5-6. | | |
| (1) | Visually examine all threaded surfaces on the cylinder. | One thread total accumulated damage is permitted. | If the damage is greater than the permitted serviceable limits, replace the cylinder. |
| (2) | Visually examine the cylinder for chrome plate coverage | Flaking of the chrome finish is not permitted.<br>Minor wear that is less than 0.001 inch (0.025 mm) and random, light scratches that are not greater than the chrome depth and do not interfere with the seal of the O-ring are permitted. Otherwise, complete chrome coverage is required. | If the wear or damage is greater than the permitted serviceable limits, repair or replace the cylinder.<br>For cylinder repair and rechroming procedures, refer to the Hard Chromium Replating chapter of Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02). |
| (3) | Visually examine the normal operating area of the cylinder for scratches, wear, or gouges. | The maximum permitted depth of a scratch, wear, or gouge is 0.001 inch (0.025 mm). | If the damage is greater than the permitted serviceable limits, repair or replace the cylinder.<br>For cylinder repair and rechroming procedures, refer to the Hard Chromium Replating chapter of Hartzell Propeller Inc Standard Practices Manual 202A (61-01-02). |
| (4) | Measure the large OD and the small OD of the cylinder. | Refer to Figure 5-6 for minimum permitted dimensional inspection limits. | If the large OD or small OD of the cylinder is smaller than the permitted serviceable limits, repair or replace the cylinder.<br>For cylinder repair and rechroming procedures, refer to the Hard Chromium Replating chapter of Hartzell Propeller Inc Standard Practices Manual 202A (61-01-02). |
| (5) | Magnetic particle inspect the cylinder at each overhaul in accordance with the Magnetic Particle Inspection chapter of Hartzell Propeller Inc Standard Practices Manual 202A (61-01-02). | A relevant indication is not permitted. | If there is a relevant indication, replace the cylinder. |

## Component Inspection Criteria
## Table 5-1

| Inspect | Serviceable Limits | Corrective Action |
|---|---|---|
| E. Guide Collar Unit (240) | | |
| (1) Visually examine the guide collar for nicks, gouges, or other damage. | A nick, gouge, or other damage is not permitted. If there is a nick, gouge, or other damage, repair it in accordance with the corrective action repair limits. | If the depth of the nick, gouge, or damage is less than 0.020 inch (0.51 mm), polish the damaged area with abrasive pad CM47 or equivalent.<br>Apply chemical conversion coating in accordance with the Chromic Acid Anodizing chapter of Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02).<br>If the depth of the damage is greater than 0.020 inch (0.51 mm), replace the guide collar. |
| (2) Penetrant inspect the guide collar in accordance with the Penetrant Inspection chapter of Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02). | A relevant indication is not permitted. | If there is a relevant indication, replace the guide collar. |
| F. Plastic Bushing (260)<br>Refer to Figure 5-7. | | |
| (1) Visually examine and measure the ID of each plastic bushing. | A maximum oval-shaped wear of 0.008 inch (0.20 mm) is permitted. Refer to Figure 5-7 for plastic bushing ID requirements. | If wear is greater than the permitted serviceable limits, the ID is greater than the maximum permitted dimension, or the plastic bushing is loose in the guide collar housing, replace the plastic bushing. Refer to the Repair chapter of this manual for replacement procedures. |

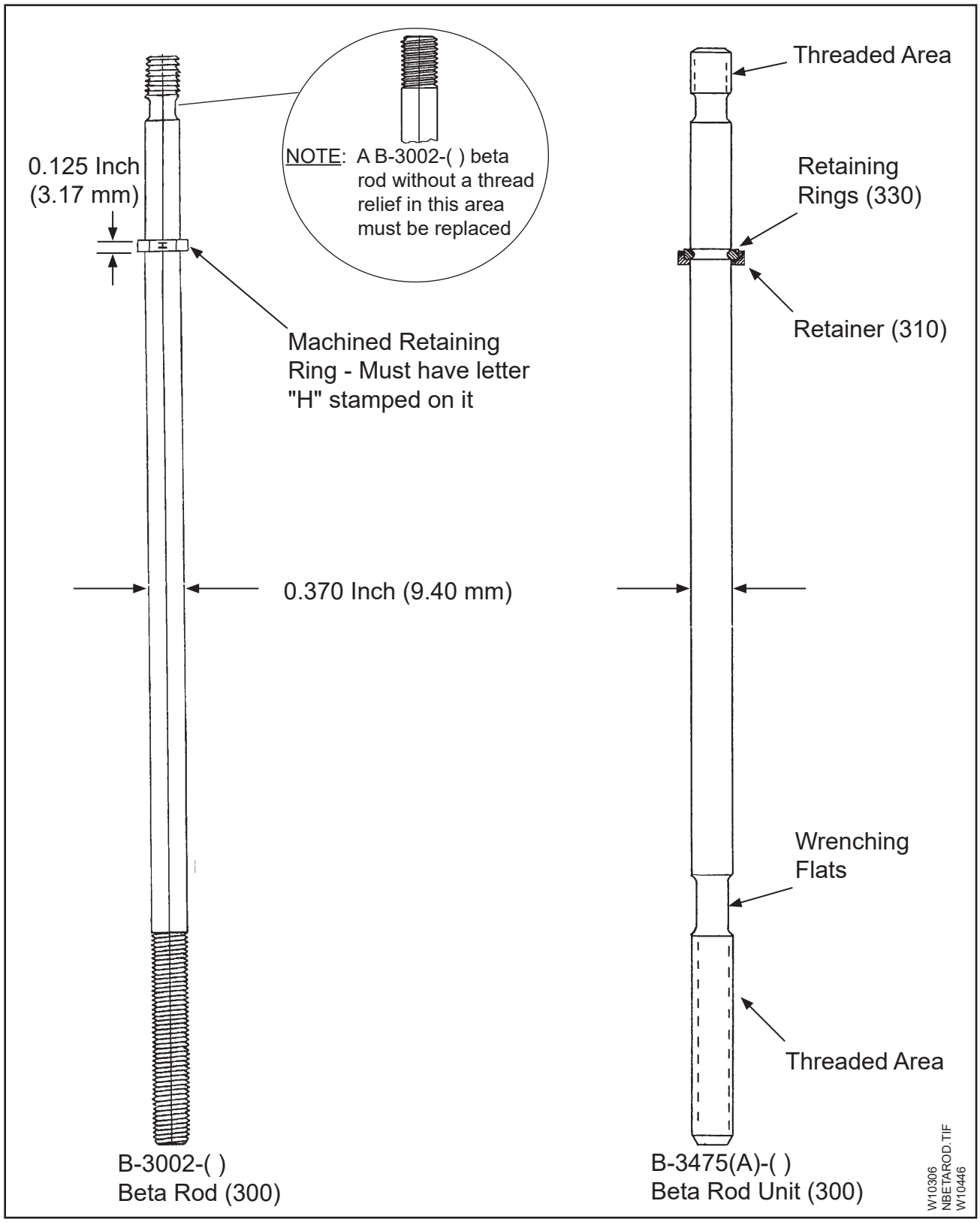
| Part Number | Maximum ID | |
|---|---|---|
| | Inches | Millimeters |
| A-116D-1 | 0.515 | 13.08 |
| A-3023 | 0.387 | 9.82 |

GUIDBUSH.XLS

**Plastic Bushing Dimensional Inspection Limits**
**Figure 5-7**

## Component Inspection Criteria
## Table 5-1

| | Inspect | Serviceable Limits | Corrective Action |
|---|---|---|---|
| G. | Beta Spring Retainer (310) | | |
| (1) | Visually examine each beta spring retainer for corrosion product and pitting. | Corrosion product is not permitted.<br>The maximum permitted depth of pitting is 0.005 inch (0.12 mm). | Remove corrosion product using glass bead cleaning in accordance with the Cleaning chapter of Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02).<br>Replate the beta spring retainer in accordance with the Cadmium Replating chapter of Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02).<br>If corrosion product cannot be removed or if pitting is greater than the permitted serviceable limits, replace the beta spring retainer. |
| (2) | Visually examine each beta spring retainer for scratches. | The maximum permitted depth for a scratch is 0.005 inch (0.12 mm). | If the depth of a scratch is greater than 0.005 inch (0.12 mm), replace the beta spring retainer. |
| (3) | Visually examine each beta spring retainer for cadmium plating coverage. | Except for a few minor scratches and corners with cadmium plating missing, complete cadmium plating coverage is required. | Replate the beta spring retainer in accordance with the Cadmium Replating chapter of Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02). |




**Beta Rod**
**Figure 5-8**

## Component Inspection Criteria
## Table 5-1

| | Inspect | Serviceable Limits | Corrective Action |
|---|---|---|---|
| H. | Beta Rod (320)<br>Refer to Figure 5-8. | | |
| (1) | Visually examine each beta rod for bending or distortion. | Each beta rod must be straight. | If the beta rod is not straight, replace the beta rod. |
| (2) | Visually examine each beta rod for damage that goes through the chrome finish. | Damage that goes through the chrome surface is not permitted. | If the damage is greater than the permitted serviceable limits, replace the beta rod. |
| (3) | Visually examine the threaded areas of each beta rod for damage or wear. | The maximum permitted amount of damage or wear is 10 degrees of circumference of the beta rod. | If the damage or wear is greater than the permitted serviceable limits, replace the beta rod. |
| (4) | Visually examine the cadmium plating coverage on the threaded areas of each beta rod. | Except for a few minor scratches and corners with cadmium plating missing, cadmium plating must completely cover the threaded areas of the beta rod. | Replate and bake the beta rod in accordance with the Cadmium Replating chapter of Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02). |
| (5) | Visually examine the machined retaining ring for damage, deformation, and wear on the older style B-3002-( ) beta rods. | Damage, deformation, or wear to the machined retaining ring greater than 0.010 inch (0.25 mm) is not permitted. | If the damage, deformation, or wear to the machined retaining ring is greater than the permitted serviceable limits, replace the beta rod. |
| | | A stamped letter "H" must be on the machined retaining ring of the B-3002-( ) beta rod, indicating the part was heat treated. | If a stamped letter "H" is not on the machined retaining ring, replace the beta rod. |

NOTE 1: A B-3002-( ) beta rod that does not have a thread relief in the bottom threaded end, must be replaced at overhaul.

NOTE 2: B-3475(A)-( ) beta rod unit, incorporates pressed-on retaining rings, which are removed and discarded at overhaul. Refer to the Assembly chapter of this manual for installation procedures.

## Component Inspection Criteria
## Table 5-1

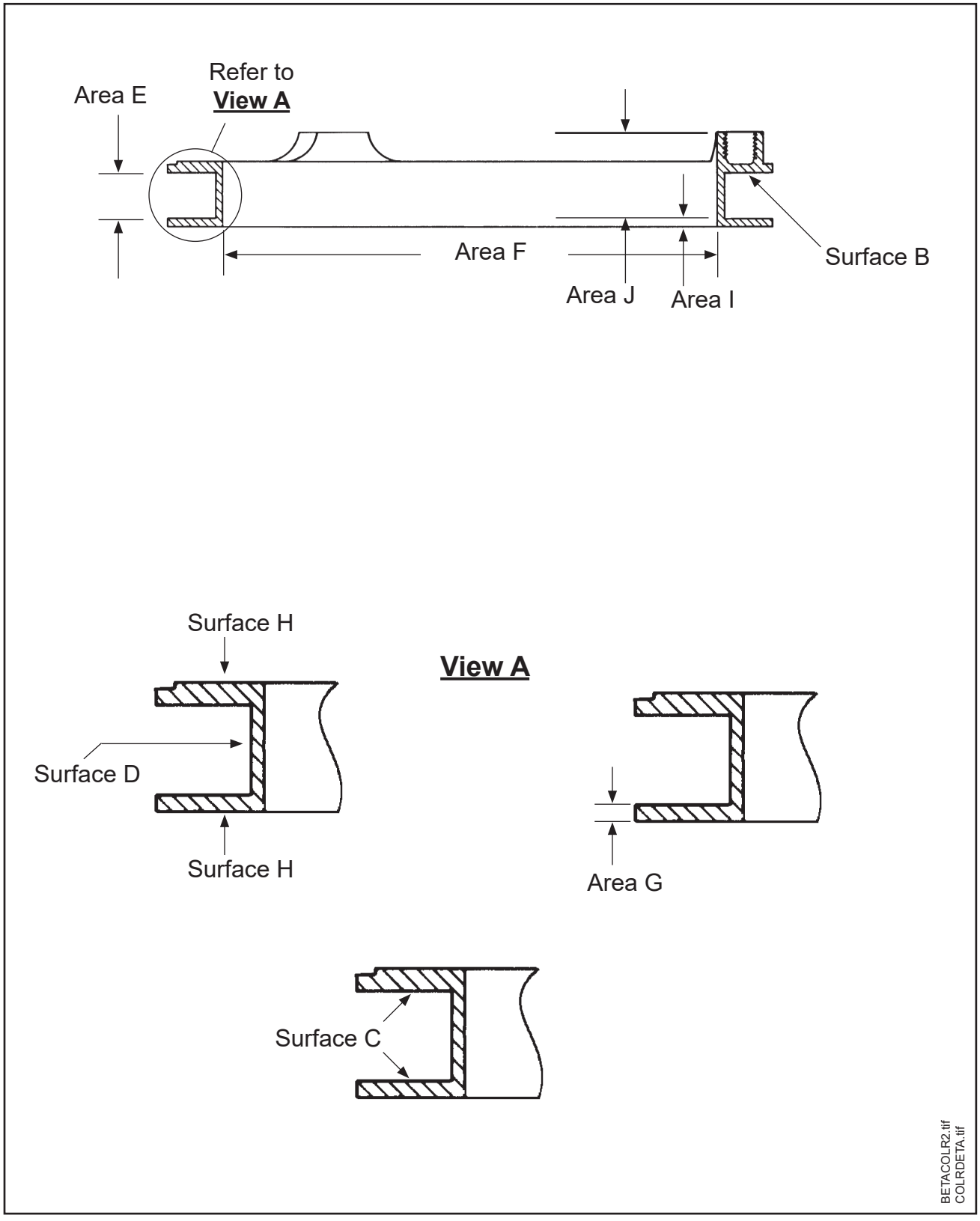
| | Inspect | Serviceable Limits | Corrective Action |
|---|---|---|---|
| H. | Beta Rod (320), continued<br>Refer to Figure 5-8. | | |
| | (6) Measure the OD of each beta rod. | Refer to Figure 5-8 for applicable limits. | If the OD is less than the permitted serviceable limits, replace the beta rod. |
| | (7) Magnetic particle inspect each beta rod in accordance with the Magnetic Particle Inspection chapter of Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02). | A relevant indication is not permitted. | If there is a relevant indication, replace the beta rod. |

## Component Inspection Criteria
## Table 5-1

| | Inspect | Serviceable Limits | Corrective Action |
|---|---|---|---|
| I. | Guide Lug (340) and Guide Lug Bushing (350) | | |
| (1) | Guide Lug (340) ONLY: Visually examine the cadmium plating coverage on the guide lug. | A few random scratches are permitted; otherwise, cadmium plating must completely cover the guide lug. | Remove the guide lug bushing (350) from the guide lug (340).<br>Remove cadmium plating from the guide lug (340), mask the ID of the guide lug, and replate in accordance with the Cadmium Replating chapter of Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02).<br>Install a guide lug bushing (350) into the guide lug (340) in accordance with the Special Adhesive and Bonding Procedures chapter of Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02). |
| (2) | Guide Lug Bushing (350) ONLY: Examine the guide lug bushing for movement within the guide lug. | Movement is not permitted. | If there is movement, replace the guide lug bushing (350) in accordance with the Special Adhesive and Bonding Procedures chapter of Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02). |
| (3) | Guide Lug Bushing (350) ONLY: Measure the ID of the guide lug bushing. | The maximum permitted ID of the guide lug bushing is 0.383 inch (9.72 mm). | If the ID of the guide lug bushing (350) is greater than maximum permitted serviceable limits, replace the guide lug bushing in accordance with the Special Adhesive and Bonding Procedures chapter of Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02). |
| | | The minimum permitted ID of the guide lug bushing is 0.379 inch (9.62 mm). | If the ID of the guide lug bushing (350) is less than the minimum permitted serviceable limits, machine the guide lug bushing ID in accordance with the Special Adhesive and Bonding Procedures chapter of Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02).<br>If the guide lug bushing cannot be machined, replace the guide lug bushing in accordance with the Special Adhesive and Bonding Procedures chapter of Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02). |

## Component Inspection Criteria
## Table 5-1

| | Inspect | Serviceable Limits | Corrective Action |
|---|---|---|---|
| J. | Spinner Mounting Plate (380) | | |
| (1) | Visually examine the spinner mounting plate for corrosion product and pitting. | Corrosion product is not permitted.<br>The maximum permitted depth of pitting is 0.005 inch (0.12 mm). | Remove corrosion product using glass bead cleaning in accordance with the Cleaning chapter of Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02).<br>If corrosion product cannot be removed or if pitting is greater than the permitted serviceable limits, replace the spinner mounting plate. |
| (2) | Visually examine the spinner mounting plate for scratches. | The maximum permitted depth of a scratch is 0.005 inch (0.12 mm). | If the depth of a scratch is greater than the permitted serviceable limits, replace the spinner mounting plate. |
| (3) | Magnetic particle inspect the spinner mounting plate at each overhaul in accordance with the Magnetic Particle Inspection chapter of Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02). | A relevant indication is not permitted. | If there is a relevant indication, replace the spinner mounting plate. |
| (4) | For one piece spinner mounting plate only: Measure the thickness of the spinner mounting plate. | The thickness of the spinner mounting plate must be 0.1192 to 0.1196 (3.027 to 3.038 mm) before cadmium plating, and 0.120 to 0.121 inch (3.04 to 3.07 mm) after cadmium plating. | If the thickness is not within the permitted serviceable limits, replace the spinner mounting plate. |
| (5) | For two piece spinner mounting plate only: Visually examine each half of the spinner mounting plate for serial numbers. | Spinner mounting plates are not interchangeable and must have the same serial number on each half. | If the spinner mounting plate does not have the same serial number on each half, it must be retired from service in accordance with Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02). |
| (6) | Visually inspect the spinner mounting plate for cadmium plating coverage. | A few random scratches and corners with cadmium plate missing is permitted; otherwise complete coverage is required. | If cadmium plate coverage is less than the permitted serviceable limits, replate the spinner mounting plate in accordance with the Cadmium Replating chapter of Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02). |



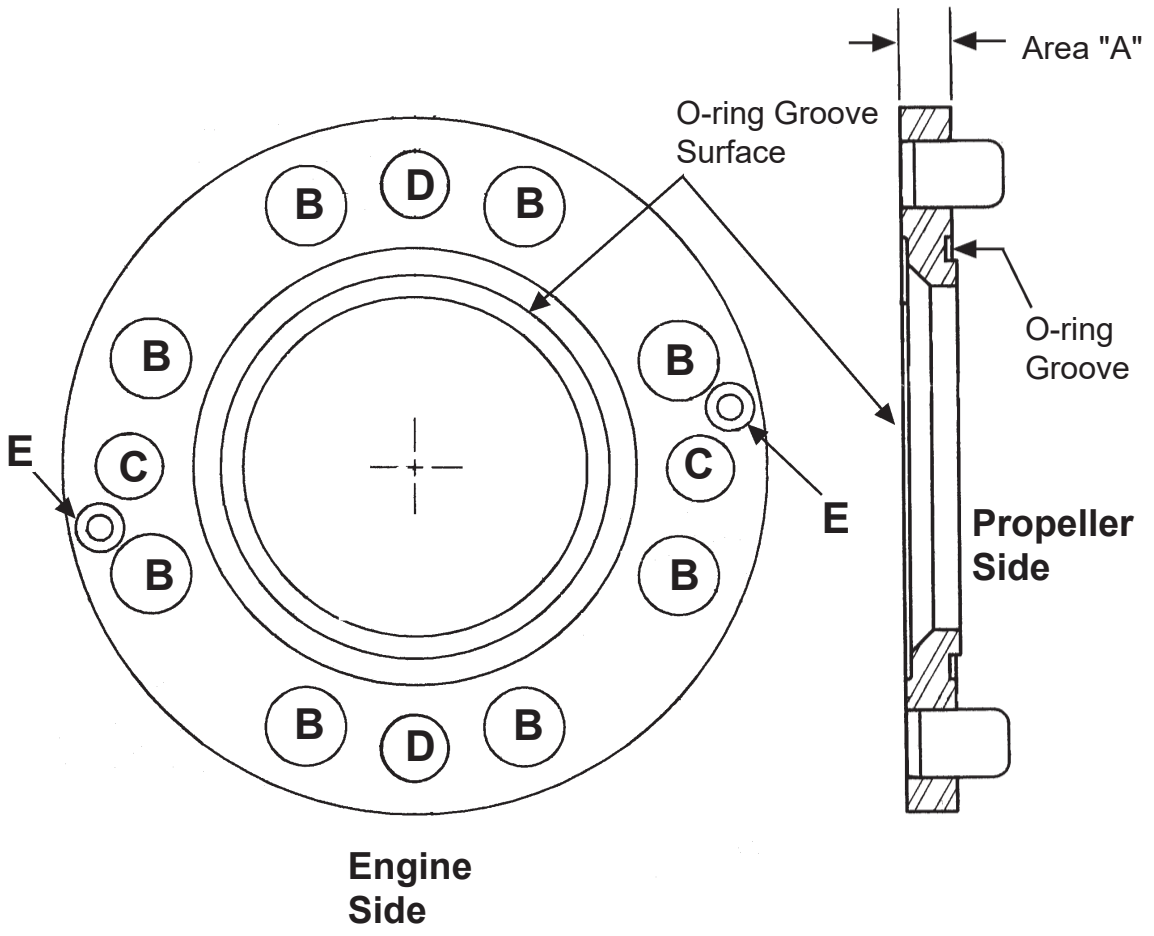

**Beta Ring**
**Figure 5-9**

## Component Inspection Criteria
## Table 5-1

| | Inspect | Serviceable Limits | Corrective Action |
|---|---|---|---|
| K. | Beta Ring (420)<br>Refer to Figure 5-9. | | |
| (1) | Visually examine the beta ring for cracks. | A crack is not permitted. | If there is a crack, replace the beta ring. |
| (2) | Visually examine the slot surface under the bottom of the threaded holes (Surface B) for indications of a raised bump or a locally raised area made by the beta ring. | The maximum permitted height of a locally raised area is 0.004 inch (0.10 mm). | If the height of a locally raised area is greater than the permitted serviceable limits, replace the beta ring. |
| (3) | Visually examine the sidewalls of the groove (Surface C) for scratches. | If there are scratches, measure the depth. The maximum permitted depth of a scratch is 0.004 inch (0.10 mm).<br>Pushed-up material caused by a scratch is not permitted. | If there is a scratch that is 0.004 inch (0.10 mm) deep or less, using an abrasive pad CM47 or equivalent, polish to remove pushed-up material adjacent to the scratch only.<br>If the depth of the scratch is greater than the permitted serviceable limits, replace the beta ring. |
| (4) | Measure any depression or gouge in the back wall of the groove (Surface D). | A depression or gouge in the back wall of the groove must be removed. The maximum permitted depth for a depression or gouge is 0.007 inch (0.17 mm). | If the damage is within the permitted serviceable limits, refer to the Repair chapter of this manual.<br>If the damage is greater than the permitted serviceable limits, replace the beta ring. |
| (5) | Measure the width of the groove (Area E) in the beta ring. | The maximum permitted width is 0.510 inch (12.95 mm). | If the width is greater than the permitted serviceable limits, replace the beta ring. |
| (6) | Measure the ID of the beta ring (Area F). | The maximum permitted ID of the beta ring is 5.4270 inches (137.845 mm). | If the ID is greater than the permitted serviceable limits, replace the beta ring. |
| (7) | Measure the width of the bottom flange on the beta ring (Area G) at a minimum of four separate locations. | The minimum permitted width at any one location on the bottom flange is 0.073 inch (1.86 mm). | If the width is less than the permitted serviceable limits, replace the beta ring. |

## Component Inspection Criteria
## Table 5-1

| | Inspect | Serviceable Limits | Corrective Action |
|---|---|---|---|
| K. | Beta Ring (420), continued<br>Refer to Figure 5-9. | | |
| (8) | Measure any gouges or scratches on the outside surface (Surface H) of the beta ring. | A gouge or scratch must be removed. The maximum permitted repairable depth of a gouge or scratch is 0.007 inch (0.17 mm) deep. | If a gouge or scratch is within the permitted serviceable limits, refer to the Repair chapter of this manual.<br>If a gouge or scratch is greater than the permitted serviceable limits, retire the beta ring. |
| (9) | Visually examine for grooves or scratches on the inner diameter surface (Area I), beginning on the area (side opposite of the lugs) extending 0.187 inch (4.76 mm) toward the lug side. | A groove or scratch must be removed. The maximum permitted repairable depth of a groove or scratch is 0.007 inch (0.17 mm) deep. | If a groove or scratch is within the permitted serviceable limits, refer to the Repair chapter of this manual.<br>If the a groove or scratch is greater than the permitted serviceable limits, retire the beta ring. |
| (10) | Visually examine the inner diameter surface Area J, the inner surface of the lug areas for grooves or scratches (not including Area I). | The maximum permitted depth of a groove or scratch is 0.007 inch (0.17 mm). | If a groove or scratch is deeper than the permitted serviceable limits, polish the inner surface (refer to the Repair chapter of this manual) maintaining a maximum ID of the beta ring as described in step 6 of this procedure.<br>If the grooves or scratches are greater than the permitted serviceable limits or corrective action limits, replace the beta ring. |
| (11) | For the B-3334 beta ring unit, visually examine the B-3333 beta switch indicator ring (425) in the beta ring unit. | The B-3333 beta switch indicator ring (425) must be tightly bonded to the beta ring along its edges. | If the B-3333 beta switch indicator ring (425) is not tightly bonded, reinstall in accordance with the Special Adhesive and Bonding Procedures chapter in the Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02). |
| (12) | Penetrant inspect the beta ring in accordance with the Penetrant Inspection chapter of Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02). | A relevant indication is not permitted. | If there is a relevant indication, replace the beta ring. |




A = Spacer thickness

B = Mounting Stud clearance hole

C = Dowel Pin Thru-Hole (To receive engine flange dowel pin)

D = Dowel Pin Hole (For spacer dowel pin insertion)

E = Spacer attachment screw hole

**Spacer**
**Figure 5-10**

## Component Inspection Criteria
## Table 5-1

| | Inspect | Serviceable Limits | Corrective Action |
|---|---|---|---|
| L. | Spacer (455)<br>Refer to Figure 5-10. | | |
| | (1) Measure the spacer in Area "A". | The minimum permitted thickness (Area "A") is 0.370 inch (9.39 mm). | If the thickness is less than the permitted serviceable limits, replace the spacer. |
| | (2) Visually examine both mating surfaces, not including the O-ring grooves, of the spacer for scratches, gouges, pitting, or other surface imperfections. | Scratches, gouges, pitting, or other surface imperfections up to 0.003 inch (0.07 mm) deep are permitted and do not require repair.<br>Scratches, gouges, pitting, or other surface imperfections deeper than 0.003 inch (0.07 mm) must be repaired in accordance with the corrective action repair limits.<br>The maximum permitted diameter of an individual pit or area of damage is 0.062 inch (1.57 mm).<br>Linear pitting is not permitted. | The maximum allowable depth of a repair is 0.010 inch (0.25 mm). If the scratch, gouge, pitting, or surface imperfections remain after repair, the depth must not exceed the serviceable limits.<br>Repair must be within an area no greater than 0.150 inch (3.81 mm) diameter. Repair must be at least 0.25 inch (6.4 mm) from any other area of repair.<br>If the scratches, gouges, pitting, other surface imperfections, or repair is greater than the permitted serviceable limits or corrective action limits, replace the spacer. |
| | (3) Visually examine the mounting stud clearance holes for scratches, gouges, pitting or other surface imperfections in Area "B". | Scratches, gouges, pitting, or other surface imperfections up to 0.002 inch (0.05 mm) deep are permitted and do not require repair.<br>Scratches, gouges, pitting, or other surface imperfections deeper than 0.002 inch (0.05 mm) must be repaired in accordance with the corrective action repair limits.<br>The maximum permitted total area of damage is 0.010 square inch (6.45 square mm).<br>The maximum permitted diameter of an individual pit or area of damage is 0.062 inch (1.57 mm).<br>The maximum permitted length for an individual scratch is 0.25 inch (6.35 mm).<br>Linear pitting is not permitted. | The maximum allowable depth of a repair is 0.010 inch (0.25 mm). If the scratch, gouge, pitting, or surface imperfections remain after repair, the depth must not exceed the serviceable limits.<br>Repair must be at least 0.25 inch (6.4 mm) from any other area of repair.<br>If the scratches, gouges, pitting, other surface imperfections, or repair is greater than the permitted serviceable limits or corrective action limits, replace the spacer. |

## Component Inspection Criteria
## Table 5-1

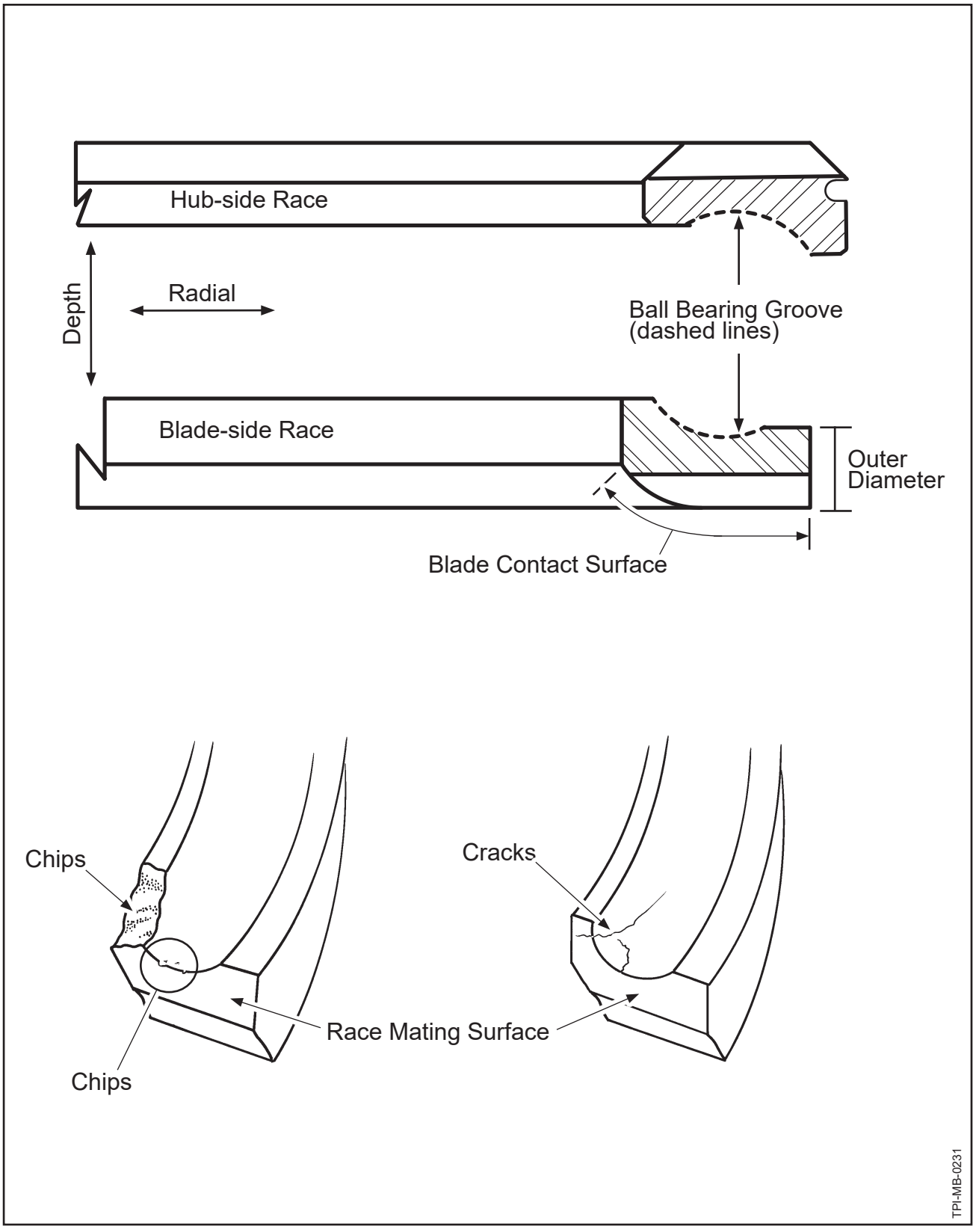
| | Inspect | Serviceable Limits | Corrective Action |
|---|---|---|---|
| L. | Spacer (455), continued<br>Refer to Figure 5-10. | | |
| | (4) Visually examine the dowel pin thru-holes for scratches, gouges, pitting or other surface imperfections in Area "C". | Scratches, gouges, pitting, or other surface imperfections up to 0.002 inch (0.05 mm) deep are permitted and do not require repair.<br>Scratches, gouges, pitting, or other surface imperfections deeper than 0.002 inch (0.05 mm) must be repaired in accordance with the corrective action repair limits.<br>The maximum permitted diameter of an individual pit or area of damage is 0.0625 inch (1.587 mm).<br>Linear pitting is not permitted. | The maximum allowable depth of a repair is 0.005 inch (0.12 mm). If the scratch, gouge, pitting, or surface imperfections remain after repair, the depth must not exceed the serviceable limits.<br>Repair must be at least 0.25 inch (6.4 mm) from any other area of repair.<br>If the scratches, gouges, pitting, other surface imperfections, or repair is greater than the permitted serviceable limits or corrective action limits, replace the spacer. |
| | (5) Measure the diameters of the dowel pin thru holes. | The maximum permitted hole diameter from the engine side surface to a depth of 0.024 inch (0.61 mm) is 0.504 inch (12.8 mm).<br>The maximum permitted hole diameter measured from 0.025 inch (0.64) below the engine flange side surface and beyond is 0.503 inch (12.77 mm). | If either thru-hole diameter is greater than the permitted serviceable limits, replace the spacer. |
| | (6) Visually examine dowel pin holes for scratches, gouges, pitting or other surface imperfections in Area "D".<br>NOTE: Remove and replace dowel pins at overhaul. | Scratches, gouges, pitting, or other surface imperfections up to 0.002 inch (0.05 mm) deep are permitted and do not require repair.<br>Scratches, gouges, pitting, or other surface imperfections deeper than 0.002 inch (0.05 mm) must be repaired in accordance with the corrective action repair limits.<br>The maximum permitted diameter of an individual pit or area of damage is 0.0625 inch (1.587 mm).<br>Linear pitting is not permitted. | The maximum allowable depth of a repair is 0.005 inch (0.12 mm). If the scratch, gouge, pitting, or surface imperfections remain after repair, the depth must not exceed the serviceable limits.<br>Repair must be at least 0.25 inch (6.4 mm) from any other area of repair.<br>Replace the spacer if scratches, gouges, pitting, other surface imperfections, or repair is greater than the permitted serviceable limits or corrective action. |
| | (7) Measure dowel pin holes in Area "D". | The maximum permitted hole diameter is 0.4995 inch (12.687 mm). | If the hole diameter is greater than the permitted serviceable limits, replace the spacer. |

## Component Inspection Criteria
## Table 5-1

| | Inspect | Serviceable Limits | Corrective Action |
|---|---|---|---|
| L. | Spacer (455), continued<br>Refer to Figure 5-10. | | |
| (8) | Visually examine the spacer attachment screw holes for scratches, pitting, and other surface imperfections in Area "E". | Raised material is not permitted.<br>The maximum permitted depth of scratches, pitting, and other surface imperfections is 0.002 inch (0.05 mm).<br>The maximum permitted diameter of an individual pit or area of damage is 0.0625 inch (1.587 mm). | Using an abrasive pad CM47 or equivalent, polish to remove raised material.<br>If the damage is greater than the permitted serviceable limits, replace the spacer. |
| | | Linear pitting is not permitted. | If there is linear pitting, replace the spacer. |
| (9) | Visually examine the surfaces of both the O-ring grooves (engine side and propeller side). | Damage up to 0.002 inch (0.05 mm) deep is permitted and does not require repair.<br>Damage deeper than 0.002 inch (0.05 mm) must be repaired in accordance with the corrective action repair limits.<br>The maximum permitted diameter of an individual pit or area of damage is 0.0625 inch (1.587 mm).<br>Linear pitting is not permitted. | The maximum allowable depth of a repair is 0.005 inch (0.12 mm). If the damage remains after repair, the depth must not exceed the serviceable limits.<br>Repair must be within an area no greater than 1.0 linear inch (25.4 mm).<br>Repair must be at least 0.25 inch (6.4 mm) from any other area of repair.<br>If the damage or repair is greater than the permitted serviceable limits or corrective action limits, replace the spacer. |
| (10) | Magnetic Particle inspect the spacer in accordance with the Magnetic Particle Inspection chapter of Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02). | A relevant indication is not permitted. | If there is a relevant indication, replace the spacer. |
| (11) | Visually examine the cadmium plating coverage on the spacer. | A few random scratches are permitted; otherwise, cadmium plating must completely cover the spacer. | Replate and bake the spacer in accordance with the Cadmium Replating chapter of Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02). |

## Component Inspection Criteria
## Table 5-1

| Inspect | Serviceable Limits | Corrective Action |
|---|---|---|
| M. C-6932 Spinner Mounting Bracket (490) | | |
| (1) Visually examine the spinner mounting bracket for corrosion product and pitting. | Corrosion product is not permitted.<br>The maximum permitted depth of pitting is 0.005 inch (0.12 mm). | Remove corrosion product by using glass bead cleaning in accordance with the Cleaning chapter of Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02).<br>If corrosion product cannot be removed or if pitting is deeper than the maximum permitted serviceable limits, replace the spinner mounting bracket. |
| (2) Visually examine the spinner mounting bracket for scratches and damage. | The maximum permitted depth for damage and scratches is 0.005 inch (0.12 mm). | If a scratch or damage is deeper than the maximum serviceable limits, replace the spinner mounting bracket. |
| (3) Visually examine the spinner mounting bracket for anodize coverage. | Except for a few minor scratches and corners with anodize coating missing, complete anodize coverage is required. | Anodize the spinner mounting bracket in accordance with the Chromic Acid Anodizing chapter of Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02). |
| (4) Penetrant Inspect the spinner mounting bracket in accordance with the Penetrant Inspection chapter of Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02). | A relevant indication is not permitted. | If there is a relevant indication, replace the spinner mounting bracket. |



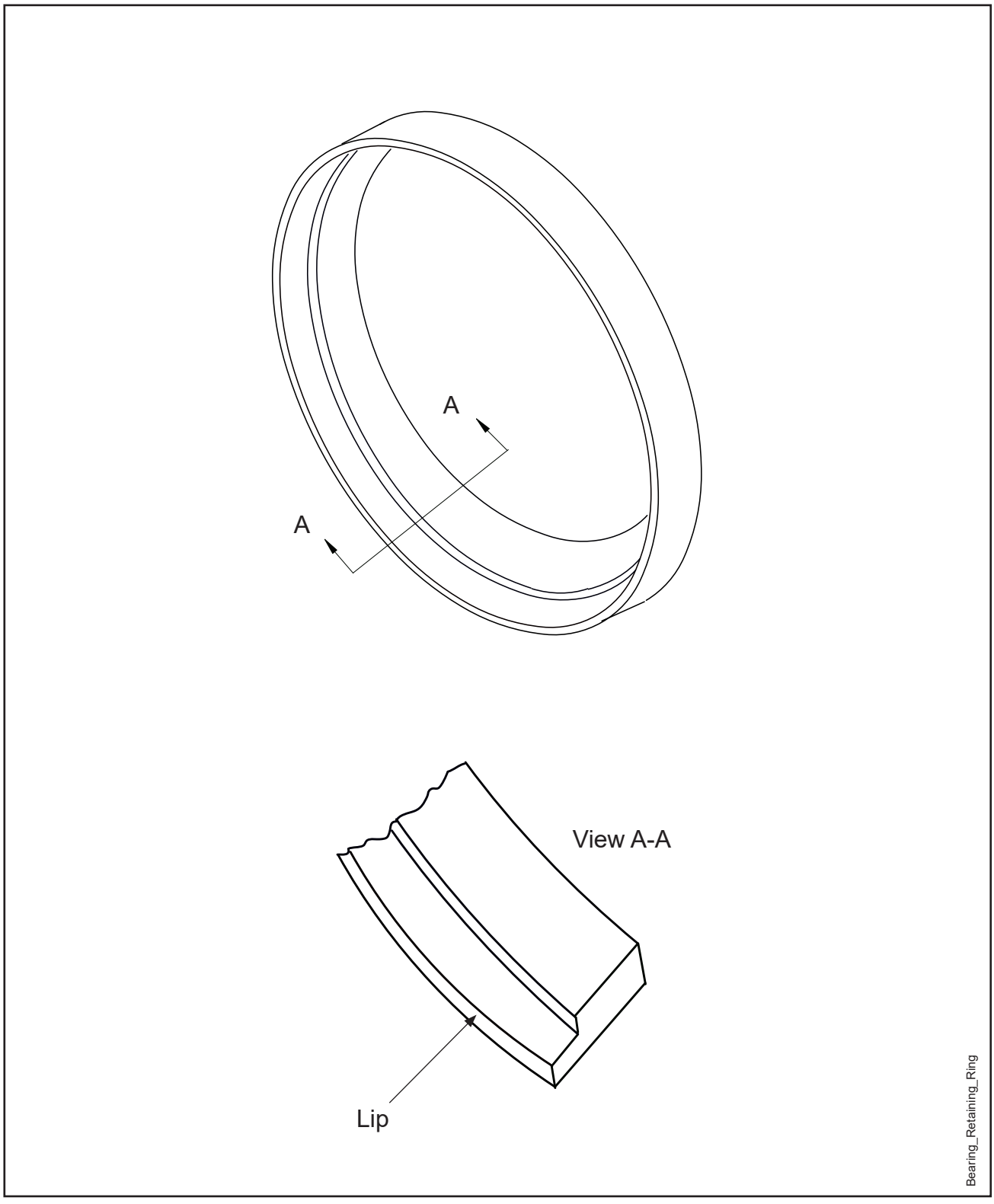

**Race Inspection**
**Figure 5-11**

## Component Inspection Criteria
## Table 5-1

| | Inspect | Serviceable Limits | Corrective Action |
|---|---|---|---|
| N. | Race (571/572)<br>Refer to Figure 5-11. | | |
| (1) | Visually examine the ball bearing groove in each race for corrosion product. | Corrosion product is not permitted. | Remove corrosion product using glass bead cleaning in accordance with the Cleaning chapter of Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02).<br>If corrosion product cannot be removed, replace the race. |
| (2) | Visually examine the ball bearing groove in each race for pitting, wear, fretting, and damage. | The maximum permitted depth of pitting is 0.003 inch (0.076 mm) in the ball bearing groove.<br>The maximum permitted diameter of a pit is 0.032 inch (0.81 mm).<br>The maximum permitted total area of pitting in the ball bearing groove on a complete race is 0.12 square inch (77.4 square mm) (two races for each bearing set).<br>Pitting must not interfere with bearing ball movement or support. | If the pitting is greater than the serviceable limits, replace the race. |
| | | If the ball bearing groove has wear, measure the wear. The maximum permitted depth of wear is 0.005 inch (0.12 mm). | If the wear is greater than the permitted serviceable limits, replace the race. |
| | | Fretting damage is not permitted. | If there is fretting damage, replace the race. |
| | | For damage other than pitting or fretting, the maximum permitted depth of damage is 0.003 inch (0.076 mm) and must not interfere with bearing ball movement or support. | If damage is greater than the permitted serviceable limits, replace the race. |
| (3) | Except for the ball bearing groove, visually examine all other surfaces of each race for corrosion product. | Corrosion product is not permitted. | Remove corrosion product using glass bead cleaning in accordance with the Cleaning chapter of Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02).<br>If corrosion product cannot be removed, replace the race. |

## Component Inspection Criteria
## Table 5-1

| | Inspect | Serviceable Limits | Corrective Action |
|---|---|---|---|
| N. | Race (571/572), continued<br>Refer to Figure 5-11. | | |
| (4) | Except for the ball bearing groove, visually examine all other surfaces of each race for pitting, wear, fretting, and damage. | The maximum permitted depth of pitting is 0.005 inch (0.12 mm).<br>The maximum permitted diameter of a pit is 0.062 inch (1.57 mm).<br>The maximum permitted total area of pitting on all surfaces except the ball bearing groove of a complete race is 0.25 square inch (161.2 square mm) (two races for each bearing set). | If the pitting is greater than the permitted serviceable limits, replace the race. |
| | | Fretting damage is permitted on the outer diameter of the races that interface with the bearing retaining ring. Fretting must not loosen the tight fit with the bearing retaining ring. | Clean the fretted area thoroughly using an abrasive pad CM47 or equivalent to decrease fretting damage to a minimum. If the fit of the bearing retaining ring to the race is not tight, replace the race. |
| | | Wear is not permitted. | If there is wear, replace the race. |
| | | For damage other than pitting or fretting, the maximum permitted depth of damage is 0.005 inch (0.12 mm) and must not interfere with the mating surfaces. | If the damage is greater than the permitted serviceable limits, replace the race. |
| (5) | Visually examine the race for chips or cracks that are adjacent to the mating surfaces of the race. | Chips or cracks that are adjacent to the mating surfaces of the race are not permitted. | If there are chips or cracks adjacent to the mating surfaces of the race, replace the race. |
| (6) | Magnetic particle inspect each race in accordance with the Magnetic Particle Inspection chapter of Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02). | A relevant indication is not permitted. | If there is a relevant indication, replace the race. |




**Bearing Retaining Ring**
**Figure 5-12**

## Component Inspection Criteria
## Table 5-1

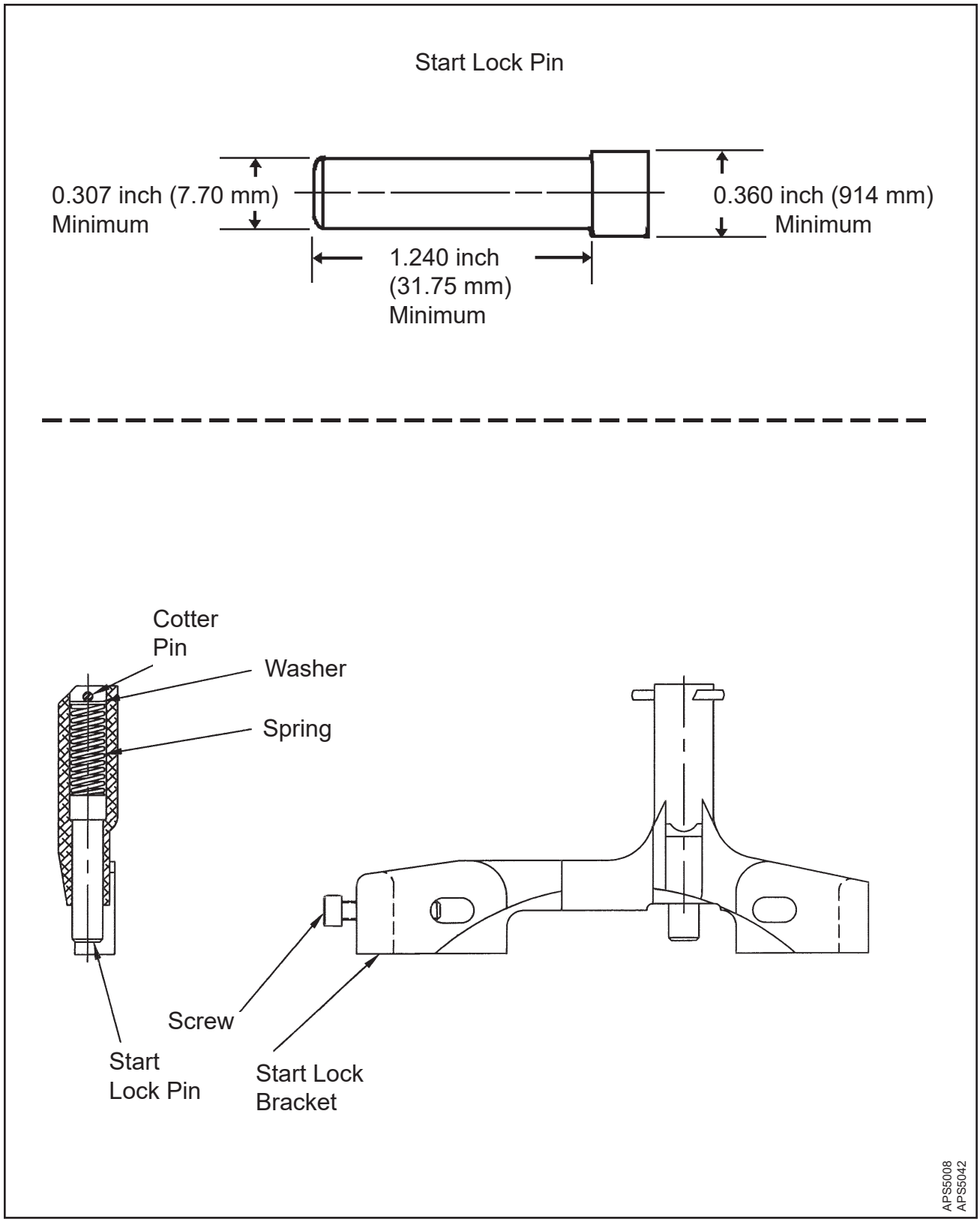
| | Inspect | Serviceable Limits | Corrective Action |
|---|---|---|---|
| O. | Bearing Retaining Ring (610)<br>Refer to Figure 5-12. | | |
| | (1) Visually examine the bearing retaining ring for corrosion product. | Corrosion product is not permitted. | Remove corrosion product by using glass bead cleaning in accordance with the Cleaning chapter of Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02).<br>If corrosion product cannot be removed, replace the bearing retaining ring. |
| | (2) Visually examine the bearing retaining ring for pitting. | The maximum permitted depth of pitting is 0.005 inch (0.12 mm). Pitting must not interfere with the ability of the bearing retaining ring to fit tight to the blade and the bearing race. | If the pitting is greater than the permitted serviceable limits, replace the bearing retaining ring. |
| | (3) Visually examine the bearing retaining ring for wear, damage, or fretting. | The bearing retaining ring must fit tightly to the blade and the bearing race when installed over the blade and bearing race. | If wear, damage, or fretting is greater than the permitted serviceable limits, replace the bearing retaining ring. |
| | (4) Visually examine the bearing retaining ring retention lip for damage. | Displaced material must not interfere with the wire ring retainer in the hub arm or rise above the normal OD of the bearing retaining ring. | Displaced material may be removed with a file or a rotary grinder (a sufficient amount lip must remain).<br>Polish the repaired area to a smooth finish with an abrasive pad CM47, or equivalent. |
| | (5) Verify an interference fit with the hub blade arm. | The bearing retaining ring must fit tightly on the hub blade arm. A loose fit is not permitted. | If the bearing retaining ring is loose, replace the bearing retaining ring. |
| | (6) Visually examine the entire bearing retaining ring for cadmium plating coverage. | A few random scratches and corners with cadmium coating missing is permitted; otherwise, complete coverage is required. | If cadmium plating is less than the serviceable limits, replate the bearing retaining ring in accordance with the Cadmium Replating chapter of Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02). |

## Component Inspection Criteria
## Table 5-1

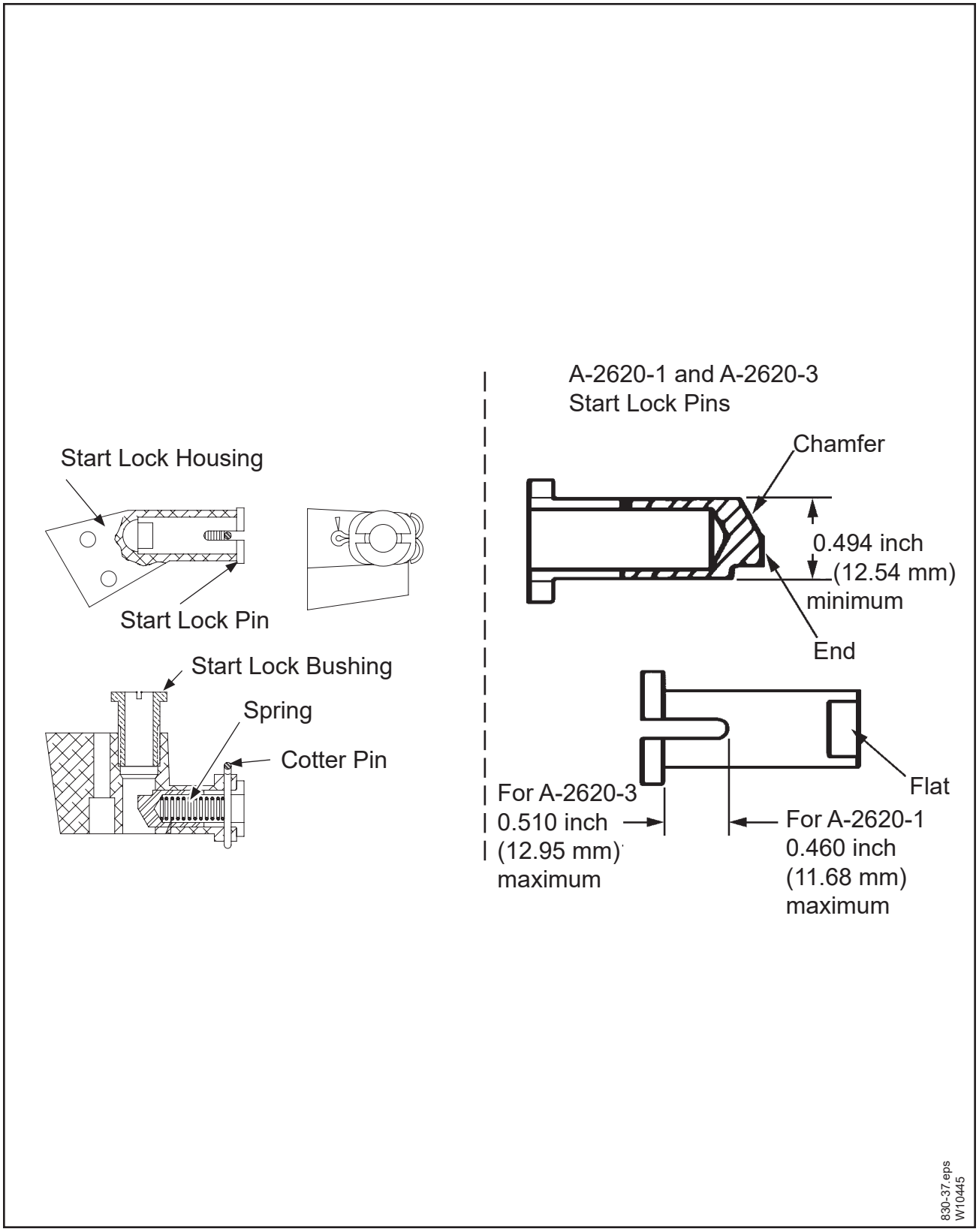
| | Inspect | Serviceable Limits | Corrective Action |
|---|---|---|---|
| O. | Bearing Retaining Ring (610), Continued<br>Refer to Figure 5-12. | | |
| | (7) Perform a magnetic particle inspection of the bearing retaining ring in accordance with the Magnetic Particle Inspection chapter of Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02). | A relevant indication is not permitted. | If there is a relevant indication, replace the bearing retaining ring. |

## Component Inspection Criteria
## Table 5-1

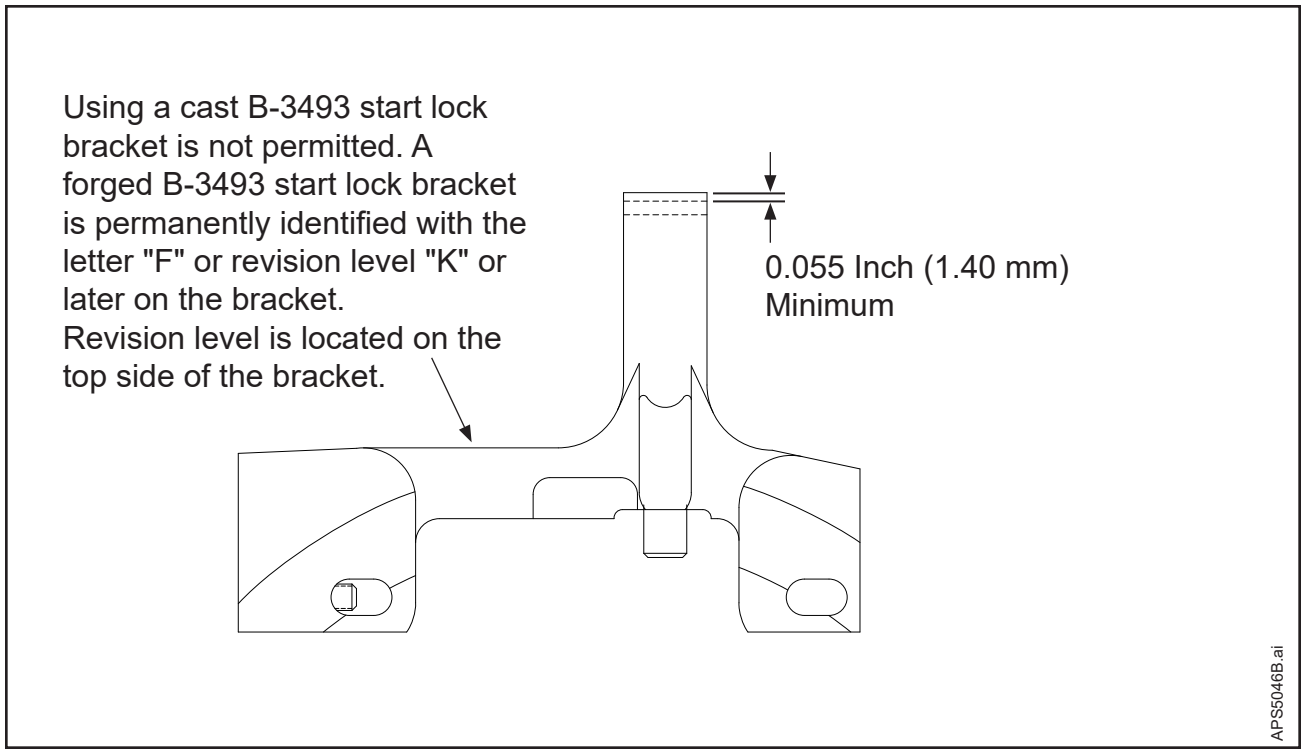
| | Inspect | Serviceable Limits | Corrective Action |
|---|---|---|---|
| P. | Balance Weight (640) | | |
| (1) | Visually examine the balance weight for pitting, wear or damage. | The maximum permitted depth of pitting, wear, or damage is 0.003 inch (0.07 mm). | Polish to a maximum depth of 0.005 inch (0.12 mm). If the depth of pitting, wear, or damage is greater than the permitted serviceable limits after rework, replace the balance weight. |
| (2) | Visually examine the balance weight for corrosion product. | Corrosion product is not permitted. | Remove corrosion product using glass bead cleaning in accordance with the Cleaning chapter of Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02). |
| (3) | Visually examine for cadmium plating coverage. | Except for a few random scratches and corners with cadmium plating missing, complete coverage is required. | If the coverage is less than the permitted serviceable limits, replate the balance weight in accordance with the Cadmium Replating chapter of Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02). |
| Q. | Split Keeper (960) | | |
| (1) | Visually examine the split keeper for corrosion product. | Corrosion product is not permitted. | Remove corrosion product using glass bead cleaning in accordance with the Cleaning chapter of Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02).<br>If corrosion product cannot be removed, replace the split keeper. |
| (2) | Visually examine the split keeper for pitting, wear, and damage. | The maximum permitted depth of pitting, wear, or damage is 0.002 inch (0.05 mm). | Visually examine the split keeper for pitting, wear, and damage. If the pitting or damage is greater than the permitted serviceable limits, replace the split keeper. |
| (3) | Visually examine the split keeper for cadmium plating coverage. | A few random scratches are permitted; otherwise, cadmium plating must completely cover the split keeper. | If the cadmium plating does not meet the permitted serviceable limit, cadmium replate the split keeper in accordance with the Cadmium Replating chapter of Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02). |



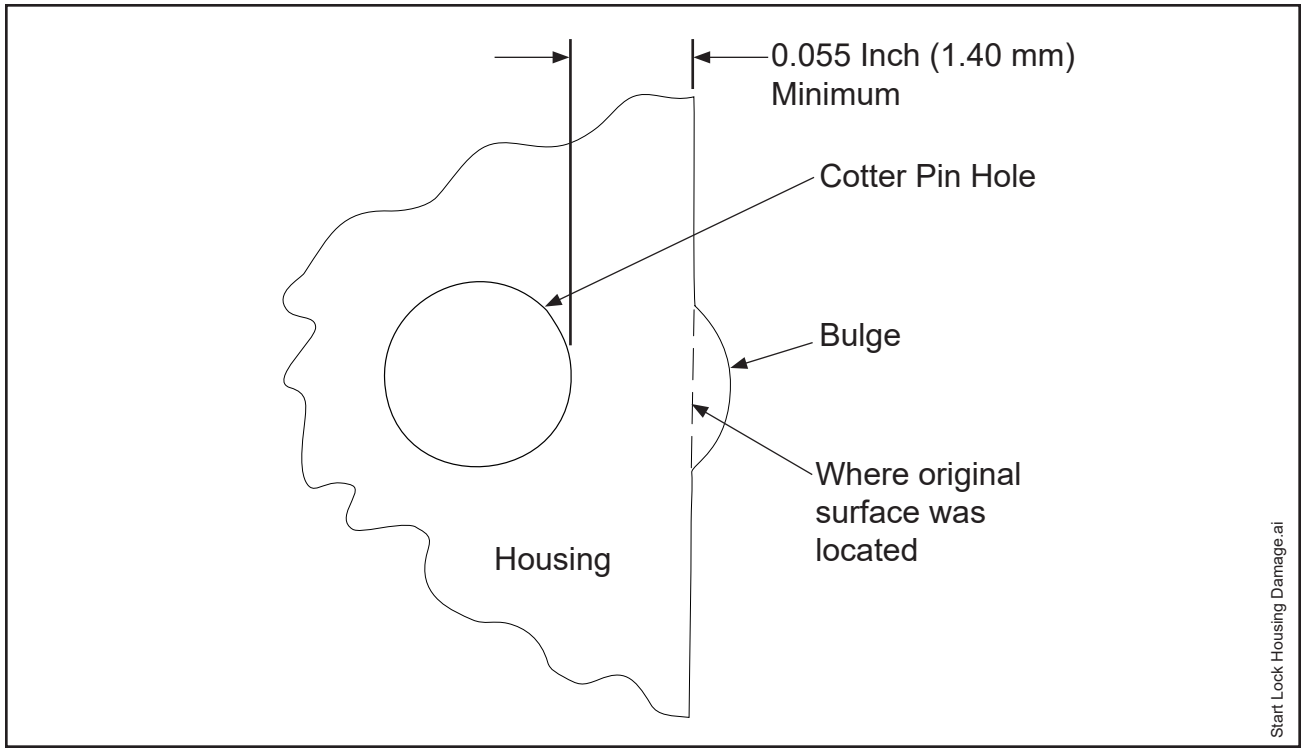

**Start Lock Unit**
**Figure 5-13**




**B-830-37 Start Lock Unit**
**Figure 5-14**




**Start Lock Bracket for HC-B4( )N-5( )(L) Propellers**
**Figure 5-15**




**Start Lock Housing**
**Figure 5-16**

## Component Inspection Criteria
## Table 5-1

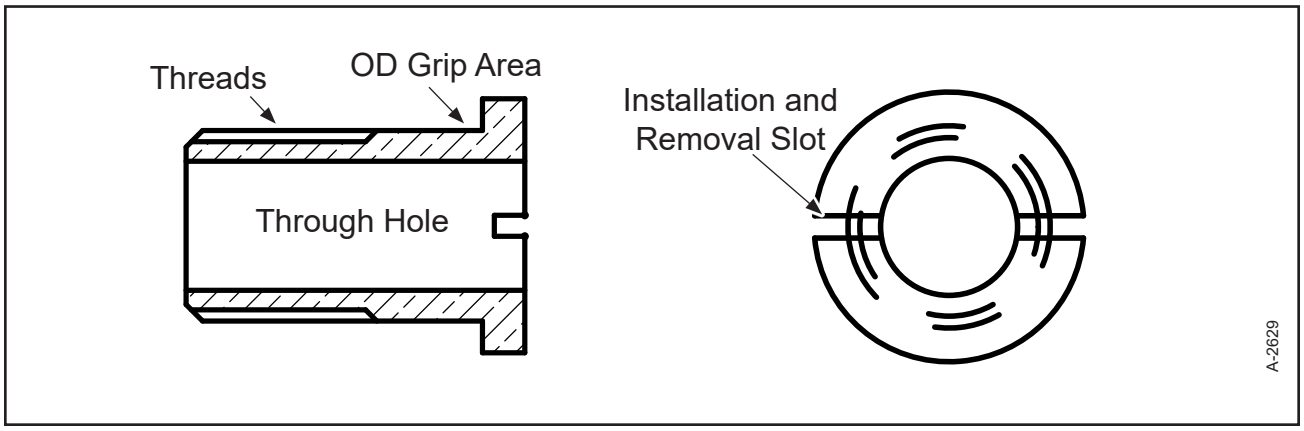
| | Inspect | Serviceable Limits | Corrective Action |
|---|---|---|---|
| R. | Start Lock Bracket (1020)<br>Refer to Figures 5-13 thru 5-16.<br>NOTE: The inspections in this section apply only to start lock brackets that are mounted on the spinner bulkhead. Refer to Figure 5-13. | | |
| (1) | Visually examine the start lock bracket surface area (not including the bracket bore area) for nicks, gouges, or other damage. | The maximum permitted depth of nicks, gouges, or other damage is 0.005 inch (0.12 mm). | If the depth of the nick, gouge, or damage is less than 0.005 inch (0.12 mm), polish the damaged area with abrasive pad CM47 or equivalent and chemical conversion coat in accordance with the Chromic Acid Anodizing chapter of Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02).<br>If the depth of the nick, gouge, or damage is greater than 0.005 inch (0.12 mm), replace the start lock bracket. |
| (2) | Visually examine the bracket bore area of the start lock bracket for corrosion product or pitting. | Corrosion product or pitting is not permitted. | If there is corrosion product or pitting, replace the start lock bracket. |
| (3) | Visually examine the start lock bracket (not including the bracket bore area) for corrosion product or pitting. | Corrosion product is not permitted.<br>Pitting is permitted to a maximum depth of 0.005 inch (0.12 mm). with no active corrosion. | Remove corrosion product up to 0.005 inch (0.12 mm) maximum depth by using glass bead cleaning in accordance with the Cleaning chapter of Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02).<br>Apply chemical conversion coating in accordance with the Chromic Acid Anodizing chapter of Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02).<br>If corrosion product cannot be removed or if pitting is greater than the permitted serviceable limits, replace the start lock bracket. |
| (4) | Penetrant Inspect the start lock bracket in accordance with the Penetrant Inspection chapter of Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02). | A relevant indication is not permitted. | If there is a relevant indication, replace the start lock bracket. |

## Component Inspection Criteria
## Table 5-1

| Inspect | Serviceable Limits | Corrective Action |
|---|---|---|
| R. Start Lock Bracket (1020), continued<br>Refer to Figures 5-13 thru 5-16. | | |
| (5) Measure the start lock bracket used in 830-32(L) and 830-34(L) start lock units, installed on HC-B4( )N-5( )(L) propeller assemblies, to make sure the wall thickness at the area of the outboard cotter pin hole is above the minimum limit. | The minimum permitted start lock bracket wall thickness is 0.055 inch (1.40 mm) in the area shown in Figures 5-15 and 5-16. | If the damage is less than the permitted serviceable limits, replace the start lock bracket. Refer to the Repair chapter of this manual for replacement procedures. |
| NOTE: Several cast B-3493 start lock brackets used in 830-34L start lock units experienced failure due to poor alloy formulation. B-3493 start lock brackets are now produced from forged material. Forged B-3493 start lock brackets are identified with the letter "F", revision level "K", or later on the bracket. | | |
| (6) Visually examine the B-3493 start lock bracket for the letter "F", revision level "K", or later. | A B-3493 start lock bracket must be permanently identified with the letter "F", revision "K", or later. Refer to Figure 5-15. | If the B-3493, start lock bracket is not permanently identified with the letter "F", revision "K", or later replace the start lock bracket. |
| S. Start Lock Housing (1030)<br>Refer to Figure 5-16. | | |
| (1) Visually examine the start lock housing for damage or displaced material on the surface adjacent to either cotter pin hole. | Damage or displaced material on the outside surface of the start lock housing is not permitted.<br>The minimum permitted distance between the cotter pin hole and the outside surface of the start lock housing is 0.055 inch (1.39 mm). | If damage or displaced material is greater than the permitted serviceable limits, replace the start lock housing.<br>If the distance between the cotter pin hole and the outside surface of the start lock housing is less than the permitted serviceable limit, replace the start lock housing. |

## Component Inspection Criteria
## Table 5-1

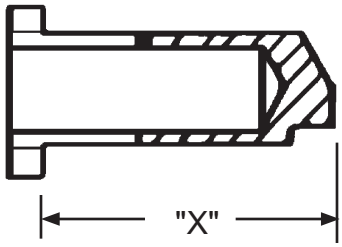
| | Inspect | Serviceable Limits | Corrective Action |
|---|---|---|---|
| T. | Start Lock Bushing (1050)<br>Refer to Figures 5-13 and 5-17. | | |
| (1) | Visually examine the start lock bushing, not including the threads, for nicks, gouges, or other damage. | The maximum permitted depth of nicks, gouges, or other damage is 0.005 inch (0.12 mm). | Remove raised edges or material that is pushed above the adjacent machined surfaces.<br>If the nick, gouges, or other damage is more than the permitted serviceable limits, replace the start lock bushing. |
| (2) | Visually examine the threads of the start lock bushing for damage such as scoring, nicks, scratches, and impact damage. | A maximum of 1/2 of one thread total accumulated damage is permitted. The damage must not cause interference with the start lock housing threads. | If the damage is greater than the permitted serviceable limits, replace the start lock bushing. |
| (3) | Visually examine the ID bore for wear. | If there is wear, measure the ID bore. The maximum permitted diameter of the ID bore is 0.3855 inch (9.791 mm). | If the wear is greater than the permitted serviceable limits, replace the start lock bushing. |
| (4) | Visually examine the OD grip area between the threads and the flange for wear. | If there is wear, measure the OD of the grip area. The minimum permitted diameter of the grip area is 0.548 inch (13.92 mm). | If the wear is greater than the permitted serviceable limits, replace the start lock bushing. |
| (5) | Visually examine the installation and removal slot for damage. | Damage that does not permit engagement of the slot for installation or removal is not permitted. | Remove raised edges or material that is pushed above the machined surfaces.<br>If the damage is greater than the permitted serviceable limits, replace the start lock bushing. |




**Start Lock Bushing**
**Figure 5-17**

## Component Inspection Criteria
## Table 5-1

| | Inspect | Serviceable Limits | Corrective Action |
|---|---|---|---|
| U. | Start Lock Pin (1060)<br>Refer to Figures 5-13, 5-14, and 5-18. | | |
| (1) | For all start lock pins, except A-2620-1 and A-2620-3 | | |
| (a) | Measure the start lock pin in accordance with Figure 5-13. | For permitted dimensional limits, refer to Figure 5-13. | If the dimensions are not within the permitted serviceable limits, replace the start lock pin. |
| (b) | Visually examine the start lock pin for corrosion product. | Corrosion product is not permitted. | Remove corrosion product using glass bead cleaning in accordance with the Cleaning chapter of Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02).<br>If corrosion product cannot be removed, replace the start lock pin. |
| (2) | For A-2620-1 and A-2620-3 start lock pins | | |
| (a) | Measure the start lock pin in accordance with Figures 5-14 and 5-18. | For permitted dimensional limits, refer to Figures 5-14 and 5-18. | If the dimensions are not within the permitted serviceable limits, replace the start lock pin. |
| (b) | Visually examine the areas identified as flat, end, and chamfer for wear or damage. Refer to Figure 5-14. | The maximum permitted depth of wear or damage is 0.005 inch (0.12 mm). | If the damage is greater than the permitted serviceable limits, replace the start lock pin. |
| (c) | Visually examine the start lock pin for corrosion product. | Corrosion product is not permitted. | Remove corrosion product using glass bead cleaning in accordance with the Cleaning chapter of Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02).<br>If corrosion product cannot be removed, replace the start lock pin. |



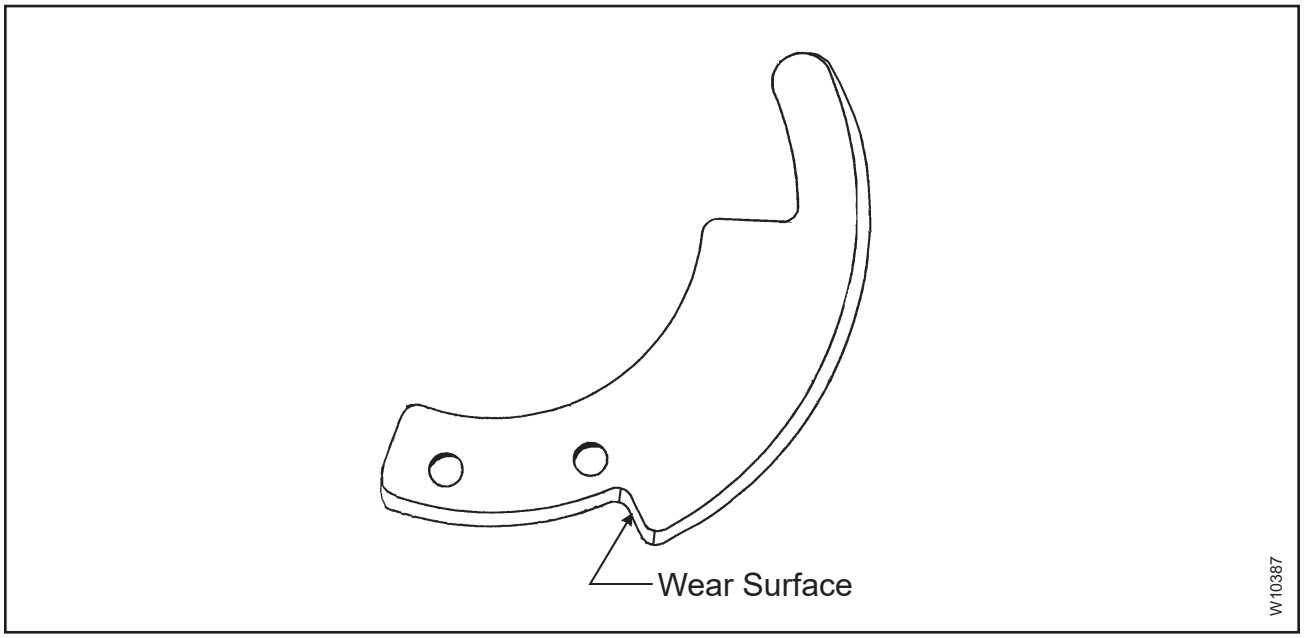

| Part No. | "X" Dimension |
|---|---|
| A-2620-1 | 1.330 inches (33.78 mm) |
| A-2620-3 | 1.380 inches (35.05 mm) |

W10445

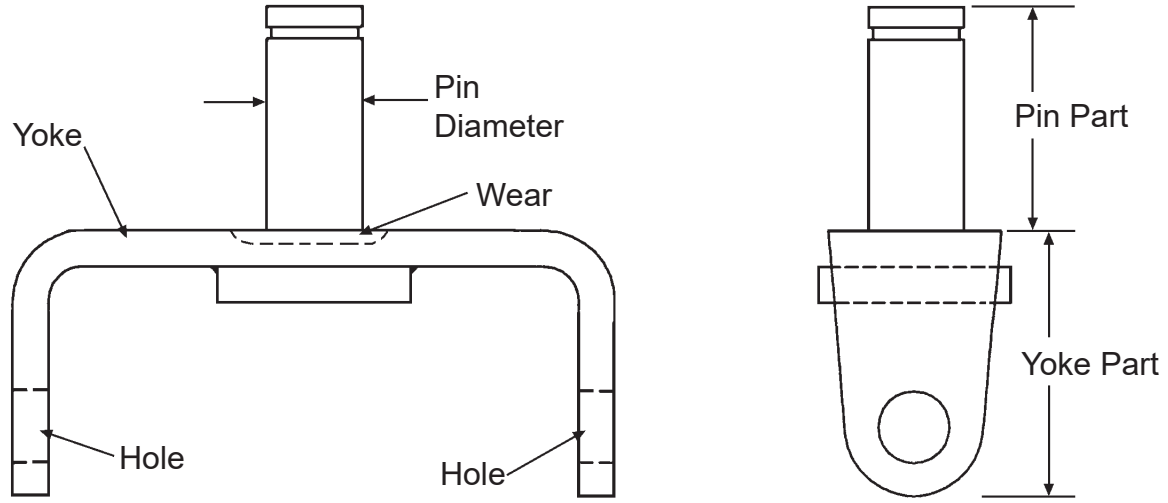
**Identification of A-2620-( ) Start Lock Pin**
**Figure 5-18**

## Component Inspection Criteria
## Table 5-1

| | Inspect | Serviceable Limits | Corrective Action |
|---|---|---|---|
| V. | Start Lock Plate (1230)<br>Refer to Figure 5-19. | | |
| (1) | Visually examine the start lock plate for corrosion product and pitting. | Corrosion product is not permitted.<br>The maximum permitted depth of pitting is 0.005 inch (0.12 mm). | Remove corrosion product to a maximum depth of 0.005 inch (0.12 mm) using glass bead cleaning in accordance with the Cleaning chapter of Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02).<br>If corrosion product cannot be removed or if pitting is greater than the permitted serviceable limits, replace the start lock plate. |
| (2) | Visually examine the start lock plate for scratches. | The maximum permitted depth of a scratch is 0.005 inch (0.12 mm). | If the depth is greater than the permitted serviceable limits, replace the start lock plate. |
| (3) | Visually examine for wear on the surface that touches the start lock pin. | The maximum permitted depth of wear is 0.020 inch (0.50 mm). | If the depth is greater than the permitted serviceable limits, replace the start lock plate. |
| (4) | Visually examine the start lock plate for cadmium plating coverage. | A few random scratches are permitted; otherwise, cadmium plating must completely cover the start lock plate. | Replate and bake the start lock plate in accordance with the Cadmium Replating chapter Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02). |



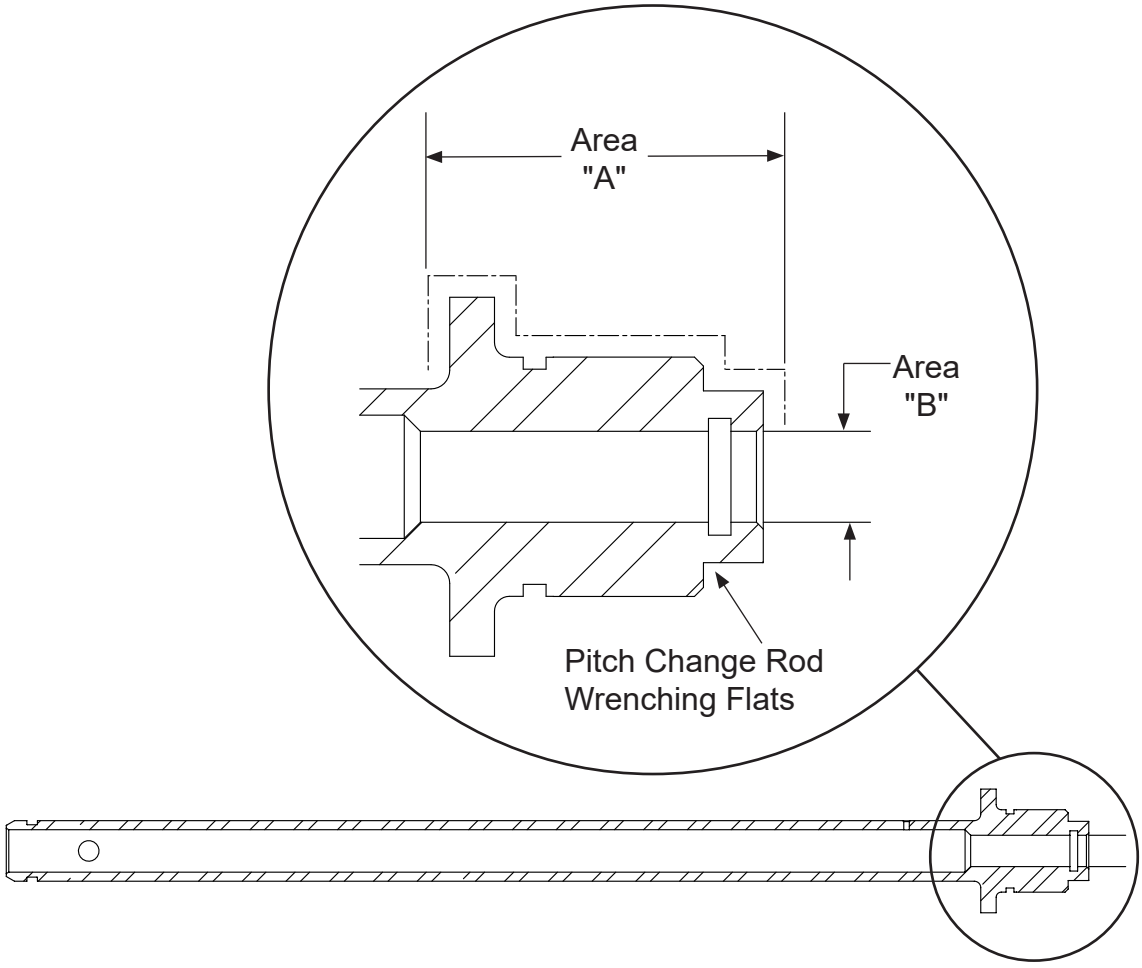

**Start Lock Plate**
**Figure 5-19**




**Yoke Unit**
**Figure 5-20**

## Component Inspection Criteria
## Table 5-1

| | Inspect | Serviceable Limits | Corrective Action |
|---|---|---|---|
| W. | Yoke Unit (1330)<br>Refer to Figure 5-20. | | |
| (1) | Visually examine the yoke unit for corrosion product and pitting. | Corrosion product is not permitted.<br>The maximum permitted depth of pitting is 0.005 inch (0.12 mm) in the yoke part only. Pitting is not permitted in the pin part. | Remove corrosion product using glass bead cleaning in accordance with the Cleaning chapter of Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02).<br>If corrosion product cannot be removed or if the damage is greater than the permitted serviceable limits, replace the yoke unit. |
| (2) | Visually examine the yoke unit for damage. | The maximum permitted depth of damage is 0.005 inch (0.12 mm) in the yoke part only.<br>Light scratches are permitted in the pin part.<br>Damage must not cause interference with the mating part. | Using an abrasive pad CM47 or equivalent, polish to remove raised material that is above the normal diameter of the pin.<br>If the damage is greater than the permitted serviceable limits, replace the yoke unit. |
| (3) | Measure the pin diameter. | The minimum permitted diameter is 0.2475 inch (6.287 mm). | If the diameter is less than the permitted serviceable limits, replace the yoke unit. |
| (4) | Measure the two holes in the yoke part. | The maximum permitted diameter is 0.1895 inch (4.813 mm). | If the diameter is greater than the permitted serviceable limits, replace the yoke unit. |
| (5) | Measure wear to the yoke part where the pin and yoke meet. | The maximum permitted depth of wear is 0.005 inch (0.12 mm). | If the depth of wear is greater than the serviceable limits, replace the yoke unit. |
| (6) | Visually examine the yoke unit for cadmium plating coverage. | A few scratches and corners with cadmium plating missing is permitted. In all other areas, complete coverage of the cadmium plating is necessary. | Replate the yoke unit in accordance with the Cadmium Replating chapter of Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02). |




| Pitch Change Rod | Minimum OD |
|---|---|
| B-868( ) | 0.731 inch (18.57 mm) |
| C-1948 | 0.781 inch (19.84 mm) |
| B-3332 | 0.731 inch (18.57 mm) |
| B-3421-( ) | 0.731 inch (18.57 mm) |
| D-5862 | 0.731 inch (18.57 mm) |

Pitch Change Rod Diameter Limits

**Pitch Change Rod B-3421( )**
**Figure 5-21**

## Component Inspection Criteria
## Table 5-1

| | Inspect | Serviceable Limits | Corrective Action |
|---|---|---|---|
| X. | Pitch Change Rod (1410)<br>Refer to Figure 5-21. | | |
| (1) | Visually examine the pitch change rod for cracks. | A crack is not permitted. | If there is a crack, replace the pitch change rod. |
| (2) | Visually examine the pitch change rod threaded areas for damage. | A maximum of 1/4 of one thread total accumulated damage is permitted. Thread damage must not cause interference with mating part threads. | If thread damage is greater than the serviceable limit, replace the pitch change rod. |
| (3) | Visually examine pitch change rod Area "A" for cadmium plating coverage. | Except for minor scratches and corners with cadmium plating missing, complete coverage is necessary. | If the coverage is less than the permitted serviceable limits, replate the head and bake the pitch change rod in accordance with the Cadmium Replating chapter of Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02). |
| (4) | Visually examine the pitch change rod wrenching flats for moved material. | Moved material caused by wrench engagement must not be above or below the pitch change rod shoulder surfaces. Sufficient flat surfaces must remain to support applied open-end wrench torque. | Remove the moved material flush with the pitch change rod shoulder thickness. If sufficient flat surfaces do not remain, replace the pitch change rod. |
| (5) | Magnetic particle inspect the pitch change rod in accordance with the Magnetic Particle Inspection chapter of Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02). | A relevant indication is not permitted. | If there is a relevant indication, replace the pitch change rod. |
| (6) | Measure the OD of the pitch change rod. | For minimum pitch change rod OD limits, refer to Figure 5-21. | If the pitch change rod OD is less than the serviceable limits, replace the pitch change rod. |
| (7) | B-3421( ) pitch change rod only: Measure the pitch change rod bore diameter, Area "B". | The maximum permitted bore diameter is 0.383 inch (9.72 mm). | If the pitch change rod bore diameter is greater than the serviceable limits, replace the pitch change rod. |

## Component Inspection Criteria
## Table 5-1

| | Inspect | Serviceable Limits | Corrective Action |
|---|---|---|---|
| X. | Pitch Change Rod (1410), continued<br>Refer to Figure 5-21. | | |
| (8) | B-3421( ) pitch change rod only - Using a microfinish comparator sample, examine the surface finish of the pitch change rod bore, Area "B". | The maximum permitted surface finish is 30 microinches. | If the surface finish of the pitch change rod bore is greater than the serviceable limits, replace the pitch change rod. |
| (9) | Pitch Change Rod Replacement Requirements | | |
| (a) | Identify the part number of the pitch change rod used in the HC-B3TN-5( ) propeller. | A B-3018( )-2 pitch change rod used in a HC-B3TN-5( ) propeller must be replaced with a C-1948 pitch change rod at overhaul or propeller tear down. | B-3018( )-2 pitch change rods removed from affected propeller assemblies must be retired from service. Replace or update the existing spring assembly to 831-75 spring assembly. Refer to the Repair chapter of this manual. |
| (b) | Identify the part number of the pitch change rods used in HC-B4(T,M)N-5( )( ) propellers. | A B-3018( )-2 pitch change rod used in a HC-B4(T,M)N-5( )( ) propeller must be replaced with a C-1948 pitch change rod. | B-3018( )-2 pitch change rods removed from affected propeller assemblies must be retired from service. Replace or update the existing spring assembly to 831-72 or 831-73 spring assembly. Refer to the Repair chapter of this manual. |
| (c) | Identify the part number of the pitch change rods used in HC-B4TN-3( ) and HC-B4MP-3( ) propellers. | A B-868AS rod used in a HC-B4TN-3( ) or a HC-B4MP-3( ) propeller must be replaced with a D-5862 pitch change rod at overhaul or propeller tear down. | B-868AS pitch change rods removed from affected propeller assemblies must be retired from service. Replace or update the existing spring assembly to 831-76 spring assembly. Refer to the Repair chapter of this manual. |

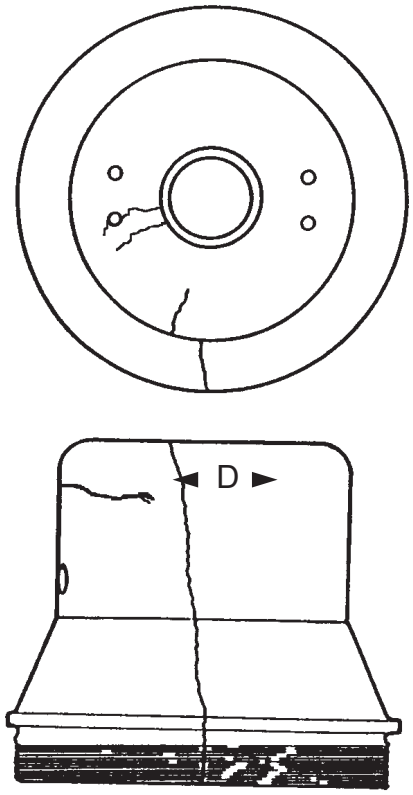
NOTE: The D-5862 Pitch Change Rod is an optional replacement for the B-868( ) Pitch Change Rod in all other propeller assemblies. The Spring Assembly must be upgraded in order to use the D-5862 rod. Refer to the Illustrated Parts List chapter of this manual for current Spring Assembly part information for each propeller model.

## Component Inspection Criteria
## Table 5-1

| Inspect | Serviceable Limits | Corrective Action |
|---|---|---|
| X. Pitch Change Rod (1410), continued<br>Refer to Figure 5-21. | | |
| (9) Pitch Change Rod Replacement Requirements, continued | | |
| (d) Visually examine each B-868( ) pitch change rods for a letter "T" or "S" stamped or etched on the end of the rod where the serial number is located. | All B-868( ) pitch change rods that are authorized to remain in service must have the letter "T" or "S" stamped or etched on the end of the rod where the serial number is located. | If the pitch change rod does not have a letter "T" or "S" on the end of the rod where the serial number is located, retire the pitch change rod from service in accordance with the Part Retirement Procedures chapter of Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02) and replace the pitch change rod.<br>Install a pitch change rod that has a "T" or "S" in the spring assembly. |
| (e) Visually examine each C-1948 pitch change rod for a letter "A" impression stamped or engraved on a wrench flat. | The letter "A" must be impression stamped or engraved on each serviceable C-1948 pitch change rod. | Corrective action is not required if the pitch change rod is identified with the letter "A". |
| | If the letter "A" is not on the C-1948 pitch change rod, the rear retainer groove must be inspected with an optical comparator. The minimum permitted corner radii in the rear retainer groove is .015 inch (0.381 mm). The maximum permitted corner radii in the rear retainer groove is 0.025 inch (0.635 mm). | Impression stamp or engrave the letter "A" on a wrench flat of the pitch change rod if it meets the serviceable limits. If the pitch change rod does not meet the corrective action limits, retire the pitch change rod from service in accordance with the Part Retirement Procedures chapter of Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02) and replace the pitch change rod. |

## Component Inspection Criteria
## Table 5-1

| | Inspect | Serviceable Limits | Corrective Action |
|---|---|---|---|
| Y. | Ball Thrust Bearing (1420) | | |
| (1) | Examine the ball thrust bearing for smooth operation. | The ball thrust bearing must turn smoothly. | If the ball thrust bearing does not turn smoothly, replace the ball thrust bearing. |
| (2) | Examine the bearing races for pitting or wear marks. | If pitting or wear marks are found then measure the bearing races. The maximum permitted depth of damage is 0.002 inch (0.05 mm). | If the damage is greater than the permitted serviceable limits, replace the ball thrust bearing. |
| (3) | Visually examine each bearing ball (encased in the ball spacer) for corrosion product and pitting. | Corrosion product or pitting is not permitted. | If there is corrosion product or pitting, replace the ball thrust bearing. |
| Z. | Spring Guide (1430) | | |
| (1) | Visually examine the spring guide for corrosion product and pitting. | Corrosion product is not permitted.<br>The maximum permitted depth of pitting is 0.005 inch (0.12 mm). | Remove corrosion product using glass bead cleaning in accordance with the Cleaning chapter of Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02).<br>If corrosion product cannot be removed or if pitting is greater than the permitted serviceable limits, replace the spring guide. |
| (2) | Visually examine the spring guide for damage caused by the feathering spring(s). | The maximum permitted depth of damage is 0.010 inch (0.25 mm). | Remove material that is raised above the normal surface.<br>If the damage is greater than the permitted serviceable limits, replace the spring guide. |
| (3) | Visually examine the spring guide for cadmium plating coverage. | Minor wear on corners and random light scratches are permitted; if not, the spring guide must have complete cadmium plating coverage. | If the cadmium plating coverage is less than the permitted serviceable limits, cadmium plate the spring guide in accordance with the Cadmium Replating chapter of Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02). |




Spring Retainer Cup Typical Crack Locations

| Spring Retainer Cup | Maximum ID |
|---|---|
| A-1827( ) | 0.741 inch (18.82 mm) |
| A-3403 | Replaced by C-2858 |
| A-3613 | 0.741 inch (18.82 mm) |
| B-666 | 0.741 inch (18.82 mm) |
| C-1939 | Replaced by C-2855 |
| C-2855 | 0.791 inch (20.09 mm) |
| C-2858 | 0.741 inch (18.82 mm) |
| C-5816 | 0.791 inch (20.09 mm) |
| C-5976 | 0.741 inch (18.82 mm) |
| 106412 | 0.738 inch (18.74 mm) |

Spring Retainer Cup Maximum ID Limits

APS 5030
SPRINGCUP.XLS

**Spring Retainer Cup**
**Figure 5-22**

## Component Inspection Criteria
## Table 5-1

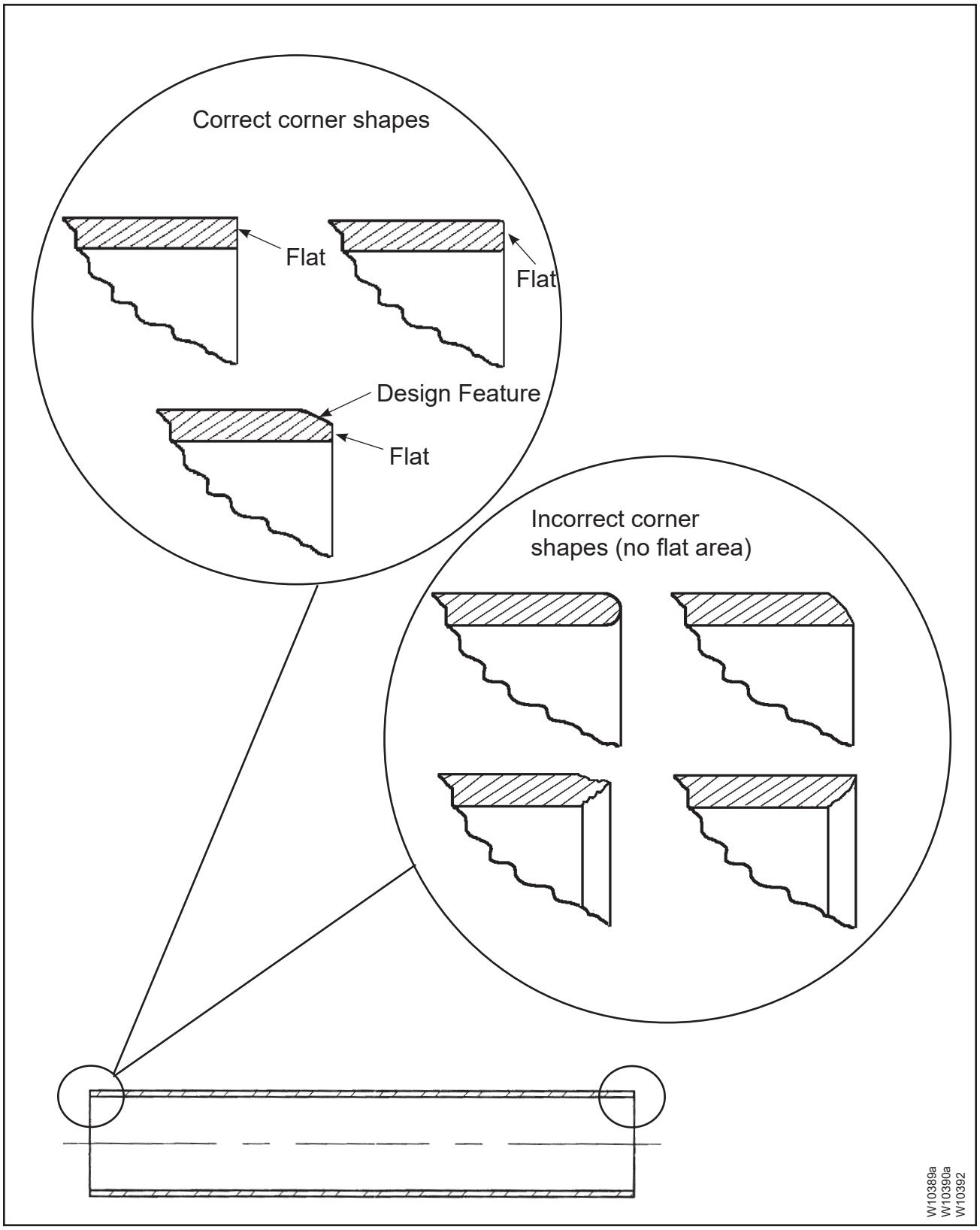
| | Inspect | Serviceable Limits | Corrective Action |
|---|---|---|---|
| AA. | Spring Retainer Cup (1440)<br>Refer to Figure 5-22. | | |
| (1) | Visually examine the spring retainer cup for damage to the threads. | Slight damage may happen to the first thread when the initial hole was drilled for the safety wire. This damage is permitted.<br>A maximum of 1/4 of one thread total accumulated damage (not including drill damage to the first three threads) is permitted. Additional thread damage is not permitted. | If the damage is greater than the permitted serviceable limits, replace the spring retainer cup. |
| (2) | Visually examine the 10-32UNF-3B threaded holes for damage. | A maximum of 1/2 of one thread total accumulated damage in each threaded hole is permitted. | If the damage is greater than the permitted serviceable limits, replace the spring retainer cup. |
| (3) | Visually examine the spring retainer cup for damage to the safety wire hole area. | Safety wire holes can be "pulled out" of the spring retainer cup. This damage is permitted if a new safety wire hole can be established. Additional damage is not permitted. | If the damage is greater than the permitted serviceable limits, replace the spring retainer cup. |
| (4) | Visually examine the spring retainer cup for cracks. | A crack is not permitted. | If there is a crack, replace the spring retainer cup. |
| (5) | Measure the pitch change rod hole (ID) of the spring retainer cup. | Refer to Figure 5-22 for the spring retainer cup maximum ID limits. | If the damage is greater than the permitted serviceable limits, replace the spring retainer cup. |
| (6) | Penetrant inspect the spring retainer cup in accordance with the Penetrant Inspection chapter of Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02). | A relevant indication is not permitted. | If there is a relevant indication, replace the spring retainer cup. |

## Component Inspection Criteria
## Table 5-1

| | Inspect | Serviceable Limits | Corrective Action |
|---|---|---|---|
| AB. | Feathering Compression Spring (1460, 1485, 1490, 1495) | | |
| (1) | Special Inspection: Visually examine for part number A-3496. | A feathering compression spring that has the part number A-3496 is not permitted. | Remove and replace with 102877 feathering compression spring. |
| (2) | Visually examine each feathering compression spring for pitting or corrosion product. | Corrosion product is not permitted.<br>The maximum permitted depth of pitting is 0.005 inch (0.12 mm). | Remove corrosion product using glass bead cleaning in accordance with the Cleaning chapter of Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02).<br>If corrosion product cannot be removed or if pitting is greater than the permitted serviceable limits, replace the feathering compression spring. |
| (3) | Magnetic particle inspect each feathering compression spring in accordance with the Magnetic Particle Inspection chapter of Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02). | A relevant indication is not permitted. | If there is a relevant indication, replace the feathering compression spring. |

## Component Inspection Criteria
## Table 5-1

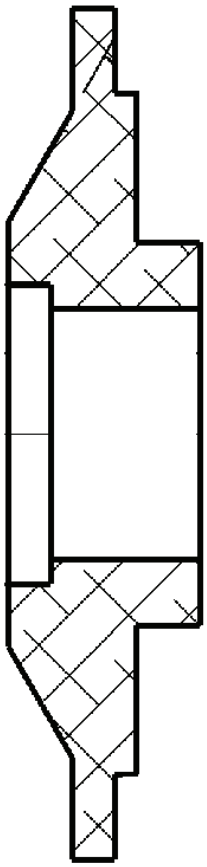
| | Inspect | Serviceable Limits | Corrective Action |
|---|---|---|---|
| AC. | Spring Extension (1470) | | |
| | (1) Visually examine the spring extension for corrosion product and pitting. | Corrosion product is not permitted.<br>The maximum permitted depth of pitting is 0.005 inch (0.12 mm). | Remove corrosion product using glass bead cleaning in accordance with the Cleaning chapter of Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02).<br>If corrosion product cannot be removed or if pitting is greater than the permitted serviceable limits, replace the spring extension. |
| | (2) Visually examine the spring extension for mechanical damage. | The maximum permitted depth of damage is 0.010 inch (0.25 mm) in the collar section of the spring extension.<br>The maximum permitted depth of damage is 0.005 inch (0.12 mm) in the tube section of the spring extension. | Remove material that is raised above the normal surface. If the damage is greater than the permitted serviceable limits, replace the spring extension. |
| | (3) Visually examine the spring extension for cadmium plating coverage. | Minor wear on corners and random light scratches are permitted; if not, the spring extension must have complete cadmium plating coverage. | If the cadmium plating coverage is less than the permitted serviceable limits, cadmium plate the spring extension in accordance with the Cadmium Replating chapter of Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02). |




**Spring Spacer Tube Corner Inspection**
**Figure 5-23**

## Component Inspection Criteria
## Table 5-1

| | Inspect | Serviceable Limits | Corrective Action |
|---|---|---|---|
| AD. | Spring Spacer Tube (1480)<br>Refer to Figure 5-23. | | |
| | (1) Visually examine for wear, corrosion product, and pitting. | Corrosion product is not permitted.<br>The maximum permitted depth of wear or pitting is 0.005 inch (0.12 mm). | Remove corrosion product using glass bead cleaning in accordance with the Cleaning chapter of Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02).<br>If corrosion product cannot be removed or if damage is greater than the permitted serviceable limits, replace the spring spacer tube. |
| | (2) Visually examine the shape of the corner of the spring spacer tube, between the ID and the OD. | The corners on both ends of the spring spacer tube must have a flat surface and acceptable corner shapes as described in Figure 5-23. | If the corner shapes do not meet the serviceable limits, replace the spring spacer tube. |
| | (3) A-3042-( ) and B-1461 only: Visually examine for anodize coverage. | Except for a few minor scratches and corners with anodize coating missing, anodize must completely cover the outside surface of the spring spacer tube. | If the anodize coverage does not meet the serviceable limits, replace the spring spacer tube. |
| | (4) B-1993 only: Visually examine for zinc or cadmium plating coverage. | Except for a few minor scratches and corners with plating missing, zinc or cadmium plating must completely cover the outside surface of the spring spacer tube. | If the zinc or cadmium plating coverage does not meet the serviceable limits, cadmium plate the spring spacer tube in accordance with the Cadmium Replating chapter of Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02). |



| Rear Spring Retainer | Minimum OD |
|---|---|
| A-1460 | 2.227 inches (56.57 mm) |
| A-3010 | 2.237 inches (56.82 mm) |
| A-4008-1 | 3.116 inches (79.15 mm) |
| A-3646 | 2.237 inches (56.82 mm) |
| B-1994 | 3.116 inches (79.15 mm) |
| B-5808 | 2.227 inches (56.57 mm) |

Inspection Limits

TPI-JM-000111

**Rear Spring Retainer**
**Figure 5-24**

## Component Inspection Criteria
## Table 5-1

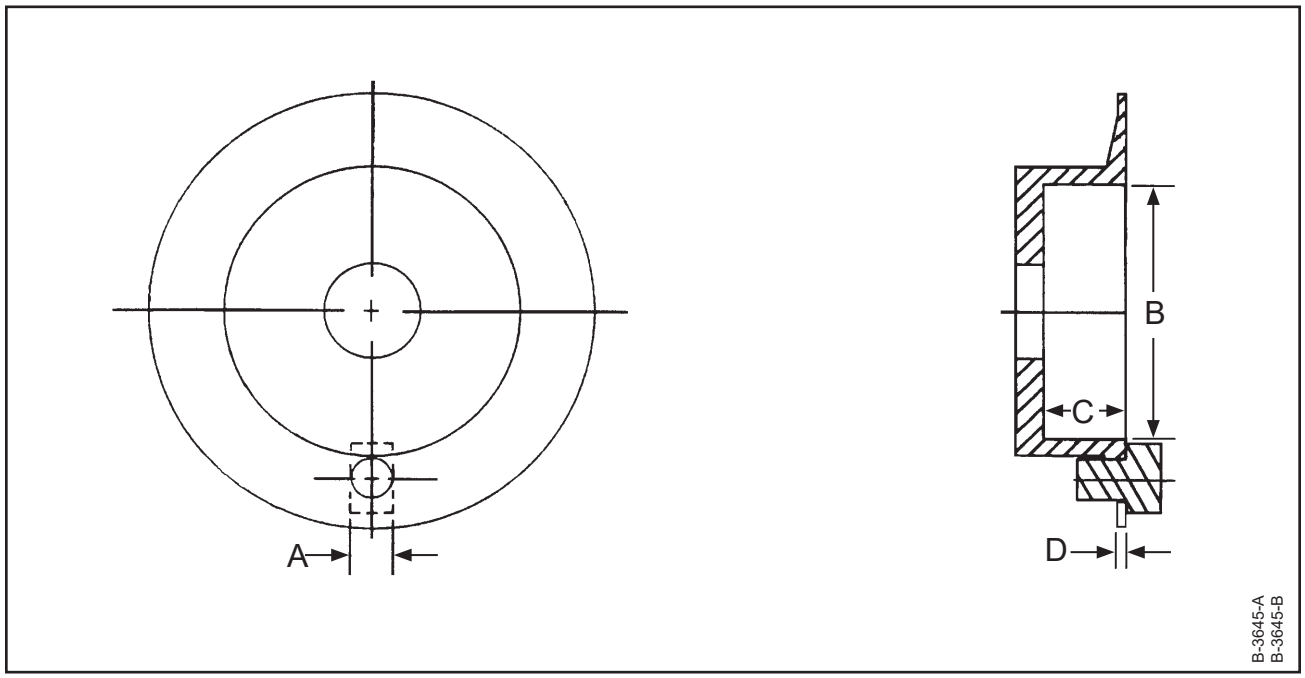
| | Inspect | Serviceable Limits | Corrective Action |
|---|---|---|---|
| AE. | Rear Spring Retainer (1500)<br>Refer to Figure 5-24. | | |
| | (1) Visually examine for corrosion product and pitting. | Corrosion product is not permitted.<br>The maximum permitted depth of pitting is 0.005 inch (0.12 mm). | Remove corrosion product using glass bead cleaning in accordance with the Cleaning chapter of Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02).<br>If corrosion product cannot be removed or damage is greater than the permitted serviceable limits, replace the rear spring retainer. |
| | (2) Visually examine for damage caused by the feathering spring. | The maximum permitted depth of damage is 0.010 inch (0.25 mm). | Using an abrasive pad CM47 or equivalent, polish to remove raised material above the surface in areas where the depth of damage is less than 0.010 inch (0.25 mm).<br>If the depth of damage is greater than the permitted serviceable limits, replace the rear spring retainer. |
| | (3) Measure the OD of the rear spring retainer. | The OD must not be less than the minimum permitted dimension listed in Figure 5-24. | If the OD is less than the permitted serviceable limits, replace the rear spring retainer. |

## Component Inspection Criteria
## Table 5-1

| | Inspect | Serviceable Limits | Corrective Action |
|---|---|---|---|
| AF. | Beta Valve Assembly (1600) | | |
| | NOTE: The beta feedback rod (1670), beta valve sleeve (1720), beta valve washer (1710), and pitch indicator pin (1700) may require replacement even though they are satisfactory in accordance with the Check chapter of this manual. For the conditions for replacement, refer to the "Reassembly of the C-3620-2KIT Subassembly" section in the Assembly chapter of this manual | | |
| | (1) All components of the beta valve assembly C-3630-( ) must be visually examined for corrosion product, scratches, dents, grooves, wear, or other forms of damage. | Refer to the specific inspection requirements of this chapter. | Replace any component that has corrosion product or damage that cannot be repaired in accordance with the serviceable limits of this chapter. |
| | (2) Magnetic particle inspect all steel components of the beta valve assembly in accordance with the Magnetic Particle Inspection chapter of Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02). | A relevant indication is not permitted. | If there is a relevant indication, replace the component. |
| | (3) Penetrant inspect all aluminum components of the beta valve assembly in accordance with the Penetrant Inspection chapter of Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02). | A relevant indication is not permitted. | If there is a relevant indication, replace the component. |
| AG. | Aluminum Spacer (1620) | | |
| | (1) Visually examine the aluminum spacer for wear or damage. | Wear or damage is not permitted. | If there is wear or damage, replace the aluminum spacer. |

## Component Inspection Criteria
## Table 5-1

| | Inspect | Serviceable Limits | Corrective Action |
|---|---|---|---|
| AH. | Beta Spring Retainer (1640)<br>Refer to Figure 5-25. | | |
| | (1) Measure the width of the tab area "A". | The minimum permitted width is 0.200 inch (5.08 mm). | If the width is less than the permitted serviceable limits, replace the beta spring retainer. |
| | (2) Measure the ID of area "B". | The maximum permitted ID is 1.200 inches (30.48 mm). | If the ID is greater than the permitted serviceable limits, replace the beta spring retainer. |
| | (3) Measure the depth of area "C". | The maximum permitted depth is 0.370 inch (9.40 mm). | If the depth is greater than the permitted serviceable limits, replace the beta spring retainer. |
| | (4) Measure the width of the flange area "D". | The minimum permitted width is 0.045 inch (1.14 mm). | If the width is not within the permitted serviceable limits, replace the beta spring retainer. |



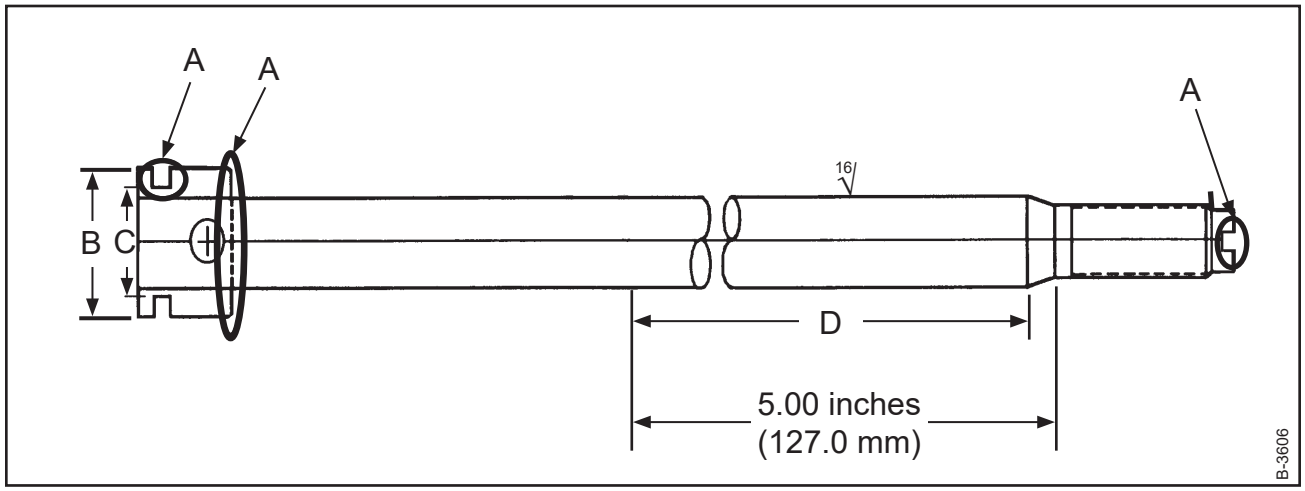

**Beta Spring Retainer**
**Figure 5-25**

## Component Inspection Criteria
## Table 5-1

| | Inspect | Serviceable Limits | Corrective Action |
|---|---|---|---|
| AI. | Compression Spring (1650) (Outer Beta Valve) | | |
| | (1) Visually examine for corrosion product, nicks, or damage. | Corrosion product, nicks, or damage that can be buffed out without removing metal is permitted. | If corrosion product, nicks, or other damage can be buffed out without reducing the cross section diameter, remove the damage.<br>If corrosion product, nicks or other damage is greater than the permitted serviceable limits and corrective action limits, replace the compression spring. |
| | (2) Measure the free length of the compression spring. | The free length must be greater than 6.86 inches (174.2 mm). | If the free length is less than the permitted serviceable limits, replace the compression spring. |
| AJ. | Compression Spring (1660) (Inner Beta Valve) | | |
| | (1) Visually examine for corrosion product, nicks, or damage. | Corrosion product, nicks, or damage that can be buffed out without removing metal is permitted. | If corrosion product, nicks, or other damage can be buffed out without reducing the cross section diameter, remove the damage.<br>If corrosion product, nicks, or other damage is greater than the permitted serviceable limits and corrective action limits, replace the compression spring. |
| | (2) Measure the free length of the compression spring. | The free length must be greater than 5.88 inches (149.4 mm). | If the free length is less than the permitted serviceable limits, replace the compression spring. |

## Component Inspection Criteria
## Table 5-1

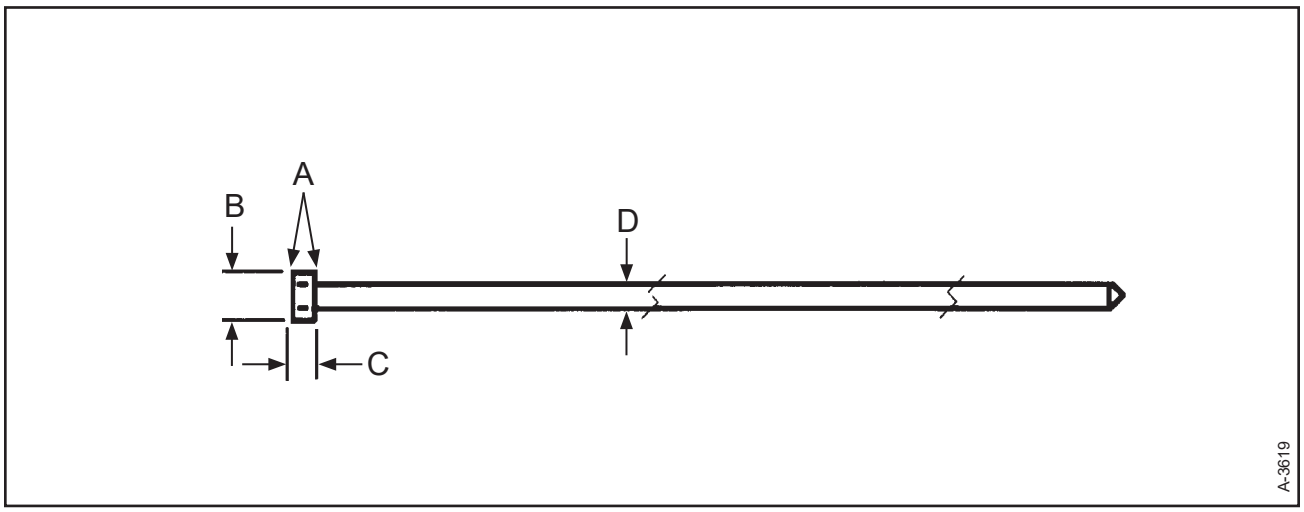
| | Inspect | Serviceable Limits | Corrective Action |
|---|---|---|---|
| AK. | Beta Rod (1670)<br>Refer to Figure 5-26.<br>NOTE: The beta rod (1670), beta valve sleeve (1720), beta valve washer (1710), and the pitch unit indicator pin (1700) may require replacement even though they are satisfactory in accordance with the Check chapter of this manual. For the conditions for replacement, refer to the section, "Reassembly of the C-3620-2KIT Subassembly" in the Assembly chapter of this manual. | | |
| | (1) Visually examine the beta feedback rod for localized damage, dents, scratches, grooves, or damage. | A dent, scratch, groove or damage is not permitted in areas indicated as "A". | If a dent, scratch, groove, or damage is within these areas, replace the beta rod. |
| | (2) Measure the outside diameter "B". | The minimum permitted OD is 0.663 inch (16.8 mm). | If the OD is less than the permitted serviceable limits, replace the beta rod. |
| | (3) Measure the groove diameter "C". | The minimum permitted groove diameter is 0.556 inch (14.12 mm). | If the groove diameter is less than the permitted serviceable limits, replace the beta rod. |
| | (4) Measure the OD of the area indicated as "D". | The minimum permitted OD is 0.372 inch (9.44 mm). | If the OD is less than the permitted serviceable limits, replace the beta rod. |
| | (5) Examine the surface finish on the area indicated "√" using a microfinish comparator sample or profilometer. | The maximum permitted surface finish is 16 microinches. | If the surface finish of the beta feedback rod is greater than the serviceable limits, send the beta rod to Hartzell Propeller Inc. for refinishing. |




**Beta Feedback Rod**
**Figure 5-26**

## Component Inspection Criteria
## Table 5-1

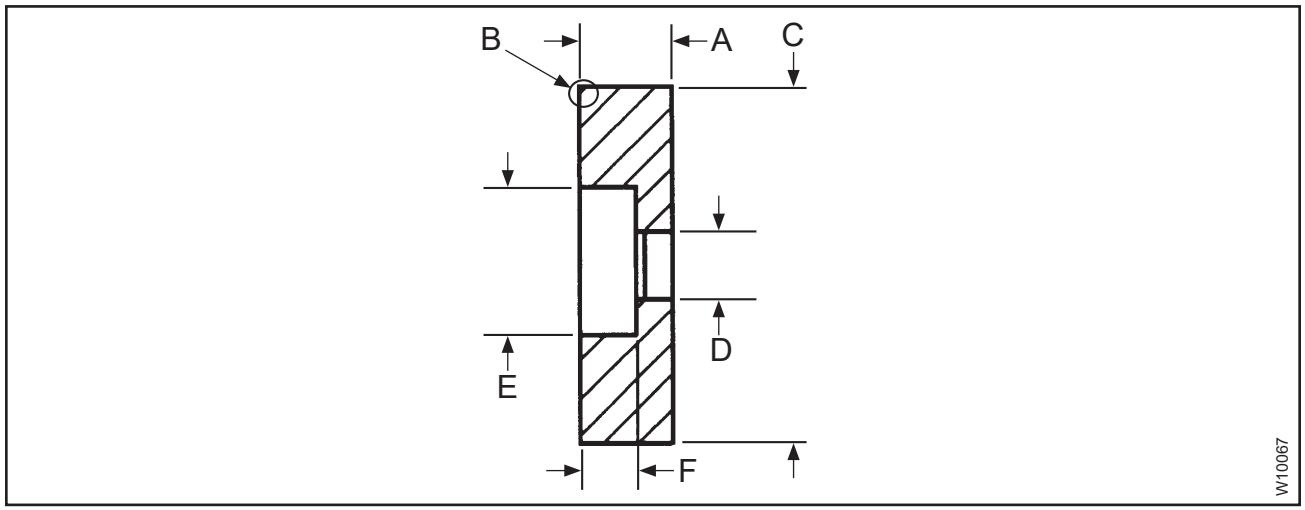
| | Inspect | Serviceable Limits | Corrective Action |
|---|---|---|---|
| AL. | Pitch Unit Indicator Pin (1700)<br>Refer to Figure 5-27. | | |
| | NOTE: The pitch unit indicator pin (1700) may require replacement even though it is satisfactory in accordance with the Check chapter of this manual. For the conditions for replacement, refer to the section, "Reassembly of the C-3620-2KIT Subassembly" in the Assembly chapter of this manual. | | |
| | (1) Visually examine the edges of area "A" for wear or damage. | Wear or damage is not permitted. | If there is wear or damage, replace the pitch unit indicator pin. |
| | (2) Measure the OD of area "B". | The minimum permitted OD is 0.225 inch (5.71 mm). | If the reverse pitch indicator pin head OD is less than the permitted serviceable limits, replace the pitch unit indicator pin. |
| | (3) Measure the width of area "C". | The minimum permitted thickness of the reverse pitch indicator pin head is 0.116 inch (2.94 mm). | If the reverse pitch indicator pin head width is less than the permitted serviceable limits, replace the pitch unit indicator pin. |
| | (4) Measure the OD of area "D". | The minimum permitted reverse pitch indicator pin OD 0.122 inch (3.09 mm). | If the reverse pitch indicator pin head OD is less than the permitted serviceable limits, replace the pitch unit indicator pin. |




**Pitch Unit Indicator Pin**
**Figure 5-27**

## Component Inspection Criteria
## Table 5-1

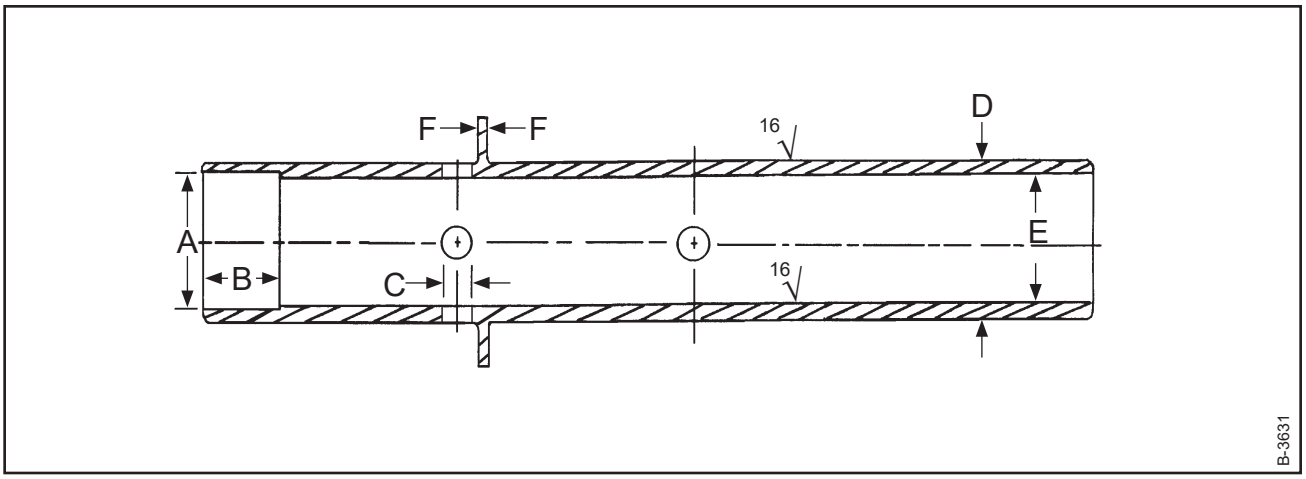
| | Inspect | Serviceable Limits | Corrective Action |
|---|---|---|---|
| AM. | Beta Valve Washer (1710)<br>Refer to Figure 5-28.<br>NOTE: The beta valve washer (1710) may require replacement even though it is satisfactory in accordance with the Check chapter of this manual. For the conditions for replacement, refer to the "Reassembly of the C-3620-2KIT Subassembly" section in the Assembly chapter of this manual. | | |
| | (1) Measure the thickness of the beta valve washer area "A". | The minimum permitted thickness is 0.180 inch (4.57 mm). | If the thickness of the beta valve washer is less than the permitted serviceable limits, replace the beta valve washer. |
| | (2) Visually examine all edges for local damage area "B". | Visible damage is not permitted. | If there is visible damage, replace the beta valve washer. |
| | (3) Measure the OD of the beta valve washer area "C". | The minimum permitted OD is 0.663 inch (16.84 mm). | If the OD of the beta valve washer is less than the permitted serviceable limits, replace the beta valve washer. |
| | (4) Measure the ID of the beta valve washer area "D". | The maximum permitted ID is 0.133 inch (3.37 mm). | If the ID of the beta valve washer is greater than the permitted serviceable limits, replace the beta valve washer. |
| | (5) Measure the ID of the pin head cutout area "E". | The maximum permitted ID is 0.270 inch (6.85 mm). | If the ID of the pin head cutout is greater than the permitted serviceable limits, replace the beta valve washer. |
| | (6) Measure the depth of the pin head cutout area "F". | The maximum permitted depth is 0.130 inch (3.30 mm). | If the depth of the pin head cutout is greater than the permitted serviceable limits, replace the beta valve washer. |




**Beta Valve Washer**
**Figure 5-28**

## Component Inspection Criteria
## Table 5-1

| | Inspect | Serviceable Limits | Corrective Action |
|---|---|---|---|
| AN. | Beta Valve Sleeve (1720)<br>Refer to Figure 5-29.<br>NOTE: The beta valve sleeve (1720) may require replacement even though it is satisfactory in accordance with the Check chapter of this manual. For the conditions for replacement, refer to the "Reassembly of the C-3620-2KIT Subassembly" section in the Assembly chapter of this manual. | | |
| | (1) Measure the ID of the beta valve sleeve area "A". | The maximum permitted ID is 0.667 inch (16.94 mm). | If the ID of the beta valve sleeve is greater than the permitted serviceable limits, replace the beta valve sleeve. |
| | (2) Measure the depth of the slot in the end of the beta valve sleeve area "B". | The depth of the hole must be between 0.577 and 0.617 inch (14.65 and 15.67 mm). | If the depth of the hole is not within the permitted serviceable limits, replace the beta valve sleeve. |
| | (3) Measure the ID of the 4 holes in the beta valve sleeve area "C". | The ID of each hole must be between 0.1870 and 0.1875 inch (4.75 and 4.76 mm). | If the ID of each hole is not within the permitted serviceable limits, replace the beta valve sleeve. |
| | (4) Measure the OD of the beta valve sleeve area "D". | The minimum OD is 0.746 inch (18.94 mm). | If the OD of the beta valve sleeve is less than the permitted serviceable limits, replace the beta valve sleeve. |
| | (5) Measure the ID of the beta valve sleeve area "E". | The maximum ID is 0.6254 inch (15.88 mm). | If the ID of the beta valve sleeve is greater than the permitted serviceable limits, replace the beta valve sleeve. |



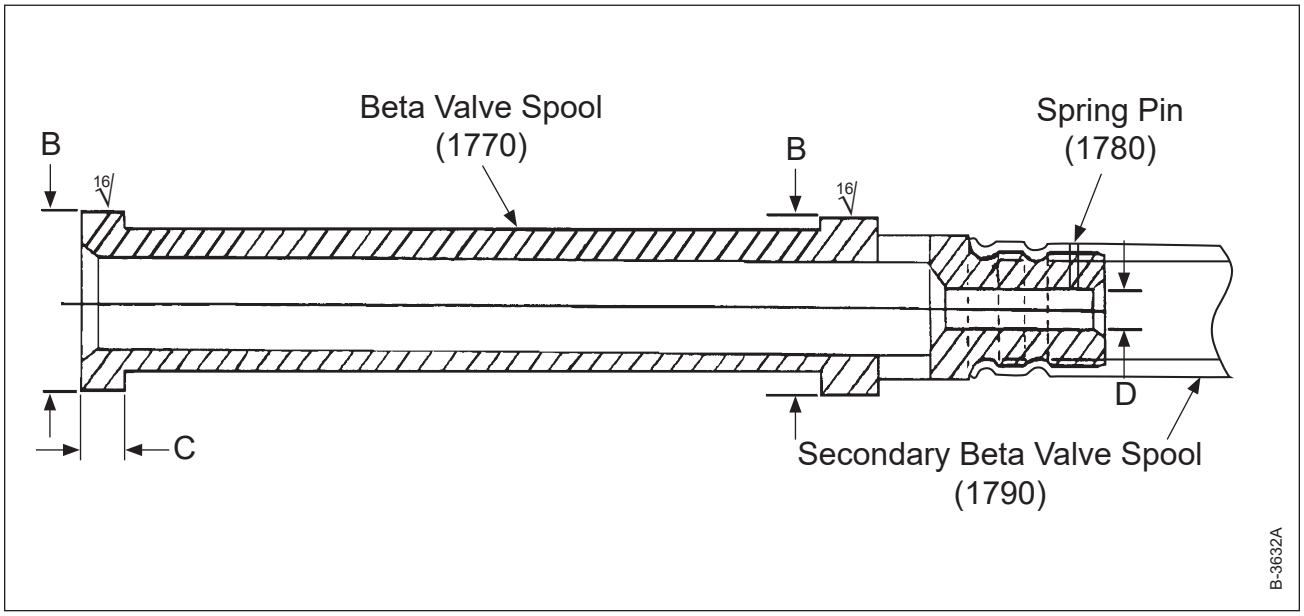

**Beta Valve Sleeve**
**Figure 5-29**

## Component Inspection Criteria
## Table 5-1

| | Inspect | Serviceable Limits | Corrective Action |
|---|---|---|---|
| AN. | Beta Valve Sleeve (1720), continued<br>Refer to Figure 5-29. | | |
| | (6) Visually examine the surfaces on the flange of the beta valve sleeve area "F". | Localized damage, dents, scratches, or grooves are not permitted. | If damage, dents, scratches, or grooves are greater than the permitted serviceable limits, replace the beta valve sleeve. |
| | (7) Examine the surface finish on the areas indicated "√" using a microfinish comparator sample or profilometer. | The surface finish must be at least 16 microinches or smoother. | If the surface finish of areas indicated "√" is not within the serviceable limits, replace the beta valve sleeve. |
| | (8) Visually examine the quantity of holes for spring pin installation. | The maximum permitted quantity of holes is four. Holes must be separated around the circumference by approximately 90 degrees from each other. | If the quantity of holes is greater than permitted serviceable limits, replace the beta valve sleeve. |

## Component Inspection Criteria
## Table 5-1

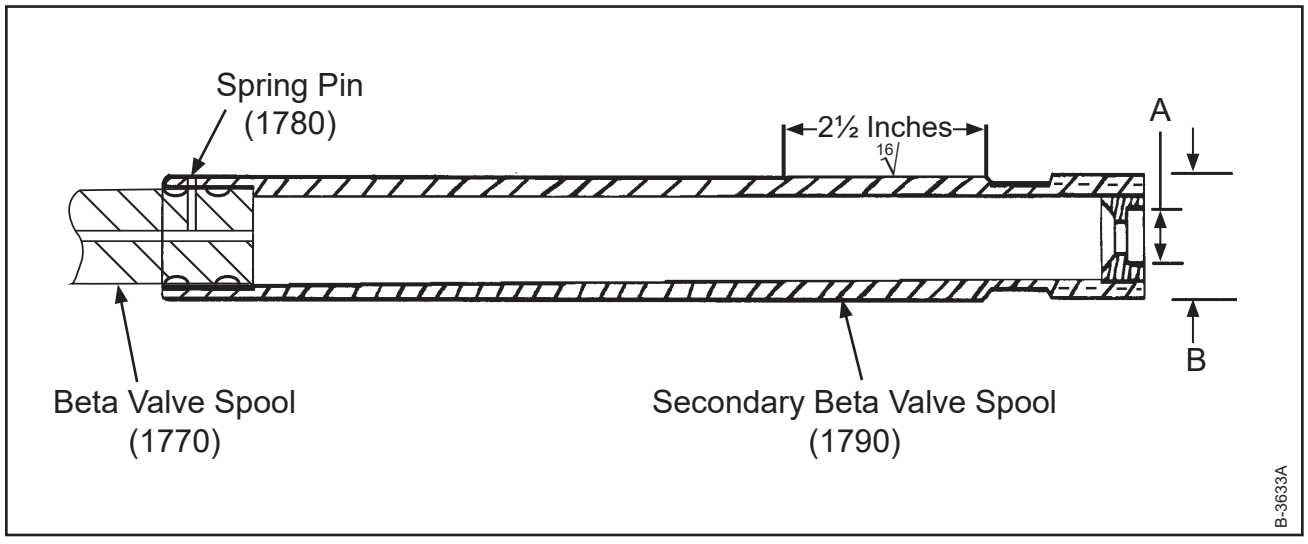
| | Inspect | Serviceable Limits | Corrective Action |
|---|---|---|---|
| AO. | Beta Valve Spool (1770)<br>Two piece assembly - attached to the Secondary Beta Valve Spool B-3633 (1790)<br>Refer to Figure 5-30.<br>NOTE: If the assembly consisting of the Beta Valve Spool (1770), the Secondary Beta Valve Spool (1790), and the Spring Pin (1780) is replaced, it must be replaced with the Beta Valve Spool (1790). | | |
| | (1) Examine the surface finish on the areas indicated "√" using a profilometer or a microfinish comparator sample. | The surface finish must be at least 16 micro-inches. | If the surface finish of the beta valve spool is not within the permitted serviceable limits, replace the beta valve spool. |
| | (2) Measure the OD of the spool (2 areas "B"). | The minimum permitted OD is 0.624 inch (15.85 mm). | If the OD of the beta valve spool is less than the permitted serviceable limits, replace the beta valve spool. |
| | (3) Measure the thickness of the flat area "C". | The minimum permitted thickness is 0.180 inch (4.57 mm). | If the thickness of the flat is less than the permitted serviceable limits, replace the beta valve spool. |
| | (4) Measure the ID of the spool area "D". | The maximum ID is 0.132 inch (3.35 mm). | If the ID of the beta valve spool is greater than the permitted serviceable limits, replace the beta valve spool. |




**Beta Valve Spool**
**Figure 5-30**

## Component Inspection Criteria
## Table 5-1

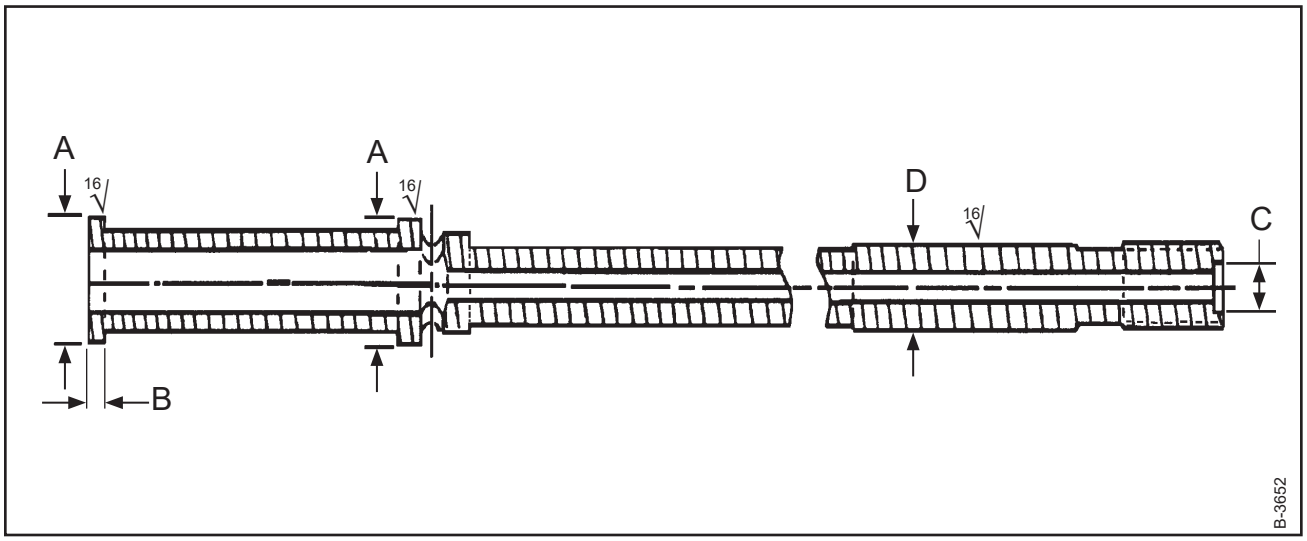
| | Inspect | Serviceable Limits | Corrective Action |
|---|---|---|---|
| AP. | Secondary Beta Valve Spool B-3633 (1790)<br>Two piece assembly - attached to the Beta Valve Spool (1770)<br>Refer to Figure 5-31.<br>NOTE: If the assembly consisting of the Beta Valve Spool (1770), the Secondary Beta Valve Spool (1790), and the Spring Pin (1780) is replaced, it must be replaced with the Beta Valve Spool (1790). | | |
| | (1) Measure the ID of the beta valve push rod area "A". | The maximum permitted ID is 0.243 inch (6.17 mm). | If the ID of the beta valve push rod is greater than the permitted serviceable limits, replace the secondary beta valve spool. |
| | (2) Measure the OD of the threaded area of the rod area "B". | The minimum permitted OD is 0.415 inch (10.54 mm). | If the OD of the threaded area of the rod is less than the permitted serviceable limits, replace the secondary beta valve spool. |
| | (3) Examine the surface finish in the area indicated "√" using a microfinish comparator sample or profilometer. | The surface finish must be at least 16 microinches. | If the surface finish of areas indicated "√" is not within the serviceable limits, replace the secondary beta valve spool. |
| | (4) Examine the spring pin (1780) tightness of fit. | The spring pin is not permitted to be loose or missing. | If the spring pin is not within the serviceable limits, replace the secondary beta valve spool. |




**Secondary Beta Valve Spool**
**Figure 5-31**

## Component Inspection Criteria
## Table 5-1

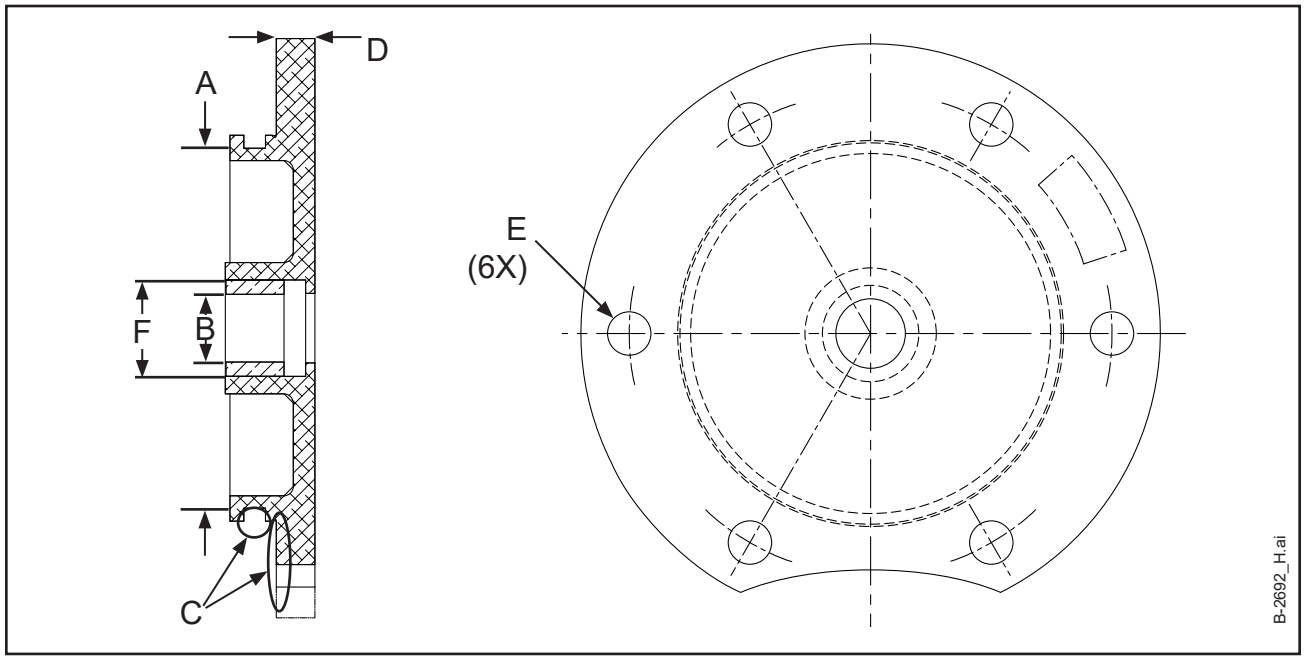
| | Inspect | Serviceable Limits | Corrective Action |
|---|---|---|---|
| AQ. | Beta Valve Spool B-3652 (1790)<br>Refer to Figure 5-32. | | |
| (1) | Measure the OD of the lands on the beta valve spool area "A". | The minimum permitted OD is 0.6243 inch (15.85 mm). | If the OD of the lands on the beta valve spool is less than the permitted serviceable limits, replace the beta valve spool. |
| | NOTE: At least three measurements must be taken with a two-point micrometer. | | |
| (2) | Measure the width of the flange area "B". | The minimum permitted thickness is 0.180 inch (4.57 mm). | If the width of the flange is less than the permitted serviceable limits, replace the beta valve spool. |
| (3) | Examine the surface finish in the area indicated "√" using a microfinish comparator sample or profilometer. | The surface finish must be at least 16 microinches. | If the surface finish of areas indicated "√" is not within the serviceable limits, replace the beta valve spool. |
| (4) | Measure the ID of the rod end area "C". | The maximum permitted ID is 0.243 inch (6.17 mm). | If the ID of the rod end is greater than the permitted serviceable limits, replace the beta valve spool. |
| (5) | Measure the OD of the rod area "D". | The minimum permitted OD is 0.436 inch (11.07 mm). | If the OD of the rod is less than the permitted serviceable limits, replace the beta valve spool. |




**Beta Valve Spool**
**Figure 5-32**

## Component Inspection Criteria
## Table 5-1

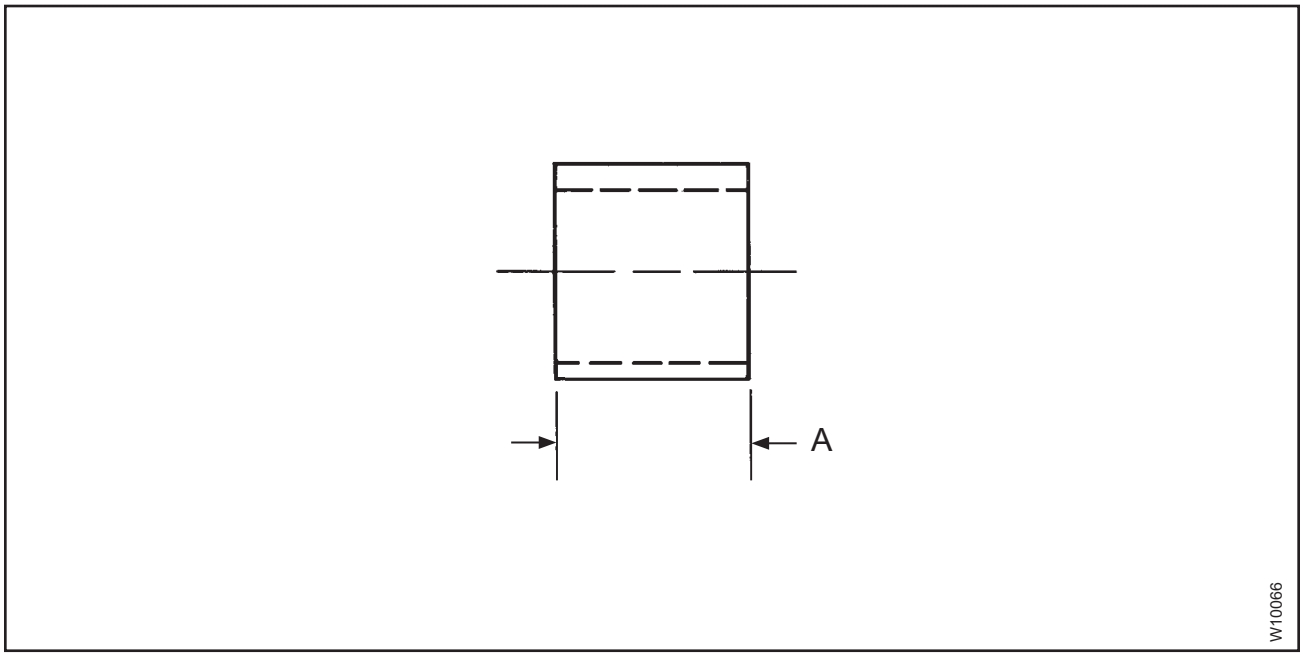
| | Inspect | Serviceable Limits | Corrective Action |
|---|---|---|---|
| AR. | Engine Cover (1830)<br>Refer to Figure 5-33. | | |
| | (1) Measure the OD of the O-ring groove area "A". | The minimum permitted OD is 2.314 inches (58.77 mm). | If the OD of the O-ring groove is less than the permitted serviceable limits, replace the engine cover. |
| | (2) Measure the ID of area "B" (bearing [1835] **installed**). | The maximum permitted ID of area "B" is 0.440 inch (11.17 mm). | If the ID of area "B" is greater than the permitted serviceable limits, replace the bearing. |
| | Measure the ID of area "F" (bearing [1835] **removed**). | The maximum permitted ID of area "F" is 0.625 inch (15.87 mm). | If the ID of area "F" is greater than the permitted serviceable limits, replace the engine cover. |
| | (3) Visually examine the indicated surfaces area "C" for localized damage, dents, scratches, or grooves. | Damage, dents, scratches, or grooves in area "C" are not permitted. | If damage, dents, scratches, or grooves are greater than the serviceable limits, replace the engine cover. |
| | (4) Measure the width of the flange area "D". | The minimum permitted width of the flange is 0.230 inch (5.84 mm). | If the width of the flange is less than the permitted serviceable limits, replace the engine cover. |
| | (5) Measure the ID of each hole area "E". | The maximum permitted ID of each hole is 0.288 inch (7.31 mm). | If the ID of a hole is greater than the permitted serviceable limits, replace the engine cover. |




**Engine Cover**
**Figure 5-33**

## Component Inspection Criteria
## Table 5-1

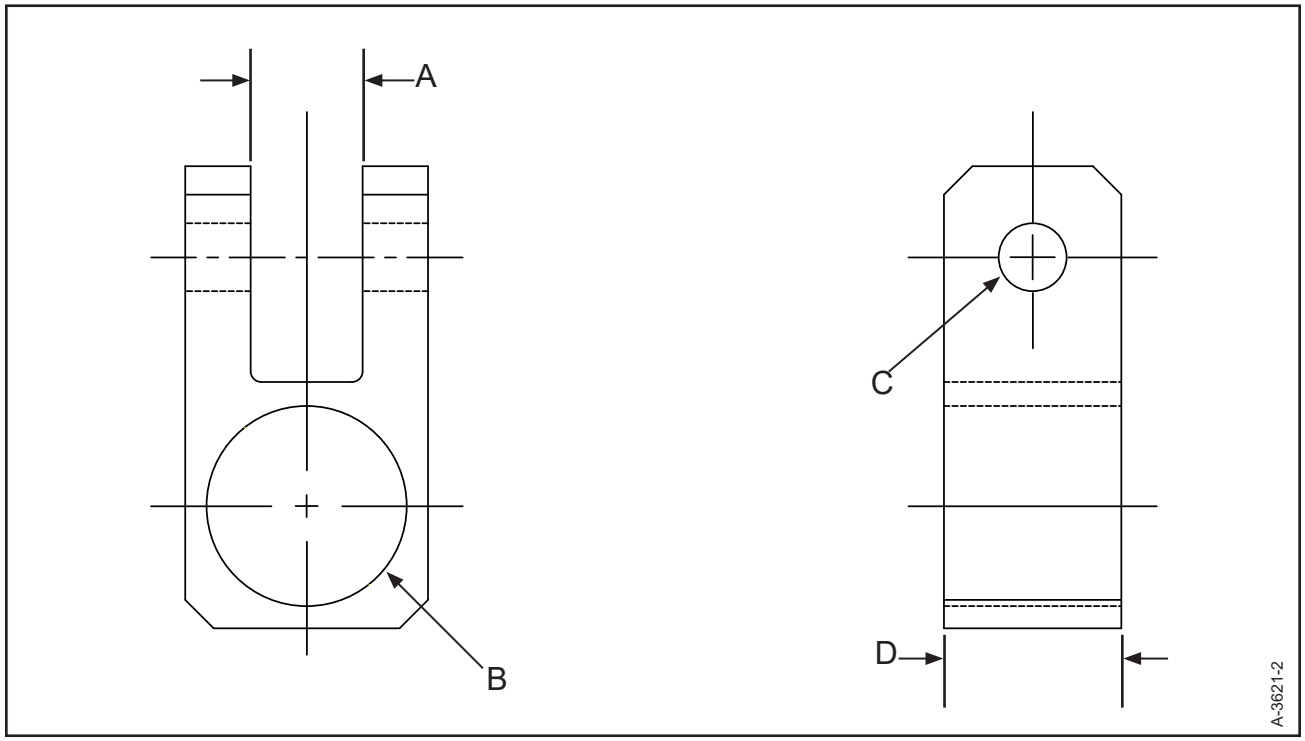
| | Inspect | Serviceable Limits | Corrective Action |
|---|---|---|---|
| AS. | Beta Valve Bushing (1850)<br>Refer to Figure 5-34. | | |
| | (1) Visually examine all surfaces of the beta valve bushing for wear, grooves, gouges, or other damage. | Wear, grooves, gouges, or other damage is not permitted. | If wear, grooves, gouges, or other damage is greater than the permitted serviceable limits, replace the beta valve bushing. |
| | (2) Measure the length of the beta valve bushing area "A". | The minimum permitted length of the beta valve bushing is 0.502 inch (12.75 mm). | If the length of the valve bushing is less than the permitted serviceable limits, replace the beta valve bushing. |




**Valve Bushing**
**Figure 5-34**

## Component Inspection Criteria
## Table 5-1

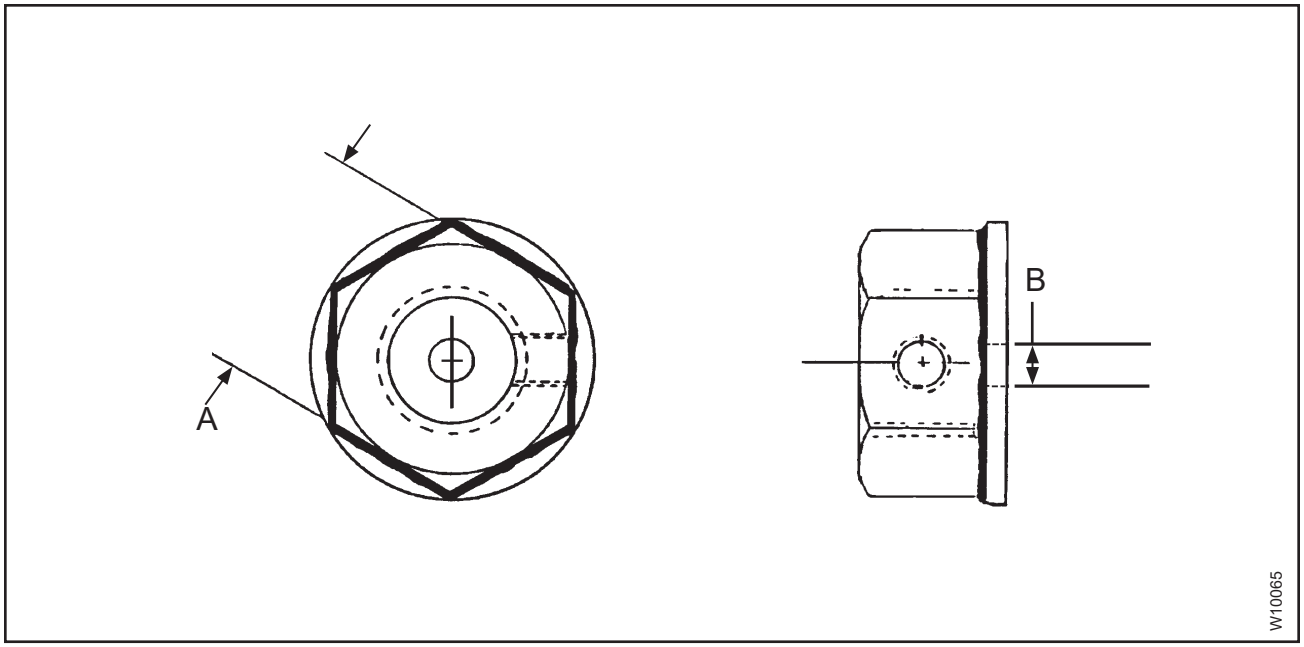
| | Inspect | Serviceable Limits | Corrective Action |
|---|---|---|---|
| AT. | Rod End Fitting (1860)<br>Refer to Figure 5-35. | | |
| | (1) Measure the width of the groove area "A". | The maximum permitted groove width is 0.318 inch (8.07 mm). | If the width of the groove is greater than the permitted serviceable limits, replace the rod end fitting. |
| | (2) Measure the ID of the bushing passage area "B". | The maximum permitted ID of the passage is 0.5645 inch (14.338 mm). | If the ID of the bushing passage is greater than the permitted serviceable limits, replace the rod end fitting. |
| | (3) Measure the ID of the hole area "C". | The maximum permitted ID of the hole is 0.1925 inch (4.889 mm). | If the ID of the hole is greater than the permitted serviceable limits, replace the rod end fitting. |
| | (4) Measure the width of the fitting area "D". | The minimum permitted width of the fitting is 0.496 inch (12.60 mm). | If the width of the fitting is less than the permitted serviceable limits, replace the rod end fitting. |




**Rod End Fitting**
**Figure 5-35**

## Component Inspection Criteria
## Table 5-1

| | Inspect | Serviceable Limits | Corrective Action |
|---|---|---|---|
| AU. | Rod End Cap Unit (1870)<br>Refer to Figure 5-36. | | |
| | (1) Measure the distance across the flats area "A". | The minimum permitted distance across the flats is 0.670 inch (17.02 mm). | If the distance across the flats is less than the permitted serviceable limits, replace the rod end cap unit. |
| | (2) Measure the ID area "B". | The maximum permitted ID is 0.154 inch (3.91 mm). | If the ID is greater than the permitted serviceable limits, replace the rod end cap unit. |
| AV. | Counterweight (800)<br>Inspect the counterweight (800) in accordance with the Blade Clamp Overhaul chapter of Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02). | | |
| AW. | Counterweight Slug (9040)<br>Inspect the counterweight slug (9040) in accordance with the Blade Clamp Overhaul chapter of Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02). | | |




**Rod End Cap Unit**
**Figure 5-36**

5. Special Mandatory Inspection Requirements

CAUTION: INSTRUCTIONS AND PROCEDURES IN THIS CHAPTER MAY INVOLVE PROPELLER CRITICAL PARTS. REFER TO THE INTRODUCTION CHAPTER OF THIS MANUAL FOR INFORMATION ABOUT PROPELLER CRITICAL PARTS. REFER TO THE ILLUSTRATED PARTS LIST IN THIS MANUAL FOR IDENTIFICATION OF PROPELLER CRITICAL PARTS.

A. Hub Pilot Tube Bores in Certain Four-Blade Propellers Mandatory Inspection Requirements

(1) To comply with AD 94-03-11 and Hartzell Propeller Inc. Alert Service Bulletin A186( ), some hubs that were previously installed on MU-2 series aircraft before their current service must be removed and sent to the Hartzell Propeller Inc. Service Center for a one-time inspection.

(a) Beech A100 and A100A with HC-B4TN-3(A)/T10173F(N),(B,K)-12.5

1 For complete inspection criteria and instructions, refer to AD 95-03-03 and Hartzell Propeller Inc. Alert Service Bulletin HC-ASB-61-A196( ).

(b) MU-2-26A, -36A, -40, -60 (and STC Modified) Four-Blade with LT10282-5.3R

1 For complete inspection criteria and instructions, refer to AD 95-01-02 and Hartzell Propeller Inc. Alert Service Bulletins HC-ASB-61-A182( ), HC-ASB-61-A183( ), and HC-ASB-61-A188( ).

# REPAIR - CONTENTS

REPAIR - CONTENTS, CONTINUED

## LIST OF ILLUSTRATIONS



## LIST OF TABLES

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WARNING 1: DO NOT ATTEMPT IN THE FIELD ANY REPAIR, REPLACEMENT, REPLATING, RE-ANODIZING OR RE-SHOT PEENING PROCEDURE NOT SPECIFICALLY AUTHORIZED BY HARTZELL PROPELLER INC. OR NOT SPECIFICALLY REFERRED TO IN HARTZELL PROPELLER INC. MANUALS. CONTACT HARTZELL PROPELLER INC. FOR GUIDANCE ABOUT THE AIRWORTHINESS OF ANY PART WITH UNUSUAL WEAR OR DAMAGE.

WARNING 2: ADHESIVES AND SOLVENTS ARE FLAMMABLE AND TOXIC TO THE SKIN, EYES, AND RESPIRATORY TRACT. SKIN AND EYE PROTECTION ARE REQUIRED. AVOID PROLONGED CONTACT AND BREATHING OF VAPORS. USE SOLVENT RESISTANT GLOVES TO MINIMIZE SKIN CONTACT AND WEAR SAFETY GLASSES FOR EYE PROTECTION. USE IN A WELL VENTILATED AREA AWAY FROM SPARKS AND FLAME. READ AND OBSERVE ALL WARNING LABELS.

CAUTION: INSTRUCTIONS AND PROCEDURES IN THIS CHAPTER MAY INVOLVE PROPELLER CRITICAL PARTS. REFER TO THE INTRODUCTION CHAPTER OF THIS MANUAL FOR INFORMATION ABOUT PROPELLER CRITICAL PARTS. REFER TO THE ILLUSTRATED PARTS LIST IN THIS MANUAL FOR IDENTIFICATION OF PROPELLER CRITICAL PARTS.

1. General Repair Requirements (Rev. 2)

A. Shot Peening

CAUTION: THE PEENING MARKS ON CERTAIN PROPELLER PARTS ARE NOT TOOL MARKS AND SHOULD NOT BE REMOVED.

(1) Certain surfaces of propeller assembly parts have been shot peened at Hartzell Propeller Inc. to improve fatigue strength.

(2) Shot peened surfaces may require re-shot peening because of rust, corrosion, fretting, or nicks. For shot peening procedure, refer to the Shot Peening chapter of Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02).

WARNING: FAILURE TO CORRECTLY SHOT PEEN THE APPLICABLE PROPELLER PARTS MAY CREATE AN UNSAFE CONDITION THAT MAY RESULT IN DEATH, SERIOUS BODILY INJURY, AND/OR SUBSTANTIAL PROPERTY DAMAGE. A QUALITY SHOT PEENING PROCESS IS CRITICAL FOR FLIGHT SAFETY. SHOT PEENING OF PROPELLER PARTS REQUIRES SPECIAL TECHNIQUES, TRAINING, MATERIALS, AND EQUIPMENT.

(a) Only repair stations that are properly certified by Hartzell Propeller Inc. should shot peen Hartzell propeller parts.

1 For certification requirements, refer to the Approved Facilities chapter of Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02).

2 For a list of repair stations that are certified by Hartzell Propeller Inc. to perform shot peening on Hartzell propeller parts:

a Go to the Sample Program Approvals page on the Hartzell Propeller Inc. website at www.hartzellprop.com

b Contact the Hartzell Propeller Inc. Product Support

(1) Refer to the section, "Contact Information" in the Introduction chapter of this manual.

B. Aluminum and Steel Parts

(1) Remove scratches, nicks, burrs, and other minor damage using a fine emery cloth or abrasive pad, such as CM47.

(a) Blend the polished area in with the surrounding area.

(b) Use extreme care to completely remove the damage while removing as little material as possible.

(2) After any repair, inspect the part in accordance with the applicable inspection criteria to be sure it is within the permitted limits.

2. Repair/Modification Procedures (Rev. 2)

A. Propeller Components (Except for those listed separately in this section)

(1) For repair and modification procedures of propeller components (except for those listed separately in this section), refer to the applicable section in this chapter.

B. Hubs

(1) Steel Hubs: Refer to the Steel Hub Overhaul chapter of Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02).

C. Blades

(1) Aluminum Blades: Refer to Hartzell Propeller Inc. Aluminum Blade Overhaul Manual 133C (61-13-33).

(2) Composite Blades: Refer to Hartzell Propeller Inc. Composite Blade Overhaul Manual 135F (61-13-35).

D. Blade Clamps

(1) Refer to the Blade Clamp Overhaul chapter of Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02).

E. Spinner Assemblies

(1) Metal Spinners: Refer to Hartzell Propeller Inc. Metal Spinner Maintenance Manual 127 (61-16-27).

(2) Composite Spinners: Refer to Hartzell Propeller Inc. Composite Spinner Maintenance Manual 148 (61-16-48).

F. Ice Protection Systems

(1) For ice protection systems supplied by Hartzell, refer to Hartzell Propeller Inc. Ice Protection System Manual 180 (30-61-80).

(2) For ice protection systems not supplied by Hartzell, refer to the applicable TC or STC holder's Instructions for Continued Airworthiness (ICA).

3. Mandatory Hub Replacement

A. Effectivity

(1) These instructions apply to all Hartzell Propeller Inc. steel hub propellers installed on turbine engine aircraft.

B. Compliance

(1) Compliance is required in accordance with Table 1 of AD-96-18-14.

C. Hub Ordering Information

(1) Use Table 6-1 to find the correct hub part number and kit (where applicable) for ordering to comply with AD-96-18-14.

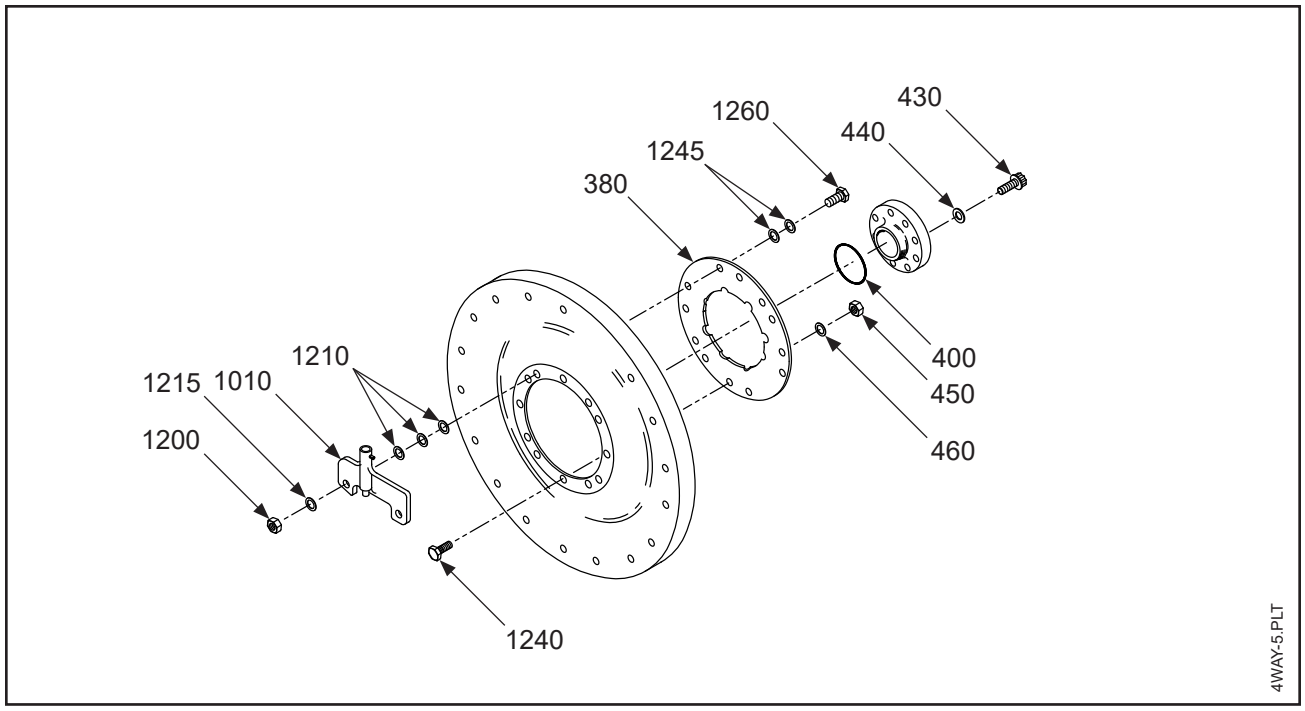
| Propeller Model | Hub Part Number | Hub/Kit Part Number to Order |
|---|---|---|
| HC-B3TN-[2, 3( )] | C-840-60 | 840-60 |
| HC-B3MN-[3( ), 5] | C-840-60 | 840-60 |
| HC-B3TN-5[C(L), D(L), E, F(L), G, K] | C-840-87 | 840-87 & A-6514 |
| HC-B3TN-5[M(L), N(L), P, SL,U] | C-840-60 | 840-60 |
| HC-A3VF-7( ) | C-840-82 | 840-82 |
| HC-B3TF-7( ) | C-840-116 | 840-116 |
| HC-B4MP-3( ) | C-840-140 | 840-140 |
| HC-B4TN-3( ) | C-840-89 **or** C-840-139 | 840-139 |
| HC-B4MN-5AL | C-840-139 | 840-139 |
| HC-B4MN-5L | C-840-91<br>C-840-139 | 840-139 & A-6275*<br>840-139 |
| HC-B4TN-5( ) | C-840-91<br>C-840-139 | 840-139 & A-6275-1*<br>840-139 |
| HC-B4TN-5( )L | C-840-91<br>C-840-139 | 840-139 & A-6275*<br>840-139 |

* Several propeller models were manufactured with 840-91 and 840-139 hub assemblies. If the propeller was manufactured with the 840-139 hub, the A-6275(-1) conversion kit is not necessary because it already uses the updated start lock components. The A-6275(-1) conversion kit is necessary for the propellers manufactured with 840-91 hub assemblies when the hub is replaced with the 840-139 hub assembly. Refer to the section, "A-6275 and A-6725-1 Conversion Kits" in this chapter.

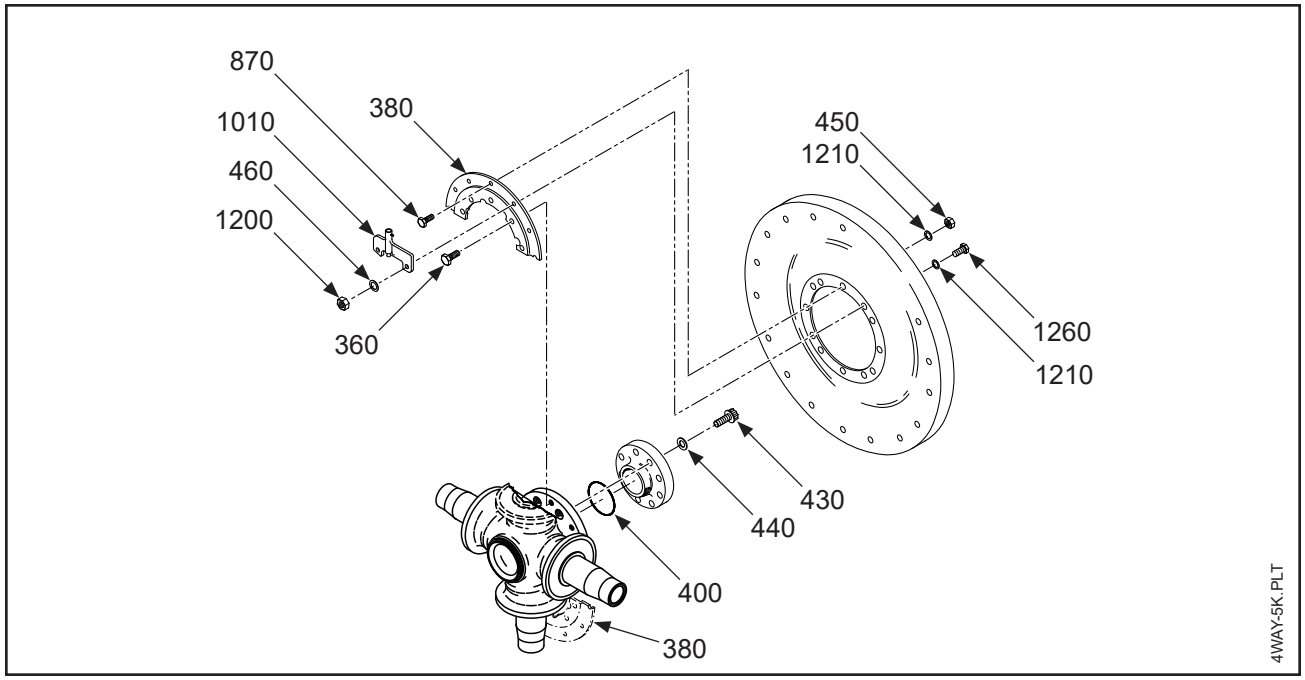
**Hub and Conversion Kit Ordering Information**
**Table 6-1**

| Part Number | Description | Quantity |
|---|---|---|
| A-6514 | HC-B3TN Replacement Kit | |
| B-3029-1 | • Spinner Mounting Plate | 1 |
| 840-87 | • Hub Unit | 1 |
| A-1891-A | • • Pilot Tube | 3 |
| B-3897-1 | • • Expansion Plug | 3 |
| A-6275 | Conversion Kit | |
| A-3495 | • Start Lock Plate | 4 |
| 830-34L | • Start Lock Assembly | 4 |
| C-3492 | • Spinner Mounting Plate | 1 |
| A-6275-1 | Conversion Kit | |
| A-3079 | • Start Lock Plate | 4 |
| 830-34 | • Start Lock Assembly | 4 |
| C-3492 | • Spinner Mounting Plate | 1 |

**Replacement/Conversion Kit Parts Lists**
**Table 6-2**




**840-91 Configuration**
**Figure 6-1**




**840-139 Configuration**
**Figure 6-2**

D. The A-6275 and A-6275-1 Conversion Kits
Refer to Table 6-2.

(1) The A-6275 and A-6275-1 conversion kits are required to replace the C-840-91 hub with the 840-139 hub installed on HC-B4(M,T)N-5( )(L) propellers.

(a) The spinner bulkhead for the (C-)840-91 is located on the propeller side of the spinner mounting plate (380). Refer to Figure 6-1.

(b) The spinner bulkhead for the 840-139 is located on the engine side of the spinner mounting plate (380). Refer to Figure 6-2.

(c) The difference in clearances between the two spinner bulkhead mounting arrangements requires different start locks and start lock plates to be installed when the (C-)840-91 hub assembly is replaced by the 840-139 hub assembly.

(d) (C-)840-91 hubs can be identified by the stepped recess on the hub flange where the spinner mounting plate is installed during assembly.

(e) Model designation after hub replacement/conversion:

NOTE: The new model number must be stamped on the hub. For information about location and marking of steel hubs, refer to the Parts Identification and Marking chapter of the Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02).

1 HC-B4TN-5**C** becomes HC-B4TN-5**F**

2 HC-B4TN-5**CL** becomes HC-B4TN-5**FL**

3 HC-B4TN-5**DL** becomes HC-B4TN-5**GL**

4 HC-B4TN-5**EL** becomes HC-B4TN-5**HL**

E. The A-6514 Replacement Kit
Refer to Table 6-2.

(1) When replacing the C-840-87 hub with an 840-87 hub, the A-6514 replacement kit is required. Refer to Table 6-2 for the A-6514 replacement kit parts.

NOTE: The A-6514 replacement kit includes a B-3029-1 spinner mounting plate.

CAUTION: THE THICKNESS OF THE SPINNER MOUNTING PLATE IS CRITICAL. WHEN THE SPINNER MOUNTING PLATE IS COMPRESSED BETWEEN THE ENGINE FLANGE AND THE PROPELLER FLANGE DURING INSTALLATION, THE SPACING CAN INFLUENCE BOLT AND FLANGE STRESSES. ALL EXISTING B-3029-1 SPINNER MOUNTING PLATES MUST BE REPLACED WHEN REPLACING THE C-840-87 HUB WITH THE 840-87 HUB.

(a) Remove and retire the B-3029-1 spinner mounting plate from service in accordance with the Part Retirement Procedures chapter of Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02)

(b) Install the B-3029-1 spinner mounting plate from the A-6514 replacement kit.

(c) Record the replacement of the spinner mounting plate in the propeller logbook.

4. Blade Clamp Repair

A. Requirements and Procedures

(1) For requirements and procedures for repairing clamps, refer to the Blade Clamp Overhaul chapter of Hartzell Propeller Inc. Standard Practices Manual 202A
(61-01-02).

5. Spinner Assembly Repair/Modification

A. Requirements and Procedures

(1) For requirements and procedures for repairing or modifying spinner assemblies, refer to Hartzell Propeller Inc. Metal Spinner Maintenance Manual 127 (61-16-27).

6. Cylinder Repair

A. Repair

(1) Remove any evidence of gouging or wear on the cylinder (200) within repair limits. Refer to Check chapter of this manual for repair limits.

(2) The cylinder may be reground and re-chromed if necessary. For re-chroming limits and procedures, refer to the Hard Chromium Re-Plating chapter of Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02).

7. Piston Unit Repair

A. Plastic Bushing Removal and Replacement - Refer to Figure 6-3.

NOTE: The following procedures must be performed by a skilled machinist.

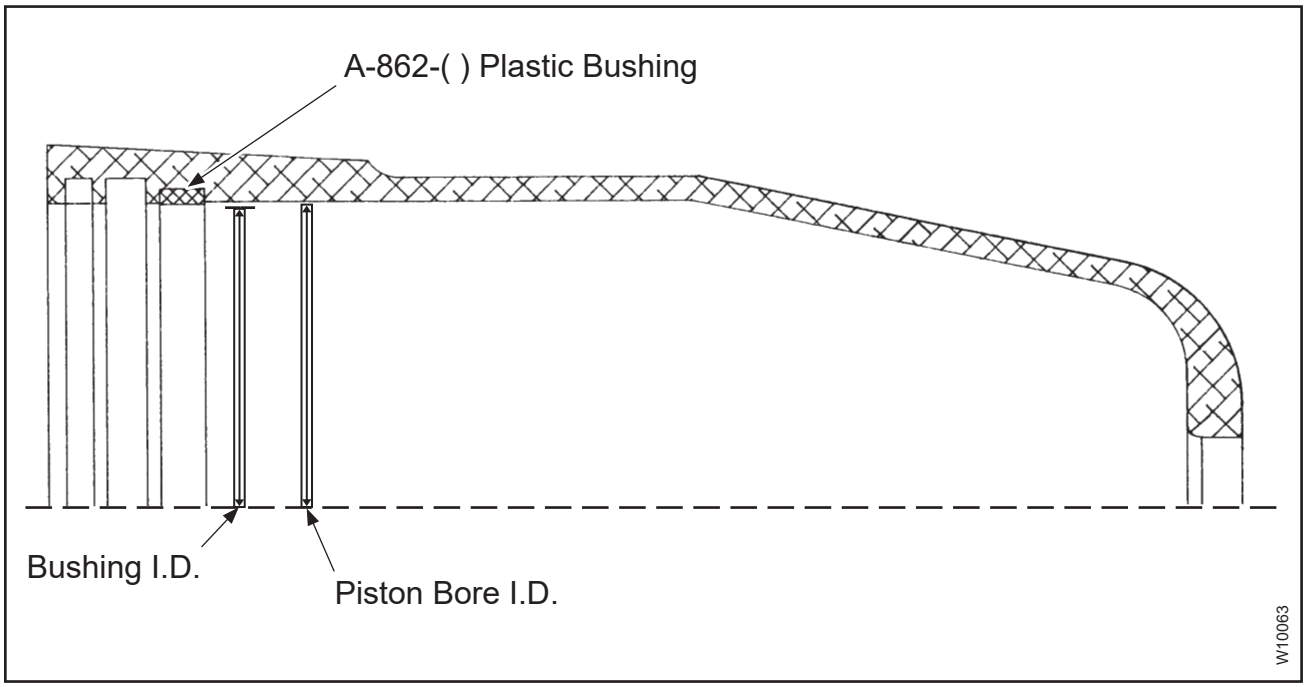
(1) Remove the plastic bushing (60), using care not to damage the bushing groove.

(2) Remove any adhesive from the bushing groove using cleaning solvent CM106.

(3) Clean, install, and ream the new plastic bushing (60) in accordance with the Special Adhesive and Bonding Procedures chapter of Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02).

(4) Measure the runout of the plastic bushing (60) to the bore of the piston outboard of the plastic bushing groove.

(a) The runout must be within 0.002 inch (0.05 mm).




**Plastic Piston Bushing Replacement**
**Figure 6-3**

B. Replacement of A-717 Piston Guide Rod

(1) For removal and replacement of piston guide rods (55), refer to the Standard Repairs chapter of Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02).

C. Repair of Link Pin Unit Safety Screw Hole

(1) Damaged link pin unit safety screw holes may be repaired by using a modified thin walled insert.

NOTE: In the past, coiled insert repairs were also authorized. Existing coiled inserts are acceptable; however, future repairs are to be made using a modified thin walled insert and the following procedure:

(2) The tools and the part necessary to make a thin walled insert repair to the link pin unit safety screw holes are as follows:

(a) 0.221 inch (5.61 mm) Diameter No. 2 Drill

(b) Repair kit TE421

1 Drive Wrench TE353

2 B-6986-192 Slimsert TE422

3 1/4-28UNF-3B Bottom Tap TE423

CAUTION: MAKE SURE THE DRILL IS CENTERED AND PERPENDICULAR TO THE HOLE.

(3) Remove the damaged threads using the No. 2 drill.

CAUTION: MAKE SURE THE TAP TE423 IS PERPENDICULAR TO THE HOLE.

(4) Using the 1/4-28UNF-3B bottom tap TE423, re-tap the hole to a depth of 0.220 to 0.270 inch (5.59 to 6.85 mm).

NOTE: This will ensure that the thin walled insert does not extend into the slot and interfere with the link arm.

(5) Clean the newly drilled and tapped hole with solvent CM106.

(6) Place the thin walled insert TE422 in a lathe and remove the counterbored end.

(7) Apply loctite primer CM127 to the thin walled insert TE422 and the tapped hole.

(8) Apply thread locking compound CM74 to the thin walled insert TE422.

(9) Install the thin walled insert by using the drive wrench TE353 so that the thin walled insert is flush, or slightly below flush, with the outboard surface of the piston.

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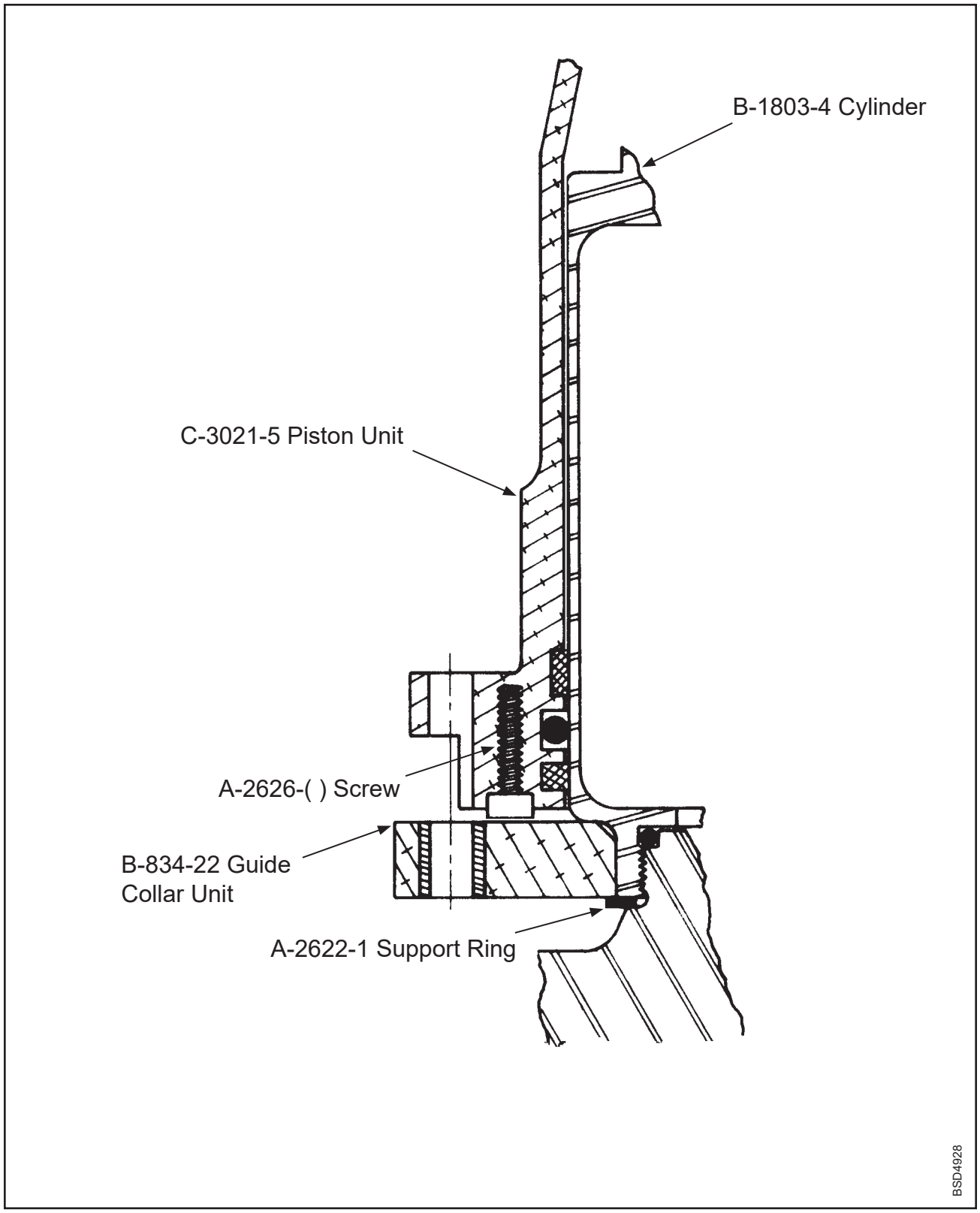



**External Feather Stop Configuration**
**Figure 6-4**

D. Modification of C-3021-( ) Piston for Installation of External Feathering Stop on HC-B3TN-3( ) Propellers

(1) General

(a) Installing an external feathering stop will simplify adjustment of the feather angle on HC-B3TN-3( ) propeller assemblies. Refer to Figure 6-4.

1 This option prevents the need to remove the piston unit (50), the beta rod support ring (30), and the low stop adjustment nuts when setting or readjusting the feather angle.

2 It is considered a minor modification that does not affect propeller eligibility.

(2) Model Designation

(a) The propeller model designation is changed when the external feathering stop option is incorporated as follows:

1 HC-B3TN-3**C** becomes HC-B3TN-3**K**

2 HC-B3TN-3**B** becomes HC-B3TN-3**M**

3 HC-B3TN-3**G** becomes HC-B3TN-3**N**

4 HC-B3TN-3**H** becomes HC-B3TN-3**P**

(b) These propeller models are the only models eligible to be modified.

NOTE: The modification is most conveniently performed at propeller overhaul or any time the propeller is removed from the aircraft and engine.

(c) The new model number must be stamped on the hub (500).

1 For information about location and marking of steel hubs, refer to the Parts Identification and Marking chapter of the Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02).

(3) Tools Required

(a) Drill fixture TE51

(b) No. 21 drill bit

(c) 10-32UNF-3B bottom tap

(d) 21/64 inch drill bit.

(4) Procedure

(a) Place the piston unit (50) on the drill fixture base so that the pitch change rod (1410) opening in the piston is aligned with the threaded hole in the base. Use the fastening knob to secure the piston to the base.

(b) Place the drill guide plate in place on the piston base by inserting the dowel pins into the beta rod (320) holes on the piston.

NOTE: Drill fixture BST-2920 (TE51) can be used for either left hand or right hand piston modification. Ensure the correct side of the plate is facing away from the piston, depending on the type of piston being modified.

(c) Place the No. 21 drill guide in the drill guide plate.

1 Using the No. 21 drill bit, drill into the base of the piston to a depth of 0.850 ±0.010 inch (21.59 ±0.25 mm).

2 Repeat the drilling procedure at the other two locations around the piston base.

3 Remove the No. 21 drill guide from the drill guide plate.

(d) Place the 21/64 drill guide in the drill guide plate.

1 Drill into the new hole in the piston base using the 21/64 drill bit to a depth of 0.200 ±0.010 inch (5.08 ±0.25 mm).

2 Repeat the drilling procedure at the other two locations around the piston base.

3 Remove the drill guide plate from the piston.

(e) Tap the No. 21 holes using the 10-32UNF-3B tap to the bottom of each hole.

1 Thoroughly clean the tapped holes when finished.

(5) Additional Requirements to Complete the Modification

(a) Replace cylinder B-1803-2 with cylinder B-1803-4.

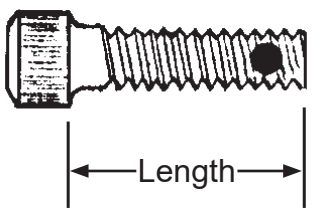
(b) Replace guide collar unit B-834-1 with guide collar unit B-834-22.

(c) Install the collar support ring (880) between the cylinder (200) and the hub (500) during assembly.

(d) Install three additional screws (190) in the piston during assembly.

NOTE: Select the length of screw (190) that maintains a minimum of 3/8 inch of screw engaged in the piston after feather adjustment is completed. Refer to Table 6-3 for part number specifications.

| Part Number | Length |
|---|---|
| A-2626 | 0.75 inch (19.0 mm) |
| A-2626-1 | 1.50 inch (38.1 mm) |
| A-2626-2 | 0.50 inch (12.7 mm) |
| A-2626-3 | 1.00 inch (25.4 mm) |
| A-2626-4 | 1.25 inch (31.7 mm) |




**A-2626-( ) Screw Specifications**
**Table 6-3**

8. Beta Ring (Low Stop Collar) Repair (-3 Propeller Models, only)

   A. General Repair

      (1) Use a soft cotton wheel to polish the beta ring (420).

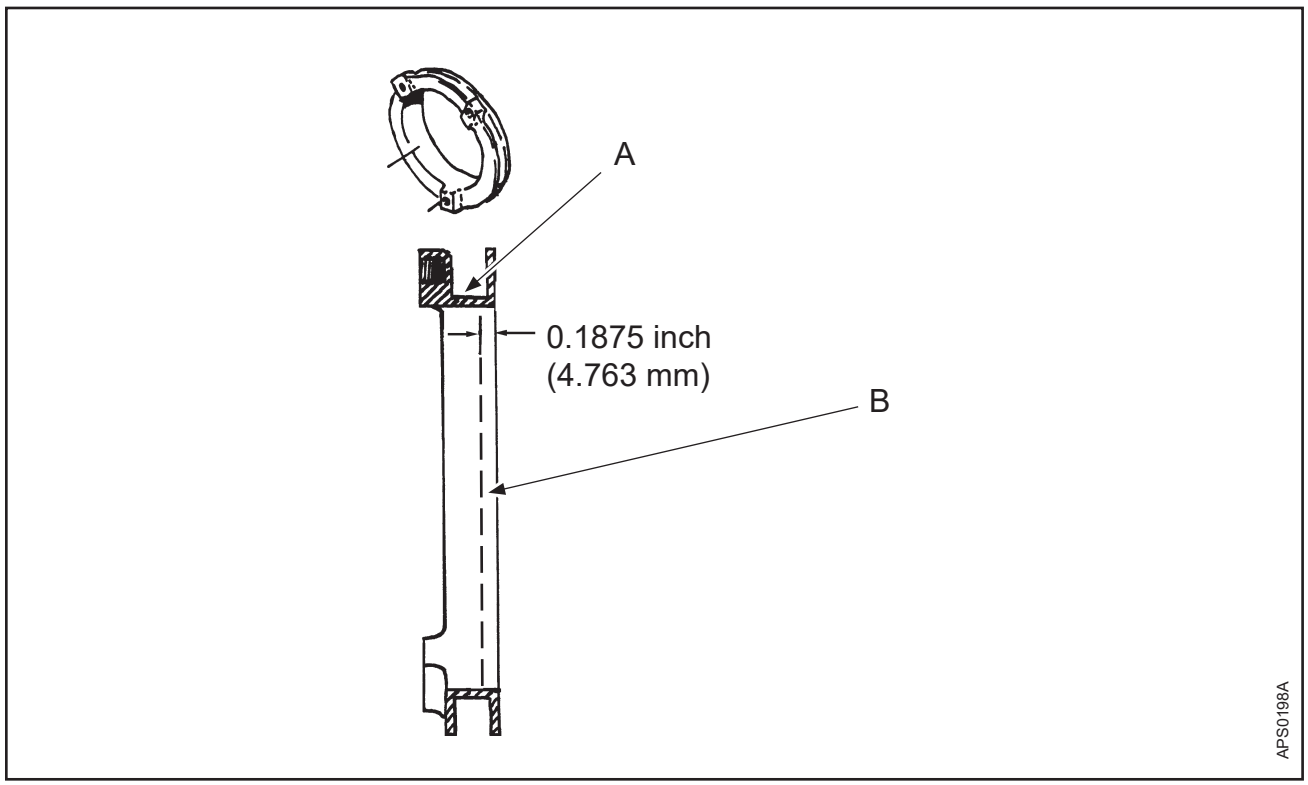
      (2) Use a soft cotton wheel to polish the clevis-pin in the carbon block assembly.

   B. Interior Surface Repair

      NOTE: The surface of the beta ring groove may be repaired if it is worn or scraped.

      (1) Grooves/scratches in areas A and B that are 0.007 inch (0.17 mm) deep or less must be removed. Refer to Figure 6-5.

      (2) Use 80 grit to 120 grit emery cloth, finishing with 240 grit polishing compound, to smooth the surfaces of the beta ring.




**Repairing Interior Surface of Beta Ring**
**Figure 6-5**

9. Guide Collar Repair

A. Replacement of Plastic Bushings (260)

CAUTION: MAKE SURE TO NOT DAMAGE THE GUIDE COLLAR UNIT (240) WHEN DRILLING OUT THE PLASTIC BUSHING (260).

(1) Using care not to damage the guide collar unit (240), drill out the oversized bushing(s).

(2) If the plastic bushing (260) being replaced is located at the split, drill out the staking pin.

(3) For plastic bushing replacement procedures, refer to the Special Adhesive and Bonding Procedures chapter of Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02).

(4) Using a center punch, install a new staking pin if the plastic bushing (260) at the split was replaced.

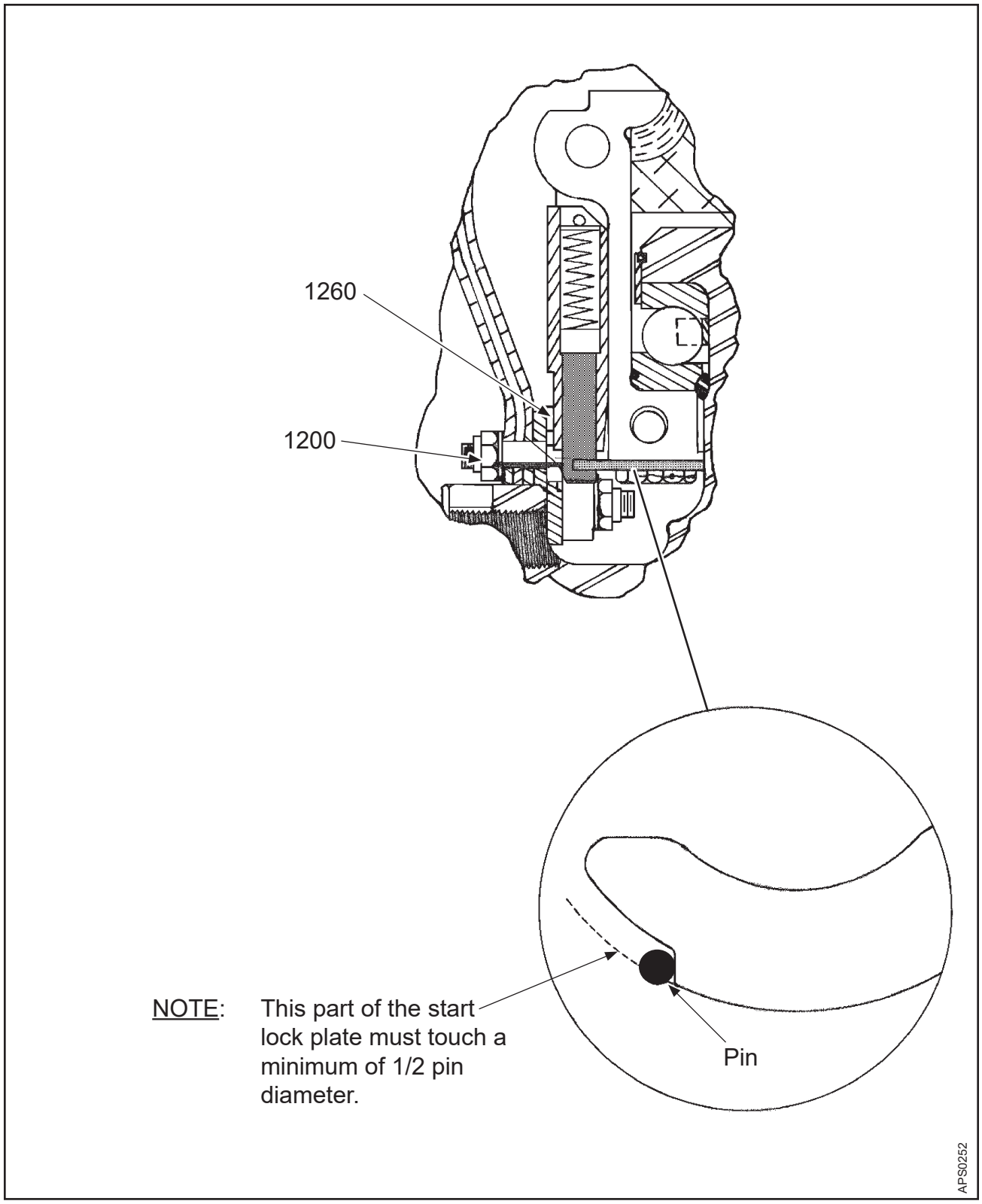
(a) Peen the end of the staking pin.

(5) Ream the plastic bushing (260) in accordance with Table 6-4.

| Plastic Bushing | Finish I.D. |
|---|---|
| A-116D-1 | 0.508 - 0.510 inch (12.91 - 12.95 mm) |
| A-3023 | 0.381 - 0.384 inch (9.68 - 9.75 mm) |

GUIDREAM.XLS

**New Plastic Bushing Diameters**
**Table 6-4**




**Start Lock Assembly and Start Lock Plate**
**Figure 6-6**

10. Start Lock Unit

A. Start Lock Assembly Replacement on the HC-B4( )( )-5(L) Propeller

NOTE: The 830-34(L) start lock assembly may be removed and replaced without removing the propeller from the aircraft. Refer to the Illustrated Parts List chapter in this manual for 830-34(L) start lock assembly parts and illustrations. Complete the following procedures if the start locks must be replaced as a result of an inspection between overhauls.

CAUTION: BEFORE REMOVING START LOCKS, BE SURE THE PROPELLER IS IN THE FEATHER POSITION INSTEAD OF SHUT DOWN ON THE START LOCKS. THIS WILL PREVENT THE SUDDEN, FORCEFUL MOVEMENT OF THE FEATHERING SPRING ASSEMBLY TO FEATHER POSITION FROM START LOCK POSITION WHEN THE A-880-2 SELF-LOCKING NUT IS REMOVED FROM THE SPRING ASSEMBLY PITCH CHANGE ROD.

(1) Remove the spinner assembly.

(2) Remove the self-locking nut (10) from the pitch change rod. This will allow free movement of the piston unit (50), as it is connected to the blade clamps by the link arms.

CAUTION: ALL "-5" PROPELLERS INSTALLED ON TPE-331 TURBINE ENGINES HAVE A BETA TUBE INSERTED IN THE FEATHER SPRING BETA TUBE. CARE MUST BE TAKEN NOT TO MOVE THE BETA TUBE WHEN THE NUT (10) IS REMOVED. IF THE BETA TUBE MOVES, FLIGHT IDLE WILL NEED TO BE RESET. CHECK AIRCRAFT MANUFACTURER'S INSTRUCTIONS FOR SETTING FLIGHT IDLE ON AIRCRAFT.

(3) Remove the self-locking nut (1200) and washer (460) from the hex head bolts (1260). This will allow the removal of the damaged start lock assembly (1010).

(4) Install the new start lock over the exposed bolts. Reinstall the washer (460) and loosely install the self-locking nuts (1200).

NOTE: This procedure is to be completed on all four start locks as required.

(5) Set the start lock position.

(a) Rotate the blade to a position where the start lock plate on the clamp assembly comes in contact with the start lock pin. This establishes the start lock angle.

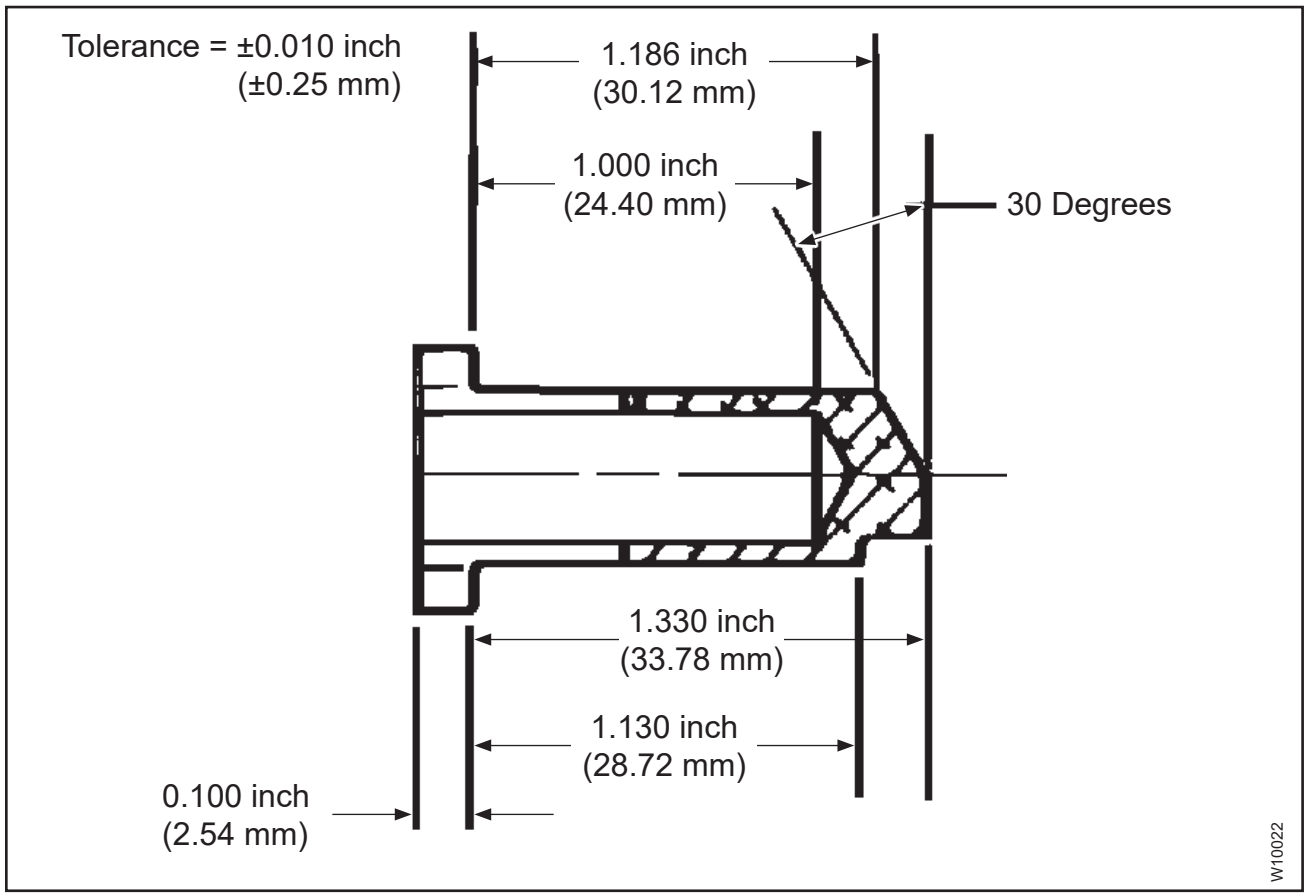
CAUTION: REFER TO FIGURE 6-6 FOR CORRECT START LOCK PIN AND START LOCK PLATE CONTACT AREA.

(b) With both nuts retaining the start lock assembly in a semi-secure position, move the start lock until the proper start lock angle has been achieved.

NOTE: Use the adjustment screw in the start lock assembly for final adjustment.

CAUTION: DO NOT TRY TO MAKE AN ADJUSTMENT WITH THE START LOCK SCREW IF THE START LOCK ASSEMBLY HAS BEEN INSTALLED AND TORQUED INTO POSITION.

(6) After the start lock blade angle has been achieved, torque the self-locking nuts (1200) onto the hex head bolt (1260). Refer to the Torque Values table in the Fits and Clearances chapter of this manual. The start lock is in position and the angle is set.




**Start Lock Pin Dimensions**
**Figure 6-7**

(7) Follow steps 1 through 6 for all four blades. Then reinstall the self-locking nut (10). Refer to the Torque Values table in the Fits and Clearances chapter of this manual. Install the safety bolt in the beta tube, and reinstall the spinner assembly.

(8) Safety the adjustment screw to the start lock body.

NOTE: At this point the propeller assembly is still in the feather position. To get the assembly back into the start lock position so that the engine can start, activate the engine-mounted unfeathering pump.

B. Repairing the 830-36 Start Lock Assembly on the HC-B3TN-5( ) when the Pin Interferes with the Stop Screw on the Piston

(1) Remove pin (1060) from the start lock assembly (1010) and modify it according to the dimensions in Figure 6-7. Pay particular attention to the chamfered area.

(2) Replace the compression spring (1110) with compression spring (1070).

(3) Reassemble the 830-36 start lock assembly (1010) and secure it with a cotter pin (1090).

(4) Inspect the stop screw (1095) in the piston guide rod (55). If the screw is loose, replace it with a new one that has a fresh locking element.

(a) Use the screw length necessary to ensure 0.38 inch (9.5 mm) minimum engagement of the piston guide rod (55). Refer to Table 6-2.

(b) If the screw head extends beyond the piston guide rod (55) more than 0.19 inch (4.8 mm), install an A-319 collar (1290) on the screw shank. This will help eliminate interference between the stop screw and the start lock pin (1060).

(5) Reassemble the start lock assemblies to the guide collar unit (240). Use new attaching screws (1040). Torque in accordance with the Torque Values Table in the Fits and Clearances chapter of this manual.

(6) Retract all the start lock pins (1060) and secure them in a retracted position. Move the piston unit (50) through its range from feather to reverse pitch, ensuring no contact with the start lock pin (1060) and the piston guide rod (55) or stop screw (180).

(7) With the piston guide rods and stop screws in a position forward of the start lock pins, release the pins into place to allow the stop screws in the piston rods to contact the pins evenly, establishing the start lock angle.

NOTE: Even contact can be ensured by trying to retract each high pitch pin individually.

11. Replacing the Bearing (1835)/Engine Cover (1830)

A. Procedure

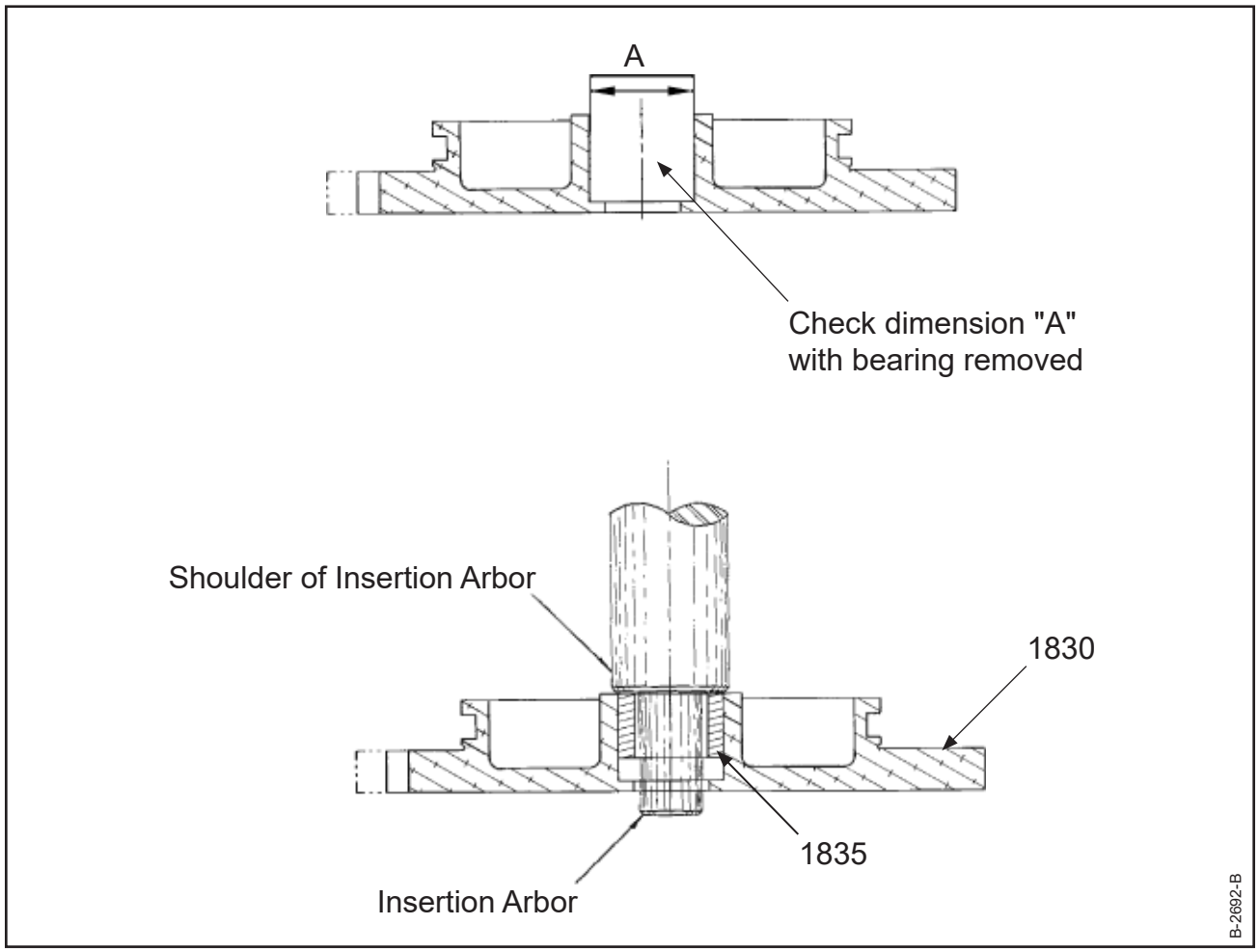
(1) Remove the bearing (1835) from the engine cover (1830).

(2) Measure the ID of engine cover area "A", as shown in Figure 6-8.

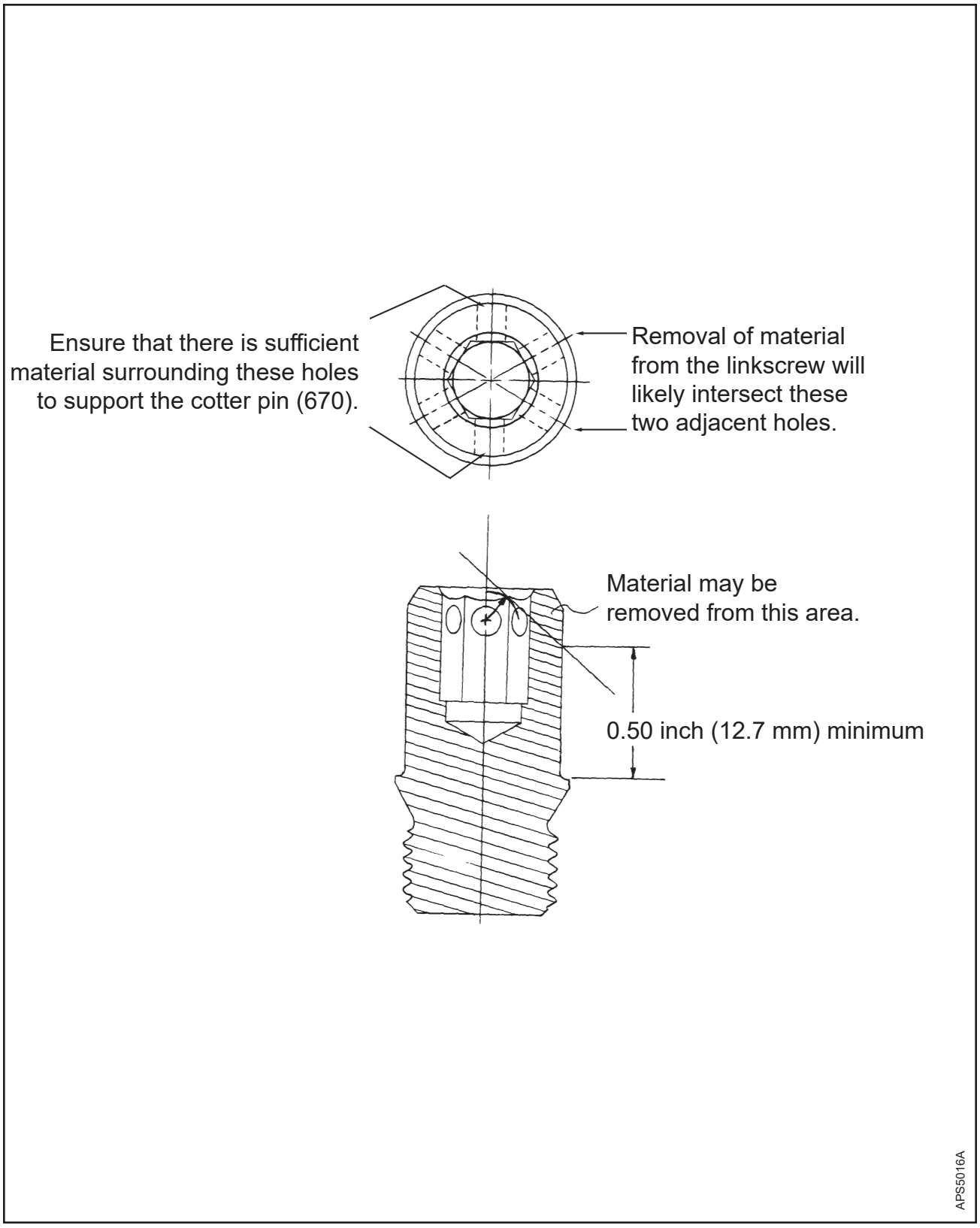
(a) If the ID of area "A" is greater than 0.625 inch (15.88 mm), replace the engine cover (1830) and the bearing (1835).

(b) If the ID of area "A" is within tolerance, replace the bearing (1835) with a new bearing.

1 Press fit a new bearing (1835) into the engine cover (1830) using an arbor press.




**C-3630-( ) Engine Cover**
**Figure 6-8**




**Linkscrew Modification Limits for Hub Clearance**
**Figure 6-9**

12. Modification of A-304 Linkscrew

A. General Information

NOTE: Only new linkscrews are permitted to be modified.

(1) Because the HC-A3(MV,V)F-7( ) propeller has a higher than normal pitch range (from -3.5 degrees reverse to 85 degrees feather) the linkscrew may contact the hub. When this happens, the full blade angle range cannot be achieved. This condition can be eliminated by grinding the linkscrew to remove material and allow clearance.

(2) On propeller models HC-B3( )-( ), contact between the linkscrew and the hub may occur. When this happens, the full blade angle range cannot be achieved. This condition can be eliminated by grinding the linkscrew to remove material and allow clearance.

B. Procedure

NOTE: Until recently, hubs were modified during production at Hartzell Propeller Inc. by removing enough material to permit linkscrew clearance. While this practice was acceptable, and there are airworthy hubs still in use that were modified in this manner, this type of modification is no longer recommended.

(1) Remove only enough material from the linkscrew (740) to permit clearance with the hub. Refer to Figure 6-9.

NOTE: Removal of material from the linkscrew will likely intersect the two adjacent holes on that side of the linkscrew.

(2) Make sure that there is sufficient material surrounding the remaining, unaffected holes in the linkscrew to support the safety cotter pin (670). Refer to Figure 6-9.

(3) To prevent corrosion, apply Polane paint to the area where the material was removed.

13. Conversion of Propeller Model HC-A3(MV,V)F-7 to HC-A3(MV,V)F-7B

A. Effectivity

(1) Compliance is required at next overhaul or propeller disassembly on all GAF (Government Aircraft Factories) model N22B, N24A, N22S or N22C Nomad aircraft with propeller assembly HC-A3(MV,V)F-7.

B. Discussion

(1) Additional counterweight force is required to assist the propeller into high pitch/high blade angle position. To supply this assistance, additional counterweight mass must be added to the propeller assembly, causing a change in propeller model designation.

| Item No. | Quantity | Part No. | Description |
|---|---|---|---|
| 155 | 1 | C-3317-012 | O-ring |
| 400 | 1 | C-3317-228 | O-ring |
| 430 | 6 | A-1328-1 | Mounting Bolt, 1/2-20, 12 Point |
| 440 | 6 | A-1381 | Cres Washer, 1/2" |
| 710 | 6 | B-3838-3-2 | Cotter Pin |
| 720 | 3 | A-65 | Dowel Pin, 1/4 |
| 730 | 6 | A-285 | Cres Spring Pin, 3/32" |
| 750 | 6 | A-321 | Screw, 3/8-24 Double 60° Head |
| 760 | 6 | A-6871-1 | Clamp Gasket |
| 770 | 6 | A-2017 | Bolt, 3/8-24, 12 Point |
| 775 | 6 | A-2031 | Washer, 3/8" |
| 780 | 6 | A-2043-1 | Self-Locking Hex Nut, 3/8-24 |
| 790 | 6 | 107995-22 | Modified Cap Screw, 7/16-20 |
| 800 | 3 | C-3669 | Counterweight |
| 820 | 6 | B-3386-14H | Hex Head Bolt, 3/8-24 |
| 830 | 6 | B-3834-0632 | Washer |
| 850 | 6 | B-6544 | Lubrication Fitting Cap |
| 860 | 6 | B-6588-1 | Lubrication Fitting |
| 1610 | 2 | B-3368 | Thin Hex Nut, 5/16-24 |
| 9040 | 3 | B-3663-3 | Counterweight Slug |

**Conversion Kit B-3682**
**Table 6-5**

C. Procedure

NOTE: Conversion kit B-3682 supplies all necessary materials for this modification. Refer to Table 6-5.

(1) Remove the blade clamp assembly from the propeller.

(2) Remove and discard the existing counterweight (800) and counterweight slug (9040) from the blade clamp by removing the spring pins (730) and the socket head cap screws (790).

(a) Gently remove the counterweight to prevent breaking the spring pin (730) between the clamp and the counterweight.

(3) Thoroughly clean the clamp in the area where the counterweight is mounted.

(4) Apply sealant CM46 to each screw (790).

(a) Install the new counterweight (800) to the clamp, using screws (790).

(b) Torque each screw (790) in accordance with the Torque Values Table in the Fits and Clearances chapter of this manual.

(5) Using a drill and a size No. 42 drill bit, drill through each side of the counterweight into the hex head drive opening in the head of each screw.

(6) Insert a spring pin (730) through the counterweight and into each screw (790) until the staking pin is flush with the counterweight.

NOTE: A cotter pin (710) can be used as an alternative to the spring pin (730).

(7) Proper counterweight-to-clamp contact is required during assembly. Follow the procedures found in the Blade Clamp Overhaul chapter of Hartzell Propeller Standard Practices Manual 202A (61-01-02).

(8) Drill the hole in the counterweight to permit installation of the counterweight dowel pin (720). Follow the procedures found in the Blade Clamp Overhaul chapter of Hartzell Propeller Standard Practices Manual 202A (61-01-02).

(9) Attach the counterweight slug (9040) to the counterweight using hex head bolts (9050).

(a) Torque the hex head bolts (9050). Refer to the "Torque Values" table in the Fits and Clearances chapter of this manual.

(10) Safety wire the hex head bolts (9050).

(11) Using a round bottom metal impression stamp, reidentify the propeller model as HC-A3(MV,V)F-7B.

(12) Make a logbook entry indicating that propeller has been converted.

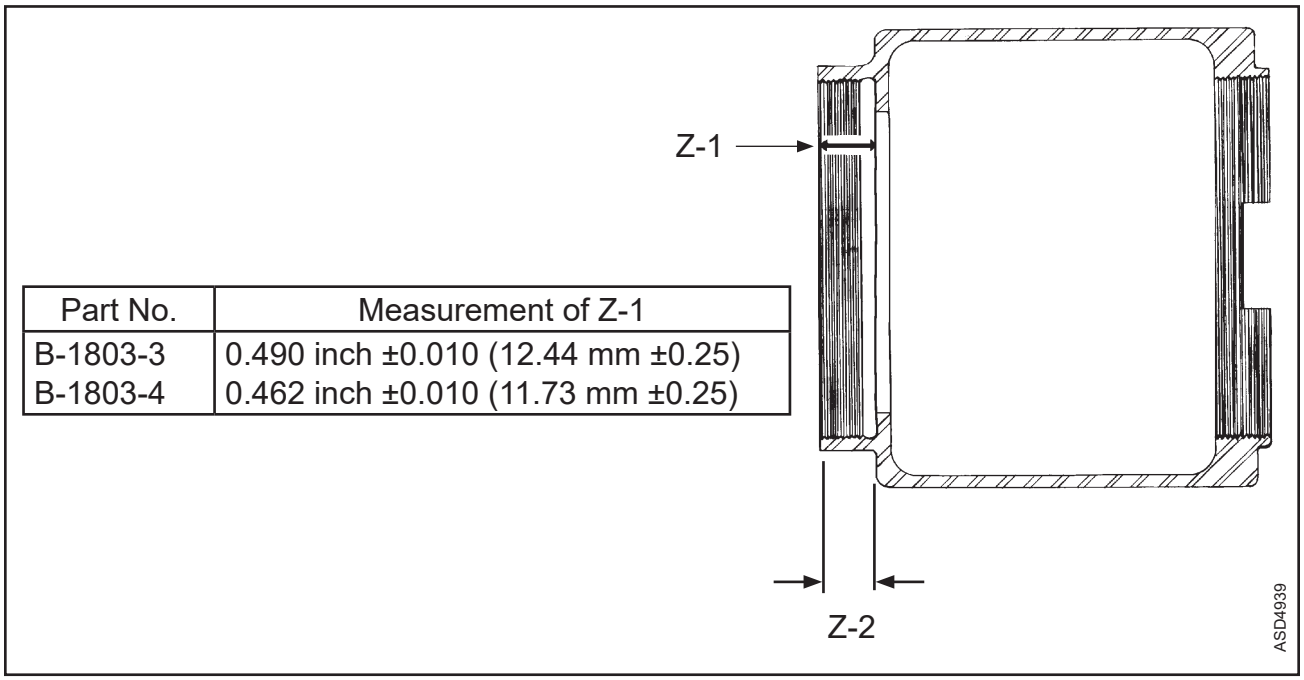
14. Correct Fit Between Cylinder and Hub when Start Lock Assemblies are Installed on the Guide Collar

A. Effectivity

(1) This procedure applies to propeller models HC-B3TN-5N( ), HC-B3TN-5M( ), HC-B3TN-5P( ), HC-B3TN-5U( ), and HC-B3TN-5W( ).

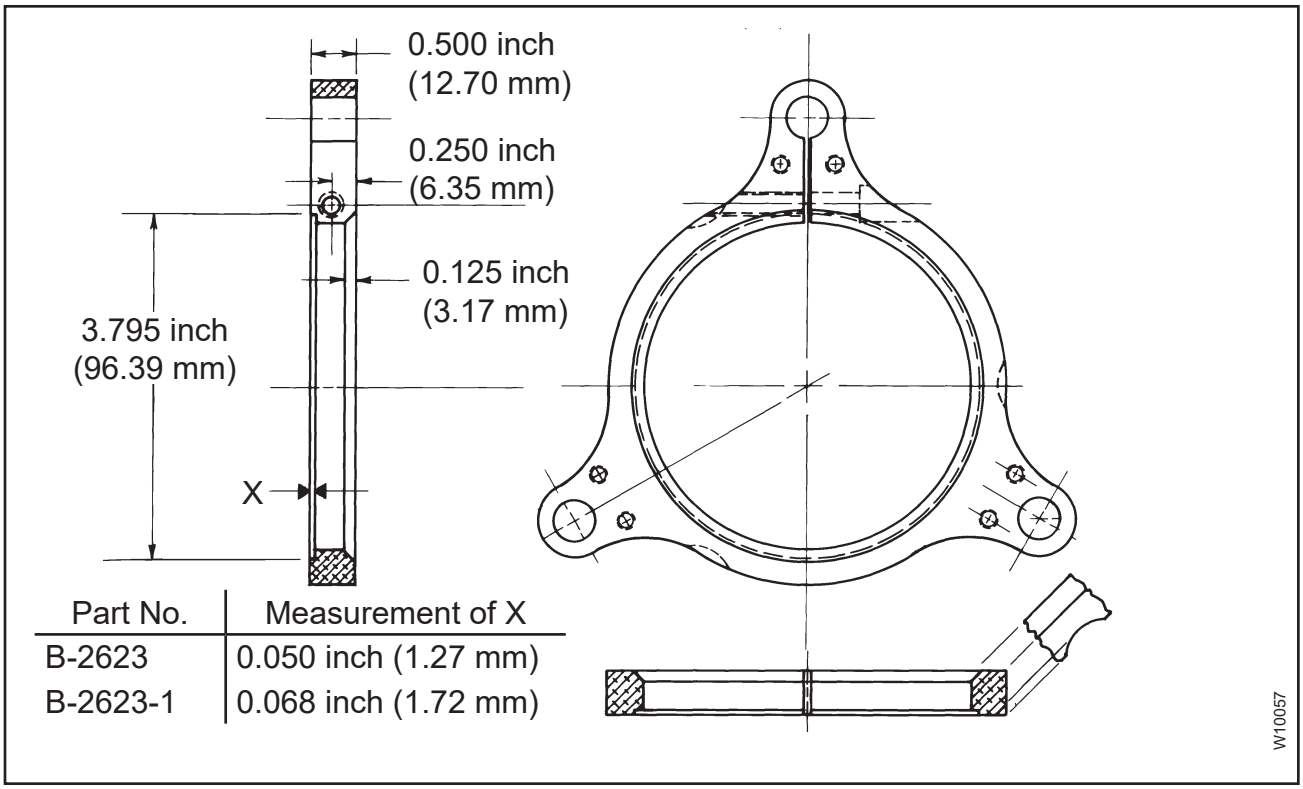
B. Discussion

(1) The propeller assembly may experience a problem where the piston guide collar appears to be loose or tends to turn, causing binding or incorrect action of the start lock assembly. When this problem is reported, or at the next overhaul, the following procedure will strengthen the system and remove the possibility of rotational movement.

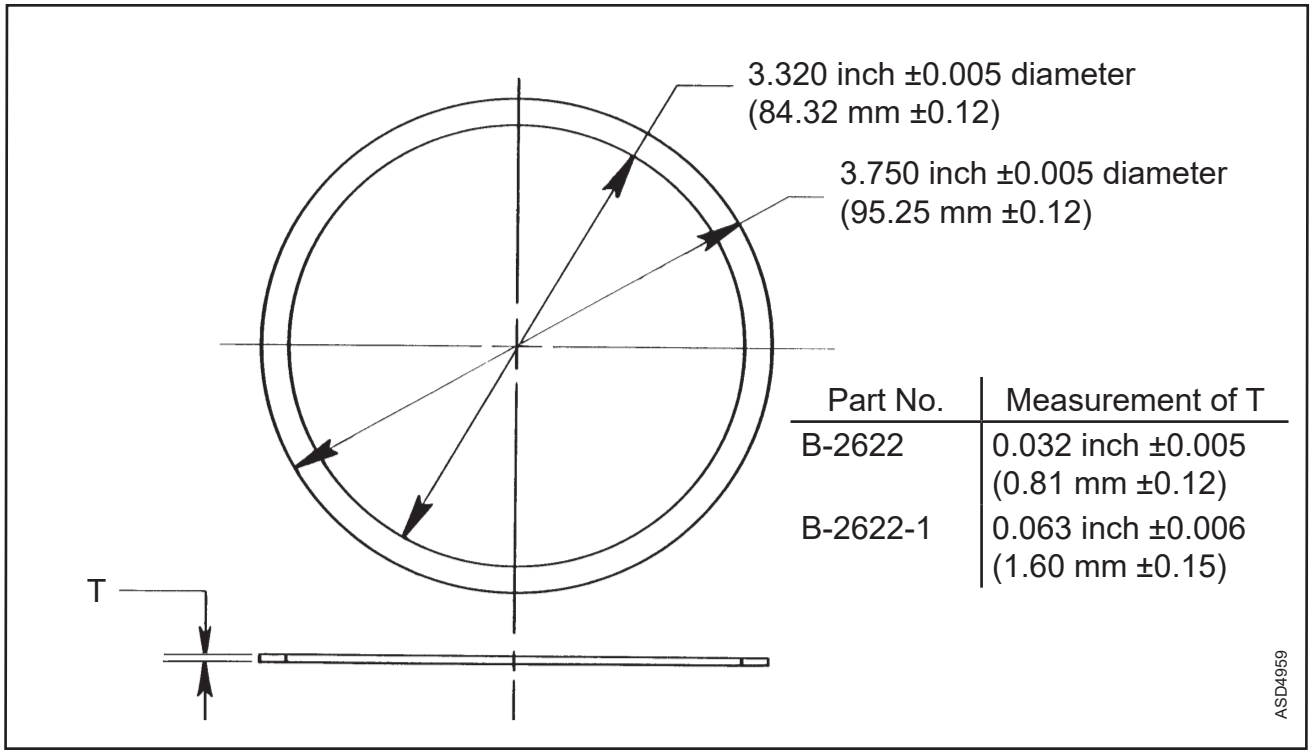



| Part No. | Measurement of Z-1 |
|---|---|
| B-1803-3 | 0.490 inch ±0.010 (12.44 mm ±0.25) |
| B-1803-4 | 0.462 inch ±0.010 (11.73 mm ±0.25) |

**Cylinder Inspection**
**Figure 6-10**




**Guide Collar Inspection**
**Figure 6-11**




**Guide Collar Support Ring Inspection**
**Figure 6-12**

C. Procedure

(1) Disassemble the propeller.

(2) Measure the cylinder at Z-1. Refer to Figure 6-10.

(3) Measure the guide collar at X. Refer to Figure 6-11.

(4) Measure the guide collar support ring at T. Refer to Figure 6-12.

(5) After measuring the parts, modify the parts to make sure of correct cylinder-to-hub fit, cylinder-to-guide-collar fit, and correct guide collar rotational play.

(a) Turn and machine Z-1 of the cylinder in a lathe to 0.462 ±0.010 inch (11.73 ±0.25 mm).

(b) After modifying Z-1, measure Z-2. If Z-2 is less than 0.490 ±0.010 inch (12.45 ±0.25 mm), increase the depth (X in Figure 6-11) of the recess in the guide collar as follows:

NOTE: When modifying the guide collar, be careful to keep the concentricity of the modified area.

| Dimension of Z-2 | Recess in Guide Collar |
|---|---|
| 0.490 inch (12.45 mm) | 0.050 inch ±0.010 (1.27 mm ±0.25) |
| 0.462 inch (11.73 mm) | 0.068 inch ±0.010 (1.72 mm ±0.25) |

(6) Verify all fits and clearances before final assembly.

(a) Install the guide collar support ring in its position on the propeller hub.

(b) Place the modified guide collar on the cylinder.

1 Do not install the O-ring at this time.

(c) Install the cylinder on the hub.

(d) Make sure the guide collar support ring is in position on the guide collar.

(e) Tighten the cylinder into position.

NOTE: The guide collar should be free to turn.

(7) Disassemble the parts.

(8) Install the O-ring.

(9) Continue assembling the propeller.

15. Mandatory Blade Clamp Replacement

A. Effectivity

(1) This requirement applies to all non-shot peened 838-97L blade clamps on HC-B4MN-5( )L/LM10585(B,ANK)+4 propellers installed on CASA 212-200 aircraft.

B. Discussion

(1) The blade may slip in the clamp, which changes the setting of the blade angles and causes rough operation of the propeller.

C. Procedure

(1) Visually examine the part number stamped on the clamp. Shot-peened clamps will have the letter "P" stamped on the clamp after the part number.

(2) Replace non-shot peened clamps with shot peened clamps.

16. Mandatory Spring Assembly Replacement

A. Spring Assemblies

(1) Several spring assemblies have become obsolete and must be replaced at overhaul. Refer to Table 6-6 for a list of obsolete spring assemblies and the applicable replacement spring assembly.

| Spring Assembly | | Application |
|---|---|---|
| Obsolete | Replacement | |
| (B-)831-69, B-831-76 (Previously 831-22 and 831-42) | 831-76 | HC-B4MP-3( ) HC-B4TN-3( ) |
| (B-)831-63, B-831-72 (Previously (B-)831-43) | 831-72 | HC-B4TN-5( ) |
| (B-)831-64, B-831-73 (Previously (B-)831-54) | 831-73 | HC-B4MN-5( ) |
| (B-)831-20, B-831-75 | 831-75 | HC-B3TN-5( ) |
| (B-)831-30, B-831-75 | 831-75 | HC-B3TN-5( ) |
| (B-)831-38, B-831-75 | 831-75 | HC-B3TN-5( ) |
| (B-)831-45, B-831-75 | 831-75 | HC-B3TN-5( ) |
| (B-)831-48, B-831-75 | 831-75 | HC-B3TN-5( ) |

**Obsolete/Replacement Spring Assemblies**
**Table 6-6**

17. Carbon Block Assembly

A. Repair of Binding Problem

(1) The clearance between the yoke pin and the corresponding linkage (beta lever bushing) may become too close due to a buildup of plating and foreign particles between the two pieces. Refer to Figure 6-13. This may cause binding, and may result in excessive wear to the carbon block, low stop collar, and beta linkage.

(a) Visually examine the beta lever and carbon block assembly interface for free movement.

(b) If there is binding between the yoke pin and the corresponding linkage (beta lever bushing), perform the following steps:

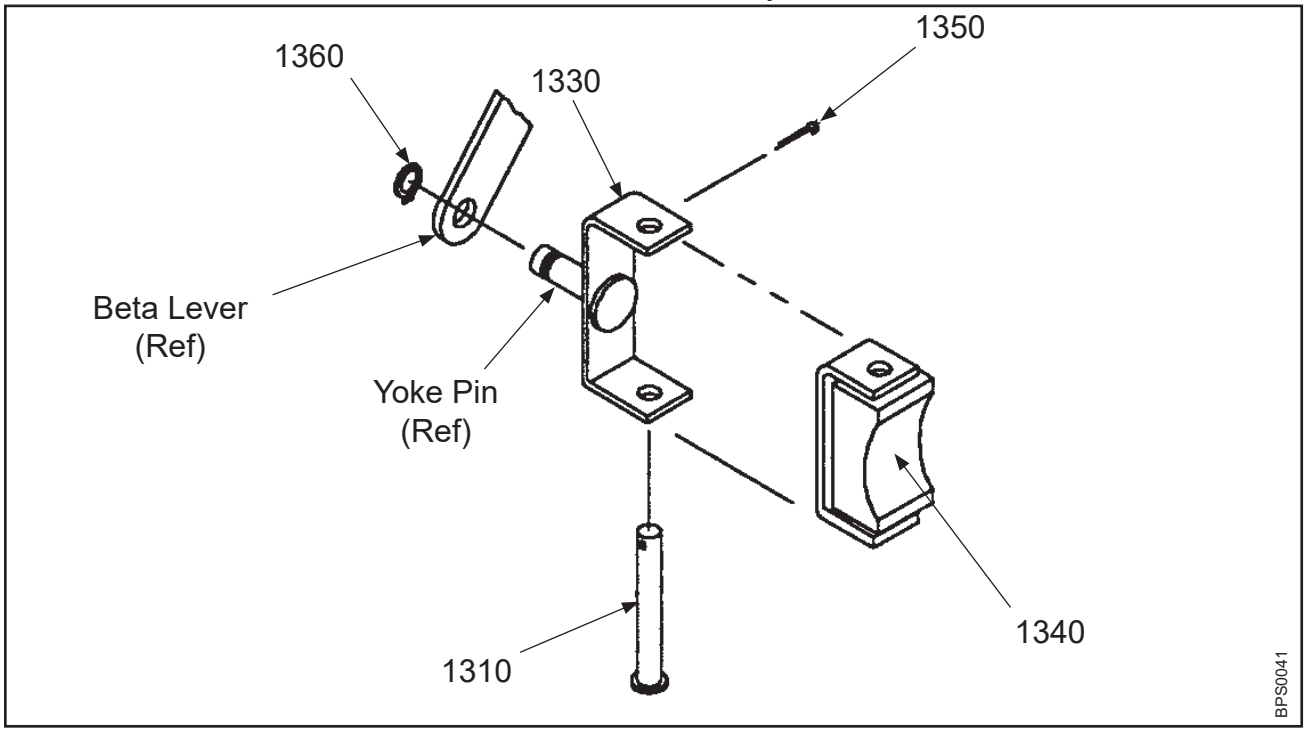
1 Disconnect the beta linkage and remove the carbon block assembly (1300) from the beta ring (420).

2 Using an abrasive pad CM47 or equivalent, polish the yoke pin to give sufficient clearance and to prevent binding.

3 Reinstall the carbon block assembly into the beta ring. Refer to the Carbon Block Assembly section of the Fits and Clearances chapter of this manual.

4 Reconnect the beta linkage to the carbon block assembly.

5 Reinspect to make sure that there is no binding between the beta lever and carbon block assembly interface.




**Carbon Block Assembly**
**Figure 6-13**

B. Replacement of Carbon Block Unit or Yoke in the Carbon Block Assembly

(1) If the carbon block unit (1340) and/or the yoke (1330) become excessively worn between overhaul intervals, replacement of one or both parts is necessary.

NOTE: The carbon block unit (1340) must be replaced at overhaul.

(a) Remove the cotter pin (1350) from the end of the clevis pin (1310).

(b) Slide the clevis pin (1310) from the assembly.

(c) Remove the carbon block unit (1340).

(d) Replace the yoke (1330) if any wear or damage is present, or replace the carbon block unit (1340) if excessive wear or damage is present.

(e) Slide the clevis pin (1310) into place.

(f) Secure the clevis pin (1310) with a cotter pin (1350).

(g) Refit the carbon block unit (1340).

1 Refer to the Carbon Block Assembly section of the Fits and Clearances chapter of this manual.

2 Establish the required clearance by dressing the block sides as necessary.

# ASSEMBLY - CONTENTS

ASSEMBLY - CONTENTS, CONTINUED

## ASSEMBLY - CONTENTS, CONTINUED



## LIST OF FIGURES

## LIST OF FIGURES, CONTINUED



## LIST OF TABLES

WARNING 1: ANY PART IDENTIFIED IN THIS MANUAL AS AN EXPERIMENTAL OR NON-AVIATION PART MUST NOT BE USED IN AN FAA OR INTERNATIONAL EQUIVALENT TYPE CERTIFICATED PROPELLER. A PART IDENTIFIED AS EXPERIMENTAL OR NON-AVIATION DOES NOT HAVE FAA OR INTERNATIONAL EQUIVALENT APPROVAL EVEN THOUGH IT MAY STILL SHOW AN AVIATION TC OR PC NUMBER STAMP. USE ONLY THE APPROVED ILLUSTRATED PARTS LIST PROVIDED IN THE APPLICABLE OVERHAUL MANUAL OR ADDITIONAL PARTS APPROVED BY AN FAA ACCEPTED DOCUMENT FOR ASSEMBLY OF A PROPELLER. THE OPERATOR ASSUMES ALL RISK ASSOCIATED WITH THE USE OF EXPERIMENTAL PARTS. USE OF EXPERIMENTAL PARTS ON AN AIRCRAFT MAY RESULT IN DEATH, SERIOUS BODILY INJURY, AND/OR SUBSTANTIAL PROPERTY DAMAGE.

WARNING 2: ADHESIVES AND SOLVENTS ARE FLAMMABLE AND TOXIC TO THE SKIN, EYES, AND RESPIRATORY TRACT. SKIN AND EYE PROTECTION ARE REQUIRED. AVOID PROLONGED CONTACT AND BREATHING OF VAPORS. USE SOLVENT RESISTANT GLOVES TO MINIMIZE SKIN CONTACT AND WEAR SAFETY GLASSES FOR EYE PROTECTION. USE IN A WELL VENTILATED AREA AWAY FROM SPARKS AND FLAME. READ AND OBSERVE ALL WARNING LABELS.

CAUTION 1: INSTRUCTIONS AND PROCEDURES IN THIS CHAPTER MAY INVOLVE PROPELLER CRITICAL PARTS. REFER TO THE INTRODUCTION CHAPTER OF THIS MANUAL FOR INFORMATION ABOUT PROPELLER CRITICAL PARTS. REFER TO THE ILLUSTRATED PARTS LIST IN THIS MANUAL FOR IDENTIFICATION OF PROPELLER CRITICAL PARTS.

CAUTION 2: THE USE OF BLADE PADDLES TO MOVE BLADES CAN RESULT IN THE OVERLOAD AND DAMAGE OF THE BLADE PITCH CHANGE MECHANISM. THIS DAMAGE IS NOT REPAIRABLE AND CAN RESULT IN SEPARATION BETWEEN THE BLADE AND THE PITCH CHANGE MECHANISM, CAUSING LOSS OF PITCH CONTROL DURING FLIGHT.

1. General (Rev. 5)

A. Important Information

(1) Read all assembly instructions before beginning the assembly procedures.

(2) Protect all unassembled components from damage.

(3) Use applicable torque values. Refer to Table 8-1, "Torque Values" in the Fits and Clearances chapter of this manual.

(4) Unless specified differently, safety wire in accordance with NASM33540 using 0.032 inch (0.81 mm) safety wire.

(5) For information about additional counterweight slugs (9040) that may be required to be attached to the counterweight arms of certain clamp models, refer to the Hartzell Propeller Application Guide Manual 159 (61-02-59).

CAUTION: BEFORE ASSEMBLING THE PROPELLER, DETERMINE IF AN ICE PROTECTION SYSTEM IS REQUIRED.

B. Ice Protection Systems

(1) If installing an ice protection system supplied by Hartzell, refer to Hartzell Propeller Inc. Ice Protection System Manual 180 (30-61-80).

(2) If installing an ice protection system not supplied by Hartzell, refer to the applicable TC or STC holder's Instructions for Continued Airworthiness (ICA).

C. O-rings

(1) Unless specified differently, lubricate all O-rings with lubricant CM12 before installing them in the propeller assembly.

(2) Hartzell Propeller Inc. recommends that the lot number and cure date for each O-ring be recorded with all work orders when an O-ring is installed in any propeller assembly.

D. Blade Bore Plug/Bearing Installation

(1) For aluminum blades, refer to Hartzell Propeller Inc. Aluminum Blade Overhaul Manual 133C (61-13-33).

(2) For composite blades, refer to Hartzell Propeller Inc. Composite Blade Overhaul Manual 135F (61-13-35).

E. Blade Angle Information

(1) For specific blade angle information, refer to the Hartzell Propeller Inc. Application Guide Manual 159 (61-02-59).

F. Blade Clamp Assembly (For steel hub props only)

(1) Refer to the Blade Clamp Overhaul chapter of Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02).

2. Special Case: Assembly Instructions for Blades that have been Removed for Shipping

NOTE 1: The propeller has been assembled and balanced at Hartzell Propeller Inc. The blade angles relative to the clamps have been marked with matching red tape attached to the clamp and blade shank. Grease has been installed in the blade-hub system. Matching numbers have been put on each blade and corresponding clamp.

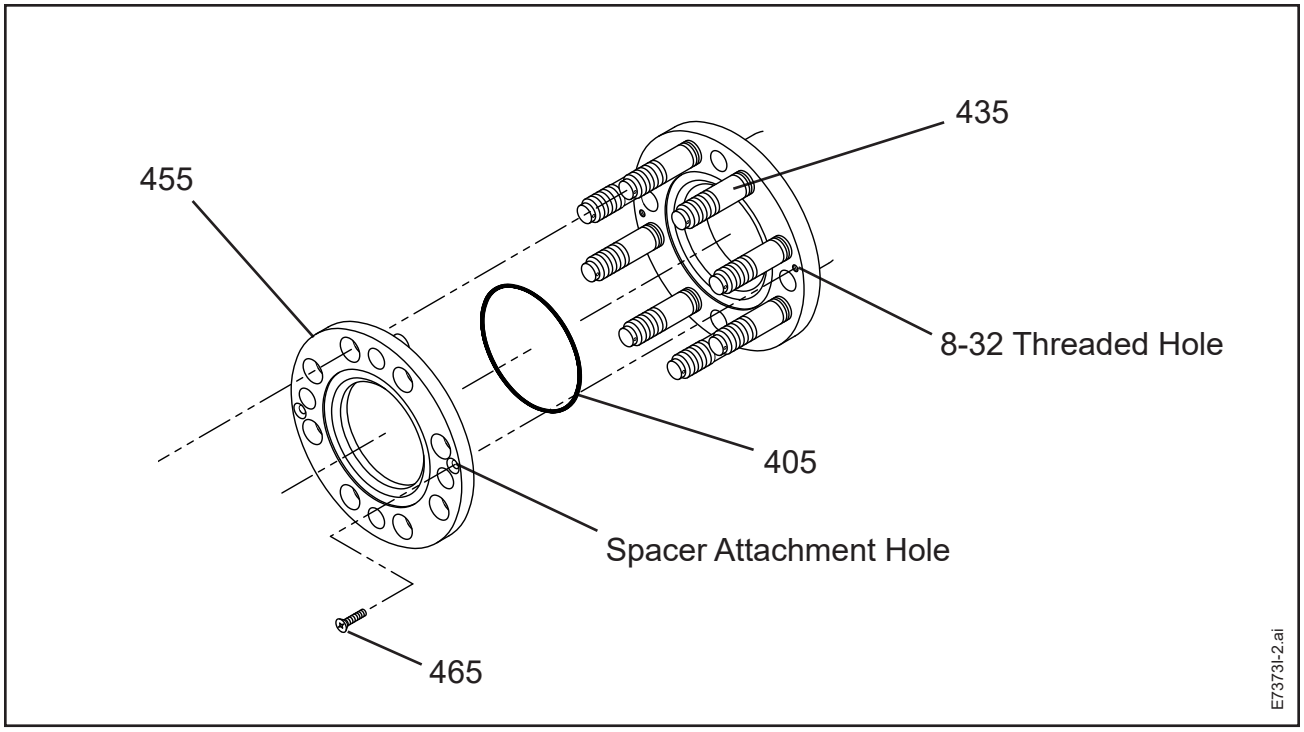
NOTE 2: For convenience of shipping all blades have been removed from the assembly. The clamps have been reinstalled on the hub. The blade ends are wrapped to preserve the grease and keep out foreign materials.

A. Propeller Models HC-B(3,4)( )W-3( ) Only

(1) If the propeller is received and the spacer (455) is attached to the hub flange, begin with step A.(3) of this procedure.

(2) If the propeller is received and the spacer (455) is not attached to the hub flange, install the spacer as follows:

(a) Lubricate the O-ring (405) with CM12 and install it in the groove in the spacer (455) that interfaces with the face of the hub flange. Refer to Figure 7-1.




**Spacer Installation**
**Figure 7-1**

(b) Position the spacer (455) over the hub mounting studs (435), with the O-ring (405) facing the hub flange.

(c) Position the spacer on the hub flange.

1 If the hub flange has two 8-32 threaded holes present, position the spacer (455) so that the spacer attachment holes align with the two 8-32 threaded holes in the hub flange. Refer to Figure 7-1.

2 If the hub flange does not have 8-32 threaded holes present, align the stud clearance holes with the hub-mounted studs (435) in the hub flange, and align the two spacer-mounted dowel pins (456) with any two dowel pin clearance holes in the hub flange. Refer to Figure 7-1.

CAUTION: MAKE SURE THE O-RING (405) STAYS IN THE GROOVE IN THE SPACER (455). IF THE O-RING IS TWISTED OR PINCHED, OIL LEAKAGE WILL RESULT WHEN THE PROPELLER IS OPERATED ON THE AIRCRAFT.

(d) Slide the spacer (455) tight against the hub flange.

(e) If the hub flange does not have threaded screw attachment holes (Figure 7-2) present to attach the spacer (455) do the following steps:

1 Apply masking tape around the outside diameter of the spacer (455) and the hub flange to keep the spacer on the propeller assembly when it is installed on the rotatable fixture.

2 Proceed to step A.(3).

(f) If the hub flange has two 8-32 threaded holes (Figure 7-2) present to attach the spacer (455) to the hub flange, do the following steps:

1 Insert a flat countersunk head screw (465) through each screw hole in the spacer (455) and into the 8-32 threaded hole in the hub flange. Refer to Figure 7-1.

CAUTION 1: MAKE SURE THE FLAT COUNTERSUNK HEAD SCREWS (465) DO NOT PROTRUDE ABOVE THE ENGINE SIDE SURFACE OF THE SPACER (455).

CAUTION 2: DO NOT OVER TIGHTEN THE FLAT COUNTERSUNK HEAD SCREWS (465).

2 Tighten the flat countersunk head screws (465) until snug.

3 If after they are tightened, one or both of the flat countersunk head screws (465) are above the engine side surface of the spacer, do the following steps:

a Remove both flat countersunk head screws and turn the spacer 180 degrees, aligning the screw holes in the spacer with the 8-32 threaded holes in the hub flange.

b Insert a flat countersunk head screw (465) through each screw hole in the spacer (455) and into the 8-32 threaded hole in the hub flange.

CAUTION: DO NOT OVER TIGHTEN THE FLAT COUNTERSUNK HEAD SCREWS (465).

c Tighten the flat countersunk head screws (465) until snug.

d If after they are tightened, one or both of the flat countersunk head screws (465) still are above the engine side surface of the spacer, remove both screws.

e Apply masking tape around the outside diameter of the spacer (455) and the hub flange to keep the spacer on the propeller assembly when it is installed on the rotatable fixture.

CAUTION 1: USE EXTREME CARE TO AVOID DAMAGE TO THE MOUNTING STUD (435) THREADS WHEN PLACING THE HUB ON THE ROTATABLE FIXTURE.

CAUTION 2: KEEP THE MOUNTING STUD THREADS CLEAN AND FREE OF GREASE OR DIRT.

(3) Install the hub on the rotatable fixture of a propeller assembly table.

CAUTION 1: ON PROPELLER MODEL HC-B(3,4)( )W-3( ), DO NOT USE LOCKING NUTS ON THE MOUNTING STUDS TO SECURE THE HUB TO THE ROTATABLE FIXTURE. REPEATED TORQUE/DRAG WILL WEAKEN THE EPOXY BOND ON THE MOUNTING STUDS, RESULTING IN POSSIBLE STUD-TO-HUB BOND FAILURE.

CAUTION 2: ON PROPELLER MODEL HC-B(3,4)( )W-3( ), INSTALL ONLY NON-LOCKING 9/16-18 UNF-3B NUTS ON THE MOUNTING STUDS (435), JUST TIGHT ENOUGH TO SECURE THE HUB TO THE ROTATABLE FIXTURE.

(4) Remove one of the clamps from the hub.

(5) Clean off any grease from the outer diameter of the blade shank.

(6) Install the blade onto the hub, matching the blade number with the corresponding clamp number.

(7) Install the clamp onto the blade using new clamp gaskets, which are furnished with the propeller assembly from Hartzell Propeller Inc.

(8) For blade installation, follow the instructions in the Assembly chapter of this manual.

(9) Do this procedure again for the other blades to be installed.

(10) Install the link arms to connect piston to blade clamps.

(11) Measure the blade angles by following the instructions in the Assembly chapter of this manual.

(12) Torque and safety all bolts following the instructions in the Assembly chapter of this manual.

(13) Torque test the blade relative to the clamp by following instructions in the Assembly chapter of this manual.

3. Hub Assembly

CAUTION 1: ACTUATION OF PROPELLERS MUST BE ACCOMPLISHED USING NITROGEN OR COMPRESSED AIR THAT HAS BEEN FILTERED FOR MOISTURE.

CAUTION 2: DO NOT EXCEED A PRESSURE OF 210 PSI (14.47 BARS) WHEN ACTUATING PROPELLERS INCLUDED IN THIS CHAPTER.

CAUTION 3: USE SUFFICIENT AIR PRESSURE TO MAKE SURE THAT THE PROPELLER ACTUATES AGAINST EACH POSITIVE STOP.

A. Special Information

(1) Use the procedure in the Steel Hub Overhaul chapter of Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02).

(2) For information about the mandatory hub replacement program, refer to the Repair chapter of this manual.

4. Assembling Blade and Flange Mounting Parts

A. Propeller Models HC-B(3,4)( )W-3( ) Only

(1) If the dowel pins (456) are not installed, press two dowel pins into the spacer (455). Refer to Figure 7-2 for location of the dowel pins.

(2) Lubricate the O-ring (405) with CM12 and install it in the groove in the spacer (455) that interfaces with the face of the hub flange. Refer to Figure 7-2.

(3) Position the spacer (455) over the hub mounting studs (435), with the O-ring (405) facing the hub flange.

(4) Position the spacer on the hub flange.

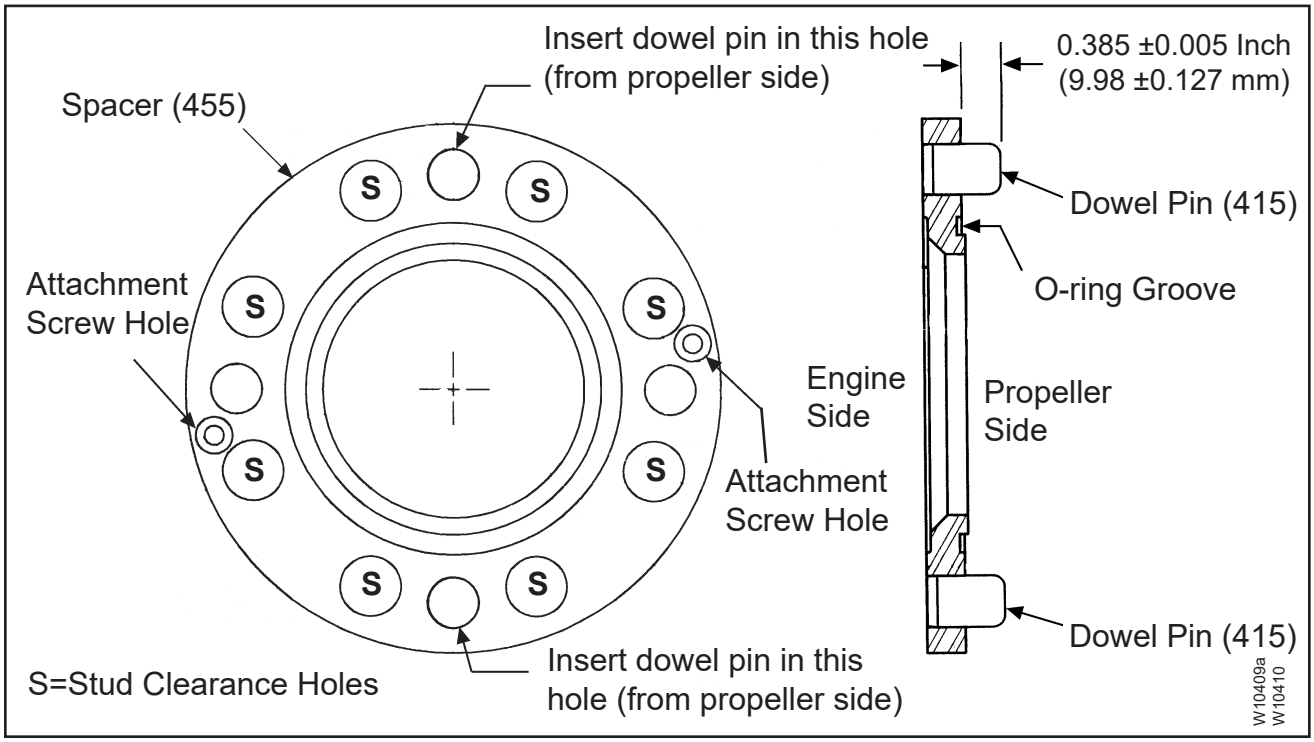
(a) If the hub flange has two 8-32 threaded holes present:

1 Position the spacer (455) so that the spacer attachment holes align with the two 8-32 threaded holes in the hub flange. Refer to Figure 7-2.

(b) If the hub flange does not have two 8-32 threaded holes present:

1 Align the stud clearance holes with the hub-mounted studs (435) in the hub flange.

2 Align the two spacer-mounted dowel pins (456) with any two dowel pin clearance holes in the hub flange. Refer to Figure 7-2.




**Dowel Pin Location in the Spacer**
**Figure 7-2**

CAUTION: MAKE SURE THE O-RING (405) STAYS IN THE GROOVE IN THE SPACER (455). IF THE O-RING IS TWISTED OR PINCHED, OIL LEAKAGE WILL RESULT WHEN THE PROPELLER IS OPERATED ON THE AIRCRAFT.

(5) Slide the spacer (455) tight against the hub flange.

(a) If the hub flange does not have threaded screw attachment holes (Figure 7-2) present to attach the spacer (455):

1 Apply masking tape around the outside diameter of the spacer (455) and the hub flange.

(b) If the hub flange does not have threaded screw attachment holes (Figure 7-2) present to attach the spacer (455):

1 Insert a flat countersunk head screw (465) through each screw hole in the spacer (455) and into the 8-32 threaded hole in the hub flange. Refer to Figure 7-2.

CAUTION 1: MAKE SURE THE FLAT COUNTERSUNK HEAD SCREWS (465) DO NOT PROTRUDE ABOVE THE ENGINE SIDE SURFACE OF THE SPACER (455).

CAUTION 2: DO NOT OVER TIGHTEN THE FLAT COUNTERSUNK HEAD SCREWS (465).

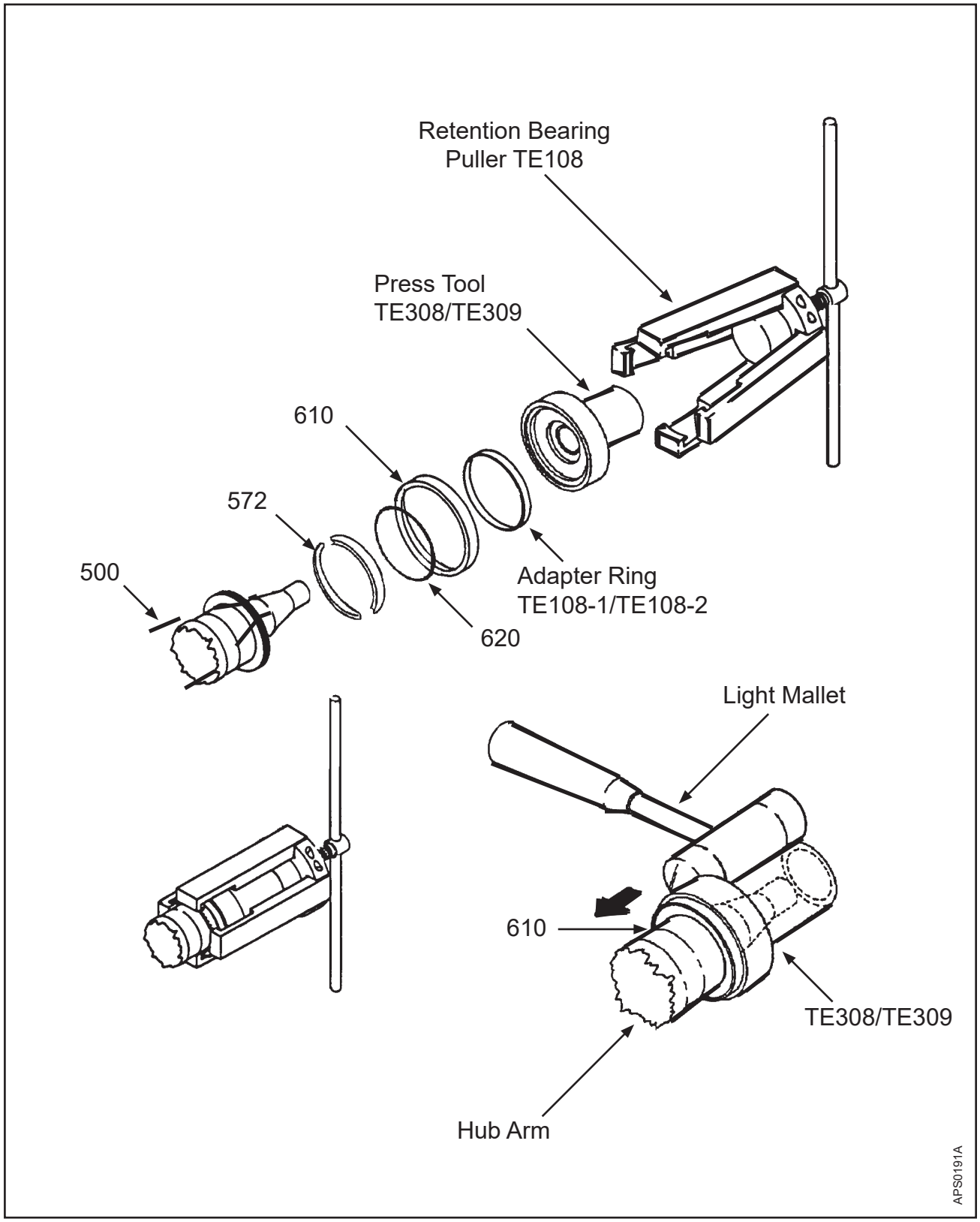
2 Tighten the flat countersunk head screws (465) until snug.

a If one or both of the flat countersunk head screws (465) are above the engine side surface of the spacer:

(1) Remove both flat countersunk head screws.

(2) Apply masking tape around the outside diameter of the spacer (455) and the hub flange

b If the flat countersunk head screws (465) are flush or below flush, continue to step (5) of this procedure.




**Hub Arm Build-Up**
**Figure 7-3**

B. Models Ending in -2, -3, -5, and -7.

(1) Install the hub on the rotatable fixture of the assembly table.

CAUTION: BE SURE THE INTERNAL RECESS OF THE BEARING GUIDE RING FACES OUTBOARD WHEN THE GUIDE RING IS SLIPPED OVER THE BLADE ARM FLANGE OF THE HUB UNIT (500).

(2) Using a light mallet and special tool TE309 for A-1852 bearing retaining rings, or TE308 for A-972 bearing retaining rings, drive a bearing retaining ring (610) onto one blade arm flange of the hub unit (500). Refer to Figure 7-3.

(a) Drive the bearing retaining ring far enough onto the blade arm flange that the ring forms a narrow channel on the inboard surface of the flange.

(3) Do steps (2) and (2)(a) of this procedure for the remaining blade arm flanges on the hub.

(4) Lightly grease the inboard surface of each blade arm flange with lubricant CM12.

(5) Put the halves of the blade-side race (572) (matched set) in position over one hub arm.

(a) The break-line for the blade-side race (572) halves must be perpendicular to the table top.

(6) Using a combination of tools TE309 and TE108 for A-1852 bearing retaining rings, or TE308 and TE108 for A-972 bearing retaining rings, press the bearing retaining ring (610) far enough onto the blade-side race (572) to allow insertion of the wire ring retainer (620) into the groove in the blade arm flange. Refer to Figure 7-3.

(7) Install the wire ring retainer (620).

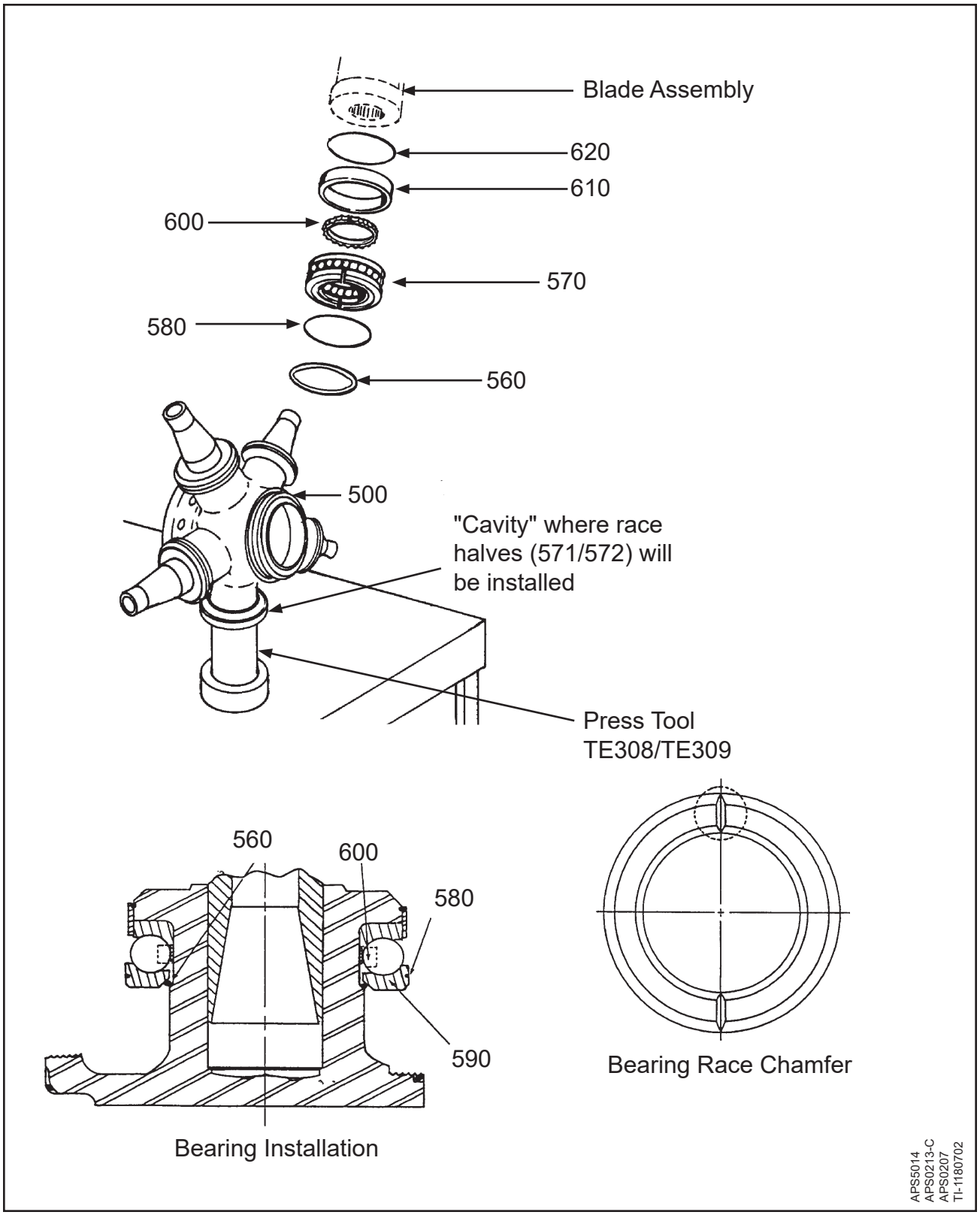
(8) Using the tools, pull the bearing retaining ring (610) outboard far enough to allow the wire ring retainer (620) and the bearing retaining ring to contact each other. Refer to Figure 7-3.

CAUTION: THE WIRE RING RETAINER (620) MUST BE FULLY ENCLOSED TO MAKE SURE IT IS NOT PINCHED.

(9) Visually examine to make sure the wire ring retainer (620) is fully enclosed.

(10) Lubricate the blade O-ring (560) with lubricant CM12 and slide it over the blade arm flange of the hub to a location inboard of the thrust bearing. Leave it there for use later in the assembly.

(11) Do steps (4) through (10) of this procedure for the remaining hub arms.




**Blade and Flange Mounting Parts**
**Figure 7-4**

(12) Remove the hub unit from the rotatable fixture on the assembly table and use special tool TE309 to hold the unit vertical. Refer to Figure 7-4.

NOTE: The arm of the hub being fitted with bearing races must be facing down so that the hub flange and the guide ring form a "cavity" that will hold the bearings.

(13) For the HC-B3TN-3( ) propeller as installed on the Beech T-34C aircraft only:

(a) If the A-1851-T bearing race does not have a chamfer in the ball race, replace with an A-1851 bearing race (570A) or an A-1851-T (570) bearing race with a chamfer.

1 The A-1851-T bearing race with a chamfer can be reused if it meets the component inspection criteria in the Check chapter of this manual.

(b) Add the letter "C" after the propeller hub serial number to indicate that the replacement was made.

WARNING: THE BREAK LINE OF THE BEARING-HALVES MUST BE AT A RIGHT ANGLE TO THE BREAK LINE OF THE BLADE CLAMP HALVES.

CAUTION 1: ANY GAP BETWEEN THE HALVES OF THE OUTBOARD BEARING RACE SHOULD BE NO GREATER THAN 0.001 INCH (0.02 MM).

CAUTION 2: ALL BEARING BALLS INSTALLED IN A SINGLE BEARING MUST BE OF THE SAME GAUGE. BEARING BALLS SUPPLIED BY HARTZELL PROPELLER INC. ARE OF THE SAME GAUGE.

(14) Install the ball spacer (600) and the required number of bearing balls (590) onto the blade-side bearing races (572), taking care not to scratch the races.

(15) Apply a slight amount of sealant CM93 to the broken edges of the hub-side bearing race (571) (matched set).

(a) Wipe clean any excess sealant that can extrude into the bearing area when the bearing halves are joined.

CAUTION: THE OPENING OF THE WIRE RING RETAINER (620) MUST BE AT A 90 DEGREE ANGLE TO THE PARTING LINE OF THE HUB-SIDE BEARING RACE (571).

(16) Put the hub-side bearing race (571) halves around one blade arm of the hub unit and install the bearing wire retainer (580) to hold the halves in position.

CAUTION: EXCESSIVE USE OF SEALANT COULD CAUSE UNEVEN SEATING BETWEEN BLADE CLAMP AND BEARING RACE.

(17) Apply a small bead of sealant CM93 to the inboard bearing race at chamfer (break point) in order to evenly fill the void in the chamfered area of the race.

(18) Slide the blade O-ring (560) outboard in position against the bearing race.

(19) Wrap wide masking tape around the outside diameter of the blade retention bearing (570) assembly to hold the parts in position.

(20) Do these assembly procedures again for each of the other blade arms on the hub unit.

5. Assembling the Spinner Mounting Plate

NOTE: Refer to special instructions for HC-B4TN-5(G&J)L/LT10282N-5.3R in this chapter.

A. Models Ending in -2

CAUTION 1: MAKE SURE EACH HALF OF THE SPINNER MOUNTING PLATE (380) HAS THE SAME SERIAL NUMBER.

CAUTION 2: INSTALL THE SPINNER MOUNTING PLATE (380) ON THE HUB MOUNTING FLANGE AT A POSITION THAT WILL PERMIT THE BETA RODS TO PASS BETWEEN THE HUB ARMS DURING LATER ASSEMBLY PROCEDURES.

(1) Attach the spinner mounting plate (380) to the hub mounting flange in ten areas with hex head bolts (360).

(a) Do not tighten the hex head bolts at this step of the assembly.

(2) For a three bladed propeller, locate the spinner mounting plate (380) using fixture TE182.

(a) Drill the spinner bulkhead mounting holes in the spinner mounting plate (380) if necessary.

NOTE: A new C-3033-( ) spinner mounting plate is supplied with the bulkhead mounting holes undersized. All twelve holes must be drilled using a 0.250 inch (6.35 mm) drill to a diameter of 0.251 inches (6.38 mm). A spinner mounting plate that was used before will already have these holes drilled.

(3) When the spinner mounting plate (380) is accurately aligned with the hub mounting flange, torque all ten hex head bolts (360). Refer to the Torque Values table in the Fits and Clearances chapter of this manual.

(4) Safety wire the bolts together with 0.032 inch (0.82 mm) minimum diameter stainless steel wire CM131.

NOTE: Safety wire CM131 is not necessary on drilled head bolts (360) that have torqued locking nuts.

B. Models Ending in -3

CAUTION 1: INSTALL THE SPINNER MOUNTING PLATE (380) ON THE HUB MOUNTING FLANGE AT A POSITION WHICH WILL PERMIT THE BETA RODS TO PASS BETWEEN THE HUB ARMS DURING LATER ASSEMBLY PROCEDURES.

CAUTION 2: MAKE SURE EACH HALF OF THE SPINNER MOUNTING PLATE (380) HAS THE SAME SERIAL NUMBER.

(1) Insert a guide lug (340) at each of the three or four locations in the split spinner mounting plate (380).

NOTE: Insert the guide lug (340) from the hub-side of the split spinner mounting plate (380).

CAUTION: IF THE SNAP RING (390) IS NOT SET CORRECTLY, DAMAGE TO THE HUB CAN OCCUR.

(2) On the table side of the spinner mounting plate, attach each guide lug (340) in position with a snap ring (390). Make sure that the snap ring is in a position where it cannot become jammed between the hub and the spinner mounting plate (380).

(3) Attach the spinner mounting plate (380) to the hub mounting flange in ten areas with hex head bolts (360) and socket head cap screw(s) (365).

NOTE: A three-blade propeller has one socket head cap screw and nine hex head bolts as fasteners. The spinner mounting plate half (380) with a single guide lug hole will use the single socket head cap screw adjacent to the installed guide lug (340). A four-blade propeller has four socket head cap screws and six hex head bolts. Because the screw(s) are installed adjacent to a nearby guide lug, an open wrench cannot be used to tighten the hex head bolt(s) (360).

(a) Do not tighten the hex head bolts or screws at this step of the assembly.

(4) For a three bladed propeller, locate the spinner mounting plate (380) using fixture TE182.

(5) For a four bladed propeller, locate the spinner mounting plate (380) using fixture TE183.

(6) Drill the spinner bulkhead mounting holes in the spinner mounting plate (380), if necessary.

NOTE: A new spinner mounting plate is supplied with the bulkhead mounting holes undersized. All twelve holes must be drilled using a 0.250 inch (6.35 mm) drill to a diameter of 0.251 inches (6.38 mm). A spinner mounting plate that was used before will already have these holes drilled.

(7) When the spinner mounting plate (380) is accurately aligned with the hub mounting flange, torque all hex head bolts (360) and socket head cap screw(s). Refer to the Torque Values table in the Fits and Clearances chapter of this manual.

(8) Drill the socket head cap screw(s) (365) using a #42 drill.

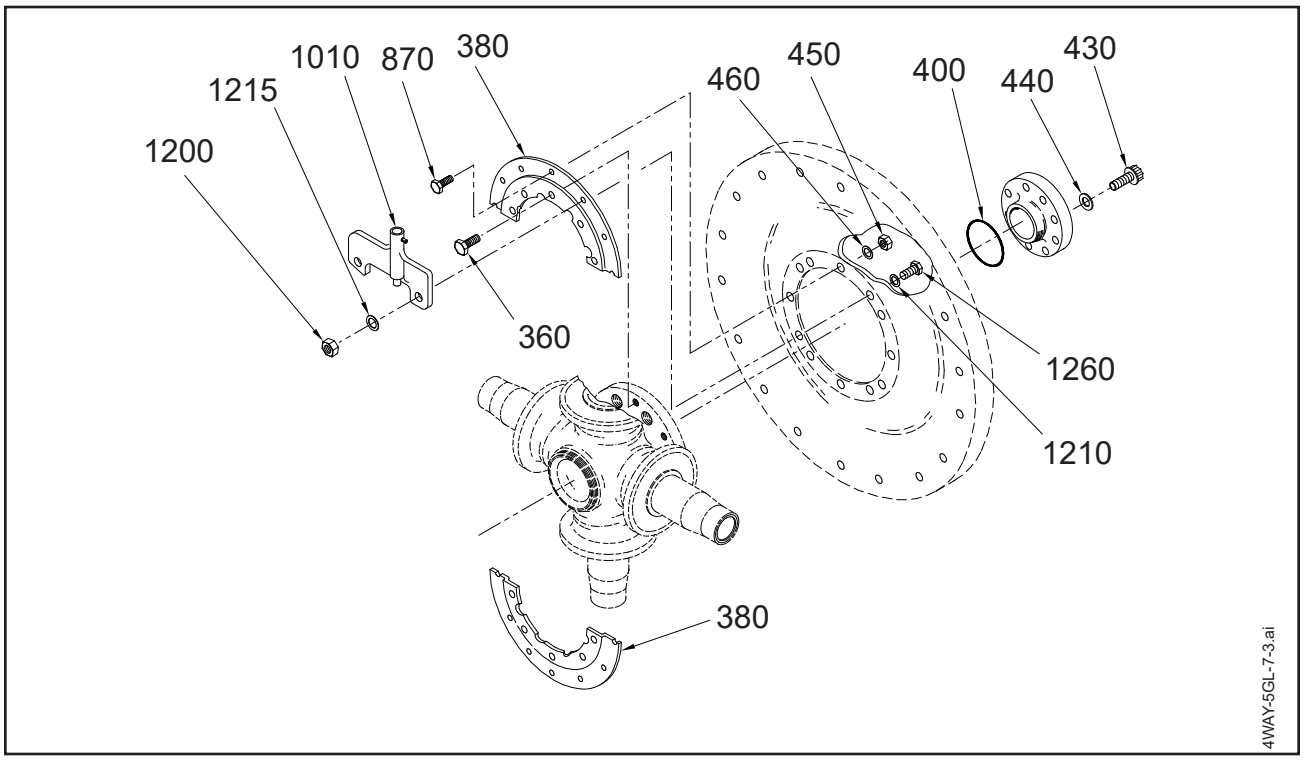
(a) Safety the socket head cap screws (365) and the hex head bolts (360)with safety wire CM131.

NOTE: Safety wire CM131 is not necessary on drilled head bolts (360) that have torqued locking nuts when installed on a spinner mounting plate.

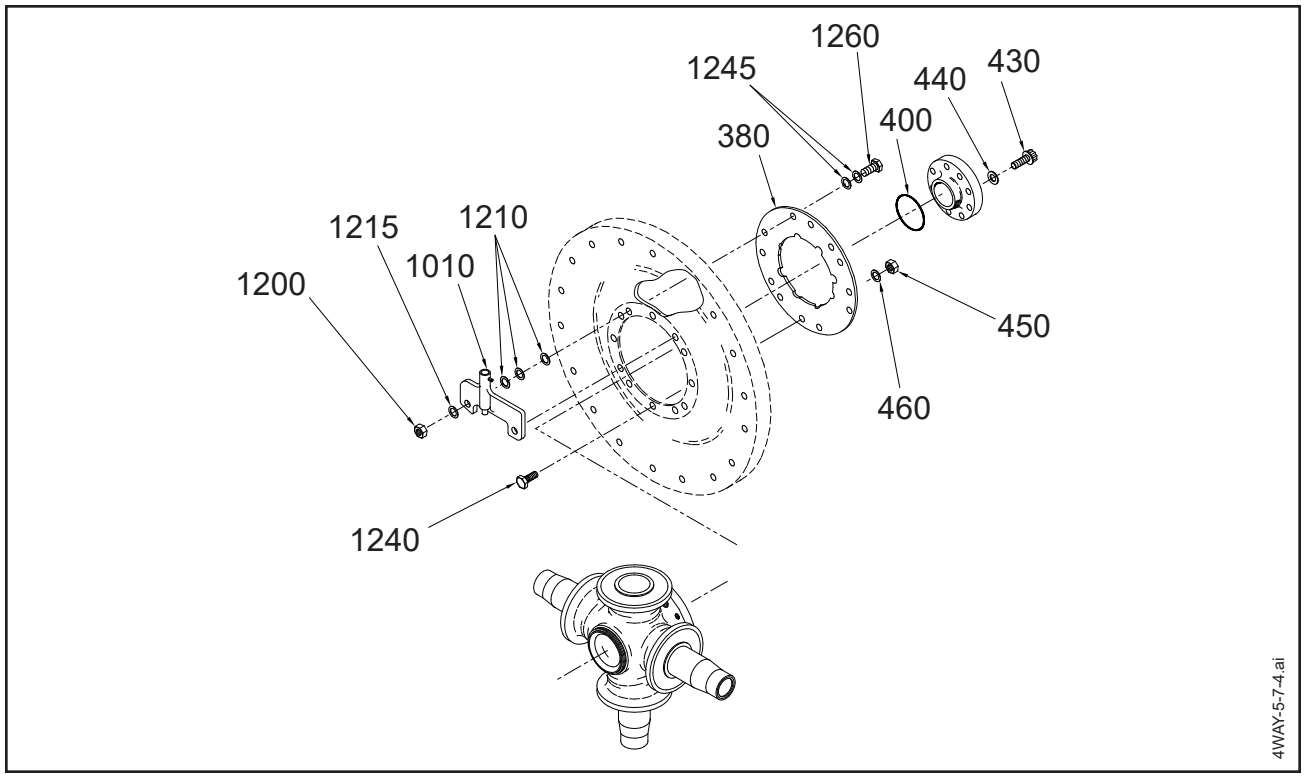
C. Models Ending in -5 or -7, with "Split" Spinner Mounting Plate (i.e., HC-B3TN-5M, -5ML, -5N, -5NL, -5P, -5SL, -5U, -5V, -5W; HC-B4MN-5AL, -5L; HC-B4TN-5F, -5FL, -5GL, -5HL, -5JL, -5KL, -5ML, -5NL, -5PL, -5QL) Refer to Figure 7-5.

CAUTION: MAKE SURE EACH HALF OF THE SPINNER MOUNTING PLATE (380) HAS THE SAME SERIAL NUMBER.

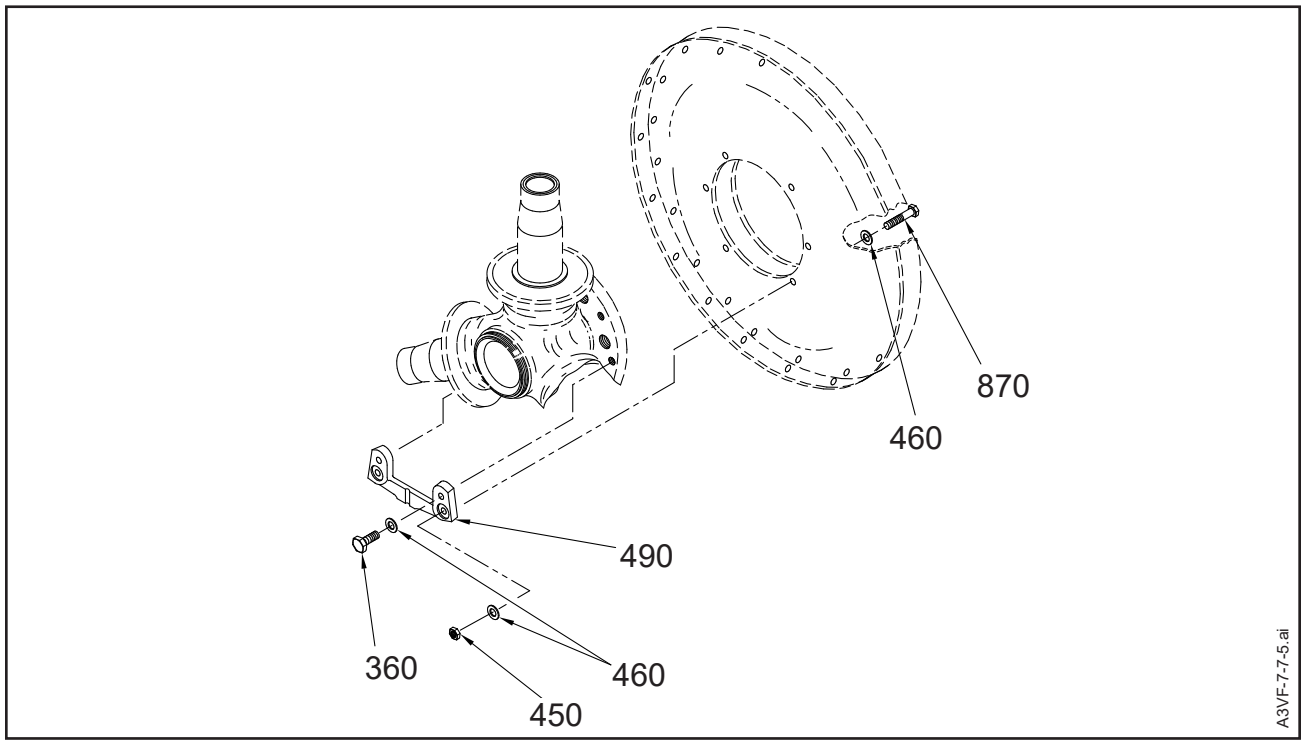
(1) Attach the spinner mounting plate (380) to the hub mounting flange in ten areas with hex head bolts (360).




**An Example of a -5 Model with a "Split" Spinner Support Plate (380)**
**Figure 7-5**




**An Example of a -5 Model With a "Non-Split" Spinner Support Plate (380)**
**Figure 7-6**




**An Example of a -7 Model with Bracket (490)**
**Figure 7-7**

(2) Install four hex head bolts (870) under the blade arms for spinner mounting. Refer to the instructions in this chapter for MU-2 de-ice installation.

(a) Do not tighten the hex head bolts at this step of the assembly.

(3) To accurately align the spinner mounting plate (380) with the hub mounting flange, temporarily attach the spinner bulkhead to the spinner mounting plate with bolts (870), washers (1215), and nuts (450).

(4) When the spinner mounting plate (380) is accurately aligned with the hub mounting flange, torque all ten hex head bolts (360). Refer to the Torque Values table in the Fits and Clearances chapter of this manual.

(5) Safety wire the bolts (360) together with 0.032 inch (0.81 mm) minimum diameter stainless steel wire CM131.

NOTE: Safety wire CM131 is not necessary on drilled head bolts (360) that have torqued locking nuts when installed on a spinner mounting plate.

(6) Remove the spinner bulkhead to make further assembly procedures easier.

D. Models Ending in -5, with "Non-Split" Spinner Support Plate (i.e., HC-B3TN-5, -5C, -5CL, -5D, -5DL, -5E, -5FL, -5G, -5K, HC-B4TN-5, -5A, -5AL, -5C, -5CL, -5DL, -5EL)

(1) Assembly is not needed at this point. Refer to Figure 7-6 and Figure 7-7.

6. Mounting Hub on Assembly Table

A. Models Ending in -2, -5, and -7.

(1) Install the hub assembly on the rotatable fixture of the assembly table.

(2) Special instructions are not needed.

(3) If not already completed, install the expansion plug (520) in each pilot tube (530) in accordance with the Steel Hub Overhaul chapter of Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02).

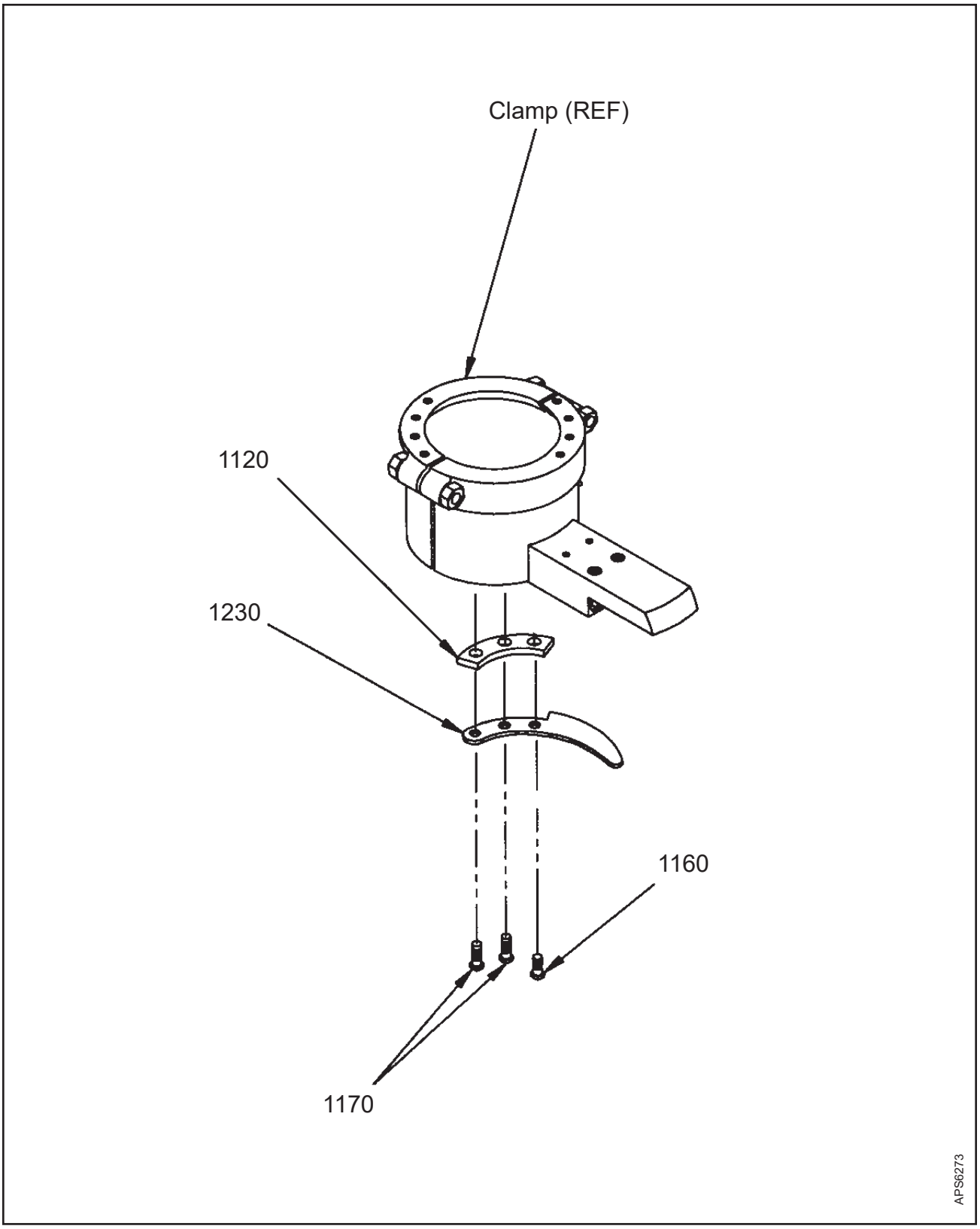
B. Models Ending in -3.

(1) Put the beta ring (30) over the rotatable fixture on the assembly table, with the raised surfaces of the beta rod access holes facing upward.

(2) Put the spinner bulkhead unit over the rotatable fixture.

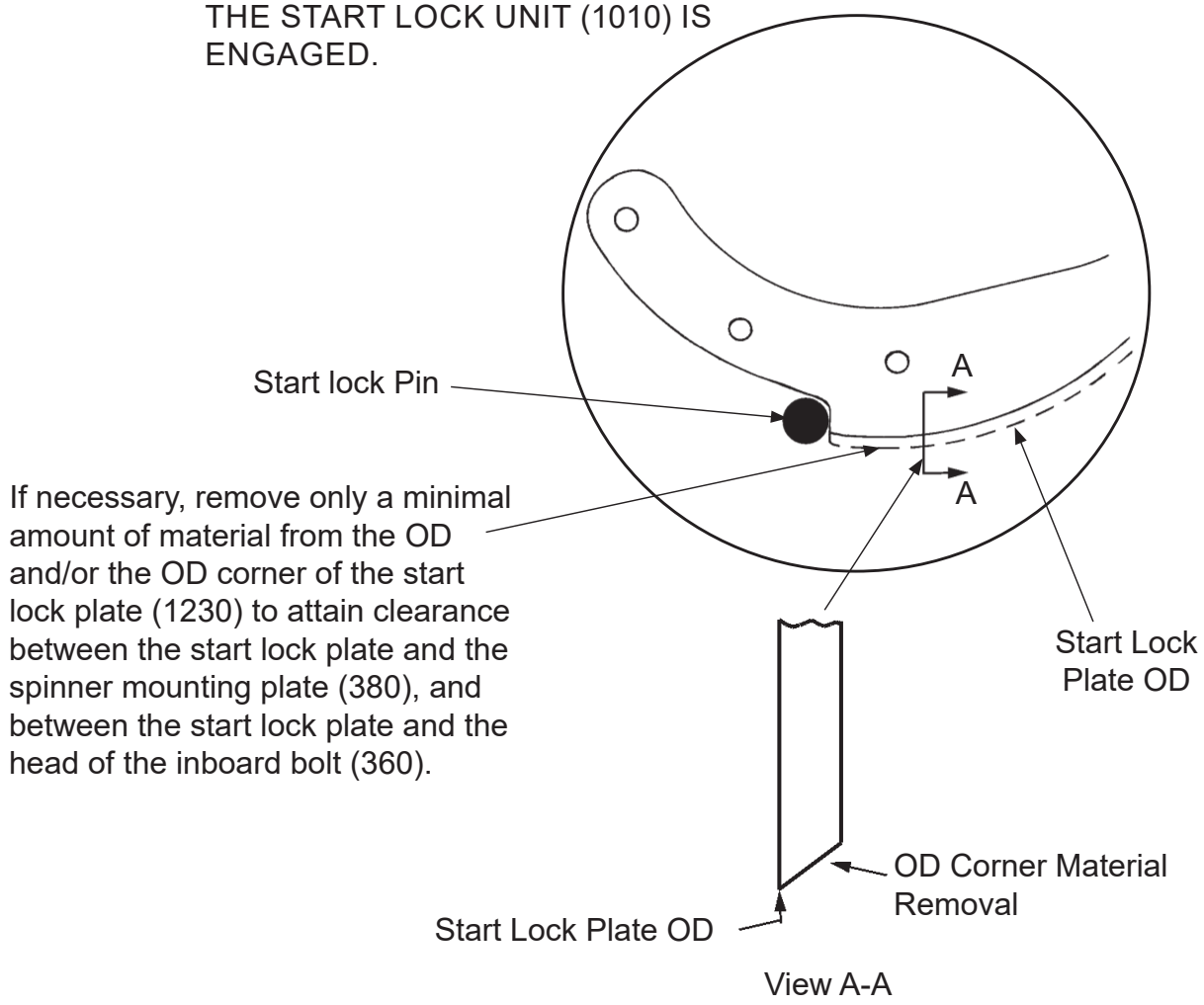
(3) Special instructions are not needed.

(4) Reinstall the hub unit (500) on the rotatable fixture of the assembly table (4). If not already completed, install expansion plug (520) in each pilot tube (530) in accordance with the Steel Hub Overhaul chapter of Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02).




**Installing Start Lock Plate on Clamp**
**Figure 7-8**

CAUTION: THE START LOCK PLATE (1230) MUST CONTACT AT LEAST ONE HALF OF THE DIAMETER OF THE START LOCK PIN WHEN THE START LOCK UNIT (1010) IS ENGAGED.




**Attaining Clearance Between Start Lock Plate and Spinner Mounting Plate**
**Figure 7-9**

7. Assembling Clamp and Counterweight

A. Procedure

(1) For all models, refer to the Clamp Overhaul chapter of Hartzell Propeller Standard Practices Manual 202A (61-01-02).

(2) For all models, refer to the Hartzell Propeller Application Guide Manual 159 (61-02-59) for information about the correct counterweight slugs (9040).

(3) For HC-B3TN-3S, -3( )Y, and HC-B3( )W-3Y models only, where a start lock kit will be installed.

(a) Using hex head bolts (1160 and 1170), attach a start lock plate spacer (1120) and start lock plate (1230) to the inboard side of each clamp. Refer to Figure 7-8.

NOTE: The start lock plate(s) (1230) could possibly need to be adjusted later to obtain the correct start pitch blade angle.

(b) Safety the hex head bolts with safety wire CM131.

(4) For all models, after each clamp (840) and counterweight (800) is assembled:

(a) This step applies to HC-B3TN-3( )Y and HC-B3( )W-3Y Models only, using the A-3419-( ) or the C-7519 start lock plate (1230):

CAUTION: THE PROPELLER MUST BE PERMITTED TO FUNCTION WITHOUT INTERFERENCE FROM THE START LOCK PLATE.

1 There must be sufficient clearance between the OD of the start lock plate (1230) and the spinner mounting plate (380), and between the start lock plate and the head of the inboard bolt (360).

CAUTION: THE START LOCK PLATE MUST CONTACT AT LEAST ONE HALF OF THE DIAMETER OF THE START LOCK PIN WHEN THE START LOCK UNIT IS ENGAGED.

2 If necessary, remove only a minimal amount of material from the OD and/or the OD corner of the start lock plate (1230) to attain clearance between the start lock plate and the spinner mounting plate (380). There must be enough material left on the start lock plate to correctly engage the start lock pin (1060) in the start lock unit (1010). Refer to Figure 7-9.

3 After the removal of material from the OD of the start lock plate, paint the OD of the start lock plate with paint CM67 to protect that area from corrosion.

CAUTION 1: A LINK ARM (70) CANNOT BE INSTALLED ON THE CLAMP HALF AFTER THE CLAMP HAS BEEN INSTALLED ON THE HUB UNIT.

CAUTION 2: THE COUNTERWEIGHT (800) MUST NOT TOUCH THE LINK PIN UNIT (80) AND THE SCREW (90) WHEN THE PROPELLER IS FUNCTIONALLY EXAMINED.

(b) Install the link screw sleeve (230) in the large hole of the link arm (70).

NOTE: All link arms must have the same length from the center of the link pin hole to the center of the link screw hole.

(c) Install the link arm bushing (650) between the link arm (70) and the clamp.

(d) Fit the link arm (70) onto the link screw (740).

NOTE: The raised shoulder on the link arm must face inboard, toward the clamp.

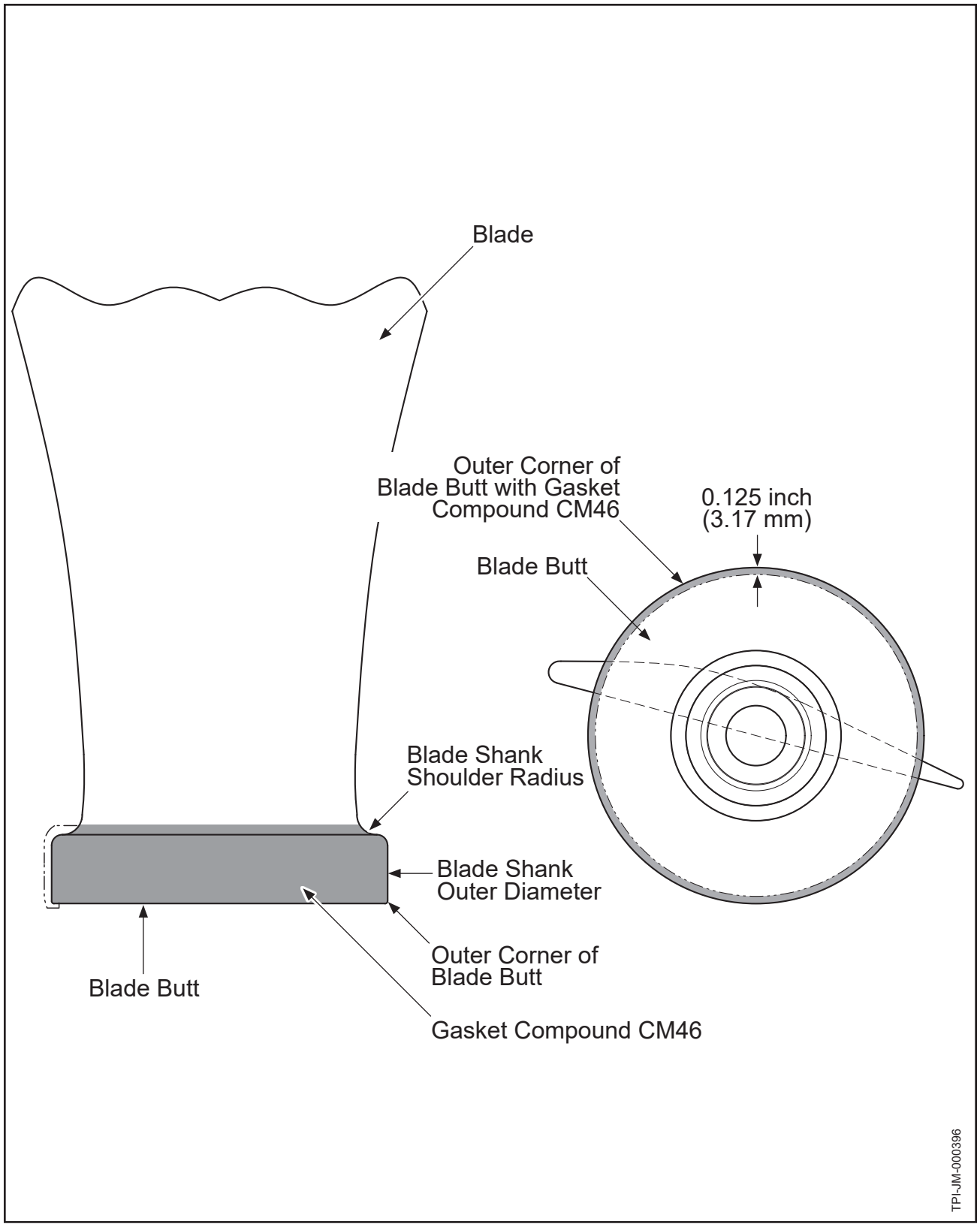
(e) Push the sleeve cotter pin (670) through the hole in the end of the link screw (740).

(f) Open the cotter pin (670) to safety it.

NOTE: The link arm should move freely on the link screw.

CAUTION: DO NOT INSTALL LUBRICATION FITTINGS (860) ON THE CLAMP AT THIS STEP OF THE ASSEMBLY.

(g) Do these assembly procedures again for the other clamps and counterweights.




**Gasket Compound CM46 Application**
**Figure 7-10**

8. Blade and Clamp Installation

A. Models Ending in -2, -3, -5, -7

CAUTION: IF POSSIBLE, EACH BLADE MUST BE REINSTALLED ON THE HUB ARM FROM WHICH IT WAS REMOVED AT DISASSEMBLY.

(1) With the hub assembly in the horizontal position, follow the "Measuring the Blade Track" procedure in this chapter.

(2) Stand blade number one in vertical position (shank up, tip down) and fill the pilot tube cavity with CM12 grease to the top of the bottom (inboard) bearing race level.

WARNING: AIR TRAPPED IN THE GREASE CAN AFFECT PROPELLER BALANCE AFTER RUN-UP.

(3) After making sure no air is trapped in the grease, press the blade onto its matching hub pilot tube.

NOTE: A slight amount of grease will ooze out around the pilot tube if the blade has been lubricated correctly.

(4) In consecutive order, do the lubrication and reinstallation procedure again for the other blades.

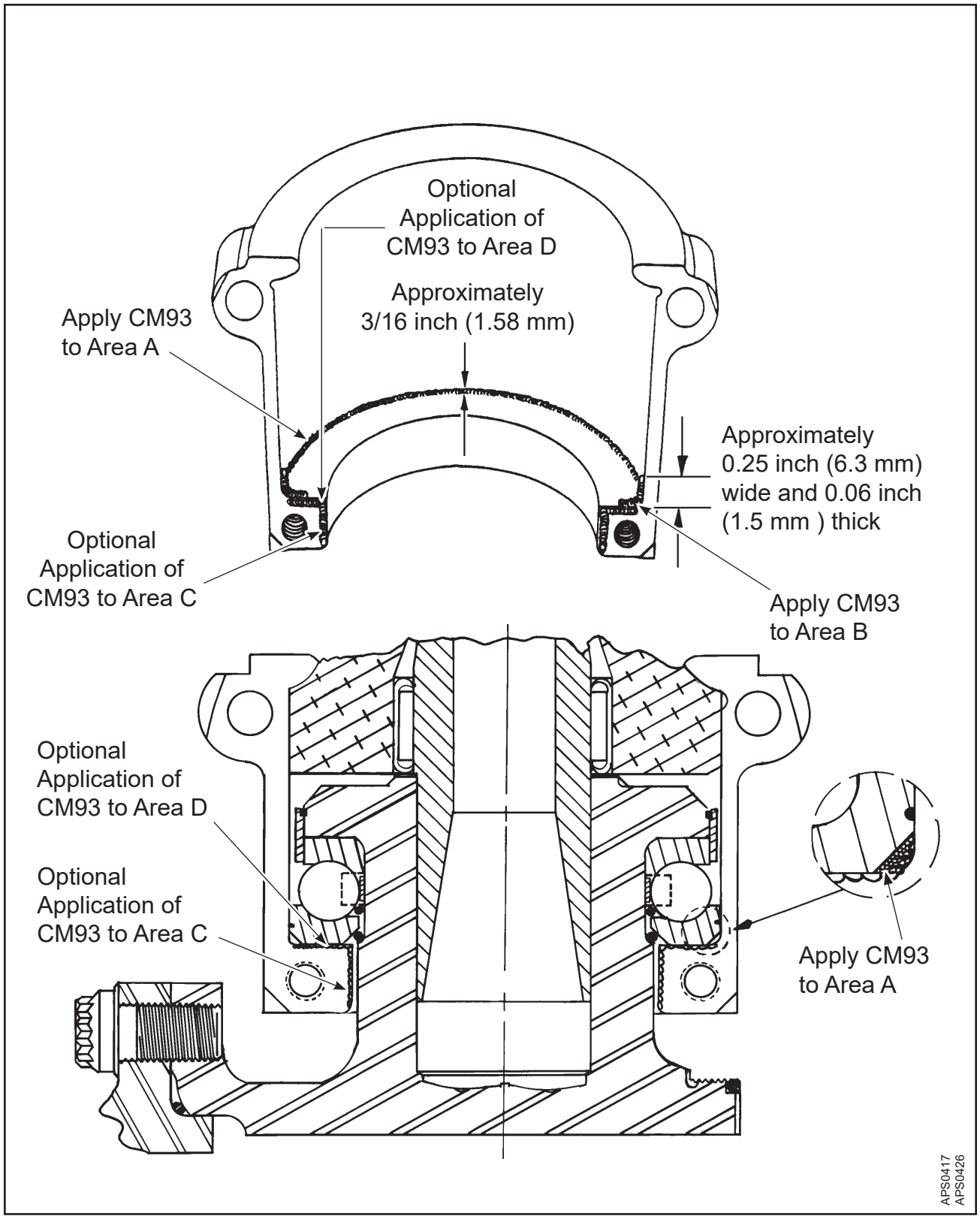
CAUTION: BE SURE TO USE HARDENING GASKET COMPOUND CM46 ON THE SHOULDER RADIUS OF THE BLADE SHANK, THE OUTER DIAMETER OF THE BLADE SHANK, AND THE OUTER CORNER OF THE BLADE BUTT. REFER TO FIGURE 7-10.

(5) Using an acid brush or finger, optionally wearing non-powdered latex gloves, apply a smooth even layer of gasket compound CM46 on the shoulder radius of the blade shank (in the area where it will contact the blade clamp), the outer diameter of the blade shank, and approximately 0.125 inch (3.17 mm) on the outer corner of the blade butt. Refer to Figure 7-10.

NOTE 1: Before installing a clamp, ensure that the shoulder radius of the blade shank, the outer diameter of the blade shank, and the outside corner of the blade butt are completely covered by a smooth even layer of gasket compound CM46. Refer to Figure 7-10.

NOTE 2: Do not apply gasket compound CM46 if blades will be removed to facilitate shipment of the propeller.

(6) Remove the masking tape used to temporarily hold the blade split-bearing together.




**CM93 Sealant Application**
**Figure 7-11**

CAUTION: THE PARTING LINE OF THE CLAMP HALVES MUST BE AT A RIGHT ANGLE TO THE PARTING LINE OF THE INBOARD BEARING RACE.

(7) Seal the blade clamp using the following steps:

CAUTION: SEALANT MUST NOT EXTEND ONTO THE CLAMP PARTING SURFACE. REMOVE SEALANT IF IT EXTENDS ONTO THE PARTING SURFACE.

(a) Put a small bead of sealant CM93 on the inboard bearing radius (areas A and B) to fill the void from the beveled edge of the bearing outside diameter. Refer to Figure 7-11.

(8) Optionally, put a small bead of sealant CM93 on a part of the mating surfaces (Areas C and D) on both clamp halves (840), as shown in Figure 7-11.

NOTE: The application of sealant CM93 to the clamp mating surfaces is an optional procedure. Application of CM93 to the clamp mating surfaces can cause the gasket to slip out of position.

(9) Install the matching clamp half (840) to which the counterweight (800) is attached.

(10) Put a clamp gasket (760) between each of the clamp half parting surfaces.

(11) Install the other clamp half.

CAUTION 1: A 0.06 INCH (1.5 MM) MAXIMUM OF GASKET MATERIAL SHOULD BE EVENLY EXPOSED THROUGH THE LIPS ON EACH CLAMP-HALF PARTING SURFACE. HOWEVER, GASKET MATERIAL MUST BE TRIMMED AS NECESSARY TO PROVIDE METAL-TO-METAL CONTACT WHERE THE CLAMP LUGS MEET.

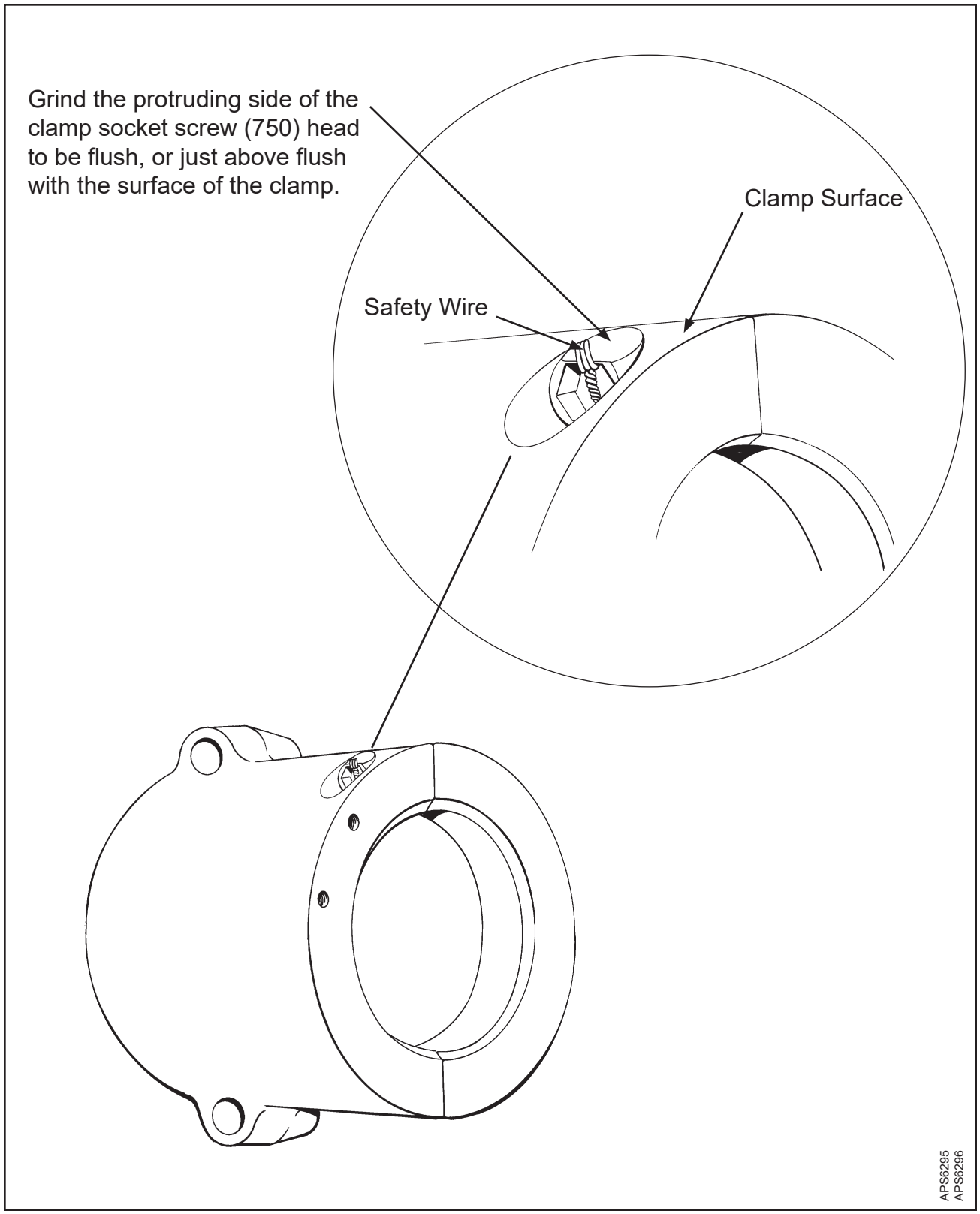
CAUTION 2: DO NOT TORQUE THE OUTBOARD CLAMP BOLTS AT THIS STEP OF ASSEMBLY.

(12) On all propeller models except HC-A3( )F-7( ), apply anti-seize lubricant CM118 to the threaded part of the outboard clamp bolts (770).

(13) Insert the outboard clamp bolts (770) and attach them with clamp nuts (780). Hand-tighten.

NOTE: This step helps align the clamp gasket (760), but do not torque the clamp bolts at this step.

(14) Insert the inboard clamp socket screws (750).




**Preventing Contact Between the Clamp Socket Screw Head and the Start Lock Bracket**
**Figure 7-12**

CAUTION: DO NOT EXCEED THE RECOMMENDED TORQUE ON INBOARD CLAMP SOCKET SCREWS. REFER TO THE TORQUE VALUES TABLE IN THE FITS AND CLEARANCES CHAPTER OF THIS MANUAL.

(15) Tighten the socket screws by increasing torque using a conventional 5/16 inch Allen wrench.

NOTE: Torque socket head screws in 10 Ft-Lb (13 N•m) increments (10, 20, etc.), alternating between screws at each increment.

CAUTION: DO NOT CONTACT THE INNER CLAMP HALF WHILE DRILLING TO SAFETY THE INBOARD CLAMP SOCKET SCREWS (750).

(16) Using a drill and a size #42 drill bit, drill the head of each inboard clamp socket screw (750).

(a) If damage is caused to an inboard clamp socket screw hole during drilling, refer to the Blade Clamp Overhaul chapter of Hartzell Propeller Standard Practices Manual 202A (61-01-02).

1 If the damage is less than the permitted serviceable limits, apply primer CM67 to the affected area.

(17) This step applies only to models HC-B3TN-5( ), where the start lock is **not** mounted on the guide collar:

(a) Due to the configuration of the start lock unit on the above models, in some instances the head of the clamp socket screw (750) will possibly touch the start lock bracket (1020). To prevent interference from occurring, do the following:

CAUTION 1: USE EXTREME CARE TO AVOID SCRATCHING, NICKING, OR DAMAGING THE CLAMP.

CAUTION 2: DO NOT GRIND THE CLAMP SOCKET SCREW HEAD BELOW FLUSH WITH THE SURFACE OF THE CLAMP.

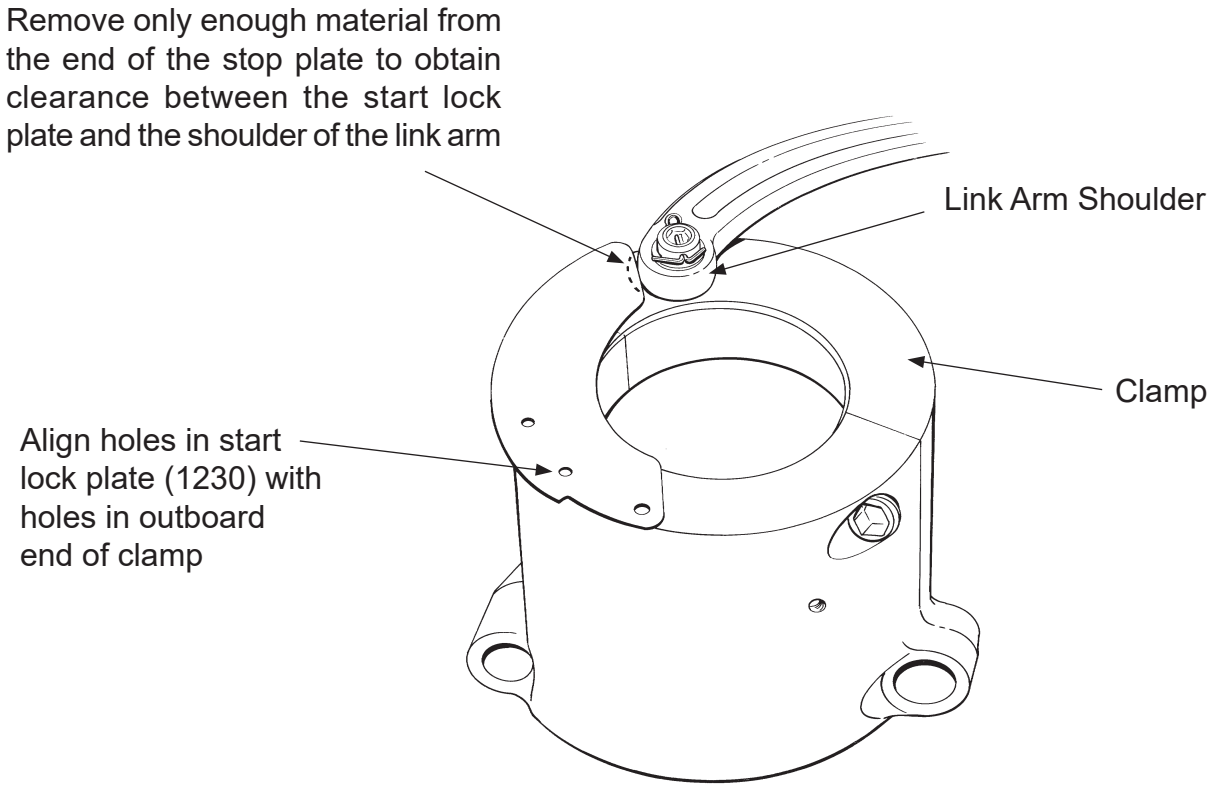
1 Carefully grind the protruding side of the clamp socket screw (750) head to be flush, or just above flush with the surface of the clamp. Refer to Figure 7-12.

2 Paint the clamp socket screw (750) head using paint CM67 to protect the screw from corrosion.

(18) Safety each socket screw.

(a) On -2, -3, and -7 models, safety each socket screw (750) using a cotter pin (710) in such a way that the cotter pin (710) contact the clamp half and prevents any risk for the socket screw (750) to back out of the clamp.

NOTE: If the cotter pin (710) causes clearance problems, three loops of safety wire CM131 can be used as an alternative to safety the socket screws (750).




**Obtaining Clearance Between the Start Lock Plate and the Link Arm on Models HC-B3TN-5CL, -5DL**
**Figure 7-13**

(b) On -5 models, a cotter pin (710) causes clearance problems. Safety the socket screw (750) with three loops of safety wire CM131.

NOTE: For -5 models where the clamp socket screw head has been ground for clearance purposes, lightly tap the loops of safety wire using a hammer to flatten them, so they will not contact the start lock bracket.

(19) On all models except HC-B3TN-5CL, and -5DL

(a) Attach the start lock plate (1230) to the clamp (700) using hex head bolts (1220).

(b) Torque the hex head bolts (1220) in accordance with the Torque Values table in the Fits and Clearances chapter of this manual.

(c) Safety the hex head bolts (1220) with stainless steel wire CM131.

(20) On models HC-B3TN-5CL, and -5DL only:

(a) Due to normal manufacturing tolerance buildup, the start lock plate (1230) may not align correctly on the clamp, and the end of the stop plate may contact the shoulder of the link arm. When this happens, material must be removed from the start lock plate to obtain clearance.
Refer to Figure 7-13.

1 Attempt to align the holes in the start lock plate (1230) with the holes on the outboard end of the clamp.

(b) If the holes in the start lock plate (1230) do not align with the holes in the outboard end of the clamp, remove only enough material from the end of the stop plate for alignment, and to obtain clearance between the start lock plate and the shoulder of the link arm.

(c) Attach the start lock plate (1230) to the clamp (700) using hex head bolts (1220).

(d) Torque the hex head bolts (1220) in accordance with the Torque Values table in the Fits and Clearances chapter of this manual.

(e) Safety the hex head bolts (1220) with stainless steel wire CM131.

(21) Do these blade clamp reinstallation procedures again for each of the other propeller blades.

9. Assembling and Installing Beta Rods

A. Propeller Models Ending in -3, Only.

CAUTION 1: BETA ROD RETAINER RINGS (THREE-SEGMENT COMPRESSION RINGS) MUST BE ASSEMBLED WITH THEIR SHARP EDGES AGAINST EACH OTHER.

CAUTION 2: STEPS 9.A.(1) AND 9.A.(2) DO NOT APPLY IF USING BETA ROD B-3002-( ). THE BETA ROD B-3002-( ) HAS A MACHINED RETAINING RING.

(1) Slide two retainer rings (330) over the inboard end of one beta rod (320) and into the groove supplied for them in the rod.

NOTE: The rounded edges of the retainer rings must face away from each other.

(2) Use the special tool TE65 (AST-2849) to crimp the retainer rings together by compressing them to a 0.550 inch (13.97 mm) maximum outside diameter.

(3) Slide a beta retainer spring (310) over the outboard end of the beta rod and down onto the crimped keeper rings. The crimped keeper rings fit down inside the beta retainer spring ID recess.

(4) If installing a B-3002-( ) beta rod (320), install a washer (295) against the outboard shoulder of the beta rod.

NOTE: The B-3002-( ) beta rod must have an "H" stamped on the machined retaining ring, indicating that this part has been heat treated. Refer to the Check chapter of this manual.

(5) Slide a beta compression spring (290) onto the outboard end of the beta rod (320).

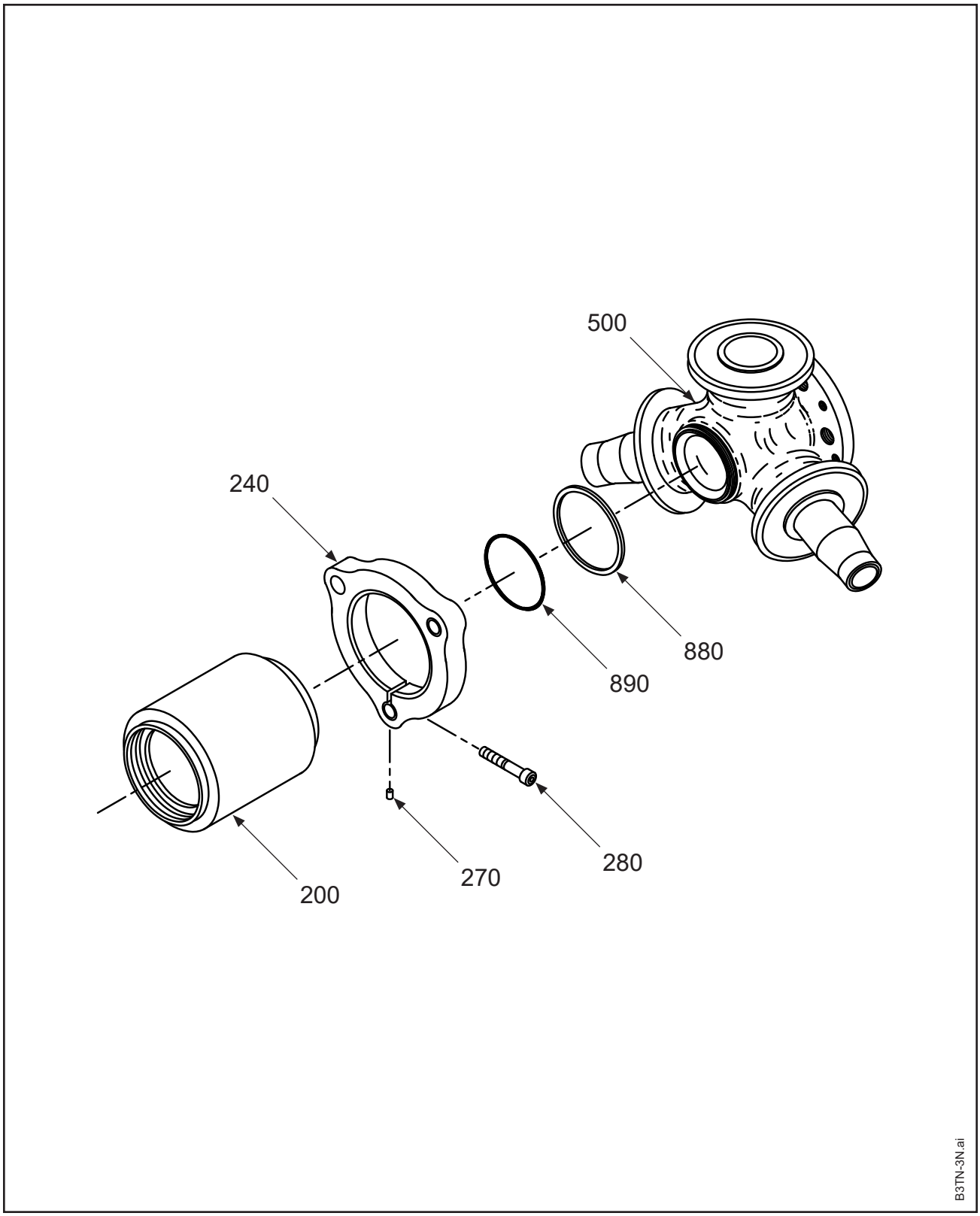
(6) Using the special tool TE29, or equivalent, compress the beta return spring (290) by hand to approximately half its length.

NOTE: Leave the special tool on the spring to aid further assembly procedures.

(7) Follow these procedures for the remaining beta rod subassemblies.

(8) Insert the assembled beta rods through the guide bushings supplied for them in the spinner mounting plate (380).

(9) Install a new socket head cap screw (280) in the guide collar unit (240).




**Cylinder Installation**
**Figure 7-14**

10. Assembling and Installing Cylinder and Guide Collar

A. Propeller Models Ending in -3

For HC-B3TN-3K, 3M, 3N, or 3P propeller models only.

(1) Put the collar support ring (880) in position on hub shoulder. Refer to Figure 7-14.

For all other propeller models ending in -3.

(1) Clean the threads on the hub unit and on the cylinder (200).

(2) Insert the socket head cap screw (280) into the guide collar unit (240) and slip the guide collar down over the beta rods (320) and the collar support ring (880), where applicable.

NOTE 1: The chamfer in the guide collar unit (240) must face the flange on the cylinder (200). The inside diameter recess of the guide collar unit, which is where the collar support ring (880) fits, must face the hub (500).

NOTE 2: For four-blade models, only: Make sure the guide collar unit (240) is positioned so the socket screw (280) can be accessed. If the socket screw cannot be accessed, take the guide collar off, turn it "up-side-down," and install it again.

CAUTION 1: DO NOT APPLY SEALANT TO THE THREADS OF THE CYLINDER.

CAUTION 2: HYDRAULIC SEALANT ADHESIVE CM134 IN THE CYLINDER COULD CONTAMINATE THE AIRCRAFT ENGINE OIL.

(3) Apply a bead of hydraulic sealant adhesive CM134 in the groove of the hub (500) where the cylinder O-ring (890) will fit. Install the O-ring (890) into the cylinder chamfer, facing the hub.

(4) Hand screw the cylinder (200) onto the hub unit (500).

(5) Torque the cylinder (200) against the hub unit (500) using a square bar of applicable size to fit the slot supplied for it in the top of the cylinder (200). Refer to the Torque Values table in the Fits and Clearances chapter of this manual.

(6) Visually examine the inside of the cylinder (200) to make sure the O-ring (890) has not been moved out of position during the cylinder (200) installation procedure.

(7) Visually examine the slot in the top of the cylinder to make sure the square-bar wrench used for torquing did not raise any sharp edges or damage the threads.

(8) Remove any sharp edges in the wrench slot on top of the cylinder (200).

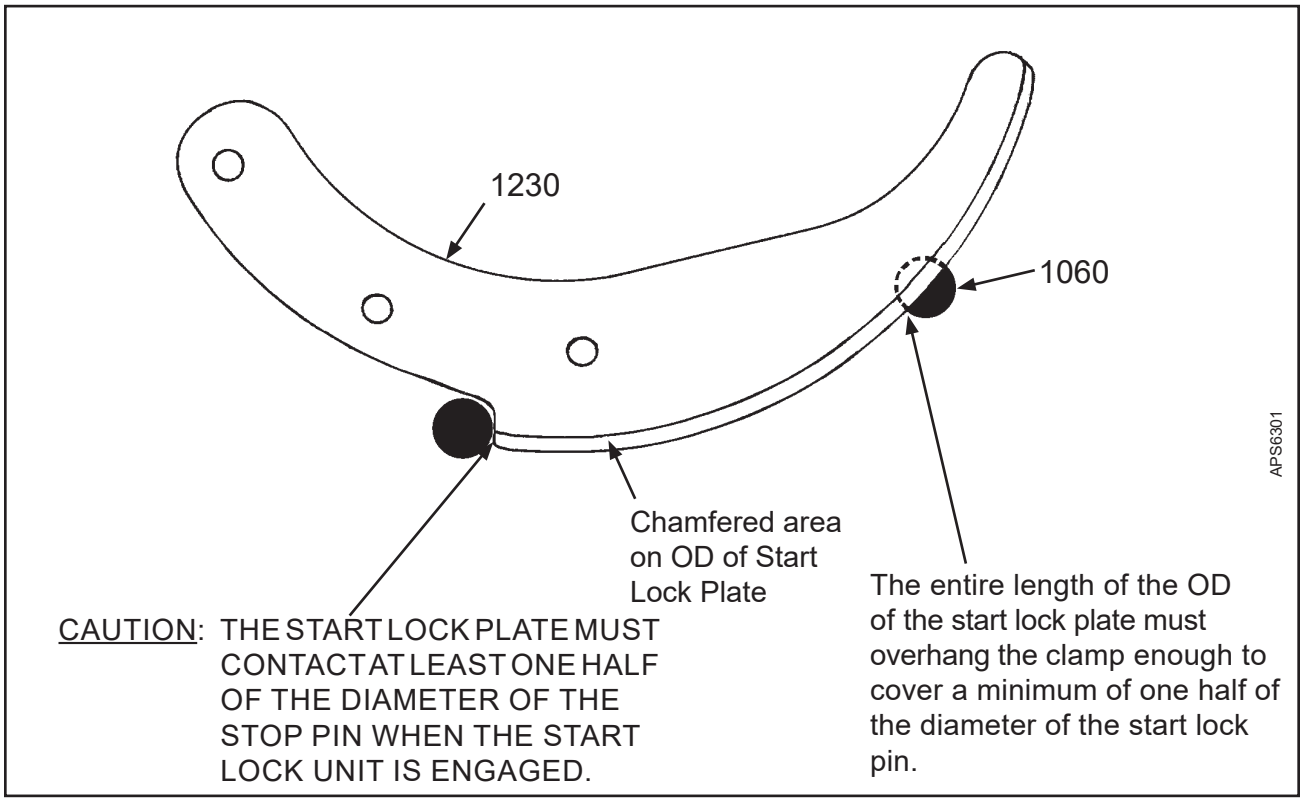
(9) Loosen and remove the special tools used to compress the beta compression springs (290).

(10) For models HC-B3TN-3S, -3( )Y and HC-B3( )W-3Y only, make sure there is clearance between the start lock plate (1230) and the beta compression spring (290).

CAUTION: THE START LOCK PLATE (1230) MUST CONTACT AT LEAST ONE HALF OF THE DIAMETER OF THE START LOCK PIN WHEN THE START LOCK UNIT IS ENGAGED.

(a) If the start lock plate (1230) contacts the beta compression spring (290), chamfer the OD of the start lock plate just enough to permit it to clear the beta compression spring. The entire length of the OD of the start lock plate must overhang the clamp (840) enough to cover a minimum of one half of the diameter of the start lock pin (1060). Refer to Figure 7-15.

(b) If it is necessary to chamfer the OD of the start lock plate (1230) to attain clearance with the beta compression spring (290), paint the chamfered area of the start lock plate using paint CM67 to protect that area from corrosion.




**Chamfer OD of Stop Plate to Clear the Beta Rod Spring**
**Figure 7-15**

B. Models HC-B3TN-5M, -5ML, -5N, -5NL, -5P, -5SL, -5U, -5V, -5W and HC-B3MN-5L

(1) These models have start locks mounted on the guide collar unit (240) as shown in Figure 7-16.

(a) Put the bushing (260) into the holes supplied in the guide collar unit (240).

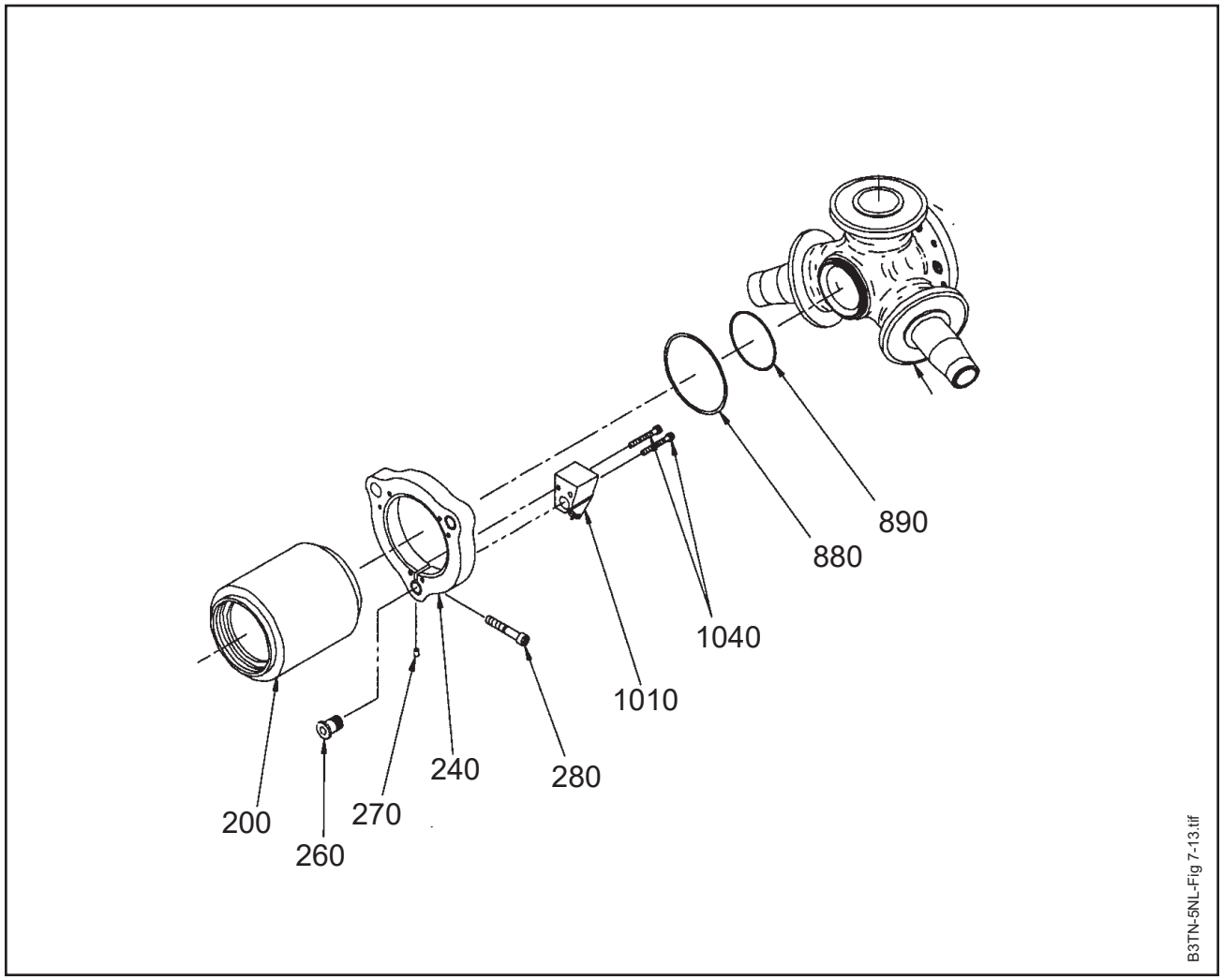
(b) Put a drop of bonding agent CM116 on the threads of the bushing (260).

1 Turn the bushing (260) into the start lock (1010), but do not tighten the bushing at this time.

(c) Install the screws (1040) through the start lock (1010) housing and into the guide collar unit (240), but do not tighten them at this time.

(d) Tighten the bushing (260) until snug.

(e) Do steps (a) through (d) again for the other start locks.




**Configuration in Which Start Locks are Attached to Guide Collar**
**Figure 7-16**

(f) Install the guide collar unit (240) on the cylinder (200) and tighten the socket head cap screw (280).

NOTE 1: The chamfer in the guide collar unit (240) must face the flange on the cylinder (200).

NOTE 2: The inside diameter recess of the guide collar unit (240), which is where the collar support ring (880) fits, must face the hub (500).

1 Install the cylinder/collar unit into the piston and make sure everything moves freely.

2 Tighten the screws (1040) according to the Torque Values table in the Fits and Clearances chapter of this manual.

(g) Put the collar support ring (880) in position on the hub shoulder. Refer to Figure 7-16.

(h) Clean the threads on the hub unit and on the cylinder (200).

CAUTION 1: DO NOT APPLY SEALANT TO THE THREADS OF THE CYLINDER.

CAUTION 2: HYDRAULIC SEALANT ADHESIVE CM134 IN THE CYLINDER COULD CONTAMINATE THE AIRCRAFT ENGINE OIL.

(i) Apply a bead of hydraulic sealant adhesive CM134 in the groove of the hub (500) where the cylinder O-ring (890) will fit.

(j) Install O-ring (890) into the cylinder chamfer, facing the hub (500).

(k) Hand screw the cylinder (200) and guide collar unit (240) onto the hub (500).

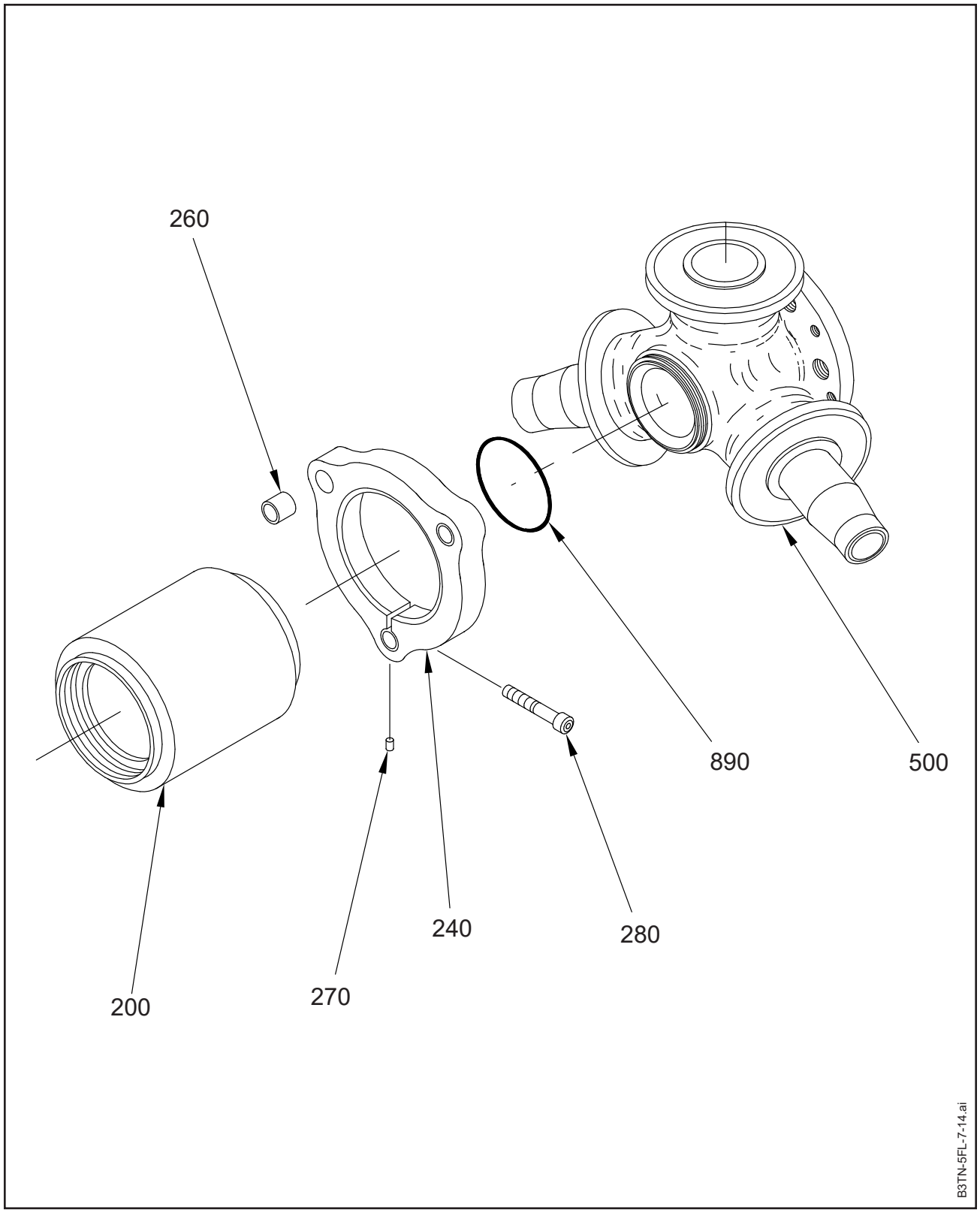
(l) Use a square bar of applicable size to fit the slot supplied for it in the top of the cylinder, and torque the cylinder (200) against the hub unit. Refer to the Torque Values table in the Fits and Clearances chapter of this manual.

CAUTION: HYDRAULIC SEALANT ADHESIVE IN THE CYLINDER COULD CONTAMINATE THE AIRCRAFT ENGINE OIL.

(m) Inspect the inside of the cylinder (200) to make sure the O-ring (890) has not been forced out of position during the cylinder installation procedure.

(n) Inspect the slot in the top of the cylinder (200) to make sure the square-bar wrench used for torquing did not raise any sharp edges or damage the threads.

(o) Remove any sharp edges in the wrench slot on top of the cylinder (200).




**Guide Collar and Cylinder**
**Figure 7-17**

C. All other Models Ending in -5, as well as those Ending in -2 and -7.

NOTE: Some models ending in -5 do not have a guide collar unit (240).

(1) Assemble the guide collar unit (240) and cylinder (200). Refer to Figure 7-17.

NOTE 1: The chamfer in the guide collar unit (240) must face the flange on the cylinder (200).

NOTE 2: For -5 models with piston guide rods (55) in the piston unit (50): assemble cylinder (200), guide collar unit (240), and piston and make sure everything moves freely.

CAUTION 1: DO NOT APPLY SEALANT TO THE THREADS OF THE CYLINDER.

CAUTION 2: HYDRAULIC SEALANT ADHESIVE CM134 IN THE CYLINDER COULD CONTAMINATE THE AIRCRAFT ENGINE OIL.

(2) Clean the threads on the hub unit and on the cylinder (200).

(3) Apply a bead of hydraulic sealant adhesive CM134 in the groove of the hub (500) where the cylinder O-ring (890) will fit.

(4) Install O-ring (890) into the cylinder chamfer, facing the hub (500).

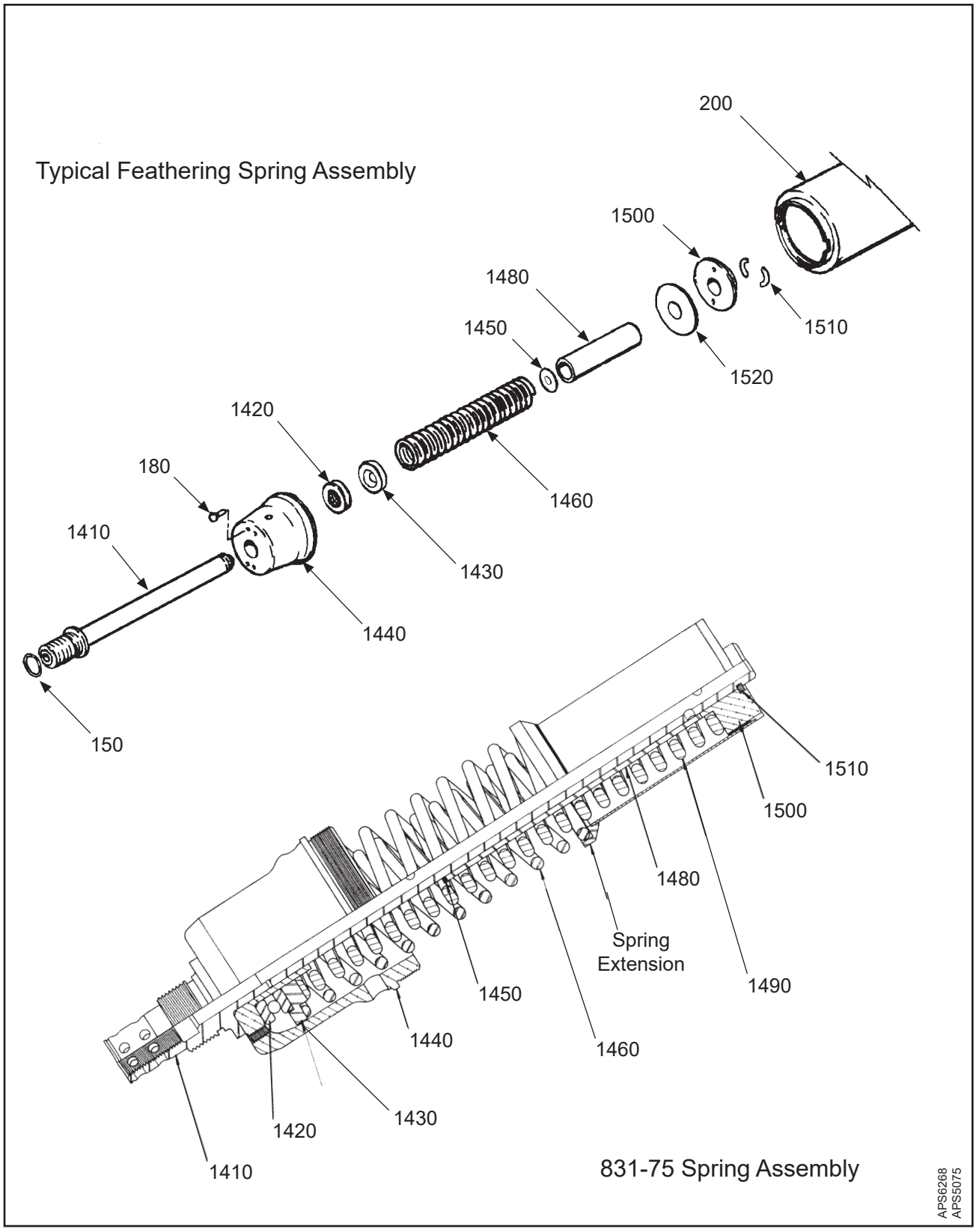
(5) Screw the cylinder (200) and guide collar unit (240) onto the hub unit (500).

(6) Use a square bar of applicable size to fit the slot supplied for it in the top of the cylinder (200), and torque the cylinder against the hub unit. Refer to the Torque Values table in the Fits and Clearances chapter of this manual.

(7) Inspect the inside of the cylinder (200) to make sure the O-ring (890) has not been forced out of position during the cylinder installation procedure.

(8) Inspect the slot in the top of the cylinder (200) to make sure the square-bar wrench used for torquing did not raise any sharp edges or damage the threads.

(9) Remove any sharp edges in the wrench slot on top of the cylinder (200).




**Feathering Spring Assembly**
**Figure 7-18**

11. Assembling the Feathering Spring

NOTE: A special fixture, TE59 or equivalent, is required for compressing the feathering spring assembly.

A. Procedure

NOTE: This is a general procedure that applies to all models included in this manual. Because there are several different types of feathering spring assemblies, some parts of the instructions may not specifically apply to the model being assembled.

CAUTION 1: FOR MODELS ENDING IN -2, THE PERMITTED CLEARANCE (AT LOW PITCH) BETWEEN THE WASHER (930) AND THE GUIDE COLLAR UNIT (240) IS 0.020-0.060 INCH (0.50-1.52 MM).

CAUTION 2: SEE THE REPAIR CHAPTER OF THIS MANUAL FOR INFORMATION ABOUT MANDATORY PITCH CHANGE ROD REPLACEMENT.

(1) Slide the spring retainer cup (1440) onto the pitch change rod (1410).

(2) Install the ball thrust bearing (1420) onto the pitch change rod (1410).

(3) If applicable, add the spring guide (1430).

(4) Add spring spacers (1450) as needed.

NOTE: The exact number of spacers needed is not known until the counterweight angle is set (later assembly procedure); however, the number of spacers needed will most likely be the same as the number of spacers removed during propeller disassembly.

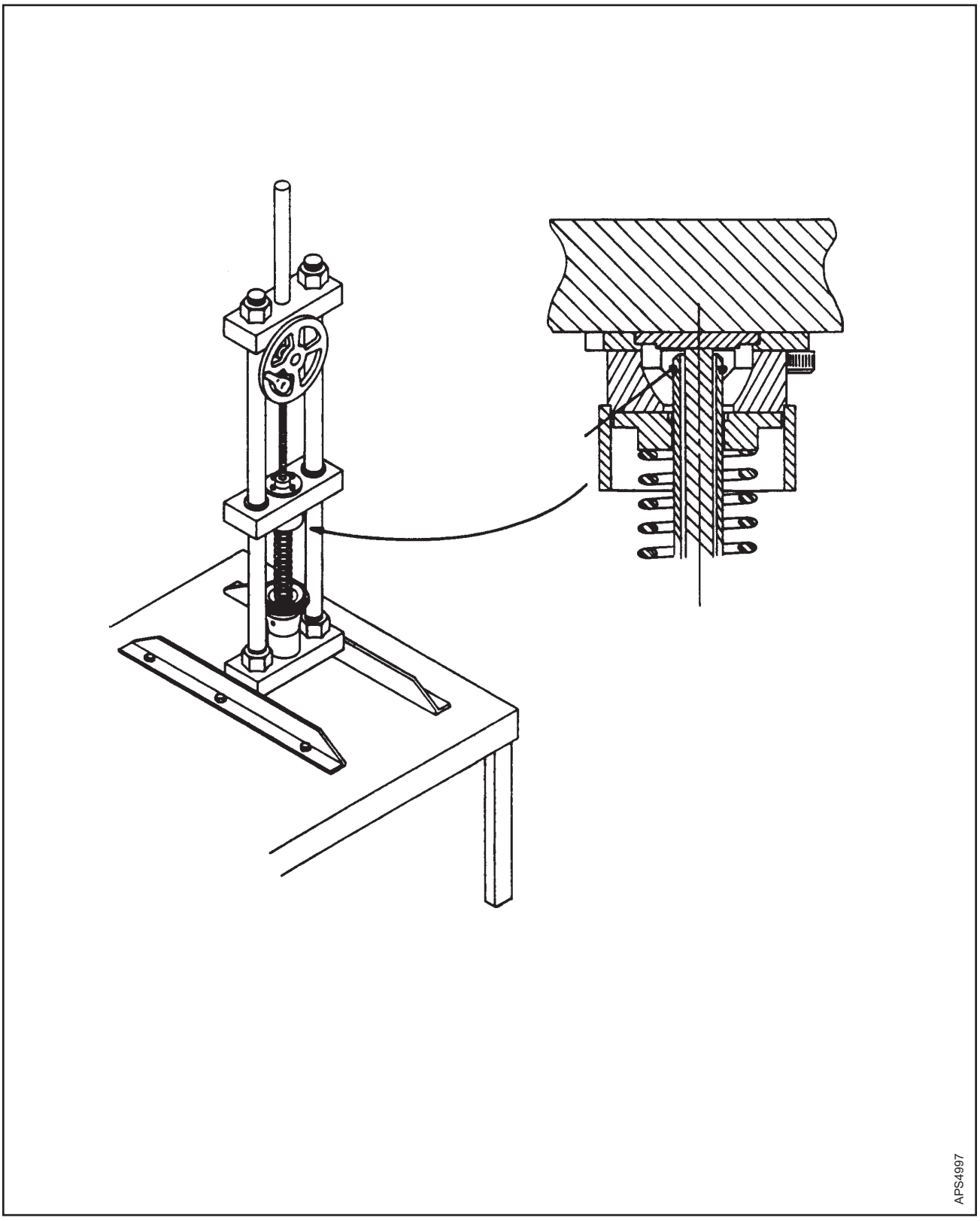
(5) Put the spring spacer tube (1480) on the pitch change rod (1410).

(6) Slide the feathering compression spring(s) (1460 and 1490) over the spring spacer tube (1480).

(7) If applicable, add the washer (1520).

NOTE: The 831-75 spring assembly, as shown in Figure 7-18, has a spring extension, which is installed onto the rear retainer (1500) before installing the rear retainer onto the spring.

(8) Put the rear retainer (1500) on the feathering compression spring(s) (1460 and 1490).




**Placing Spring Assembly in Special Fixture**
**Figure 7-19**

(9) Put the threaded end of the pitch change rod (1410) into the special fixture TE59 or equivalent. Refer to Figure 7-19.

WARNING: WHEN COMPRESSED, THE FEATHERING SPRING ASSEMBLY IS LOADED TO APPROXIMATELY 1000 POUNDS (454 KG) FORCE. ENSURE THE SAFETY OF EVERYONE IN THE VICINITY DURING ASSEMBLY PROCEDURES.

(10) Compress the feathering spring assembly enough to insert the split keeper (1510) that holds the spring in compression on the pitch change rod (1410).

NOTE 1: Apply oil or grease to each half of the rear split keeper (1510) to keep it in position until spring is decompressed.

NOTE 2: If you are using P/N A-867 split keepers, be sure they have a 45 degree chamfer, 0.030 inch (0.76 mm) deep, machined on the inside diameter, as shown in Figure 7-20.

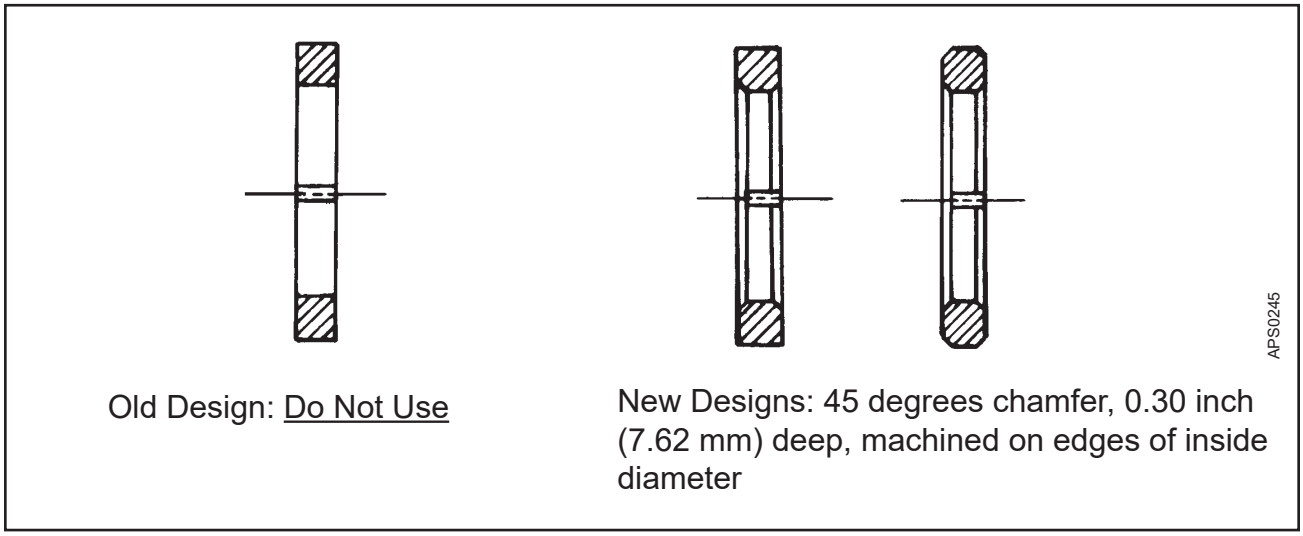
(11) Carefully decompress (unload) the feathering spring assembly, making sure the split keeper does not come out of its groove in the pitch change rod during decompression of the feathering spring.

(12) Apply a layer of anti-seize compound CM118 to the threads of the spring retainer cup (1440).

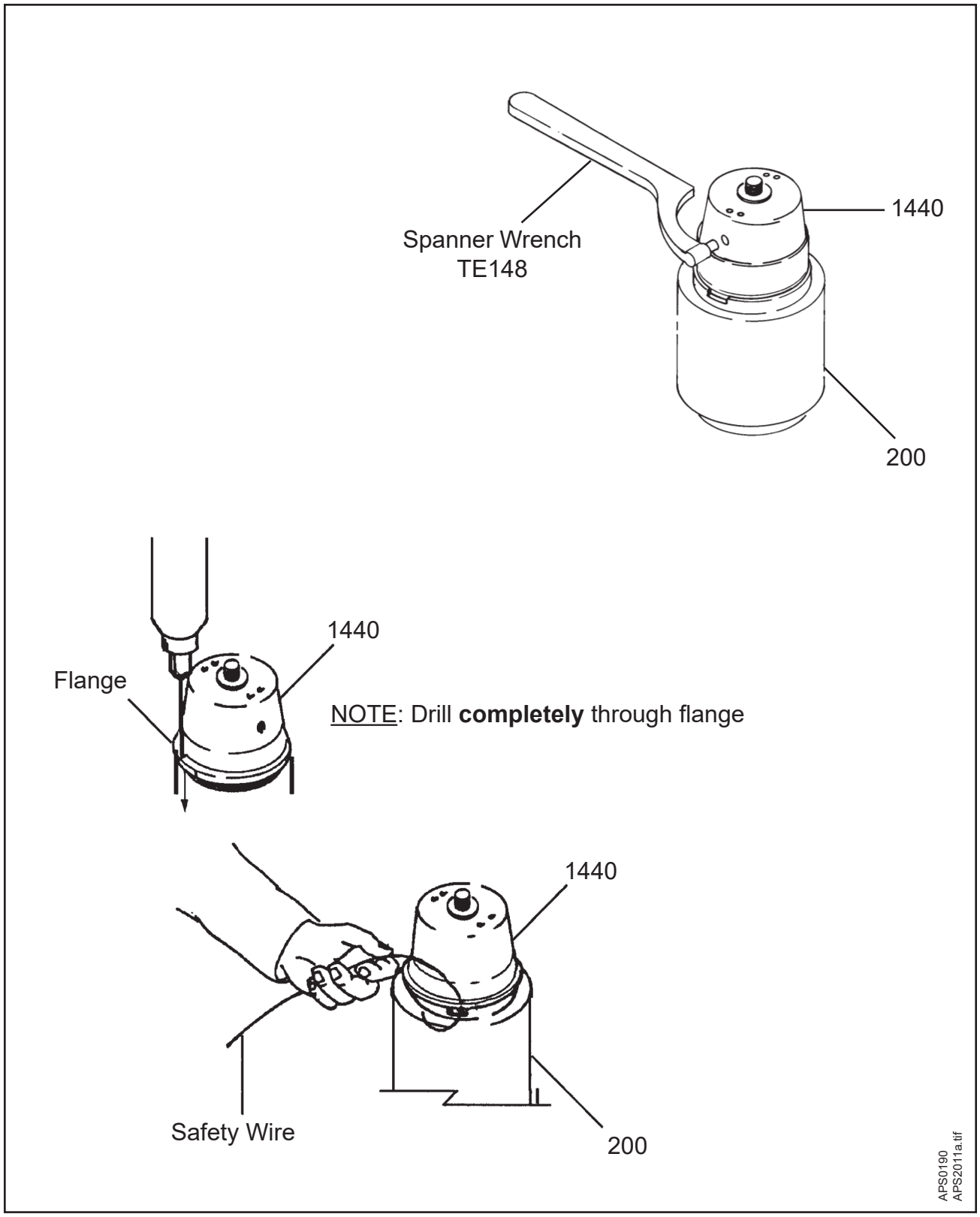
(13) Insert the feathering spring assembly into the cylinder (200).

(14) Using the special spanner wrench TE148 or locally procured strap wrench, thread the feathering spring into position in the cylinder.

(15) Tighten the assembly until it is snug.




**A-867 Split Keepers**
**Figure 7-20**




**Feathering Spring Assembly**
**Figure 7-21**

(16) Using a #42 size bit, drill through the flange of the spring retainer cup (1440) at the wrench slot in the cylinder (200). Refer to Figure 7-21.

(a) Drill in and down at an angle that exits on the other side of the flange.

(17) Insert 0.032 inch (0.81 mm) minimum diameter stainless steel wire CM131 through the drilled hole.

(a) Using three loops of wire, safety the feathering spring assembly.

(b) Tuck the “pigtail” into the slotted area.

NOTE: Steps (18) and (19) do not apply to models HC-B3TN-3K, -3M, -3N, or -3P.

(18) Install four hex head screws (180) in the spring retainer cup (1440). Turn the hex head screws all the way in; then, back them out to an even height of approximately three threads.

(19) Safety the hex head screws (180) with 0.032 inch (0.81 mm) minimum diameter stainless steel wire CM131. These screws might need to be adjusted later to obtain the correct feathering angle.

CAUTION: ENGINE OIL ENTERS THIS AREA OF THE ASSEMBLY. MAKE SURE ALL BITS OF METAL FROM DRILLING AND SAFETY WIRING ARE REMOVED.

(20) Using lubricant CM12, lubricate the pitch change rod O-ring (150).

(21) Install the pitch change rod O-ring (150) in the groove that is supplied for it.

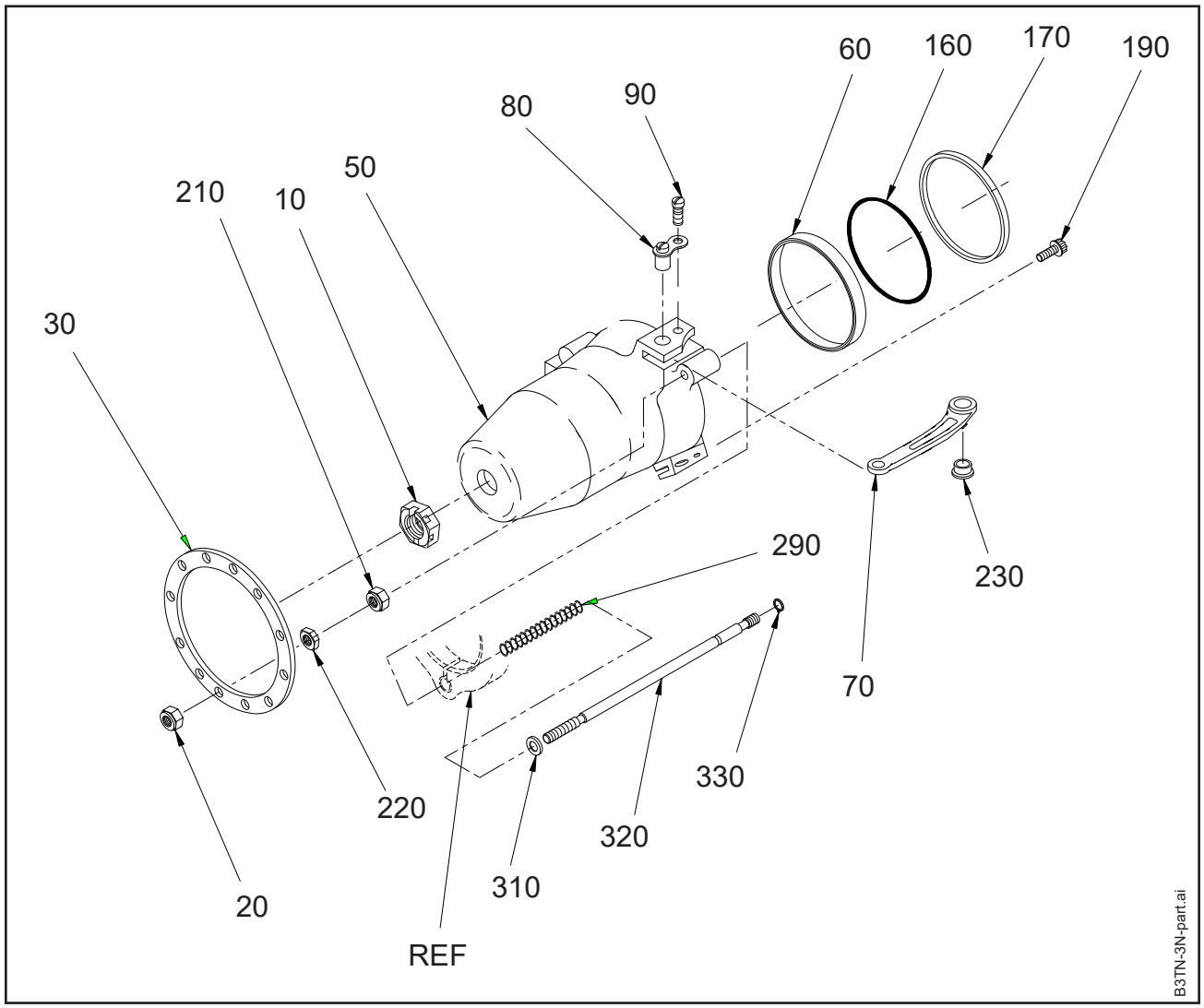
12. Piston Installation

A. Models Ending in -3. Refer to Figure 7-22.

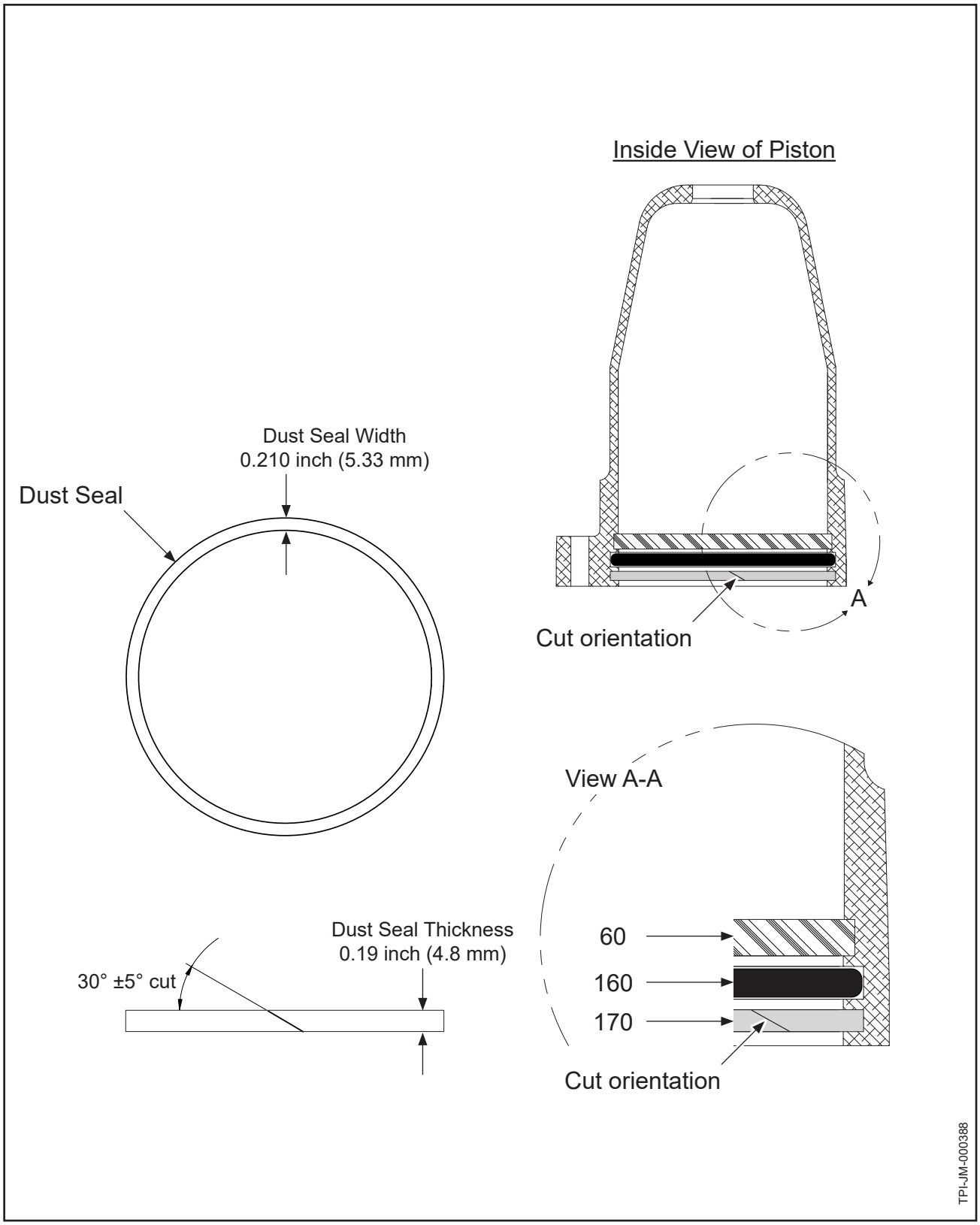
NOTE: Refer to Figure 7-23 for the installation and orientation of components installed in the piston unit (50).

(1) Using lubricant CM12, lubricate the piston O-ring (160).

(2) Carefully install the piston O-ring (160) in the groove supplied for it in the piston unit (50).




**Piston for Models Ending in -3**
**Figure 7-22**




**Piston Dust Seal Orientation**
**Figure 7-23**

CAUTION: MAKE SURE THAT THE PISTON DUST SEAL (170) IS FUZZ-FREE.

(3) Cut the necessary length of the piston dust seal material (170) on a 30 degree diagonal so that there is an overlap at the parting line with a smooth, fuzz-free surface.

(a) If the piston dust seal (170) has fuzz or long strands that could interfere with the operation of the O-ring, replace the piston dust seal.

(4) Soak the felt dust seal (170) in aviation grade turbine engine oil until it is completely saturated.

(a) Squeeze the excess oil from the piston dust seal (170).

CAUTION: MAKE SURE THAT THE DIAGONAL OVERLAP OF THE PISTON DUST SEAL (170) REMAINS VISIBLE AND DOES NOT ROTATE TO ITS SIDE AS IT IS INSTALLED IN THE GROOVE OF THE PISTON UNIT (50).

(5) Install the thinnest section of the piston dust seal (170) in the remaining piston OD groove.

(6) For models ending in -3(AE, AEY, K, KY, M, MY, N, P, PY, or Z) only:

CAUTION: EACH SCREW (190) MUST BE ENGAGED A MINIMUM OF 0.375 INCH (9.53 MM) INTO THE PISTON UNIT (50).

(a) Install three screws (190) in the base of the piston unit (50).

(b) Make sure that all three screws (190) are approximately an equal distance above the piston unit (50) base.

(7) Slide the piston unit (50) into position over the cylinder (200).

(8) Align the beta rods (320) with the holes supplied for them in the piston unit (50).

(9) Apply a thin layer of anti-seize compound CM118 in the hole of the free end of each link arm (70).

(10) Install the free end of each link arm (70) in the slot supplied for it in the piston unit (50).

(11) Install all link pin units (80) and safety screws (90).

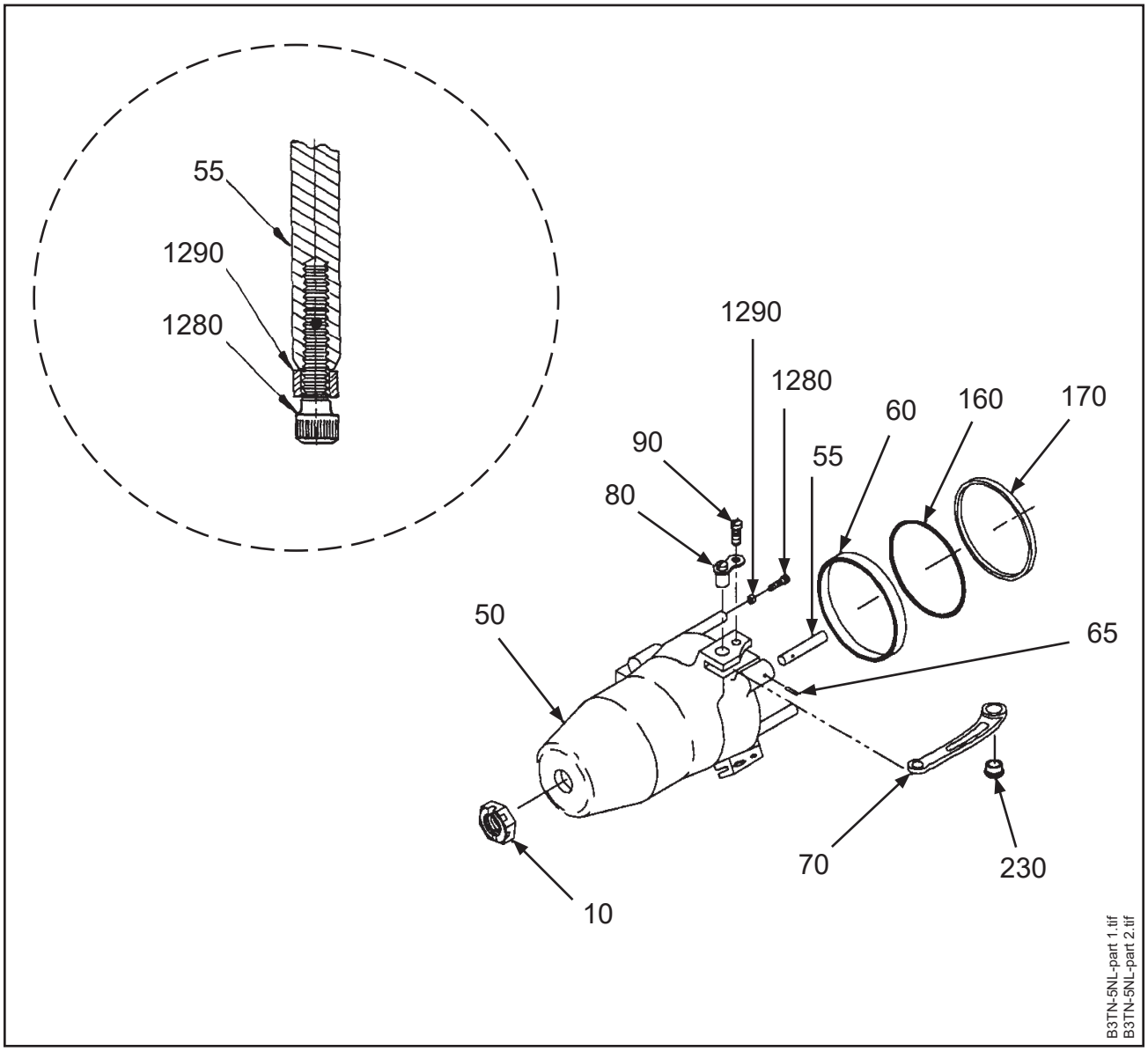
(12) Make sure that the guide collar unit (240) is seated solidly against the cylinder (200) at the correct radial location.

(a) If necessary, shift the guide collar unit (240) radially to align the piston unit (50) and the beta rods (320).

(13) When the necessary alignment is correct, use a 3/16 inch normal Allen wrench with a torquing adapter to tighten the Nylock socket head cap screw in the guide collar unit (240) in accordance with the Torque Values table in the Fits and Clearances chapter of this manual.

(14) Turn the large self-locking nut (10) onto the end of the pitch change rod (1410).

(15) Using a wrench on the nut (10) and a 5/8 inch socket on the pitch change rod (1410), torque the nut (10) in accordance with the Torque Values table in the Fits and Clearances chapter of this manual.




**Enlargement of Piston Guide Rod Area**
**Figure 7-24**

B. Models HC-B3TN-5M, -5ML, -5N, -5NL, -5P, -5SL, -5U, -5V, -5W and HC-B3MN-5L Refer to Figure 7-24.

NOTE 1: These models have start locks mounted on the guide collar as shown in Figure 7-16.

NOTE 2: Refer to Figure 7-23 for the installation and orientation of components installed in the piston unit (50).

CAUTION: USE ONLY A PISTON UNIT (50) WITH A-717 PISTON GUIDE RODS (55) THAT HAVE A CHAMFER AND RADIUS ON THE THREADED END. REFER TO FIGURE 5-3 IN THE CHECK CHAPTER OF THIS MANUAL.

(1) Using lubricant CM12, lubricate the piston O-ring (160).

(2) Carefully install the piston O-ring (160) in the groove supplied for it in the piston unit (50).

CAUTION: MAKE SURE THAT THE PISTON DUST SEAL (170) IS FUZZ-FREE.

(3) Cut the necessary length of the piston dust seal material (170) on a 30 degree diagonal so that there is an overlap at the parting line with a smooth, fuzz-free surface.

(a) If the piston dust seal (170) has fuzz or long strands that could interfere with the operation of the O-ring, replace the piston dust seal.

(4) Soak the felt dust seal (170) in aviation grade turbine engine oil until it is completely saturated.

(a) Squeeze the excess oil from the piston dust seal (170).

CAUTION: MAKE SURE THAT THE DIAGONAL OVERLAP OF THE PISTON DUST SEAL (170) REMAINS VISIBLE AND DOES NOT ROTATE TO ITS SIDE AS IT IS INSTALLED IN THE GROOVE OF THE PISTON UNIT (50).

(5) Install the thinnest section of the piston dust seal (170) in the remaining piston OD groove.

(6) Install the collar (1290), if necessary, and the screw (1280) into each piston guide rod (55) as shown in Figure 7-24.

(a) Use a collar (1290) only if there is more than 0.190 inch (4.82 mm) between the piston guide rod (55) end and the screw (1280) head.

(b) The piston guide rods (55) are not removed during overhaul. If a piston guide rod is damaged beyond the permitted serviceable limits specified in the Check chapter of this manual, repair the piston unit (50) in accordance with the Standard Repairs chapter of Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02).

(7) Slide the piston unit (50) into position over the cylinder (200).

(8) Align the piston guide rod (55) with the hole supplied for it in the guide collar unit (240).

(9) Apply a thin layer of anti-seize compound CM118 in the hole of the free end of each link arm (70).

(10) Install the free end of each link arm (70) in the slot supplied for it in the piston unit (50).

CAUTION: MAKE SURE THAT THE CORRECT SCREW (90) IS INSTALLED AND THAT ADEQUATE THREADS ARE AVAILABLE IN THE PISTON UNIT (50) TO HOLD THE SCREW IN PLACE. AT LEAST THREE THREAD LENGTHS MUST BE ENGAGED.

(11) Install each link pin unit (80) and safety screw (90).

(12) Seat the guide collar unit (240) solidly against the cylinder (200) at the correct radial location to assist in aligning the piston unit (50).

(a) If necessary, shift the guide collar unit (240) radially to align the piston unit (50) and the beta rods (320).

(13) When the necessary alignment is correct, use a 3/16 inch Allen wrench with a torquing adapter to tighten the socket head cap screw (280) in the guide collar unit (240) in accordance with the Torque Values table in the Fits and Clearances chapter of this manual.

(14) Turn the large self-locking nut (10) onto the end of the pitch change rod (1410).

(15) Using a wrench on the nut (10) and a one inch socket on the pitch change rod, torque the nut (10) in accordance with the Torque Values table in the Fits and Clearances chapter of this manual.

C. All other Models Ending in -5 and -2

NOTE 1: The start locks on HC-B3TN-5( ) propeller models described in this section are attached to the bulkhead. The A-3021-4 or -4L piston used can have A-717 guide rods that either do or do not have a chamfer and radius on the threaded end or can have any combination of the two rod configurations. Refer to Figure 5-3 in the Check chapter of this manual.

NOTE 2: Refer to Figure 7-23 for the installation and orientation of components installed in the piston unit (50).

(1) For -2 models only:

(a) Using lubricant CM12, lubricate the piston O-ring (160).

(b) Carefully install the piston O-ring (160) in the groove supplied for it in the piston unit (50).

CAUTION: MAKE SURE THAT THE PISTON DUST SEAL (170) IS FUZZ-FREE.

(2) Cut the necessary length of the piston dust seal material (170) on a 30 degree diagonal so that there is an overlap at the parting line with a smooth, fuzz-free surface.

(a) If the piston dust seal (170) has fuzz or long strands that could interfere with the operation of the O-ring, replace the piston dust seal.

(3) Soak the felt dust seal (170) in aviation grade turbine engine oil until it is completely saturated.

(a) Squeeze the excess oil from the piston dust seal (170).

CAUTION: MAKE SURE THAT THE DIAGONAL OVERLAP OF THE PISTON DUST SEAL (170) REMAINS VISIBLE AND DOES NOT ROTATE TO ITS SIDE AS IT IS INSTALLED IN THE GROOVE OF THE PISTON UNIT (50).

(4) Install the thinnest section of the piston dust seal (170) in the remaining piston OD groove.

(5) Slide the piston unit (50) into position over the cylinder (200).

(6) Except for propeller models HC-B3TN-5C, -5D, -5CL, and -5DL, align the piston guide rod (55) with the hole supplied for it in the guide collar unit (240).

(7) Install the washer (120), jam nut (110) and screw (100) in the end of each of the piston guide rods (55).

(8) Apply a thin layer of anti-seize compound CM118 in the hole of the free end of each link arm (70).

(9) Install the free end of each link arm (70) in the slot supplied for it in the piston.

CAUTION: MAKE SURE THAT THE CORRECT SCREW (90) IS INSTALLED AND THAT ADEQUATE THREADS ARE AVAILABLE IN THE PISTON UNIT (50) TO HOLD THE SCREW IN PLACE. AT LEAST THREE THREAD LENGTHS MUST BE ENGAGED.

(10) Install each link pin unit (80) and safety screw (90).

(11) Except for propeller models HC-B3TN-5C, -5D, -5CL, and -5DL, seat the guide collar unit (240) solidly against the cylinder (200) at the correct radial location to assist in aligning the piston unit (50).

(a) If necessary, shift the guide collar unit (240) radially to align the piston guide rod (55).

(12) When the necessary clearances are correct, use a 3/16 inch Allen wrench with a torquing adapter to tighten the socket head cap screw (280) in the guide collar unit (240) in accordance with the Torque Value table in the Fits and Clearances chapter of this manual.

(13) Turn the large self-locking nut (10) onto the end of the pitch change rod (1410).

(14) Using a wrench on the nut (10) and a 5/8 inch socket on the pitch change rod (1410), torque the nut (10) in accordance with the Torque Values table in the Fits and Clearances chapter of this manual.

D. All other Models Ending in -7

NOTE: Refer to Figure 7-23 for the installation and orientation of components installed in the piston unit (50).

(1) Using a locally fabricated plug, seal the end of the opening for the beta valve, so that the air pressure to the propeller assembly can be maintained.

(2) Install the spring assembly

(a) Slide the spring assembly (1400) into the cylinder (200).

(b) Install the split keeper (960) between the cylinder (200) and the front spring retainer cup (1440).

(c) Slide the split keeper (960) into the recess in the cylinder (200).

(d) Pull the spring retainer cup (1440) tight against the split keeper (960).

(e) Install the retaining ring (950).

(f) Install the ring retention plate screws (940) and torque them in accordance with the Torque Values table in the Fits and Clearances chapter of this manual.

(g) Safety the screws (940) with 0.032 inch (0.81 mm) minimum diameter stainless steel safety wire. (Two screws for each safety).

(3) Using lubricant CM12, lubricate the piston O-ring (160).

(4) Carefully install the piston O-ring (160) in the groove supplied for it in the piston unit (50).

CAUTION: MAKE SURE THAT THE PISTON DUST SEAL (170) IS FUZZ-FREE.

(5) Cut the necessary length of the piston dust seal material (170) on a 30 degree diagonal so that there is an overlap at the parting line with a smooth, fuzz-free surface.

(a) If the piston dust seal (170) has fuzz or long strands that could interfere with the operation of the O-ring, replace the piston dust seal.

(6) Soak the felt dust seal (170) in aviation grade turbine engine oil until it is completely saturated.

(a) Squeeze the excess oil from the piston dust seal (170).

CAUTION: MAKE SURE THAT THE DIAGONAL OVERLAP OF THE PISTON DUST SEAL (170) REMAINS VISIBLE AND DOES NOT ROTATE TO ITS SIDE AS IT IS INSTALLED IN THE GROOVE OF THE PISTON UNIT (50).

(7) Install the thinnest section of the piston dust seal (170) in the remaining piston OD groove.

(8) Slide the piston unit (50) into position over the cylinder (200).

(9) Align the piston guide rod (55) with the hole supplied for it in the guide collar unit (240).

(10) Apply a thin layer of anti-seize compound CM118 in the hole of the free end of each link arm (70).

(11) Install the free end of each link arm (70) in the slot supplied for it in the piston unit (50).

(12) Install each link pin unit (80) through the large hole in each side of the piston unit (50) and through the hole in each link arm (70).

(13) Push each link pin unit (80) flush with the piston unit (50).

CAUTION: MAKE SURE THAT THE CORRECT SCREW (90) IS INSTALLED AND THAT ADEQUATE THREADS ARE AVAILABLE IN THE PISTON UNIT (50) TO HOLD THE SCREW IN PLACE. AT LEAST THREE THREAD LENGTHS MUST BE ENGAGED.

(14) Install the fillister head screw (90) through each link pin unit (80) and into the piston unit (50).

(15) Safety the fillister head screws (90).

(16) Seat the guide collar unit (240) solidly against the cylinder (200) at the correct radial location to assist in aligning the piston unit (50).

(a) If necessary, shift the guide collar unit (240) radially to align the piston unit (50) and the link arms (70).

(17) Torque the socket head cap screw (280) into the guide collar unit (240) to attach it in position on the cylinder (200) in accordance with the Torque Values table in the Fits and Clearances chapter of this manual.

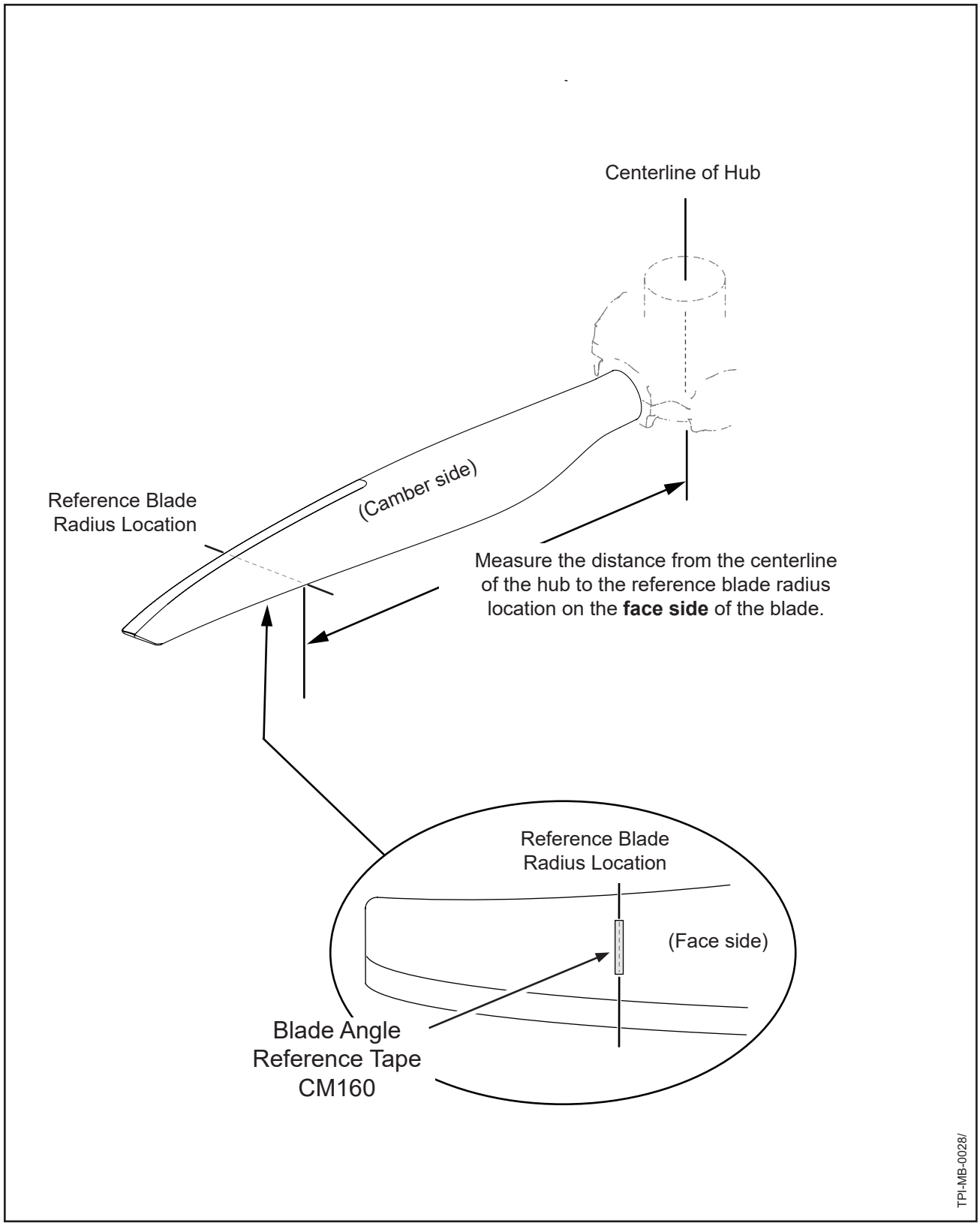
(18) Turn the large self-locking nut (10) onto the end of the pitch change rod (1410).

(19) Using a wrench on the nut and a 5/8 inch socket on the pitch change rod, torque the nut (10) in accordance with the Torque Values table in the Fits and Clearances chapter of this manual.

CAUTION: MAKE SURE THAT THE FLAT EDGE OF EACH WASHER (120) FACES THE HUB (500). IF NOT ALIGNED CORRECTLY THE WASHER (120) WILL DAMAGE THE HUB (500).

(20) Install the socket head screw (100), washer (120), and jam nut (110) onto the end of each of the piston guide rods (55).

(21) When the required clearances are correct, use a 3/16 inch Allen wrench with a torquing adapter to tighten the socket head cap screw (280) in the guide collar unit (240) in accordance with the Torque Value table in the Fits and Clearances chapter of this manual.




**Blade Angle Reference Tape**
**Figure 7-25**

E. Blade Angle Reference Tape Application (Optional) (Rev. 2)

CAUTION: DO NOT CONFUSE REFERENCE BLADE RADIUS WITH BLADE STATION. REFERENCE BLADE RADIUS AND BLADE STATION OF THE SAME NUMBER MAY NOT ALWAYS INDICATE THE SAME LOCATION ON THE BLADE.

(1) Reference blade radius is measured from the center of the propeller hub to a predetermined reference location on the blade for blade angle measurement.

(2) Blade stations are used during the repair or overhaul process of a blade to define a blade span location for dimensional measurement.

(3) Establish a reference blade radius location

(a) Refer to the Aircraft Type Certificate Data Sheet or the Hartzell Propeller Inc. Application Guide Manual 159 (61-02-59), for the reference blade radius location specified for the applicable aircraft installation.

(b) Beginning with blade one, measure from the center of the propeller hub to the reference blade radius location specified. Refer to Figure 7-25.

(c) Apply a piece of reference tape CM160 to the face side of the blade at the reference blade radius location, perpendicular to the blade centerline as shown in Figure 7-25.

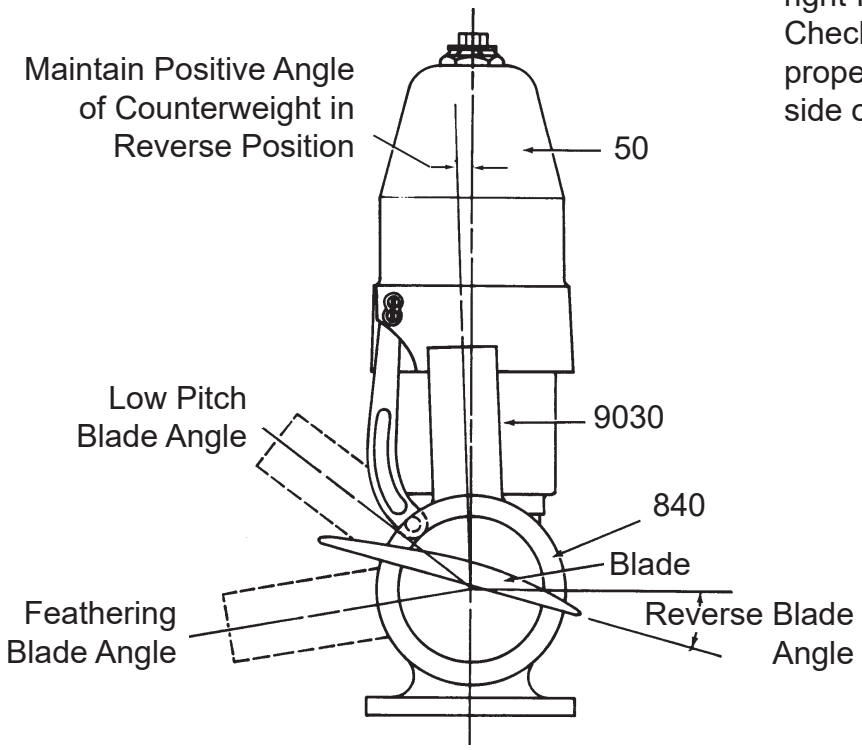
1 Put the reference tape CM160 on the blade so that the reference blade radius location runs through the center line of the tape.

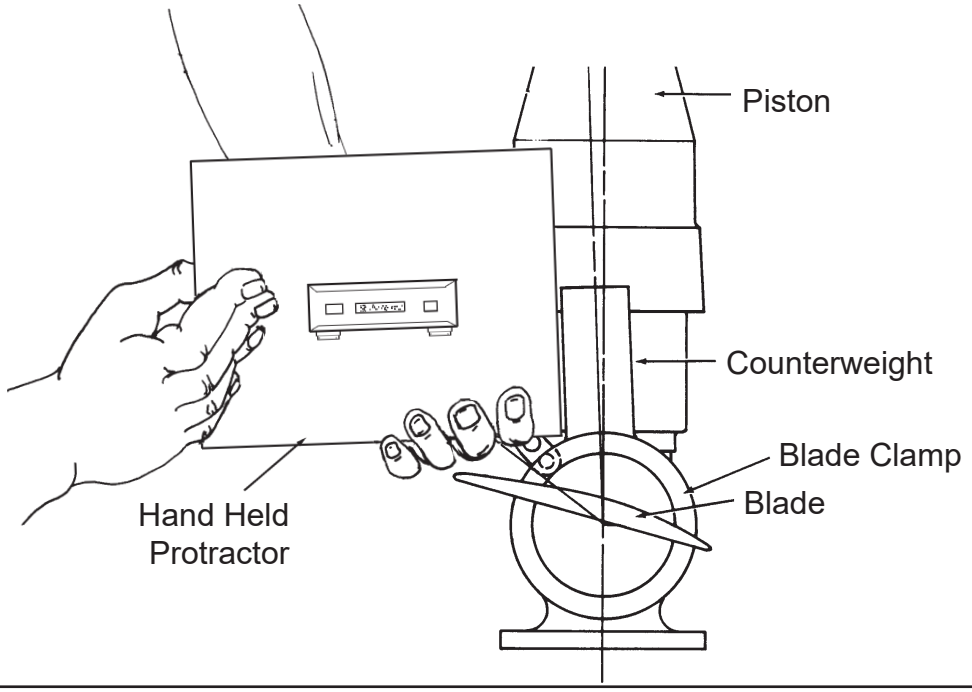
(d) Do steps (3)(b) and (3)(c) again for the remaining blades in the hub assembly.

(e) Put a pattern cut-out over each blade angle reference tape CM160.

(f) Spray each piece of reference tape CM160 with clear lacquer CM129 to prevent peeling.

NOTE: These illustrations depict a right-hand (rotation) propeller. Check a left-hand (rotation) propeller from the opposite side of the counterweight.




**Correct Angle of Counterweight Relative to Axis of Piston**
**Figure 7-26**

13. Setting Counterweight Angle and Blade Pitch

A. All models except those ending in -2 and -7

WARNING: TO PREVENT THE PROPELLER FROM "STICKING" IN REVERSE, SET CORRECT COUNTERWEIGHT ANGLE WITH REFERENCE TO THE PROPELLER CENTER LINE WHEN THE PISTON IS IN FULL REVERSE POSITION. REFER TO FIGURE 7-26. FOR CORRECT ANGLE, REFER TO HARTZELL PROPELLER INC. APPLICATION GUIDE MANUAL 159 (61-02-59).

CAUTION: AT THIS STAGE OF ASSEMBLY THE OUTBOARD CLAMP BOLTS HAVE NOT BEEN TIGHTENED, BECAUSE ADJUSTMENTS OF COUNTERWEIGHT ANGLE AND BLADE PITCH USUALLY INVOLVE SOME DISASSEMBLY PROCEDURE.

NOTE: Counterweight angles are not adjustable on models ending with -7. For those models ending with -7, the angles are determined by contact between the piston rod washers and the rear most surface of the guide collar.

(1) Apply pressure to the piston through the rotatable fixture on the propeller assembly table.

(2) Force the piston to full reverse position.

(3) Use hand-held protractor to measure the angle of the counterweight relative to the axis of the piston as shown in Figure 7-26.

NOTE: The blade-to-blade counterweight angle tolerance is 1.5 degrees.

CAUTION 1: FOR THE APPLICABLE COUNTERWEIGHT ANGLE REQUIRED, REFER TO THE APPLICABLE AIRCRAFT TYPE CERTIFICATE DATA SHEET OR HARTZELL PROPELLER INC. APPLICATION GUIDE MANUAL 159 (61-02-59).

CAUTION 2: AS INDICATED IN FIGURE 7-26, THE POSITIVE ANGLE, USUALLY 2 DEGREES OR MORE, IS FOR REFERENCE ONLY. DO NOT CONSIDER IT FOR THE PRESCRIBED ANGLE.

(4) Adjust the counterweight angle, if necessary, by adding or removing one spring spacer (1450) forward of the spring spacer tube (item 1480 in Figure 7-18) in the feathering spring assembly to increase or decrease the angle by approximately 1 degree.

NOTE: The quantity and thickness of counterweight adjustment spacers needed at assembly will probably be the same as the quantity and thickness of the spacers removed at disassembly. If spacers are added at assembly, use the correct thickness and quantity specified for the required change in angle.

B. Models Ending in -2

(1) Apply pressure to the piston through the rotatable fixture on the propeller assembly table.

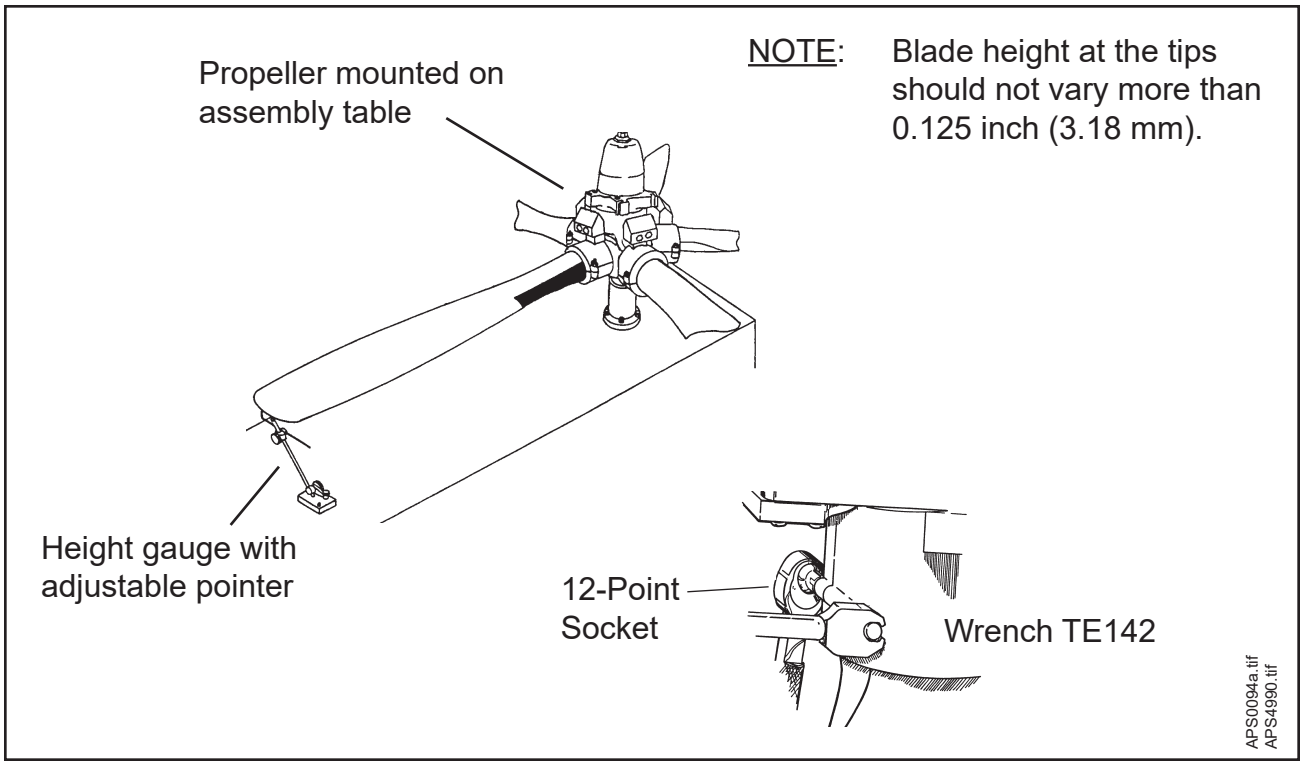
(2) Move the piston to the low pitch position.

(3) Measure the clearance between the washer (930) and the guide collar unit (240).

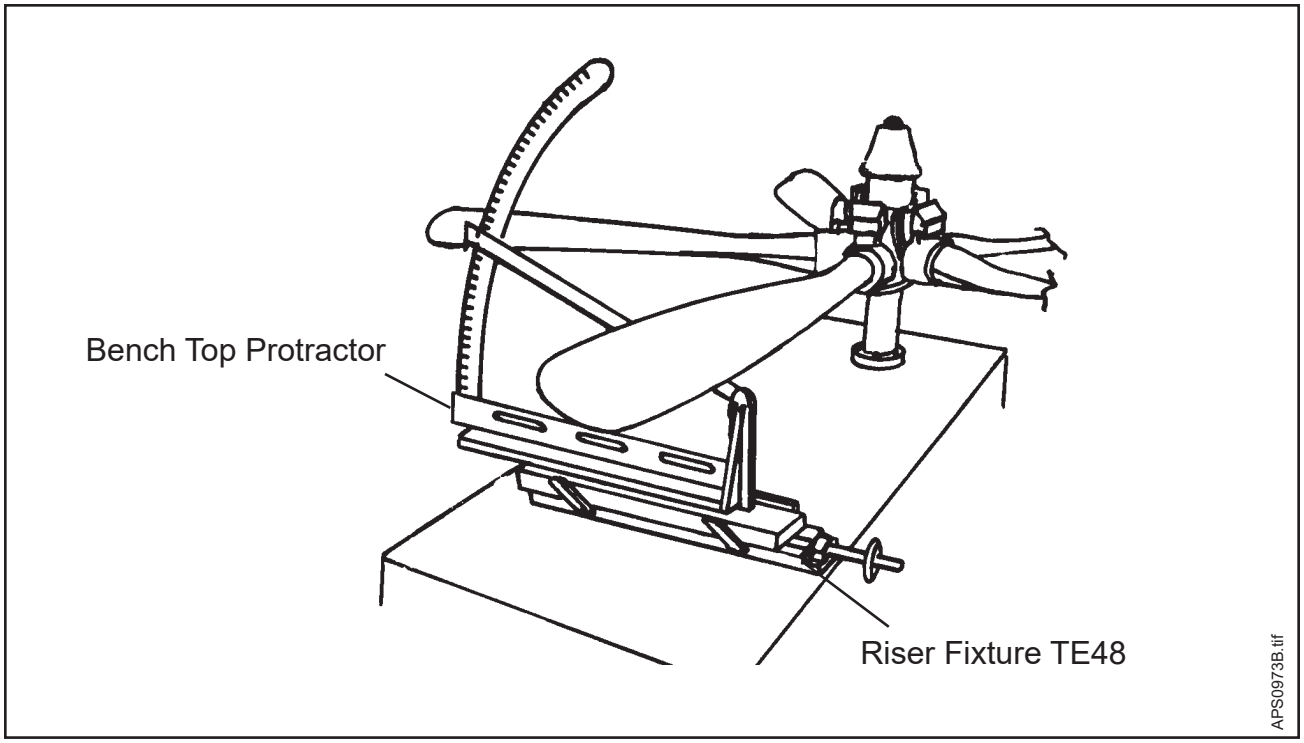
(a) The permitted clearance (at low pitch) between the washer (930) and the guide collar unit (240) is 0.020-0.060 inch (0.50-1.52 mm).

(b) Adjust the clearance, if necessary, by adding or removing spring spacers (1450) forward of the spacer sleeve (1480). Refer to Figure 7-18.

NOTE: The quantity and thickness of spring spacers (1450) at assembly will probably be the same quantity and thickness of spring spacers removed at disassembly.




**Blade Angle and Clamp Torque**
**Figure 7-27**




**Setting Reverse Blade Angle**
**Figure 7-28**

14. Setting the Reverse Angle of the Blades

A. Procedure for all models

(1) Keep pressure applied to the piston unit (50) through the rotatable fixture on the propeller assembly table.

(2) Keep the piston in reverse pitch position.

(3) Use a bench-top protractor and special riser fixture as shown in Figure 7-28, to set the correct reverse angle on Blade One at the reference blade radius specified in the Hartzell Propeller Inc. Application Guide Manual 159 (61-02-59), or aircraft type certificate.

NOTE: For the specified reverse blade angle, blade to blade tolerance at reverse blade angle, and reference blade radius required for measurement, refer to the aircraft type certificate data sheet or Hartzell Propeller Inc. Application Guide Manual 159 (61-02-59).

(4) Use wrench TE142, as shown in Figure 7-27, to hold nut (780), and a standard 12-point socket to torque the outboard clamp bolts (770), in accordance with the Torque Values table in the Fits and Clearances chapter of this manual.

(a) While torquing the outboard clamp bolts, make sure the gasket position is held in order to supply a sufficient grease seal.

(b) Make sure a nearly equal gap between the two halves is held after final torque is applied.

(5) Do this reverse angle setting procedure and clamp bolt torquing again for each of the other blades.

NOTE: A blade to blade tolerance is applicable when setting the reverse blade angle. A blade-to-blade tolerance is also applicable when setting the low pitch (-3 propellers) or the floating pitch (-5 and -7 propellers) and feather blade angle (all models). It is recommended that a minimum blade-to-blade tolerance be met in the reverse blade angle. This will help to make sure all blade angle tolerance requirements for each propeller are met.

(6) Make sure of the correct blade angle setting and counterweight angle by cycling the propeller from reverse to feather, and back to reverse. Make sure that the reverse blade angle settings and counterweight angle are correct.

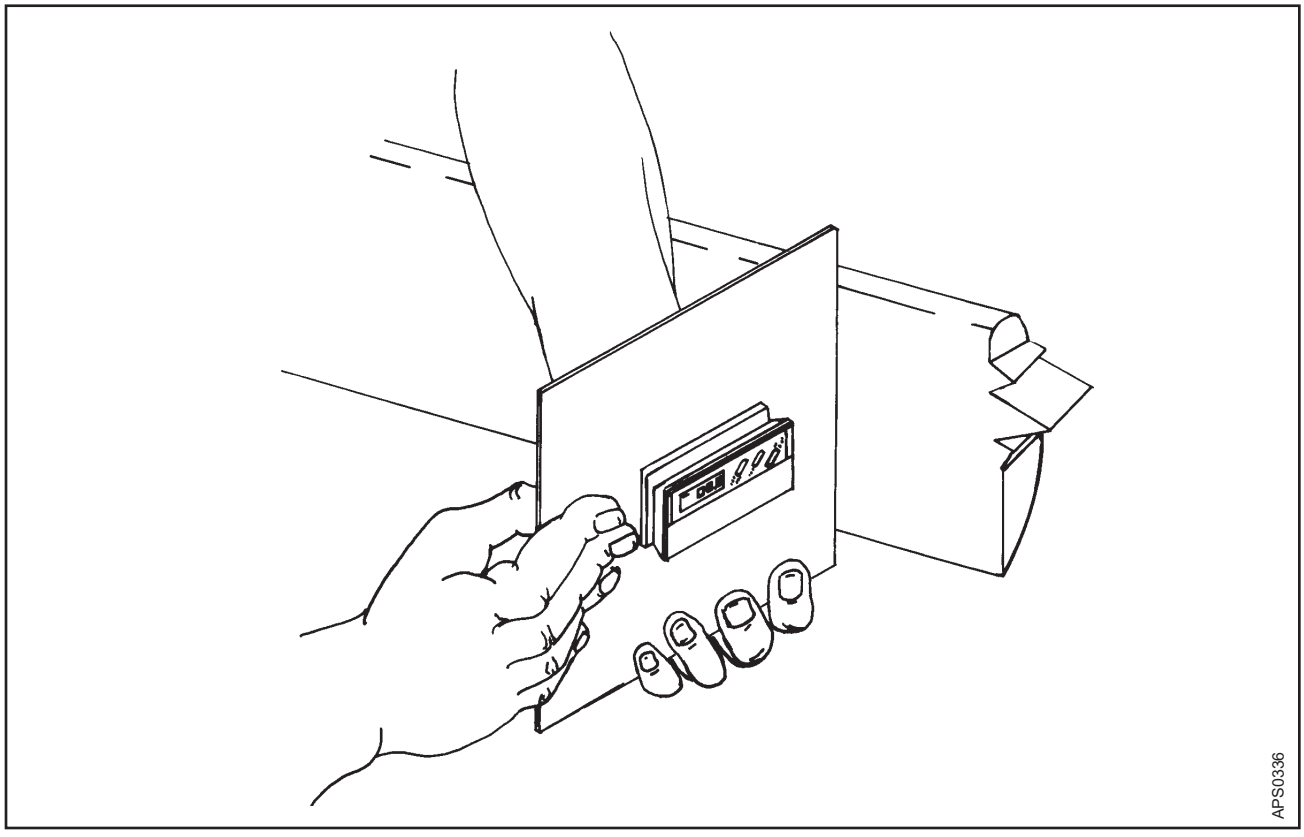
(7) If the counterweight angle is incorrect, remove and disassemble the spring. Add or remove the spring spacers (1450) as needed to get the correct counterweight angle. If necessary, reset the reverse and feather angles after adjusting the counterweight angle.

15. Measuring the Blade Track

A. Procedure for all models

(1) Turn the propeller on the rotatable fixture and measure the height at the tip of each blade using a gauge and adjustable pointer. Refer to Figure 7-27.

NOTE: Blade heights at the tip must not vary more than 0.125 inch (3.18 mm).




**Checking Feathering Angle of Blade**
**Figure 7-29**

16. Setting the Feathering Angle of Blades

CAUTION: INSTRUCTIONS AND PROCEDURES IN THIS CHAPTER MAY INVOLVE PROPELLER CRITICAL PARTS. REFER TO THE INTRODUCTION CHAPTER OF THIS MANUAL FOR INFORMATION ABOUT PROPELLER CRITICAL PARTS. REFER TO THE ILLUSTRATED PARTS LIST IN THIS MANUAL FOR IDENTIFICATION.

A. All Models except those Ending in -3 (AE, AEY, AF, K, KY, M, MY, N, P, PY, or Z)

(1) Release the air pressure to the rotatable fixture.

(2) Use a hand-held protractor to measure the feathering angle on Blade One at the reference blade radius specified in the Hartzell Propeller Inc. Application Guide Manual 159 (61-02-59), or aircraft type certificate. Refer to Figure 7-29.

NOTE: For the specified requirements for feathering angle and blade-to-blade tolerance at feather blade angle, refer to the applicable aircraft type certificate data sheet or Hartzell Propeller Inc. Application Guide Manual 159 (61-02-59).

(3) Adjust the feathering angle as necessary by removing the piston and turning the feathering stop screws (180).

NOTE 1: Before removing the piston, mark a piston ear using a grease pencil CM162, and match mark the guide collar to make sure that the piston is reinstalled in the same position.

NOTE 2: Turning a stop screw in one turn will increase the feathering angle approximately 1.5 degrees.

Turning a stop screw out one turn will decrease the feathering angle approximately 1.5 degrees.

(4) If applicable, re-safety the feathering stop screws together, two by two.

CAUTION: MAKE SURE THAT THE GREASE PENCIL MARK ON THE PISTON EAR ALIGNS WITH THE MATCH MARK ON THE GUIDE COLLAR. FAILURE TO ALIGN GREASE PENCIL MARKS MAY RESULT IN A CHANGE OF BLADE ANGLES, DUE TO NORMAL STACK-UP TOLERANCES BETWEEN THE LINK PIN HOLES AND THE LINK ARMS.

(5) Reinstall the piston unit (50).

(6) Measure the feather blade angle of all the blades again.

(7) Measure the blade to blade tolerance at feather blade angle.

B. Models Ending in -3 (AE, AEY, AF, AFY, K, KY, M, MY, N, P, PY, or Z) with External Feather Stops

(1) Release pressure to the piston.

(2) Measure feather angle. Refer to Figure 7-29.

(3) With the propeller in full reverse, adjust feather angle by turning all three adjusting screws (190). Turning screws into piston will increase angle; backing screws out will decrease angle.

17. Installing Spinner Bulkhead

CAUTION: INSTRUCTIONS AND PROCEDURES IN THIS CHAPTER MAY INVOLVE PROPELLER CRITICAL PARTS. REFER TO THE INTRODUCTION CHAPTER OF THIS MANUAL FOR INFORMATION ABOUT PROPELLER CRITICAL PARTS. REFER TO THE ILLUSTRATED PARTS LIST IN THIS MANUAL FOR IDENTIFICATION.

A. Start Lock Unit Assembly

(1) Insert the start lock pin (1060) into the start lock bracket (1020).

(2) Insert the compression spring (1070) into the start lock bracket (1020), against the start lock pin (1060).

(3) Compress the compression spring (1070) and install the washer (1080) on top of the compression spring.

(4) Insert the cotter pin (1090) into the start lock bracket (1020) to retain the washer (1080), compression spring (1070), and start lock pin (1060) in the start lock bracket.

(5) Install the cotter pin (1090).

NOTE: When installing the cotter pin (1090), do not permit it to roll over the forward part of the start lock bracket (1020), or the start lock pin (1060) may contact the clamp (840).

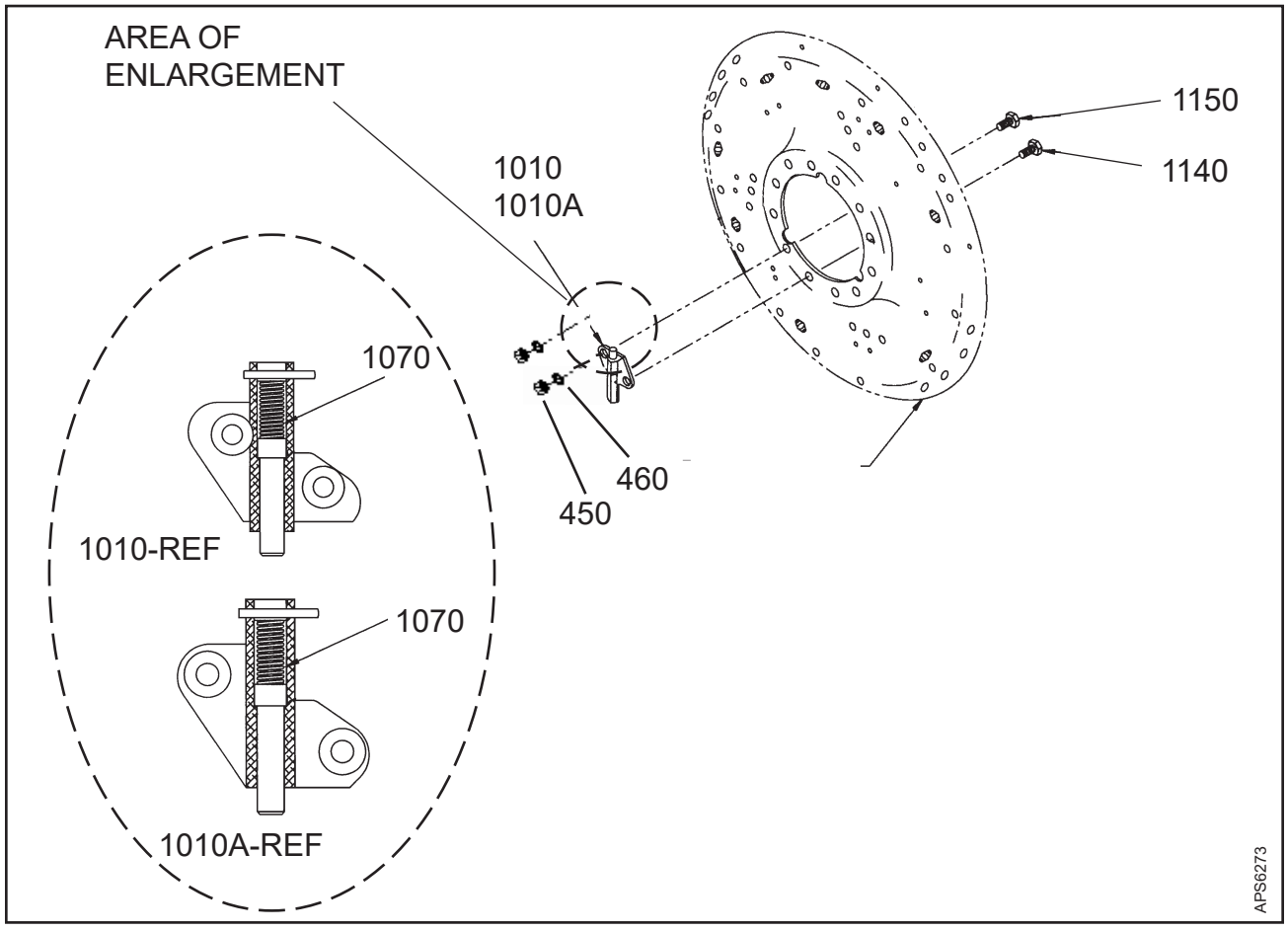
B. Models Ending in -3

(1) Using a suitable sling and overhead hoist, lift the propeller assembly from the rotatable fixture on the assembly table and into a vertical position.

CAUTION 1: IF THE PROPELLER IS EQUIPPED WITH AN ICE PROTECTION SYSTEM, APPLICABLE INSTRUCTIONS AND TECHNICAL INFORMATION CAN BE FOUND IN HARTZELL PROPELLER INC. ICE PROTECTION SYSTEM MANUAL 180 (30-61-80) FOR THOSE SYSTEM COMPONENTS SUPPLIED BY HARTZELL PROPELLER INC. ICE PROTECTION SYSTEM COMPONENTS NOT SUPPLIED BY HARTZELL PROPELLER INC. ARE CONTROLLED BY THE APPLICABLE TC OR STC HOLDER'S INSTRUCTIONS FOR CONTINUED AIRWORTHINESS (ICA).

CAUTION 2: USE APPROPRIATE LENGTH HEX HEAD BOLTS (870) TO MAINTAIN CLEARANCE WITH THE BLADE CLAMP.

(a) Attach the bulkhead unit to the spinner mounting plate (380) using the specified hex head bolts (870), washers (460) and nuts (450).




**Start Lock Units for HC-B3TN-3S, -3( )Y, and HC-B3( )W-3Y**
**Figure 7-30**

(b) Torque the bolts (870) in accordance with the Torque Values table in the Fits and Clearances chapter of this manual.

(2) For propeller models HC-B3TN-3S, -3( )Y, and HC-B3( )W-3Y, where a start lock kit is installed:

(a) Attach the bulkhead unit to the spinner mounting plate (380) using six hex head bolts (870).

(b) Torque the hex head bolts (870) in accordance with the Torque Values table in the Fits and Clearances chapter of this manual.

(c) Safety the hex head bolts (870) with stainless steel wire CM131.

(d) Attach the three start lock units (1010 and 1010A) to the spinner bulkhead using the specified screws or bolts. Refer to Figure 7-30.

(e) Models with a de-ice system require button head socket screws (1140 and 1150) to attach the start lock units to the bulkhead.

1 If the A-2070-( ) button head socket screw (1140) is recessed in the nut (450), substitute a longer A-2070-( ) screw.

CAUTION: MAKE SURE THAT THE BETA RING (420) DOES NOT CONTACT THE HEADS OF THE A-2070-( ) SCREWS.

2 If an A-2070-( ) screw contacts the clamp (840), use a washer (1190) under the head of the screw. Make sure that the beta ring (420) does not contact the heads of the A-2070-( ) screws.

CAUTION: MAKE SURE THAT THE BETA RING (420) DOES NOT CONTACT THE HEADS OF THE A-2070-( ) SCREWS.

3 If the A-2070-10 button head socket screw (1150) is recessed in the nut, substitute A-2070-9 screw. Make sure that the beta ring (420) does not contact the heads of the screws.

(f) For propeller models HC-B3TW-3Y with no de-ice system use hex head bolts (1140 and 1150) to attach the start lock units to the bulkhead.

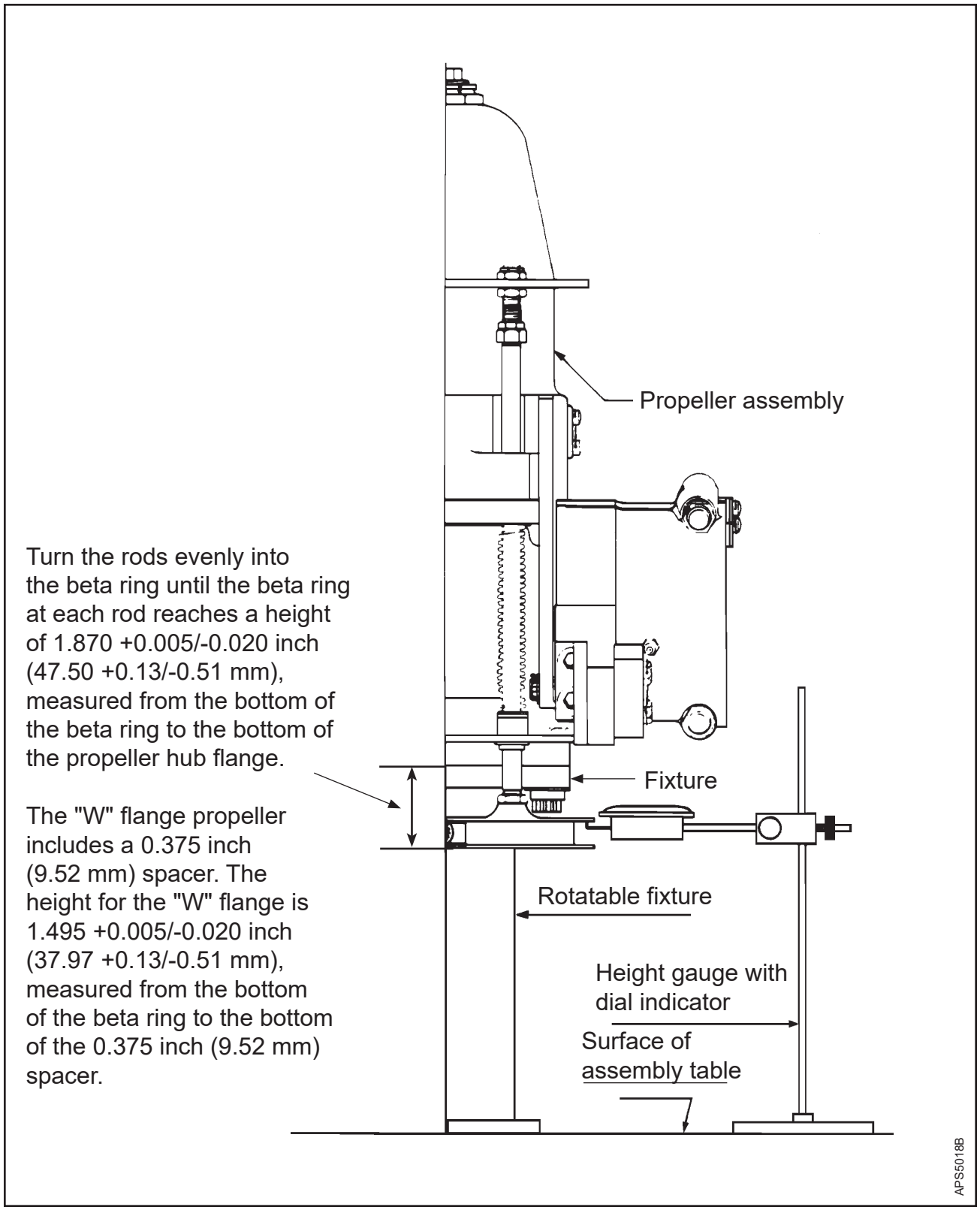
1 Use one washer (460) under each nut (450).

2 Use washers (460) under the head of each hex head bolt (1150) and/or hex head bolt (1140), as required.

CAUTION: MAKE SURE THAT THE B-3384-6H BOLT DOES NOT CONTACT THE CLAMP OR OTHER PARTS.

3 If one full thread of the hex head bolts (1140) is not visible beyond the mating nut, bolt B-3384-6H may be substituted. Make sure that the B-3384-6H bolt does not contact the clamp or other parts.

(3) Return the propeller assembly to the rotatable fixture on the assembly table.




**Using Dial Indicator to Measure the Height and Runout of Beta Ring**
**Figure 7-31**

C. Models Ending in -2, -7 and -5 with "Split" Spinner Support Plate (380). Refer to Figure 7-5.

(1) Using a suitable sling and overhead hoist, lift the propeller assembly from the rotatable fixture on the assembly table and into a vertical position.

CAUTION: IF THE PROPELLER IS EQUIPPED WITH A DE-ICE SYSTEM, REFER TO APPLICABLE MANUFACTURER'S MANUALS AND GENERAL ARRANGEMENT DRAWINGS FOR SPECIFIC INFORMATION CONCERNING INSTALLATION OF DE-ICE SYSTEM HARDWARE.

(2) Attach the bulkhead unit to the spinner support plate (380) using the specified hex head bolts (870), washers (460), and nuts (450). Refer to the Torque Values table in the Fits and Clearances chapter of this manual.

(3) Return propeller assembly to the rotatable fixture on the assembly table.

18. Installing Beta Ring

CAUTION: INSTRUCTIONS AND PROCEDURES IN THIS CHAPTER MAY INVOLVE PROPELLER CRITICAL PARTS. REFER TO THE INTRODUCTION CHAPTER OF THIS MANUAL FOR INFORMATION ABOUT PROPELLER CRITICAL PARTS. REFER TO THE ILLUSTRATED PARTS LIST IN THIS MANUAL FOR IDENTIFICATION.

A. Models Ending in -3

(1) Thread a beta jam nut (410) onto the end of each beta rod (320).

(2) Thread an elastic pitch adjustment nut (210) onto each beta rod.

CAUTION: TAKE CARE NOT TO BOTTOM THE RODS IN THE BETA RING. THIS COULD RESULT IN DAMAGE TO THE PARTS.

(3) Turn the beta rods (320) evenly into the beta ring (420) until each beta rod reaches the height indicated in Figure 7-31.

NOTE: Use a 1.0 inch to 2.0 inch (25 mm to 50 mm) depth micrometer to measure beta ring height.

(4) Measure the runout of beta ring (420).

CAUTION: BETA RING RUNOUT MUST BE KEPT WITHIN 0.010 INCH (0.25 MM) TOTAL.

(a) Use a dial indicator to measure the runout of the beta ring (420) at full feather. Refer to Figure 7-31.

(b) After measuring the runout of the beta ring, tighten the beta jam nuts (410). Refer to the Torque Values table in the Fits and Clearances chapter in this manual.

(c) Measure the beta ring runout again.

19. Setting the Floating Pitch Angle of the Blades

A. Models Ending in -5 and -7

(1) After reverse and feather pitch angle of all blades are set, measure to make sure the floating pitch angle of all blades is within tolerance.

CAUTION: THE FLOATING PITCH ANGLE OF ALL BLADES MUST BE WITHIN A TOLERANCE OF ±0.1 DEGREE, OR A MAXIMUM OF 0.2 DEGREE ONE DIRECTION.

(2) With the propeller assembly still mounted on the rotatable fixture of the assembly table, apply pressure to the piston until blade number one attains a floating pitch position between 20 degrees and 25 degrees.

(3) Measure the floating pitch angle of each of the other blades.

(4) If the blade to blade tolerance is excessive, then one or more blades must be turned in the blade clamp(s).

(a) Use wrench TE142, to hold nut (780). Refer to Figure 7-27.

(b) Use a standard 12-point socket to loosen the outboard clamp bolts to let the blade turn in the clamp.

(c) Do procedure 14.A. again for setting the reverse angle of the blades.

(d) Do procedure 16.A. again for setting the feather angle of the blades.

(e) Do procedure 19.A. again for setting the floating pitch angle of the blades.

NOTE: Measure the floating pitch angle again after resetting any blade angle.

20. Setting the Low Pitch Angle of the Blades

A. Models Ending in -2

NOTE: This model does not reverse.

(1) Apply pressure, forcing the propeller into low pitch.

(2) Set low pitch angle of all blades within a tolerance of ±0.1 degree, or a maximum of 0.2 degree in one direction.

B. Models Ending in -3

(1) Setting the low pitch angle of the blades establishes "hydraulic low pitch" for the propeller.

CAUTION: WHEN A BLADE ANGLE IS SET OR CHECKED, ACTIVATE THE ASSEMBLY AWAY FROM THE REVERSE PITCH POSITION BY HAND TO RESEAT THE BLADE AND CLAMP PARTS AND TO REMOVE PLAY FROM THE ASSEMBLY.

(a) Apply pressure to the piston through rotatable fixture on propeller assembly table until Blade Number One reaches the correct low pitch blade angle as indicated by the bench-top protractor. Refer to Figure 7-28.

(b) Trap the pressure at this position of the setup blade.

NOTE: The low pitch angle of all blades must be within a blade to blade tolerance of ±0.1 degree or 0.2 degree from the maximum to the minimum blade angle at low pitch.

(c) Turn the elastic pitch adjustment nuts (210) on the three beta rods so that the nuts are against the bosses on the piston at low stop position.

CAUTION: ADJUSTING THE BETA RING RUNOUT WILL AFFECT THE LOW PITCH ANGLE. A RECHECK OF THE LOW PITCH BLADE ANGLE IS REQUIRED.

(d) Apply pressure to the rotatable fixture, forcing the propeller against the reverse pitch stop.

(e) Select a blade with a beta rod adjacent to it. "Zero" the dial indicator on the beta ring (420) at a position close to the selected beta rod.

(f) Adjust the other two or three elastic pitch adjustment nuts (210) to correct the beta ring (420) runout to within 0.010 inch (0.25 mm) maximum movement for one revolution of the propeller.

(g) Release pressure from the rotatable fixture, permitting the propeller blade angle to move to feather or to a blade pitch higher than low pitch.

(h) Apply pressure to the rotatable fixture to force the propeller from a higher blade angle to low pitch blade angle.

NOTE: Make sure that the elastic pitch adjustment nuts (210) are just barely engaged by the piston unit (50).

CAUTION: BETA RODS (320) AND BETA RING (420) SHOULD NOT MOVE WHEN VERIFYING CONTACT BETWEEN THE PISTON UNIT (50) AND THE ELASTIC PITCH ADJUSTMENT NUTS (210).

(i) Move the assembly away from the reverse pitch position by hand to reseat the blade and clamp parts, and to remove play from the assembly.

(j) Measure the low pitch blade angle and the blade-to-blade tolerance at low pitch blade angle again of the specified blades.

(k) If the blade-to-blade tolerance is excessive, then one or more blades must be turned in the blade clamp(s).

1 Do the procedure in this chapter again for setting the reverse angle and tolerance of the blades.

2 Do the procedure in this chapter again for setting the feather angle and tolerance of the blades.

3 Do the procedure in this chapter again for setting the low pitch angle and tolerance of the blades.

NOTE: If the blade-to-blade tolerance is within specification, but the actual blade angle is not within specification, evenly turn the elastic pitch adjustment nuts (210) **down** to increase the low pitch angle, or turn them **up** to decrease the low pitch angle.

(l) With pressure applied to the piston, and with the propeller assembly in full reverse position, measure the beta ring runout. Total maximum permitted runout is 0.010 inch (0.25 mm).

21. Measuring Start Pitch Blade Angle

CAUTION: INSTRUCTIONS AND PROCEDURES IN THIS CHAPTER MAY INVOLVE PROPELLER CRITICAL PARTS. REFER TO THE INTRODUCTION CHAPTER OF THIS MANUAL FOR INFORMATION ABOUT PROPELLER CRITICAL PARTS. REFER TO THE ILLUSTRATED PARTS LIST IN THIS MANUAL FOR IDENTIFICATION.

A. HC-B3TF-7AY, HC-B3TN-3S, -3( )Y, and HC-B3( )W-3Y Models Only

(1) Install the start lock unit (1010), attaching the hex head bolts (870, 360) with washers (460, 365), or button head socket screws (1140, 1150), as applicable, to the bulkhead.

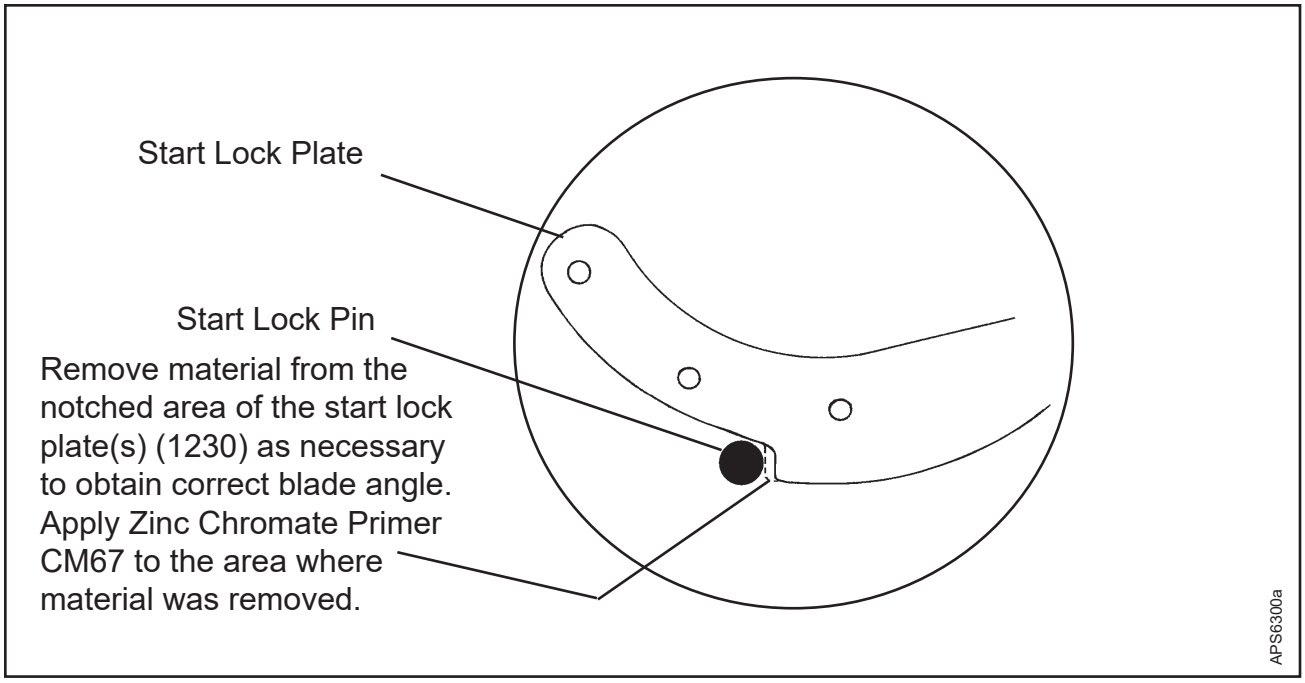
(2) Torque the hex head bolts (1140, 1150) or (870, 360) in accordance with the Torque Values table in the Fits and Clearances chapter of this manual.

(3) Apply pressure to position the propeller to full reverse.

(4) Release the pressure and permit the blades to turn into the start lock position.

(5) Measure the start lock angle.

(a) For the specified start lock angle specifications and tolerances, refer to the Hartzell Propeller Inc. Application Guide.




**Obtaining Correct Start Pitch Blade Angle on HC-B3TF-7AY, HC-B3TN-3S, -3( )Y, and HC-B3( )W-3Y**
**Figure 7-32**

(6) Measure all blades to make sure they are within 0.2 degree of each other.

(7) At this time, if adjustments are required for the start lock angle, do the following:

(a) Remove material from the notched area of the start lock plate(s) (1230), as necessary, to obtain the correct blade angle. Refer to Figure 7-32.

(b) Paint the notched area of the start lock plate (1230), where material was removed, using paint CM67 to protect that area from corrosion.

(8) Make sure there is correct contact between the start lock plate (1230) and start lock pin (1060).

B. Models Ending in -5 with Start Lock Mounted on Guide Collar

(i.e., HC-B3TN-5M, -5ML, -5N, -5NL, -5P, -5SL, -5U, -5V, and -5W.)

(1) Release the pressure and permit the blades turn into the start lock position.

(2) Measure all blades to make sure they are within 0.1 degree of each other.

(3) At this time, if adjustments are required for the start lock angle, do the following:

(a) Apply enough air pressure to the rotatable fixture to raise the piston off the start lock units (1010).

(b) Turn the screws (1280) on the end of the piston rod the same distance. Turn the screws **out** to decrease the angle; turn the screws **in** to increase the angle.

(4) If the gap between the guide rod (55) end and the screw (1280) head is greater than 0.190 inch (4.83 mm), install a collar (1290) between the screw head and guide rod end.

C. All other Models Ending in -5

(1) Reassemble the Start Lock Unit

(a) Insert the start lock pin (1060) into the start lock bracket (1020).

(b) Insert the compression spring (1070) into the start lock bracket (1020).

(c) Compress the compression spring (1070) and install the washer (1080) on top of the compression spring.

(d) Insert the cotter pin (1090) into the start lock bracket (1020) to hold the washer (1080), compression spring (1070), and start lock pin (1060) in the start lock bracket.

(e) Secure the cotter pin (1090).

(2) Install the start lock units (1010), using bolts through the bulkhead and spinner mounting plate (380). Do not torque the bolts at this time; tighten them just enough to hold them in position.

CAUTION: TO PREVENT POSSIBLE OVERLOAD OF ONE START LOCK DURING THE CHECK PROCEDURE, RELEASE THE LINK ARMS FROM THE PISTON TO PERMIT THE BLADES TO BE ROTATED BY HAND TO ENGAGE THE CLAMP-MOUNTED START LOCK PLATES AGAINST THE START LOCK PINS.

(3) Apply pressure to the piston through the rotatable fixture on the propeller assembly table.

(4) Force the piston to full reverse position.

(5) Remove the fillister head screws (90) and the link pin unit (80) from each piston ear and link arm (70).

(6) Make sure that each start lock pin (1060) is extended.

NOTE: If the start lock pin (1060) has been attached to the start lock bracket (1020) with wire, remove the wire to release the pin.

(7) Hand-turn each blade to firmly engage the clamp-mounted start lock plates (1230) against the start lock pins (1060).

(8) While holding hand pressure against the blade to firmly engage the clamp-mounted start lock plates (1230) against the start lock pins (1060), measure the blade angle.

CAUTION: THE STARTING PITCH ANGLE OF ALL BLADES MUST BE WITHIN A TOLERANCE OF 0.2 DEGREE TOTAL.

(9) Adjust the location of the start locks to get the desired start lock blade angle.

(a) Turn the socket head cap screw (1100), located on the start lock bracket, to get the desired start lock angle.

(b) Keep a maximum blade-to-blade difference of 0.2 degree.

NOTE: For the specified starting pitch angle and reference blade radius required for blade angle measurement, refer to the applicable aircraft type certificate data sheet or Hartzell Propeller Inc. Application Guide Manual 159 (61-02-59).

(10) Make sure there is correct contact between the start lock plate and the start lock pin (1060).

NOTE: The start lock plate must contact a minimum of one half of the diameter of the start lock pin (1060) when the start lock unit is engaged.

(11) Torque the bolts in accordance with the Torque Values table in the Fits and Clearances chapter of this manual.

CAUTION: MAINTAIN CLEARANCE BETWEEN THE START LOCK BRACKET (1020) AND THE CLAMP SCREWS.

(12) Make sure that there is clearance between the start lock bracket (1020) and the clamp screws.

(a) Retract the start lock pins (1060) and hold them in position with heavy wire inserted through the hole of each start lock housing.

(b) Turn each blade by hand to feather position to check for clearance.

1 If the clamp screws contact the start lock bracket (1020), refer to the section Installing Blades and Clamps in this chapter.

(13) Turn the blades by hand to full reverse.

(14) Apply a thin layer of anti-seize compound CM118 in the hole of the free end of each link arm (70).

(15) Install the free end of each link arm (70) in the slot supplied for it in each piston ear.

(16) Install a link pin unit (80) through each piston ear and link arm (70) to hold the link arm to the piston unit (50).

CAUTION: MAKE SURE THAT THE CORRECT FILLISTER HEAD SCREW (90) IS INSTALLED AND THAT ADEQUATE THREADS ARE AVAILABLE IN THE PISTON UNIT (50) TO HOLD THE SCREW IN PLACE. AT LEAST THREE THREADS MUST BE ENGAGED.

(17) Install a fillister head screw (90) through each link pin unit (80) and into the piston unit (50).

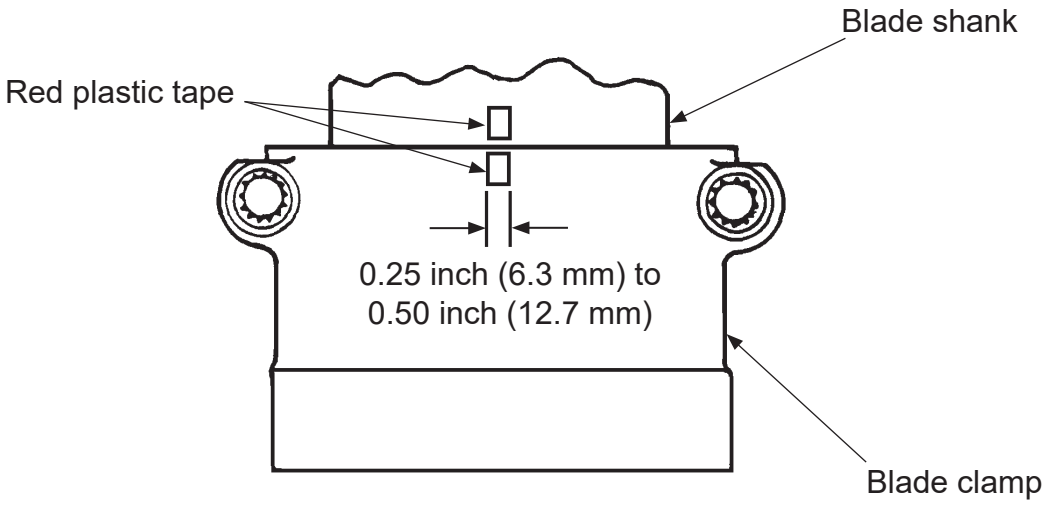
(18) Tighten the screws (90) until snug.

(19) Slowly release pressure and permit the feathering spring assembly (1400) turn all blades to firmly engage the clamp-mounted start lock plates (1230) against the start lock pins (1060).

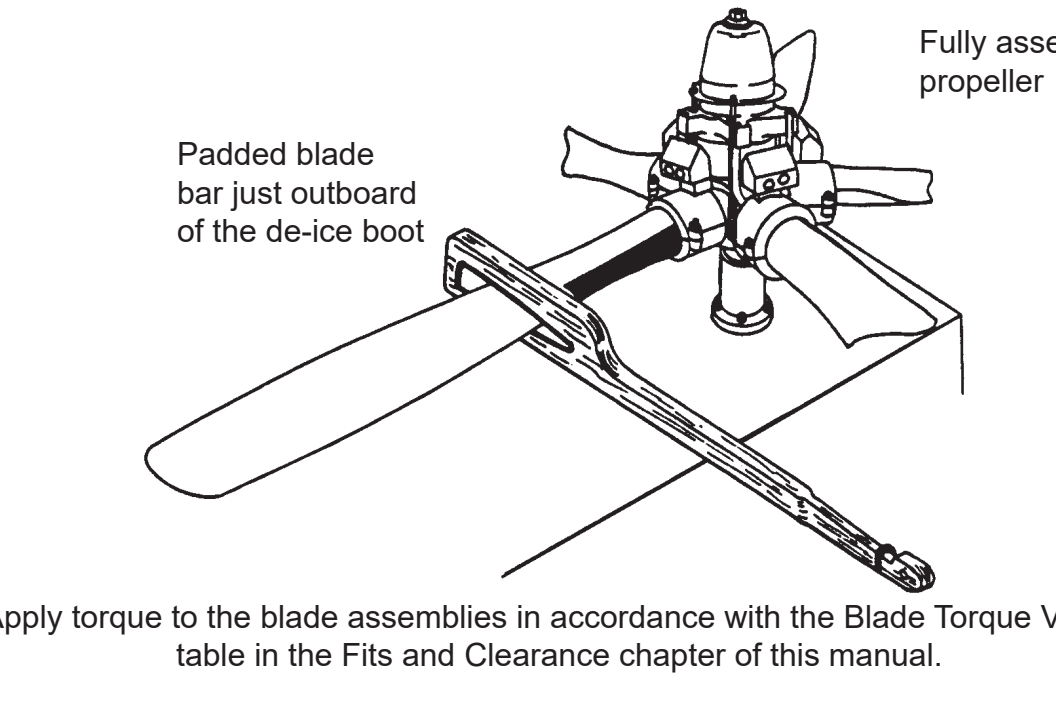
CAUTION: DO NOT ADJUST THE SOCKET HEAD CAP SCREWS (1100) WITH FULL FEATHERING SPRING PRESSURE AGAINST THE START LOCK PINS (1060). MAKE SURE THAT ALL START LOCK PINS (1060) CONTACT THE START LOCK PLATES (1230) AT THE SAME TIME.

(20) Using 0.032 inch (0.81 mm) minimum stainless steel wire, safety the fillister head screw (90) to the link pin unit on each piston ear.

(21) Using 0.032 inch (0.81 mm) minimum stainless steel wire, safety the socket head cap screw (1100) to the start lock bracket (1020) on each assembly.




**Providing for Visual Detection of Blade Slippage in Clamp**
**Figure 7-33**




**Using Padded Blade Bar to Do a Check for Blade Slippage in Clamp**
**Figure 7-34**

22. Check for Blade Slippage in Clamp

A. Procedure for all models

(1) With the propeller still mounted on the rotatable fixture of the assembly table, proceed as follows to supply visual detection of slippage between the blade shank and the blade clamp.

CAUTION: DO NOT USE A PUNCH OR SCRIBE A LINE ON THE BLADE SHANK. THIS COULD START A CRACK IN THE BLADE.

(a) Position a strip of red plastic tape down the shank and across the clamp (840) of blade number one as shown in Figure 7-33.

(b) Carefully slit the tape along the line where the blade and blade clamp (840) meet.

(c) Spray the pieces of tape with lacquer so cleaning solvent will not wash them off.

(d) Do this procedure again on the other blade assemblies.

NOTE: Misalignment of the halves of tape on a blade assembly indicates slippage between the blade and clamp (840). Follow the section, "Repair" in the Blade Clamp Overhaul chapter of Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02).

CAUTION: DO NOT PLACE THE PADDED BAR IN THE AREA OF THE DE-ICE BOOT WHEN APPLYING TORQUE TO A BLADE ASSEMBLY. PLACE THE BAR IN THE THICKEST AREA OF THE BLADE, JUST OUTBOARD OF THE DE-ICE BOOT AS SHOWN IN FIGURE 7-34.

(e) Using a padded blade bar, apply torque to each blade assembly. Refer to the Torque Values table in the Fits and Clearance chapter of this manual. Torque blade toward reverse.

(f) If necessary to correct blade slippage, refer to Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02) Blade Clamp Overhaul chapter.

23. Optional Sealant CM93 Application

A. Procedure

NOTE: The application of sealant CM93 to the blade/blade clamp interface is an optional procedure that may supply additional protection against corrosion of the blade retention components.

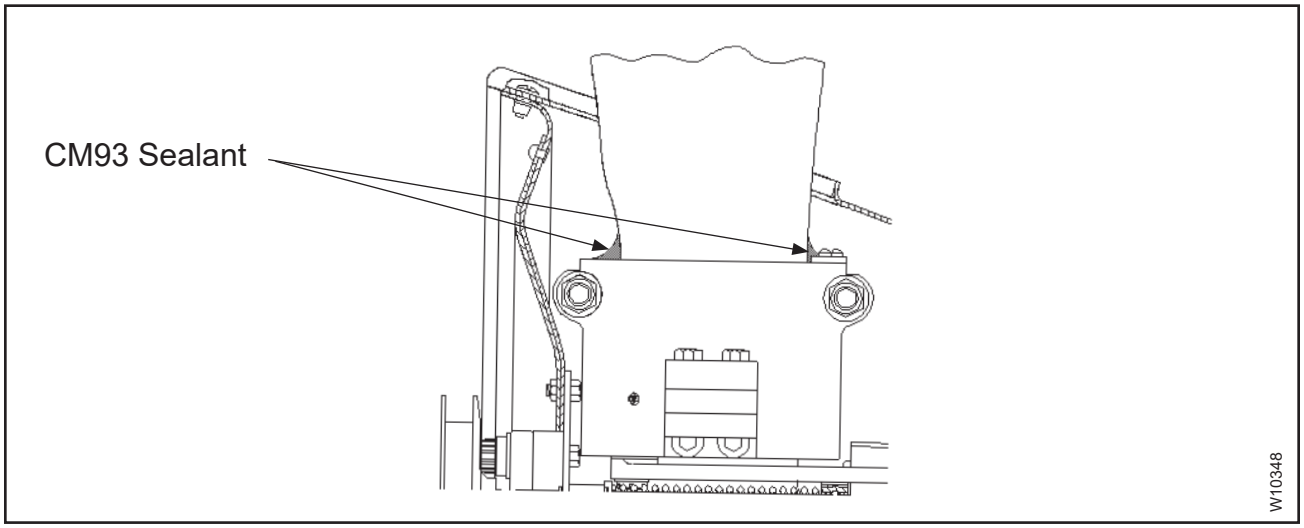
CAUTION 1: TO AVOID PERMANENT DAMAGE TO THE BLADE RETENTION COMPONENTS CAUSED BY TRAPPED CHEMICALS, THIS PROCEDURE MUST ONLY BE PERFORMED FOLLOWING THE ASSEMBLY OF A PROPELLER AFTER OVERHAUL OR AFTER ANY OTHER PROCEDURE INVOLVING DISASSEMBLY AND CLEANING OF THE PROPELLER BLADE RETENTION COMPONENTS.

CAUTION 2: TO MAKE SURE OF CORRECT ADHESION OF SEALANT CM93, BLADE AND BLADE CLAMP SURFACES MUST BE FREE OF GREASE AND DIRT.

CAUTION 3: DO NOT ALLOW THE CM93 TO EXTEND ONTO THE SURFACE OF THE CLAMP, WHERE BALANCE WEIGHTS AND DE-ICE HARDWARE ARE INSTALLED.

(1) After doing a check for blade slippage in the clamp, fill the external void at the blade/blade clamp interface with a 0.25 inch (6.3 mm) maximum bead of sealant CM93, around the entire circumference of blade, as shown in Figure 7-35.

(2) Permit the sealant to cure for a minimum of two hours, before returning the propeller to service.




**Sealant CM93 Application**
**Figure 7-35**

24. Finishing the Assembly of the Beta System

A. Models Ending in -3, only

(1) Thread a check nut (220) onto the end of each beta rod. Position equal distance from the elastic nut (210).

(2) Position the beta rod support ring (30) on the end of the beta rods.

(3) Thread an elastic nut (20) onto the end of each beta rod.

(4) Torque each elastic nut in accordance with the Torque Values table in the Fits and Clearances chapter of this manual.

CAUTION: BINDING OF THE GUIDE LUGS MAY OCCUR IF THE PISTON/GUIDE COLLAR ARE OUT OF ALIGNMENT. MAKE SURE THE BETA ROD GUIDE LUGS IN THE SPINNER SUPPORT PLATE CAN BE TURNED BY HAND. REFER TO STEPS A.(6) AND A.(8).

(5) Apply air pressure until there is a gap between the guide lug (340) and the retainer ring (330) of approximately 0.050 inch to 0.100 inch (1.27 mm to 2.54 mm).

(6) Check for free rotation of the guide lugs (340).

(a) If the guide lugs (340) cannot be turned smoothly, without sticking, the guide collar unit (240) or spinner support plate (380) must be loosened and adjusted.

(7) Apply air pressure until the propeller is in reverse position.

(8) Check for free rotation of the guide lugs (340).

(a) If the guide lugs (340) cannot be turned smoothly (without sticking), the guide collar unit (240) or spinner support plate (380) must be loosened and adjusted.

25. Propeller Lubrication

A. For lubrication procedures, refer to the Propeller Lubrication chapter of Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02).

26. Propeller Balancing Procedures

A. For static and dynamic balancing procedures, refer to the Static and Dynamic Balance chapter of Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02).

27. Label Replacement

A. For installation of labels, refer to the Parts Identification and Marking chapter and the Paint and Finish chapter of Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02).

28. Beta Valve Assembly Procedures for Propeller Models Ending in -7 Only

NOTE: Complete assembly of the C-3630-( ) beta valve is not possible prior to installation on the engine or before propeller installation. The C-3630-( ) beta valve is assembled around the engine and propeller. A subassembly (C-3630-2Kit) is able to be assembled prior to installation on the engine and is addressed first. Other parts of the beta valve assembly will be addressed in the sequence in which they are assembled together during the propeller installation on the engine.

CAUTION: THIS ASSEMBLY PROCEDURE FOR THE C-3630-2KIT PARTS IS PERMITTED ON CONDITION THAT THE ONLY REPLACED PARTS ARE THE SPRING PIN (1680) AND THE O-RING (1690). IF ANY OTHER PART SHOULD FAIL TO PASS TABLE 5-1, "COMPONENT INSPECTION CRITERIA" OF THIS MANUAL, THEN REFER TO THE SECTION, C-3630-2KIT ASSEMBLY AFTER OVERHAUL OR TABLE 7-1, "C-3630-2KIT REUSABLE PARTS" IN THIS CHAPTER FOR APPROVED ALTERNATE ASSEMBLY PROCEDURES.

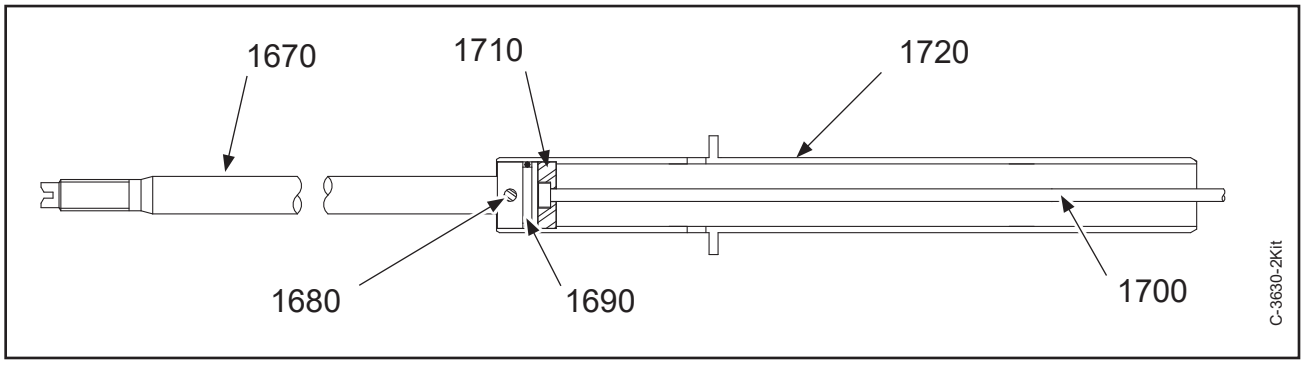
A. C-3630-2Kit Field Assembly Procedure Only

(1) Use this procedure after the beta rod (1670), beta valve sleeve (1720), washer (1710), and the pitch indicator pin (1700) passes the overhaul check inspection in accordance with Table 5-1, Component Inspection Criteria in the Check chapter of this manual. Only the spring pin (1680) and the O-ring (1690) have been replaced.

(2) Refer to C-3630-2Kit Assembly in Figure 7-36 and the exploded view in Figure 10-110 in the Illustrated Parts List chapter of this manual to identify the referenced parts.

(3) Drilling of the beta valve sleeve (1720) and the beta rod (1670) is not required or permitted in this procedure.

(4) Lubricate the O-ring (1690) with turbine oil CM60.




**C-3630-2Kit**
**Figure 7-36**

(5) Install the O-ring (1690) into the O-ring groove on the large diameter end of the beta rod (1670).

(6) Lubricate the inside diameter of the beta valve sleeve (1720) with turbine oil CM60.

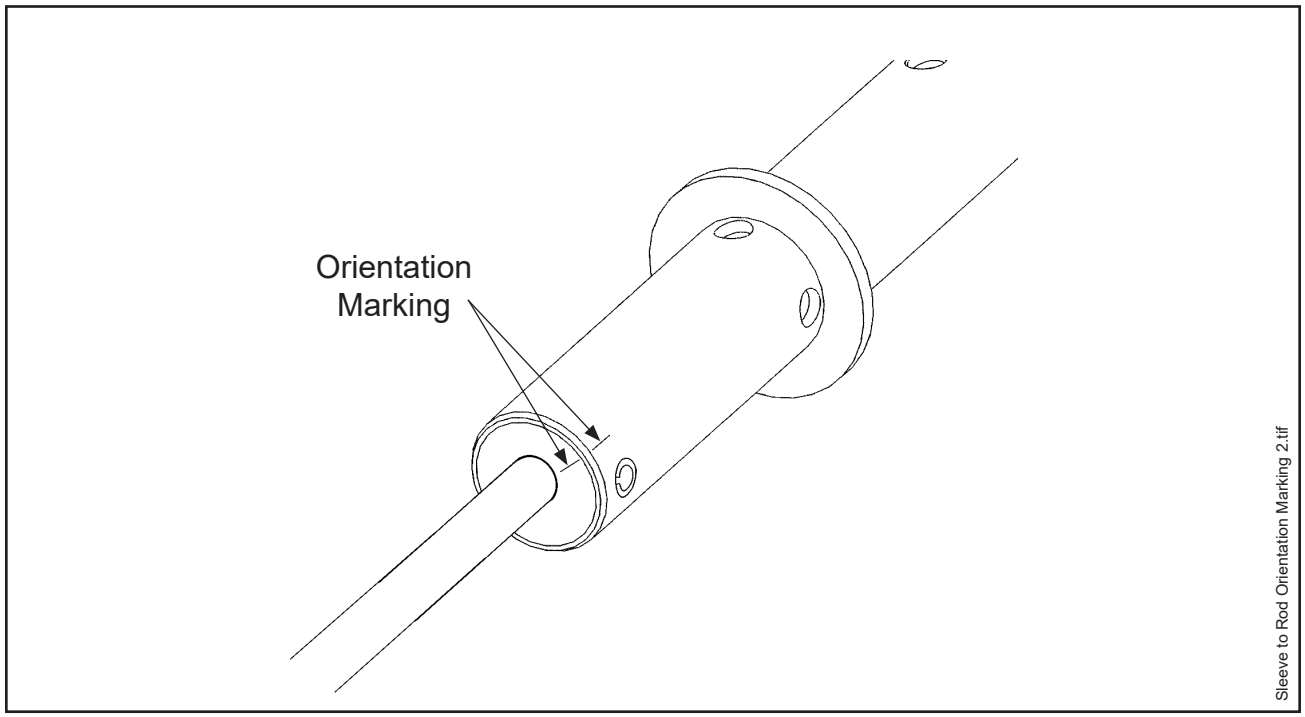
(7) Lubricate the counterbored washer (1710) with turbine oil CM60.

(8) Install the counterbored washer (1710) into the inside diameter counterbore of the beta valve sleeve (1720) with the counterbore of the counterbored washer facing toward the soon to be installed beta rod (1670).

(9) Lubricate the pitch indicator pin unit (1700).

(10) Slide the pitch indicator pin unit (1700) through the counterbored washer (1710), inside of the beta valve sleeve (1720). The larger diameter head of the pitch indicator pin unit (1700) is to rest in the counterbore of the counterbored washer (1710).

(11) Slide the large diameter end of the beta rod (1670) into the counterbored end of the beta valve sleeve (1720) until contact of the installed counterbored washer (1710).




**Orientation Markings**
**Figure 7-37**

CAUTION 1: THE ORIENTATION MARKING REFERENCED IN FIGURE 7-37 WAS PERMANENTLY MARKED BETWEEN THE BETA ROD (1670) AND THE BETA VALVE SLEEVE (1720) TO MAKE SURE OF THE CORRECT ORIENTATION OF THE DRILL ENTRANCE AND THE EXIT HOLES BETWEEN THE SUBJECT PARTS FOR SPRING PIN INSTALLATION AND FIT. FAILURE TO MAINTAIN THIS ORIENTATION COULD CAUSE DAMAGE TO EITHER OR BOTH PARTS AND RESULT IN FAILURE DUE TO HOLE MISALIGNMENT.

CAUTION 2: IF ORIENTATION MARKS ARE NOT VISIBLE OR AVAILABLE, THE CORRECT ORIENTATION OF THE BETA ROD (1670) AND THE BETA VALVE SLEEVE (1720) CAN NOT BE MADE. BOTH PARTS MUST BE REPLACED. REFER TO TABLE 7-1, C-3630-2KIT REUSABLE PARTS, FOR GUIDANCE ON HOW REPLACEMENT OF THESE TWO PARTS WILL EFFECT ASSEMBLY PROCEDURES.

(12) Rotate the beta rod (1670) and the beta valve sleeve (1720) relative to each other to align the orientation marking. Refer to Figure 7-37.

NOTE: The beta valve sleeve (1720) is permitted to have 2 or 4 holes in the area where the spring pin (1680) installs. The single hole in the beta rod (1670) will not align with the two holes in the beta valve sleeve (1720) when four holes are in the beta valve sleeve. A single through hole in the beta rod (1670) and only two holes in the beta valve sleeve (1720) will align.

CAUTION: THE SPRING PIN (1680) IS TO BE FLUSH, TO BELOW FLUSH WITH THE OUTSIDE DIAMETER OF THE BETA VALVE SLEEVE (1720).

(13) Press the spring pin (1680) into the interfacing hole between the beta rod (1670) and the beta valve sleeve (1720).

B. C-3630-( ) Beta Valve Installation Into The Engine

(1) Lubricate the beta valve spool (1790) with turbine oil CM60 on the two outside diameter shoulders, that interface with the beta valve sleeve (1720) and the inside diameter that rubs against the pitch indicator pin (1700).

(2) Install the beta valve spool (1790) two outside diameter shoulders into the open beta valve sleeve (1720) inside diameter.

(3) Install the Engine Manufacturer supplied beta valve shaft adapter with four O-rings installed in accordance with the Engine Manufacturer installation instructions. A retaining ring supplied by the Engine Manufacturer is used to retain the beta valve shaft adapter in place. Refer to the Engine Manufacturer overhaul and installation instructions.

(4) Slide the C-3630-2( )Kit with the installed beta valve spool (1790) into the engine shaft and through the Engine Manufacturer supplied beta valve shaft adapter. The beta valve spool (1790) is to enter the engine first with the beta rod (1670) protruding from the engine shaft. A shoulder on the beta valve sleeve (1720) will contact the Engine Manufacturer supplied beta valve shaft adapter and stop further movement into the engine.

(5) Lubricate the O-ring (1800) with turbine oil CM60.

(6) Install the O-ring (1800) into a counterbore on the inside diameter, the threaded end of the beta valve spool (1790), and around the pitch indicator pin (1700).

C. Beta Valve Spring Assembly Installation Into The Engine

(1) Slide the outer compression spring (1650) over the inner compression spring (1660).

(2) Slide both compression springs over the beta rod (1670) and into the inside diameter of the engine shaft and around the beta valve sleeve (1720). The compression springs will stop against a shoulder on the beta valve sleeve (1720).

(3) Slide the beta spring retainer (1640) over the beta rod (1670) with the recessed center section facing toward the compression springs (1650 and 1660).

(4) Position the compression springs (1650 and 1660) inside the center section of the beta spring retainer (1640).

(5) Rotate the beta spring retainer (1640) until the indexing block aligns with a recess in the engine shaft provided for it.

(6) Secure the beta spring retainer (1640) in place on the front of the engine flange/shaft with a manufacturer supplied retaining ring that installs on the inside of the engine flange/shaft inner groove.

D. Beta Valve Assembly on the Engine Side of the Gearbox (away from the propeller)

(1) Lubricate the O-ring (1820) with turbine engine oil CM60.

(2) Install the O-ring (1820) into the inside O-ring groove of the engine cover (1830) adjacent to the installed bushing.

(3) Lubricate the O-ring (1810) with turbine engine oil CM60.

(4) Install the O-ring (1820) onto the outside diameter O-ring groove, on the outside diameter shoulder of the engine cover (1830).

(5) Turn the engine cover so the shoulder that supports the external O-ring (1810) is facing toward the engine gearbox. Slide the engine cover (1830) over the pitch indicator pin (1700) but stop short of the threads on the beta valve spool (1790).

(6) Lubricate the beta valve spool (1790) from the threads to the gearbox with turbine engine oil CM60. Lubrication will reduce abrasion to the engine cover (1830) inside diameter O-ring (1820) when sliding over these threads.

(7) Gently slide and rotate the engine cover (1830), with the installed inside diameter O-ring (1820), over the beta valve spool (1790) threads ground surface until the engine cover (1830) contacts the engine gear box.

(8) Attach the engine cover (1830) to the engine gearbox with the Engine Manufacturer supplied fasteners and in accordance with the Engine Manufacturer instructions.

(9) Thread the thin hex nut (1840) onto the threads of the threaded end of the beta valve spool (1790).

(10) Slide the beta valve bushing (1850) over the threaded end of the beta valve spool (1790) until it rests against the installed thin hex nut (1840).

(11) Slide the rod end fitting (1860) over the beta valve bushing (1850) until it rests against the thin hex nut (1840).

CAUTION: INSPECT THE COUNTERBORE AT THE INSIDE DIAMETER IN THE THREADED END OF THE BETA VALVE SPOOL (1790) AND MAKE SURE THAT THE O-RING (1800) HAS BEEN INSTALLED BEFORE THE INSTALLATION OF THE ROD END CAP UNIT (1870).

(12) Thread the rod end cap unit (1870) onto the threaded end of the beta valve spool (1790) until it contacts the end of the beta valve spool.

NOTE: If the rod end cap unit (1870) does not contact the end of the beta valve spool (1790), thread the thin hex nut (1840) further on the beta valve spool (1790) threads toward the engine gearbox to permit clearance for the rod end cap unit (1870) to contact the end of the beta valve spool (1790).

(13) If the beta valve spool (1790) is a replacement, a flat will need to be filed into the threads of the beta valve spool (1790). If the beta valve spool (1790) was reused, go to step (18).

(14) Torque the rod end cap unit (1870) against the end of the beta valve spool (1790) in accordance with the Torque Values table in the Fits and Clearances chapter of this manual.

(15) Identify the circumferential location of the set screw (1880) in the rod end cap unit (1870).

NOTE: A flat must be filed into the threads of the beta valve spool (1790) under the set screw location of the rod end cap unit (1870). The flat will permit the set screw (1880) to press against the flat for improved anti-rotation of the rod end cap unit (1870), will prevent the set screw (1880) from damaging the beta valve spool (1790) threads, and will make part removal from the beta valve spool (1790) easy or possible at next overhaul.

(16) Remove the rod end cap unit (1870) and file a flat into the noted circumferential location to engage the set screw (1880). File close but not lower than the minor diameter of the thread. The O-ring (1800) inside the end of the beta valve spool (1790) must be shielded to prevent filings from contaminating or bonding to the O-ring (1800).

(17) Thread the rod end cap unit (1870) onto the threaded end of the beta valve spool (1790) until it contacts the end of the beta valve spool (1790).

(18) Torque the rod end cap unit (1870) against the end of the beta valve spool (1790) in accordance with the Torque Values table in the Fits and Clearances chapter of this manual.

(19) Apply thread locking fluid CM21 to set screw (1880).

(20) Thread the set screw (1880) into the rod end cap unit (1870)

(21) Tighten the set screw (1880) by hand, against the filed flat on the beta valve spool (1790).

(22) Thread the thin hex nut (1840) toward the engine gear box, away from the beta valve bushing (1850) and the rod end fitting (1860), to permit access to the threads under the thin hex nut (1840).

(23) Apply a small quantity of thread locking fluid CM21 to several threads adjacent to the beta valve bushing (1850).

(24) Thread the thin hex nut (1840) away from the gear box and against the beta valve bushing (1850). The beta valve bushing (1850) is slightly wider than the rod end fitting (1860). This will permit the rod end fitting (1860) to turn freely on the beta valve bushing (1850).

(25) Torque the thin hex nut (1840) against the beta valve bushing (1850) in accordance with the Torque Values table in the Fits and Clearances chapter of this manual.

(26) Check the rod end fitting (1860) to make sure that it will rotate freely on the beta valve bushing (1850).

E. Installation of Beta Valve Parts Adjacent to the Propeller Piston and Pitch Change Rod

(1) Install the O-ring (400) onto the engine flange. Refer to Hartzell Propeller Inc. Propeller Owner's Manual 139 (61-00-39).

(2) Inspect the inside diameter of the propeller pitch change rod to make sure of the installation of the O-ring (1630) in the groove at the end of the pitch change rod. If not installed, lubricate the O-ring (1630) with turbine engine oil CM60 and install in the inside diameter O-ring groove in the pitch change rod.

(3) Support the propeller by a sling and install.

(a) Carefully slide the propeller over the beta rod (1670) toward the engine flange. Refer to Hartzell Propeller Inc. Propeller Owner’s Manual 139 (61-00-39).

(4) Attach the propeller to the engine in accordance with Hartzell Propeller Inc. Propeller Owner's Manual 139 (61-00-39).

(5) Slide the aluminum spacer (1620) onto the beta rod (1670) out through the propeller pitch change rod.

(6) Thread the self locking nut (1610) onto the threads of the beta rod (1670). The location of this nut will be relocated based on a low pitch blade angle setting that will be completed at a later time, during propeller control system rigging.

29. C-3630-2KIT Assembly After Overhaul

CAUTION: INSTRUCTIONS AND PROCEDURES IN THIS CHAPTER MAY INVOLVE PROPELLER CRITICAL PARTS. REFER TO THE INTRODUCTION CHAPTER OF THIS MANUAL FOR INFORMATION ABOUT PROPELLER CRITICAL PARTS. REFER TO THE ILLUSTRATED PARTS LIST IN THIS MANUAL FOR IDENTIFICATION.

NOTE: The C-3630-2 KIT was created to represent a subassembly of parts in the C-3630-2 Beta Valve Assembly. For definition of the C-3630-2KIT subassembly of parts, an exploded view, and parts listing, refer to Figure 10-110 in the Illustrated Parts List chapter of this manual. For subassembly parts assembled together, refer to Figure 7-36.

A. Important Information

(1) The spring pin (1680) and O-ring (1690) of the C-3630-2KIT are replaced at overhaul. The remaining four parts are inspected in accordance with Table 5-1, Component Inspection Criteria in the Check chapter of this manual. All four parts could be determined to be reusable or some of them may have to be replaced. Replacement of some parts will force replacement of other parts within the C-3630-2KIT, even though the other parts passed the Component Inspection Criteria in Table 5-1 in accordance with the Check chapter of this manual.

(2) The purpose of Table 7-1 is to identify which of the four parts may be reused in accordance with Table 5-1, Component Inspection Criteria in the Check chapter of this manual's inspection results and to identify what agency, Field Shop or Hartzell Propeller Inc., is permitted to reassemble the C-3630-2KIT subassembly.

## C-3630-2KIT Reusable Parts

| Item No. | Description | Check Inspection Results | | | | |
|---|---|---|---|---|---|---|
| | | "A" | "B" | "C" | "D" | "E" |
| 1670 | Beta Rod | OK | Replace △1 | OK | OK | OK |
| 1720 | Beta Valve Sleeve | OK | OK | Replace △2 | OK | OK |
| 1710 | Counterbored Washer | OK | OK | OK | Replace △3 | OK |
| 1700 | Pitch Unit Indicator Pin | OK | OK | OK | OK | Replace △4 |

△5 Field Assembly

△5 HPI Assembly

△5 Field Assembly

△1 Replacement of the beta rod (1670). A beta valve sleeve (1720) can be reused with a new beta rod (1670) only if the beta valve sleeve has only one set of holes for spring pin (1680) installation. If the beta valve sleeve has two sets of holes (4 holes) for spring pin installation, the beta valve sleeve must be replaced. Refer to Figure 7-38.

△2 Replacement of the beta valve sleeve (1720) required in accordance with section, "Beta Valve Sleeve (1720)" in the Check chapter of this manual requires replacement of the beta rod (1670) even though it may have been acceptable in accordance with the section, "Beta Rod (1670)" in the Check chapter of this manual. Drilling the beta rod a second time to attach it to the new beta valve sleeve with a spring pin (1680) is not permitted.

△3 Replacement of the counterbored washer (1710) required in accordance with the section, "Beta Valve Washer (1710)" in the Check chapter of this manual requires a new hole to be drilled for the spring pin (1680) installation. Drilling the beta rod (1670) a second time is not permitted. Therefore, the beta rod must be replaced even though it may have been satisfactory in accordance with the section, "Beta Rod (1670)" in the Check chapter of this manual. If the beta valve sleeve (1720) has two sets of holes (4 holes) for spring pin installation, it must also be replaced. Refer to Figure 7-38.

△4 Replacement of the pitch unit indicator pin (1700) does not require replacement of any other part.

△5 For discussion of Field Assembly versus Hartzell Propeller Inc. assembly, refer to the section, "Assembly of the C-3630-2KIT Subassembly" in this chapter.

**C-3630-2KIT Reusable Parts**
**Table 7-1**

30. Assembly of the C-3630-2KIT Subassembly

A. Important Information

(1) The following discussion addresses Field Assembly vs. Hartzell Propeller Inc. assembly of the C-3630-2KIT. For the assembled view of the C-3630-2KIT, refer to Figure 7-36. For the exploded view of the C-3630-2KIT, refer to Figure 10-110 in the Illustrated Parts List chapter of this manual.

(a) The C-3630-2KIT was created to show a subassembly of parts in the C-3630-2 Beta Valve Assembly. The parts in the new C-3630-2KIT are assembled together at Hartzell Propeller Inc. An O-ring (1690) is installed and a hole is drilled through the beta rod (1670) and beta valve sleeve (1720) when clamped together in a factory fixture. A spring pin (1680) is installed to hold the subassembly together.

(b) Matching serial numbers between the beta valve sleeve (1720) and the beta valve spool (1790) is not necessary. The C-3630-( ) Beta Valve Assembly serial number is always found on the installed beta valve spool.

(c) If the beta valve spool (1790) is replaced in the C-3630-( ) Beta Valve Assembly, the Beta Valve Assembly will be identified by the serial number of the replacement beta valve spool, even if the currently installed beta valve sleeve (1720) has a different serial number.

(2) In Table 7-1, there are combinations of a possible five “Check” inspection results, represented as inspection results "A", "B", "C", "D", and "E".

NOTE: During overhaul, the O-ring (1690) and spring pin (1680) are removed and discarded. New replacements must be obtained prior to assembly.

(a) With inspection results "A" and "E", assembly of the subassembly parts in the C-3630-2KIT are permitted to be accomplished by the field.

(b) With inspection results "B", "C", or "D" (or a combination of "B", "C", and "D"), assembly must be accomplished by Hartzell Propeller Inc.

1 For the drilling of the beta valve sleeve (1720) and the beta rod (1670), Hartzell Propeller Inc. factory fixture must be used to maintain a tight fit.

(3) With inspection result "A", all parts are reusable.

(a) The overhaul facility may reassemble the C-3630-2KIT with attention to proper orientation of the beta rod (1670) and the beta valve sleeve (1720). For orientation markings, refer to Figure 7-37 and the section, "C-3630-2KIT Field Assembly Procedure Only" in this chapter.

(4) With inspection result "E", the pitch unit indicator pin (1700) is not reusable.

(a) The overhaul facility may reassemble the C-3630-2KIT with a new pitch unit indicator pin (1700) and proper orientation of the beta rod (1670) and the beta valve sleeve (1720). For orientation markings, refer to Figure 7-37 and the section, "C-3630-2KIT Field Assembly Procedure Only" in this chapter.

(5) With inspection result "B", all parts but the beta rod (1670) are reusable.

(a) The overhaul facility has three options.

1 The first option is to return all inspected parts but the beta rod (1670) to Hartzell Propeller Inc. The beta valve sleeve (1720) must not have more than one set of holes (2 holes). Refer to Figure 7-38.

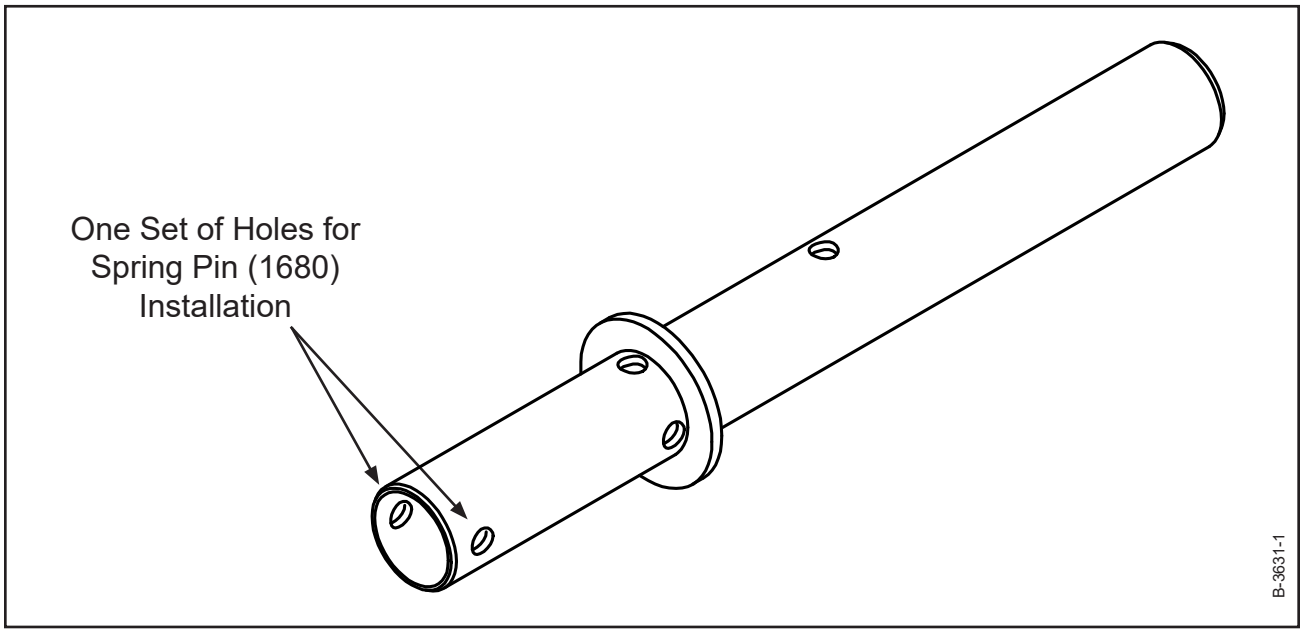
a Hartzell Propeller Inc. will supply the following:

(1) a new beta rod (1670)

(2) a new O-ring (1690)

(3) a new spring pin (1680)

b For installation of a new spring pin (1680), Hartzell Propeller Inc. will drill the used beta valve sleeve (1720) with a second set of holes rotated approximately 90 degrees and the new beta rod (1670).




**B-3631-1 Beta Valve Sleeve**
**Figure 7-38**

2 The second option is to return all inspected parts except the beta rod (1670) and the beta valve sleeve (1720) to Hartzell Propeller Inc., if the beta valve sleeve has two sets of holes (4 holes). Refer to Figure 7-38.

a Hartzell Propeller Inc. will supply the following:

(1) a new beta rod (1670)

(2) a new beta valve sleeve (1720)

(3) a new O-ring (1690)

(4) a new spring pin (1680)

b For installation of a new spring pin (1680), Hartzell Propeller Inc. will drill the new beta valve sleeve (1720) and the new beta rod (1670).

3 The third option is to not return any parts and purchase a new C-3630-2KIT already assembled from Hartzell Propeller Inc.

(6) With inspection result "C", the beta valve sleeve (1720) is not reusable.

(a) In this situation the beta rod (1670) is not permitted to be reused. The overhaul facility has two options.

1 The first option is to return the beta valve washer (1710) and the pitch unit indicator pin (1700) to Hartzell Propeller Inc.

a Hartzell Propeller Inc. will supply the following:

(1) a new beta rod (1670)

(2) a new beta valve sleeve (1720)

(3) a new O-ring (1690)

(4) a new spring pin (1680)

b For installation of a new spring pin (1680), Hartzell Propeller Inc. will drill the beta valve sleeve (1720) and beta rod (1670).

2 The second option is to not return any parts and purchase a new C-3630-2KIT already assembled from Hartzell Propeller Inc.

(7) With inspection result "D", the beta valve washer (1710) is not reusable.

(a) In this situation a new spring pin (1680) hole will need to be drilled. Drilling the beta rod (1670) a second time is not permitted. The overhaul facility has three options. Refer to Figure 7-37.

1 The first option is to return the beta valve sleeve (1720), if it does not have more than one set of holes (2 holes), and the pitch unit indicator pin (1700) to Hartzell Propeller Inc.

a Hartzell Propeller Inc. will supply the following:

(1) a new beta rod (1670)

(2) a new beta valve washer (1710)

(3) a new O-ring (1690)

(4) a new spring pin (1680)

b For installation of a new spring pin (1680), Hartzell Propeller Inc. will drill the used beta valve sleeve (1720) and the new beta rod (1670).

2 The second option is to return the pitch unit indicator pin (1700) only, if the beta valve sleeve (1720) has two sets of holes (4 holes). Refer to Figure 7-37.

a Hartzell Propeller Inc. will supply the following:

(1) a new beta rod (1670)

(2) a new beta valve sleeve (1720)

(3) a new beta valve washer (1710)

(4) a new O-ring (1690)

(5) a new spring pin (1680)

b For installation of a new spring pin (1680), Hartzell Propeller Inc. will drill the beta valve sleeve (1720) and beta rod (1670).

3 The third option is to not return any parts and purchase a new C-3630-2KIT already assembled from Hartzell Propeller Inc.

(8) If both the beta rod (1670) and the beta valve sleeve (1720) must be replaced, Hartzell Propeller Inc. recommends that a new C-3630-2KIT be purchased due to the following:

(a) The economics of shipment

(b) The lesser value of the remaining parts

(c) The possible damage of serviceable part(s) in shipment to Hartzell Propeller Inc.

HARTZELL PROPELLER INC.
Assembly Inspection Check-off Record
Constant Speed Propeller
Reversing and Feathering Propeller

MODEL HC-B3TN-3 HC-B3MN-3 Assembly Serial No.

Customer

Factory No.

| Order | New | Repair | Experimental | Warranty |
|---|---|---|---|---|
| Hub Serial No. | | | FINAL ASSEMBLY | Functional Test 0 to 200 lbs. |
| Ass'y No. 840-60 | | | PITCH L.P. at | Radius - |
| BLADES Design No. | | | F.A. -- | R.P. -- S.P. -- |
| Ser. No.: (1) (2) | (3) | | Track | Cw't Angle - Reverse Position |
| Grease In Pilot Tube Hole | | | Blade Angle Set By | Insp. By: |
| CLAMPS 838-(65, 67) | 838-(65L, 67L) | | COLLAR -- Ser. No. | B-3001-2 Set at |
| 838-88 838-109 | with RTV 123 | | B-3001-2 has _____ | Total Runout in Reverse |
| Ser. No. (1) (2) | (3) | | B-3001-2 has _____ | Total Runout in Feather |
| Cwt. Slugs B-3663-1 A-3039 A-890 | | | | |
| 7/16-20 Clamp Bolts Torqued at 60-65 ft.lbs. | | | Deicer Slip Ring Ass'y No. | Serial No. |
| A-321 Clamp Bolts Torqued at 40 ft.lbs. | | | Deicer Unit Installed Yes ____ No ____ | Deicer Platter Runout |
| Blades Torqued at 167 ft.lbs. | @ 200 ft.lbs. | | BALANCE Greased By: | |
| PISTON Serial No. | Ass'y No. B-1368-(6)-(14) | | Slugs Per Blade (1) | (2) |
| Cyl. No. B-1803-2 | B-1803-4 | | (3) | Total: |
| C-3317-235 O'Ring & B-1843 Dust Seal In Place | | | Bal. By: | Insp. By: |
| GUIDE COLLAR 834-22 | Ass'y No. 834-12 | | SHIPPING INSPECTION | |
| SPRING ASS'Y | No. 831- | | (8) B-3339 Bolts | B-3049 Ring Installed |
| C-3317-347-2 "O" Ring (Color Ident. Red) | | | (8) A-2048-2 Washer | General Appearance |
| Hub and Cyl. Clean | Spring Safetied | | (1) C-3317-230 O'Ring | Link Screws Safetied |
| Tip Angle - ° Differance at 42" | 48" | Radius | A-3074 Block Ass'y | Red Index Tape Installed |
| Dwg. _____ Rev. _____ | | | (1) A-3044 Carbon Block Ass'y | Bulkhead Serial No. |
| IDS No. _____ Date: _____ | | | (1) A-880-1 | (1) A-3338-4 Lube |
| Filtered Plug Installation For Rod | | | COMMENTS: | |
| Cylinder/Spring Retainer Assembly Cleanliness Inspection | | | | |
| Cylinder & Cylinder Hub Flange Cleanliness Insp. Prior to Cylinder Install. | | | Inspector | |
| Hub Cavity Cleanliness Inspection | | | Date: | |
| Borescope Inspection And Capping Of Rod At Assembly Inspection | | | | |

**The approved design data for this propeller incorporates all changes required by applicable Airworthiness Directives.**

**An Example of an Inspection Check-Off Form**
**Figure 7-39**

31. Inspection of the Assembled Propeller

A. Procedure

(1) Use an assembly inspection check-off form as a check-list for final inspection of the reassembled propeller. An example of such a form is in Figure 7-39.

(a) For all propeller models except -7.

1 Make sure that blade balance has been completed.

2 Check blade track.

NOTE: Height at the tip of each blade can vary within ±0.0625 inch (1.587 mm) from blade to blade.

3 Check end-play in each blade.

a Maximum movement of 0.125 inch (3.18 mm) is permitted. Refer to Figure 1-2 in the Testing and Fault Isolation chapter of this manual.

4 Check the fore-and-aft movement of each blade.

a Maximum movement of 0.125 inch (3.18 mm) is permitted. Refer to Figure 1-2 in the Testing and Fault Isolation chapter of this manual.

5 Check for radial play in each blade.

a Maximum angular movement of 0.5 degree is permitted. Refer to Figure 1-2 in the Testing and Fault Isolation chapter of this manual.

6 Check blade pitch settings.

a Keep the maximum limits referred to in the Hartzell Propeller Inc. Application Guide Manual 159 (61-02-59).

(b) For -7 propeller models only

1 Remove the locally fabricated plug that was installed before to seal the end of the opening for the beta valve.

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## FITS AND CLEARANCES - CONTENTS



## LIST OF ILLUSTRATIONS



## LIST OF TABLES

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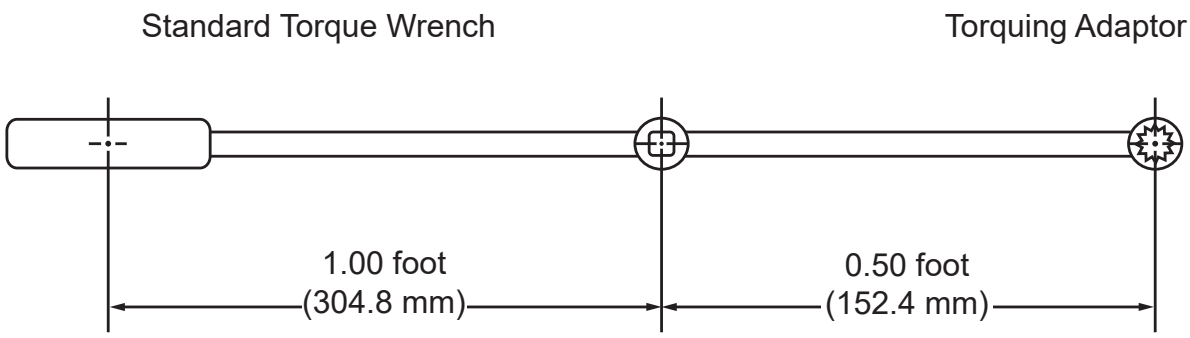



$$\frac{\text{(actual torque required) x (torque wrench length)}}{\text{(torque wrench length) + (length of adaptor)}} = \text{torque wrench reading to achieve required actual torque}$$

EXAMPLE:

$$\frac{\text{100 Ft-Lb (136 N•m) x 1 ft (304.8 mm)}}{\text{1 ft (304.8 mm) + 0.50 ft (152.4 mm)}} = \text{66.7 Ft-Lb (90.1 N•m)}$$

reading on torque wrench with 6-inch (152.4 mm) adapter for actual torque of 100 Ft-Lb (136 N•m)

The correction shown is for an adapter that is aligned with the centerline of the torque wrench. If the adapter is angled 90 degrees relative to the torque wrench centerline, the torque wrench reading and actual torque applied will be equal.

APS212

**Calculating Torque When Using a Torque Wrench Adaptor**
**Figure 8-1**

1. Torque Values (Rev. 2)

A. Important Information

(1) The structural integrity of joints in the propeller that are held together with threaded fasteners is dependent upon proper torque application.

(a) Vibration can cause an incorrectly tightened fastener to fail in a matter of minutes.

(b) Correct tension in a fastener depends on a variety of known load factors and can influence fastener service life.

(c) Correct tension is achieved by application of measured torque.

(2) Use accurate wrenches and professional procedures to make sure of correct tensioning.

(3) For the torque values to use when assembling a Hartzell propeller, refer to Table 8-1, "Torque Values" in this chapter.

(4) When an adapter is used with a torque wrench, use the equation in Figure 8-1 to determine the correct torque value.

CAUTION 1: TORQUE VALUES ARE BASED ON NON-LUBRICATED THREADS, UNLESS SPECIFIED IN TABLE 8-1.

CAUTION 2: FOR TORQUE READING WHEN USING A TORQUE WRENCH ADAPTER, REFER TO FIGURE 8-1.

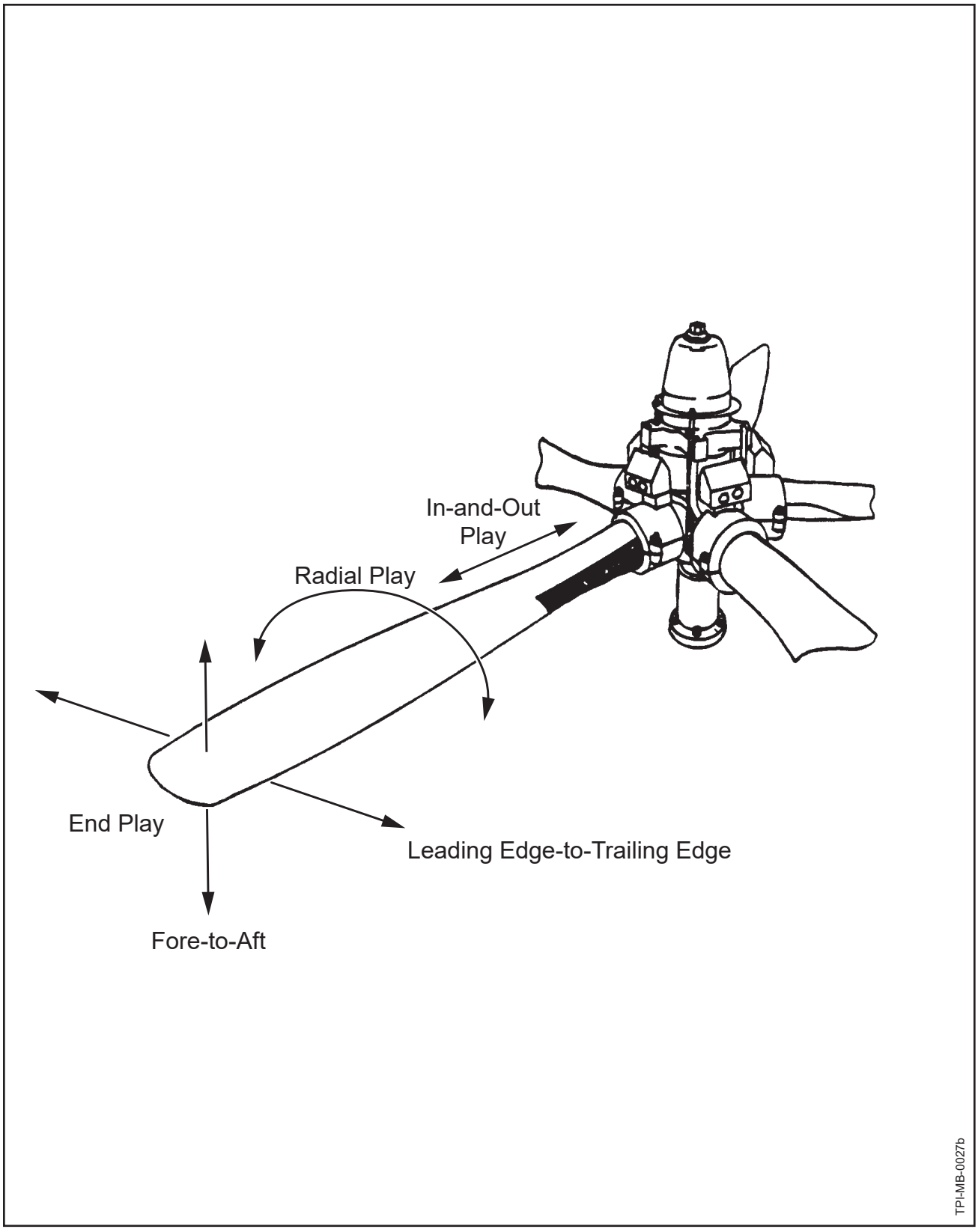
NOTE 1: Torque tolerance is ±10 percent unless otherwise noted.

| Item No. | Part Number | Description | Torque Ft-Lb | Torque In-Lb | Torque N•m |
|---|---|---|---|---|---|
| 10 | A-880-( ) | Thin Self-Locking Hex Nut/ Piston | 120 | 1440 | 162 |
| 20 | B-3359 | 3/8-24 Self-locking Hex Nut/ Rod End Ring | 12 | 144 | 16 |
| | B-3599 | 3/8-24 Self-locking Hex Nut/ Rod End Ring | 12 | 144 | 16 |
| 90 | B-3840-6 | 10-32, Fillister Head Screw | -- | 24 | 2.7 |
| 200 | B-854-( ) | Cylinder | 125-150 | 1500-1800 | 169-203 |
| | B-1803-( ) | Cylinder | 125-150 | 1500-1800 | 169-203 |
| | B-3406 | Cylinder | 125-150 | 1500-1800 | 169-203 |
| 360 | A-2051 | 5/16-24 Hex Head Bolt/ Spinner Mounting Plate | 15 | 180 | 20 |
| 365 | A-2037-1 | 5/16 Cap Screw/ Spinner Mounting Plate | 15 | 180 | 20 |
| 410 | A-3439 | 3/8-24 Thin Hex Nut/ Low Stop Collar | 12 | 144 | 16 |
| | B-3382 | 3/8-24 Thin Hex Nut/ Low Stop Collar | 12 | 144 | 16 |
| 750 | A-321 | 3/8-24 Double 60° Head Screw/ Blade Clamp | 40 | 480 | 54 |
| 770 | A-2017 | 3/8-24, 12 Point Bolt/ Clamp Outer | 35 | 420 | 47 |
| | A-1372 | 7/16-20, 12 Point Bolt/ Clamp Outer | 60-65 Wet | 720-780 Wet | 82-88 Wet |
| | A-1379 | 7/16-20, 12 Point Bolt/ Clamp Outer | 60-65 Wet | 720-780 Wet | 82-88 Wet |
| 870 | B-3384-( ) | 1/4-28, Hex Head Bolt/ Bulkhead Mounting | -- | 96-120 | 10.9-13.5 |
| 940 | B-3840-8 | 10-32 Fillister Head Screw/ Plate Ring Retention | -- | 24 | 2.7 |

**Torque Values**
**Table 8-1**

| Item No. | Part Number | Description | Torque Ft-Lb | Torque In-Lb | Torque N•m |
|---|---|---|---|---|---|
| 1040 | A-2626-( ) | 10-32 Cap Screw/ Start Lock Guide Collar | -- | 24 | 2.7 |
| 1140 | A-2070-9 | 1/4-28 Button Head Screw/ Bulkhead Mounting | -- | 40-120 | 4.6-13.5 |
| | A-2070-8 | 1/4-28 Button Head Screw/ Bulkhead Mounting | -- | 40-120 | 4.6-13.5 |
| | B-3384-5H | 1/4-28 Hex Head Bolt/ Bulkhead | -- | 96-120 | 10.9-13.5 |
| 1150 | A-2070-10 | 1/4-28 Button Head Screw/ Bulkhead Mounting | -- | 40-120 | 4.6-13.5 |
| | A-2070-9 | 1/4-28 Button Head Screw/ Bulkhead Mounting | -- | 40-120 | 4.6-13.5 |
| | B-3384-8H | 1/4-28 Hex Head Screw/ Bulkhead Mounting | -- | 96-120 | 10.9-13.5 |
| 1160 | B-3720 | 10-32 Hex Head Bolt/ Start Lock Plate | -- | 48-72 | 5.5-8 |
| 1170 | A-1018 | Hex Head Bolt/ Start Lock Plate | -- | 48-72 | 5.5-8 |
| | B-3383-7H | 10-32 Hex Head Bolt/ Start Lock Plate | -- | 48-72 | 5.5-8 |
| 1200 | B-3808-4 | Self-locking Hex Nut | -- | 96-120 | 10.9-13.5 |
| 1220 | A-2016-( ) | Bolt, 10-32, Hex Head/ Start Lock Plate | -- | 48-72 | 5.4-8 |
| 1240 | B-3384-35H | Bolt, 1/4-28, Hex Head | -- | 96-120 | 10.9-13.5 |
| 1260 | B-3384-( ) | Bolt, 1/4-28, Hex Head/ Start Lock Bracket Mounting | -- | 96-120 | 10.9-13.5 |
| 9050 | B-3386-( ) | Bolt, 3/8-24, Hex Head/ Counterweight Slug Mounting | 22 | -- | 29 |
| | | | | | |
| Aluminum Blade, mounted in blade clamp | | | 167 | 2004 | 226 |
| Composite Blade, mounted in blade clamp | | | 200 | 2400 | 271 |

**Torque Values**
**Table 8-1, Continued**




**Blade Play**
**Figure 8-2**

2. Blade Tolerances (Rev. 5)

A. Blade Play

(1) Limits for blade play are specified below. Refer to Figure 8-2.

(a) End Play:

| | |
|---|---|
| Leading Edge-to-Trailing Edge | ± 0.625 inch (1.58 mm)<br>Total: 0.125 inch (3.17 mm) |
| Fore-to-Aft (face-to-camber) | ± 0.625 inch (1.58 mm)<br>Total: 0.125 inch (3.17 mm) |

(b) In-and-Out Play — 0.032 inch (0.81 mm)

(c) Radial Play (pitch change) — ±0.5 degree (Total: 1 degree) measured at reference station

(2) Blades should be tight in the propeller; however, play that is within the allowable limits is acceptable if the blade returns to its original position when released.

(a) If blade play is greater than the allowable limits, or if the blade(s) do not return to their original position when released, there may be internal wear or damage that should be referred to a certified propeller repair station with the appropriate rating.

B. Blade Track

| | |
|---|---|
| (1) Aluminum Blades | ±0.0625 inch (1.58 mm)<br>Total: 0.125 inch (3.17 mm) |
| (2) Composite Blades | ±0.125 inch (3.17 mm)<br>Total: 0.250 inch (6.35 mm) |

C. Blade Pitch Tolerance

| | |
|---|---|
| (1) Blade pitch setting tolerance between blades at low pitch | 0.2 degree |

3. Clearance Between the Carbon Block Unit and the Beta Ring

A. Important Information

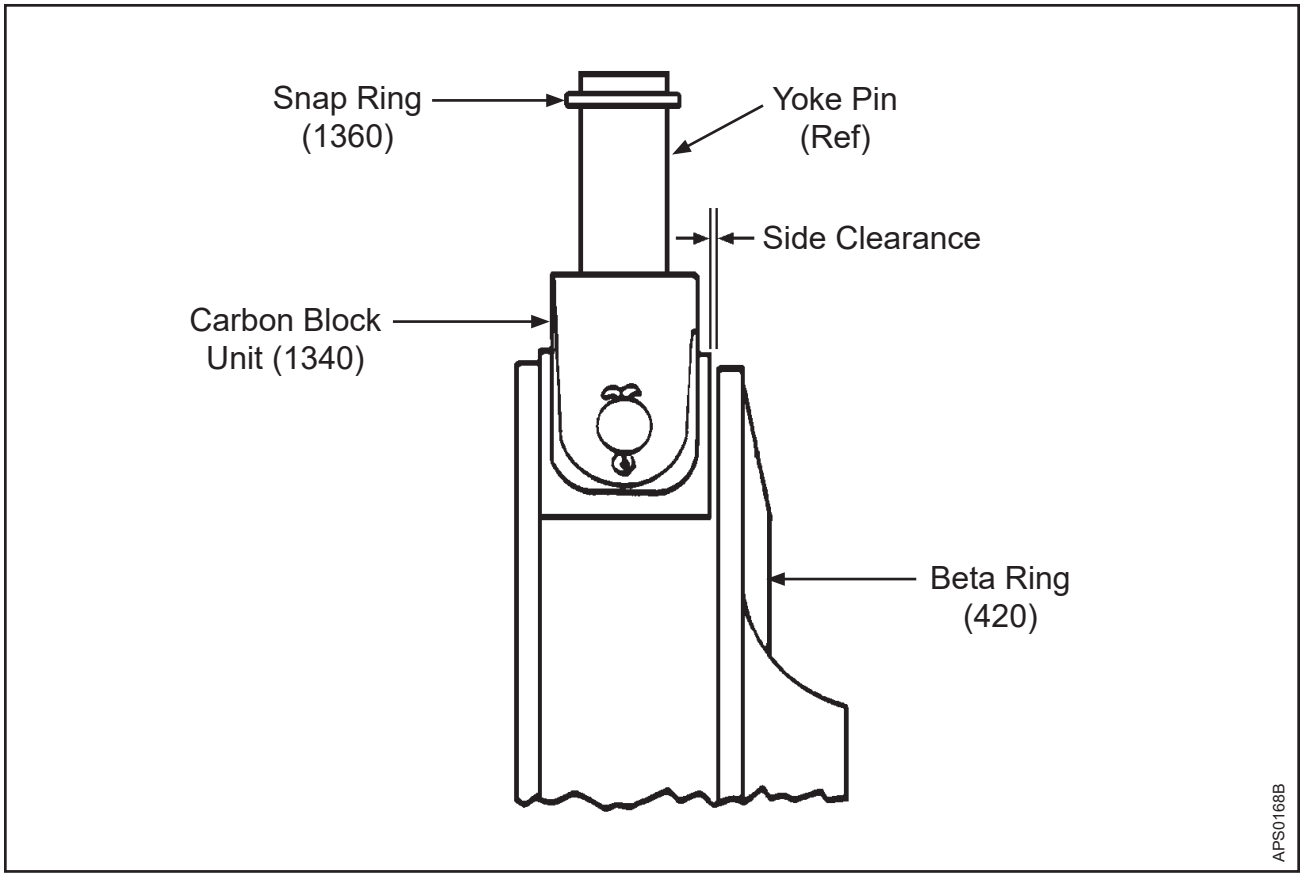
(1) The carbon block unit (1340) must be replaced at overhaul.

(2) Make sure of the following clearance dimension when installing the carbon block assembly in the beta ring, and whenever there are unusual conditions that could create too much wear.

(a) The minimum permitted side clearance between a new carbon block unit (1340) and the beta ring (420) when installed is 0.001 (0.03 mm). Refer to Figure 8-3.

(b) The maximum permitted side clearance between the carbon block unit (1340) and the beta ring (420) is 0.010 inch (0.25 mm).

(c) If the side clearance between the carbon block unit (1340) and the beta ring (420) is not in the permitted limits, replace the carbon block unit (1340).




**Carbon Block and Beta Ring Clearance**
**Figure 8-3**

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## SPECIAL TOOLING, FIXTURES, AND EQUIPMENT - CONTENTS

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1. Tooling and Facility Requirements (Rev. 1)

A. Standard Tooling

(1) Propeller repair stations certified by the FAA or international equivalent to overhaul Hartzell Propeller Inc. propellers are expected to possess precision fixtures, tools, and blade tables for blade inspection and repair.

(a) Except as specifically required in this manual, locally fabricated tooling is acceptable for most repair and inspection operations.

B. Special Tooling

(1) Special tooling may be required for procedures in this manual. For further tooling information, refer to Hartzell Propeller Inc. Illustrated Tool and Equipment Manual 165A (61-00-65).

(a) Tooling reference numbers appear with the prefix “TE” directly following the tool name to which they apply. For example, a template that is reference number 133 will appear as: template TE133.

(b) It is the responsibility of the repair station or the technician performing the repair or servicing to use these special tools as required.

C. Facilities

(1) Grinding, plating, and painting of propeller components can create health and safety hazards beyond that of other areas of a typical workshop.

(a) Areas where grinding, plating, and painting are performed should comply with governmental regulations for occupational safety and health, industry standards, and environmental regulations.

(2) Workshop areas need to be segregated to prevent contamination.

(a) Separate areas should be designated for cleaning, inspection, painting, plating, and assembly.

(b) Propeller balancing must be performed in a draft free area.

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# ILLUSTRATED PARTS LIST - CONTENTS

## THREE-BLADE PROPELLER PARTS LISTS AND FIGURES

## FOUR-BLADE PROPELLER PARTS LISTS AND FIGURES

## SUB-ASSEMBLY PARTS LISTS AND FIGURES

### Blade Retention Parts



### Clamp Assemblies

## SUB-ASSEMBLY PARTS LISTS AND FIGURES, CONTINUED

### Clamp Assemblies, Continued



### Start Lock Kits



### Start Lock Assemblies

## SUB-ASSEMBLY PARTS LISTS AND FIGURES, CONTINUED

Start Lock Assemblies, Continued

## SUB-ASSEMBLY PARTS LISTS AND FIGURES, CONTINUED

### Spring Assemblies

## SUB-ASSEMBLY PARTS LISTS AND FIGURES, CONTINUED

### Beta Feedback Block Assemblies



### Beta Valve Assemblies/Kit

1. Introduction (Rev. 1)

WARNING: ANY PART IDENTIFIED AS AN EXPERIMENTAL OR NON-AVIATION PART MUST NOT BE USED IN AN FAA OR INTERNATIONAL EQUIVALENT TYPE CERTIFICATED PROPELLER. A PART IDENTIFIED AS EXPERIMENTAL OR NON-AVIATION DOES NOT HAVE FAA OR INTERNATIONAL EQUIVALENT APPROVAL EVEN THOUGH IT MAY STILL SHOW AN AVIATION TC OR PC NUMBER STAMP. USE ONLY THE APPROVED ILLUSTRATED PARTS LIST PROVIDED IN THE APPLICABLE OVERHAUL MANUAL OR ADDITIONAL PARTS APPROVED BY AN FAA ACCEPTED DOCUMENT FOR ASSEMBLY OF A PROPELLER. THE OPERATOR ASSUMES ALL RISK ASSOCIATED WITH THE USE OF EXPERIMENTAL PARTS. USE OF EXPERIMENTAL PARTS ON AN AIRCRAFT MAY RESULT IN DEATH, SERIOUS BODILY INJURY, AND/OR SUBSTANTIAL PROPERTY DAMAGE.

A. General

CAUTION: INSTRUCTIONS AND PROCEDURES IN THIS CHAPTER MAY INVOLVE PROPELLER CRITICAL PARTS. REFER TO THE INTRODUCTION CHAPTER OF THIS MANUAL FOR INFORMATION ABOUT PROPELLER CRITICAL PARTS. REFER TO THE ILLUSTRATED PARTS LIST IN THIS MANUAL FOR IDENTIFICATION OF PROPELLER CRITICAL PARTS.

(1) This chapter includes the parts lists and applicable illustrations for the propeller models included in this manual.

CAUTION: THE ILLUSTRATIONS IN THIS CHAPTER ARE PROVIDED FOR PART IDENTIFICATION AND LOCATION REFERENCE ONLY. THEY SHOULD NOT BE USED FOR ASSEMBLY.

(a) The illustrations in this chapter use some general views of parts that may not exactly depict every propeller part configuration.

B. Counterweights/Slugs/Mounting Hardware

(1) Counterweights, counterweight slugs, and the applicable mounting hardware are application specific. Refer to Hartzell Propeller Inc. Application Guide Manual 159 (61-02-59).

C. Spinner Assemblies/Mounting Hardware

(1) Spinner assemblies and the applicable mounting hardware are application specific. Refer to Hartzell Propeller Inc. Application Guide Manual 159 (61-02-59).

D. Ice Protection System Components

(1) Ice protection systems are application specific. Refer to Hartzell Propeller Inc. Application Guide Manual 159 (61-02-59).

(a) For components of ice protection systems supplied by Hartzell, refer to Hartzell Propeller Inc. Ice Protection System Manual 180 (30-61-80).

(b) For components of ice protection systems not supplied by Hartzell, refer to the applicable TC or STC holder's Instructions for Continued Airworthiness (ICA).

2. Description of Columns (Rev. 1)

A. Fig./Item Number

(1) Figure Number refers to the illustration where items appear.
Item Numbers refer to the specific part callout in the applicable illustration.

(a) Items Numbers that are listed but not shown in the illustration are identified by a dash to the left of the item number. (example: "-800")

(b) Alpha variants will be used to add additional items. There are two reasons for the use of alpha variants:

1 A part may have an alternate, or may be superseded, replaced, or obsoleted by another part.

a For example, the self-locking nut (A-2043) that is item 20 was superseded by the self-locking nut (A-2043-1) that is item 20A.

2 An Illustrated Parts List may contain multiple configurations. Effectivity codes are used to distinguish different part numbers within the same list.

a For example, one propeller configuration may use a mounting bolt (B-3339-1) that is item 30, yet another propeller configuration uses a mounting bolt (B-3347) that is item 30A. Effectivity codes are very important in the determination of parts in a given configuration.

B. Part Number

(1) The Part Number is the Hartzell Propeller Inc. identification number for the part.

(2) Use the Hartzell Propeller Inc. part number when ordering the part from Hartzell or a Hartzell-approved distributor.

C. Description

(1) This column provides the Hartzell Propeller Inc. description of the part.

(2) Bullets and indentations are used to indicate parts that are components of a sub-assembly.

(a) For example, a Fork Assembly that is part of a HC-C2YR-1 propeller assembly will have one bullet ( • ) before the description. This indicates that the Fork Assembly is part of the Propeller Assembly.

1 A Fork Bumper that is part of the Fork Assembly will appear directly below the Fork Assembly with two bullets ( • • ) before the description. This indicates that the Fork Bumper is part of the Fork Assembly - that is part of the Propeller Assembly.

a Example: HC-C2YR-1
• Fork Assembly
• • Fork Bumper

(3) If the description in this column includes a "PCP:" prefix, the part is classified as a Propeller Critical Part.

(4) If applicable, information regarding part alternatives, supersedures, replacements, or obsolescence will appear in the Description column.

(a) Refer to the section, "Description of Terms" in this chapter for definitions and requirements for part "alternates", "supersedures", etc.

(b) When part alternatives, supersedures, replacements, etc. are listed, the service document number related to the change may be included for reference.

(5) If applicable, vendor CAGE codes will be listed in the Description column.

D. Effectivity Code (EFF CODE)

(1) This column is used when additional information about a part is required.

(a) Effectivity codes can be used to identify parts that are only used on a particular model, or to direct the user to additional information in the "Effectivity" box at the bottom of the page.

(b) Whenever an effectivity code is present, refer to the "Effectivity" box at the bottom of the page for the applicable information.

(2) Parts common to all assembly models on the page show no effectivity code.

E. Units Per Assembly (UPA)

(1) Designates the total quantity of an item required for the next higher assembly or subassembly.

F. Overhaul (O/H)

(1) Designates the parts to be replaced at overhaul. A “Y” identifies the parts that must be replaced at overhaul.

NOTE: An overhaul kit may not contain all the parts identified with a "Y" for a particular model propeller. An example of parts that may not be included in the overhaul kit is spinner mounting parts.

G. Propeller Critical Part (PCP)

(1) This column identifies the Propeller Critical Parts (PCP) that are contained in each propeller model.

(a) Refer to the Introduction chapter of this manual for the definition of Propeller Critical Parts (PCP).

3. Description of Terms (Rev. 1)

A. Alternate

(1) Alternate parts are identified by the term "ALTERNATE" in the Description column. Alternate items are considered airworthy for continued flight and existing stock of parts may be used for maintenance and/or repair. The new or alternate part number may be used interchangeably when ordering/stocking new parts.

B. Supersedure

(1) Part changes are identified by the terms “SUPERSEDES ITEM _____” or “SUPERSEDED BY ITEM _____” in the Description column. Superseded items are considered airworthy for continued flight and existing stock of superseded parts may be used for maintenance and/or repair. Once the superseding part has been incorporated/installed into an assembly, the original superseded part may no longer be used. Superseded parts may no longer be available, and the new part number must be used when ordering/stocking new parts.

C. Replacement

(1) Part changes identified by the terms "REPLACES ITEM _____” or “REPLACED BY ITEM _____” in the Description column are considered airworthy for continued flight, but must be replaced with a part with the new part number at overhaul. Existing stock of replaced parts may not be used for maintenance and/or repair of effected assemblies. Replaced parts may no longer be available, and the new part number must be used when ordering/stocking new parts.

D. Obsolete

(1) Obsolete parts are identified by "OBS” in the Units Per Assembly (UPA) column. Obsolete items are considered unairworthy for continued flight.

4. Vendor Supplied Hardware (Rev. 1)

A. Important Information

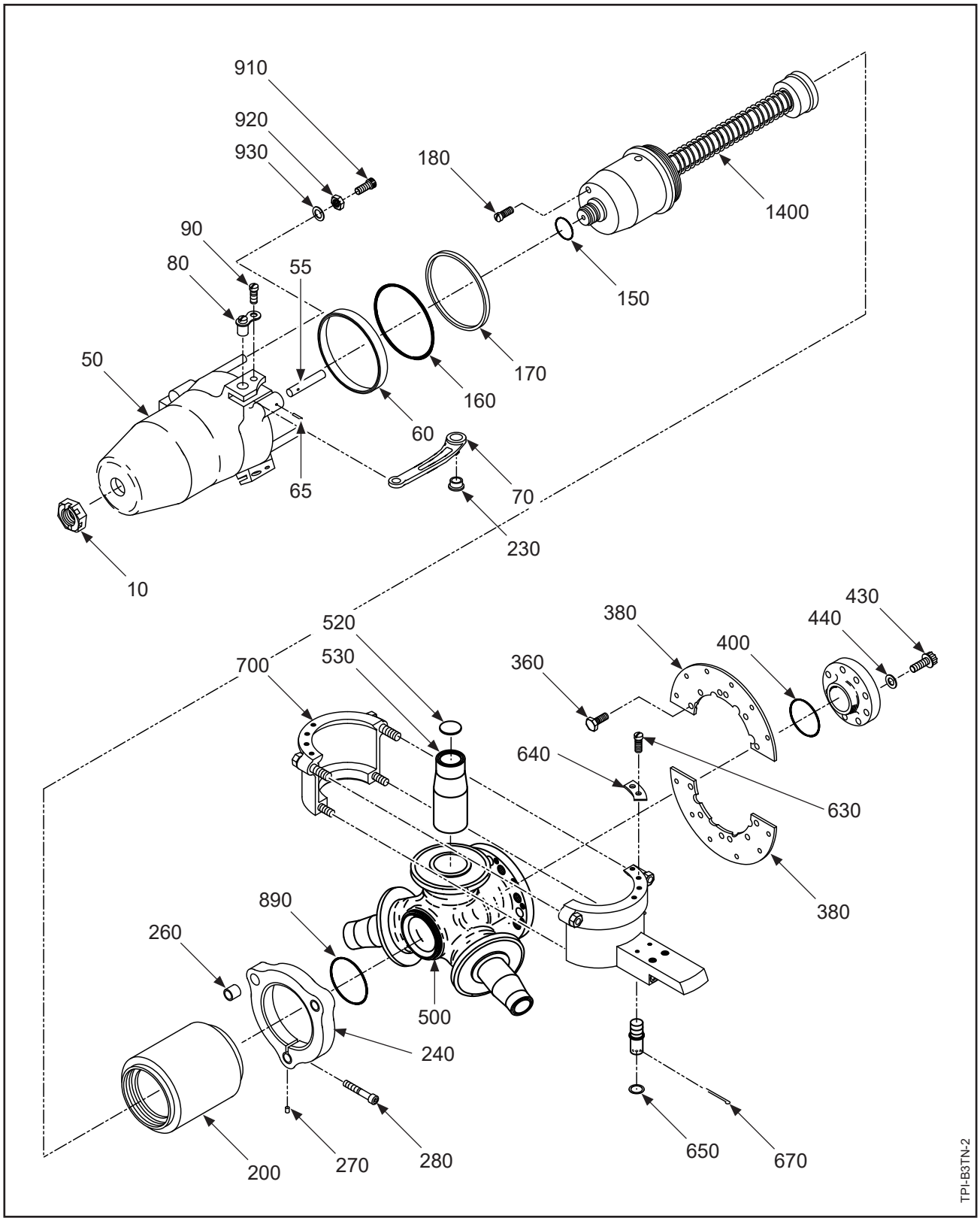
(1) Many O-rings, fasteners, and other vendor supplied hardware listed in Hartzell Propeller Inc. manuals have previously been specified with AN, MS, NAS, or vendor part number. To provide internal controls and procurement flexibility, Hartzell part numbers have been assigned to all O-rings, fasteners, and hardware. Part shipments from Hartzell Propeller Inc. will specify only the Hartzell part numbers.

(2) Some O-rings, fasteners, and hardware manufactured in accordance with established industry specifications (certain AN, MS, NAS items) are acceptable for use in Hartzell Propeller Inc. products without additional standards imposed by Hartzell.

(a) For a listing of part number interchangeability, refer to the Vendor Cross Reference chapter of Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02).

(b) Where permitted, both the Hartzell part number item and AN, MS, NAS, and other specified vendor number items can be used interchangeably.

(c) The Hartzell part number must be used when ordering these parts from Hartzell Propeller Inc.




**HC-B3TN-2(B): Propeller Parts**
**Figure 10-1**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10-1** | | **HC-B3TN-2(B) PROPELLER ASSEMBLY** | | | | |
| 10 | A-880-1 | • NUT, HEX, SELF-LOCKING, THIN | | 1 | Y | |
| 50 | C-1802 | • PISTON UNIT, SUPERSEDED BY ITEM 50A (USE WITH ITEMS 1400 AND 1400A) | | 1 | | |
| 50A | C-1863 | • PISTON UNIT, SUPERSEDES ITEM 50 (USE WITH ITEM 1400B) | | 1 | | |
| 55 | A-817-2 | • • ROD, GUIDE, PISTON | | 3 | | |
| 60 | A-862-1 | • • BUSHING, PLASTIC | | 1 | | |
| 65 | A-114-B | • • DOWEL PIN | | 3 | | |
| 70 | A-861-3 | • LINK ARM | | 3 | | |
| 80 | A-1464 | • LINK PIN UNIT | | 3 | Y | |
| 90 | B-3840-6 | • SCREW, 10-32, FILLISTER HEAD | | 3 | Y | |
| 150 | C-3317-020 | • O-RING | | 1 | Y | |
| 160 | C-3317-347-2 | • O-RING | | 1 | Y | |
| 170 | A-863 | • SEAL, DUST, PISTON, REPLACED BY ITEM 170A | | OBS | | |
| 170A | B-1843 | • SEAL, DUST, PISTON, REPLACES ITEM 170 | | 1 | Y | |
| 180 | B-3840-6 | • SCREW, 10-32, FILLISTER HEAD | | 4 | Y | |
| 200 | B-1803-1 | • PCP: CYLINDER, SUPERSEDED BY ITEM 200A (USE WITH ITEMS 1400 AND 1400A) | | 1 | | PCP |
| 200A | B-1803-2 | • PCP: CYLINDER, SUPERSEDES ITEM 200 (USE WITH ITEM 1400B) | | 1 | | PCP |
| 230 | A-944 | • SLEEVE, LINKSCREW | | 1 | Y | |
| 240 | 834-7A | • GUIDE COLLAR UNIT | | 1 | | |
| 260 | A-116-D1 | • • BUSHING, PLASTIC | | 3 | | |
| 270 | A-114-2 | • • DOWEL PIN | | 1 | | |
| 280 | A-2038-14 | • • SCREW, 1/4-28, CAP | | 1 | Y | |
| 360 | A-2051 | • BOLT, 5/16-24, HEX HEAD, REPLACED BY ITEM 360A | | OBS | | |
| 360A | A-2051-1 | • BOLT, 5/16-24, HEX HEAD, REPLACES ITEM 360 | | 10 | Y | |
| 380 | C-3003-1 | • PLATE, MOUNTING, SPINNER | | 1 | | |
| 400 | C-3317-230 | • O-RING | | 1 | Y | |
| 430 | B-3339 | • BOLT, MOUNTING, 9/16-18, 12 POINT | | 8 | Y | |
| 440 | A-2048-2 | • WASHER, MOUNTING, 9/16" CSK | | 8 | Y | |
| 500 | 840-60 | • PCP: HUB UNIT | | 1 | | PCP |
| 520 | B-3897-1 | • • PLUG, EXPANSION | | 3 | Y | |
| 530 | A-1891-A | • • PILOT TUBE | | 3 | | |
| 630 | B-3840-( ) | • SCREW, 10-32, FILLISTER HEAD [LENGTH OF SCREW MUST SUIT ITEM 640 AND SUPPLY A 0.125 INCH (3.18 MM) MINIMUM ENGAGEMENT] | | AR | Y | |
| 640 | A-1305 | • BALANCE WEIGHT | | AR | | |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| | | | |

- ITEM NOT ILLUSTRATED

**HC-B3TN-2(B), page 1 of 2**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10-1** | | **HC-B3TN-2(B) PROPELLER ASSEMBLY** | | | | |
| 650 | A-6119 | • BUSHING, LINK ARM | | 3 | Y | |
| 670 | B-3838-3-3 | • COTTER PIN | | 3 | Y | |
| 890 | C-3317-235 | • O-RING | | 1 | Y | |
| 910 | A-2037 | • SCREW, 5/16, CAP | | 3 | Y | |
| 920 | B-3368 | • NUT, 5/16-24, HEX, THIN | | 3 | Y | |
| 930 | A-1444 | • WASHER, 5/16" | | 3 | Y | |
| **10A-1** | | **BLADE RETENTION PARTS** | | | | |
| | | **REFER TO THE A-1851-(T) BLADE RETENTION PARTS IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST** | | | | |
| | | **CLAMP ASSEMBLY** | | | | |
| | | **REFER TO THE APPLICABLE CLAMP ASSEMBLY IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST** | | | | |
| 700 | 838-17E | • PCP: CLAMP ASSEMBLY | | 3 | | PCP |
| | | **SPRING ASSEMBLY** | | | | |
| | | **REFER TO THE APPLICABLE SPRING ASSEMBLY IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST** | | | | |
| 1400 | 831-12 | • SPRING ASSEMBLY, REPLACED BY ITEM 1400A (USE WITH ITEM 50 AND ITEM 200) | | 1 | | |
| 1400A | 831-87 | • SPRING ASSEMBLY, REPLACES ITEM 1400 (USE WITH ITEM 50 AND ITEM 200) | | 1 | | |
| 1400B | 831-57 | • SPRING ASSEMBLY (USE WITH ITEM 50A AND ITEM 200A) | | 1 | | |
| | | **COUNTERWEIGHT SLUGS/MOUNTING HARDWARE** | | | | |
| -9040 | | • COUNTERWEIGHT SLUG | | | | |
| -9050 | | • HEX HEAD BOLT<br>ARE APPLICATION SPECIFIC, REFER TO HARTZELL PROPELLER APPLICATION GUIDE MANUAL 159 (61-02-59) FOR PART NUMBER AND PROPELLER CRITICAL PART (PCP) IDENTIFICATION | | | Y | |
| | | **SPINNER PARTS** | | | | |
| | | • APPLICATION SPECIFIC<br>REFER TO HARTZELL PROPELLER APPLICATION GUIDE MANUAL 159 (61-02-59) AND THE APPLICABLE HARTZELL PROPELLER SPINNER MAINTENANCE MANUAL:<br>MANUAL 127 (61-16-27) - METAL SPINNER ASSEMBLIES<br>MANUAL 148 (61-16-48) - COMPOSITE SPINNER ASSEMBLIES | | | | |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| | | | |

- ITEM NOT ILLUSTRATED

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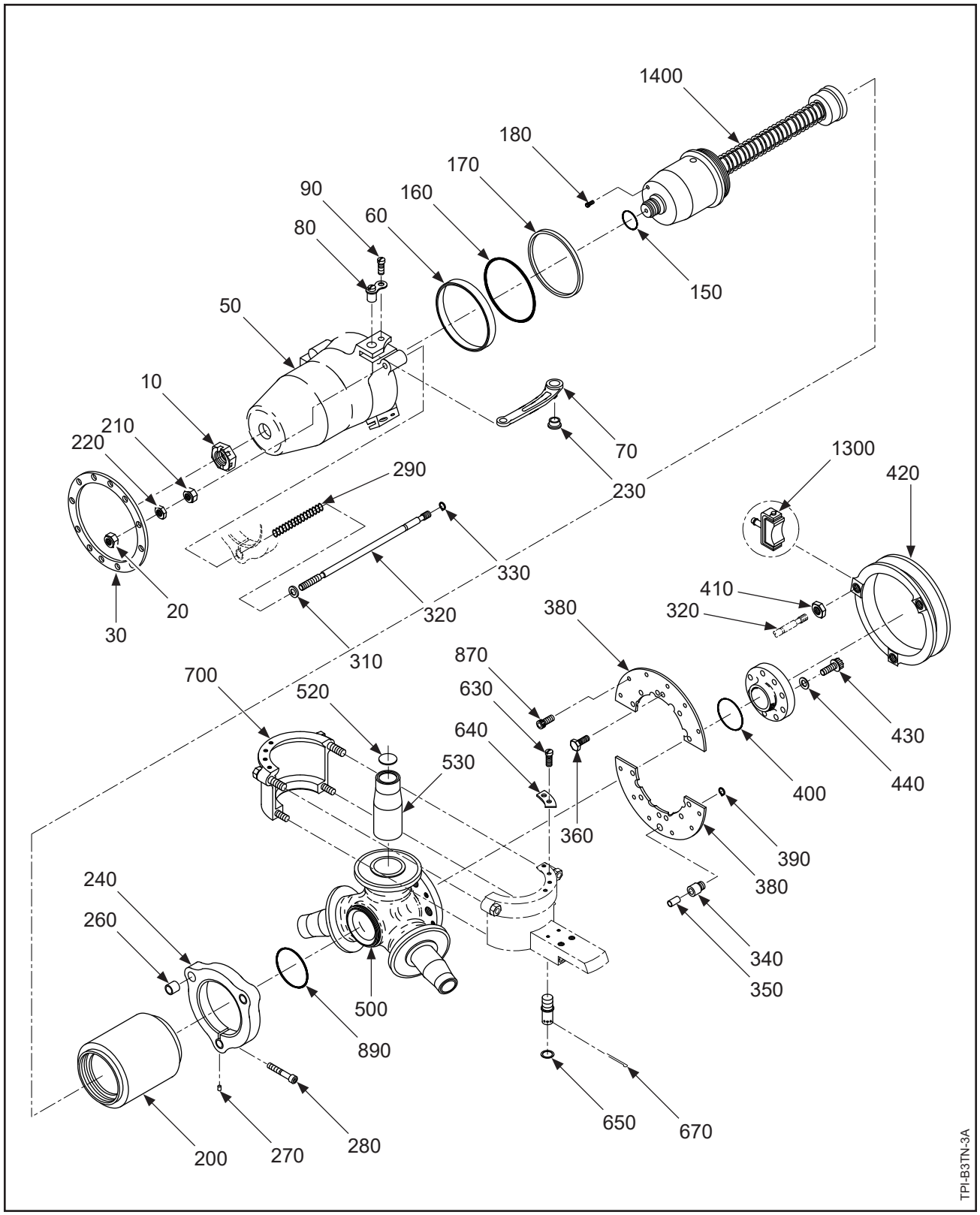



**HC-B3TN-3(A, B, C, D, G, S): Exploded View**
**Figure 10-2**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10-2** | | **HC-B3TN-3(A, B, C, D, G, S) PROPELLER ASSEMBLY** | | | | |
| 10 | A-880-1 | • NUT, HEX, SELF-LOCKING, THIN | | 1 | Y | |
| 20 | B-3359 | • NUT, 3/8-24, HEX, SELF-LOCKING | | 3 | Y | |
| 20A | B-3599 | • NUT, 3/8-24, HEX, SELF-LOCKING, ALTERNATE FOR ITEM 20 | | 3 | Y | |
| 30 | B-3049 | • RING, SUPPORT, ROD, BETA | | 1 | | |
| 50 | C-3021-5 | • PISTON UNIT | | 1 | | |
| 50A | C-3021 | • PISTON UNIT, ALTERNATE FOR ITEM 50 | | 1 | | |
| 60 | A-862-1 | • • BUSHING, PLASTIC | | 1 | | |
| 70 | B-4016 | • LINK ARM | | 3 | | |
| 70A | B-1901 | • LINK ARM, ALTERNATE FOR ITEM 70 | | 3 | | |
| 80 | A-1464 | • LINK PIN UNIT | | 3 | Y | |
| 90 | B-3840-6 | • SCREW, 10-32, FILLISTER HEAD | | 3 | Y | |
| 150 | C-3317-020 | • O-RING | | 1 | Y | |
| 160 | C-3317-347-2 | • O-RING | | 1 | Y | |
| 170 | A-863 | • SEAL, DUST, PISTON, REPLACED BY ITEM 170A | | OBS | | |
| 170A | B-1843 | • SEAL, DUST, PISTON, REPLACES ITEM 170 | | 1 | Y | |
| 180 | B-3840-5 | • SCREW, 10-32, FILLISTER HEAD | | 4 | Y | |
| 200 | B-1803-2 | • PCP: CYLINDER | | 1 | | PCP |
| 210 | A-2043 | • NUT, 3/8-24, HEX, SELF-LOCKING, REPLACED BY ITEM 210A | | OBS | | |
| 210A | A-2043-1 | • NUT, 3/8-24, HEX, SELF-LOCKING, REPLACES ITEM 210 | | 3 | Y | |
| 220 | A-3439 | • NUT, 3/8-24, HEX, THIN | | 3 | Y | |
| 220A | B-3382 | • NUT, 3/8-24, HEX, THIN, ALTERNATE FOR ITEM 220 | | 3 | Y | |
| 230 | A-944 | • SLEEVE, LINKSCREW | | 3 | Y | |
| 240 | 834-12 | • GUIDE COLLAR UNIT | | 1 | | |
| 260 | A-3023 | • • BUSHING, PLASTIC | | 3 | | |
| 270 | A-114-6 | • • DOWEL PIN | | 1 | | |
| 280 | A-2038-12 | • • SCREW, 1/4-28, CAP | | 1 | Y | |
| 290 | A-3099 | • SPRING, COMPRESSION, BETA | | 3 | Y | |
| -295 | A-965 | • WASHER, 7/16, CRES (USE WITH ITEM 300) | | 3 | Y | |
| -300 | B-3002-2 | • LOW STOP ROD UNIT, SUPERSEDED BY ITEM 300A | | 3 | | |
| -300A | B-3475A-2 | • ROD, BETA UNIT, SUPERSEDES ITEM 300 | | 3 | | |
| 310 | A-3478-1 | • • SPRING RETAINER, BETA | | 1 | | |
| 320 | B-3476A-2 | • • ROD, BETA | | 1 | | |
| 330 | A-3482 | • • RING, RETAINING, CRIMPED | | 2 | Y | |
| 340 | A-3067-2 | • LUG, GUIDE | | 3 | | |
| 350 | A-3023-2 | • • BUSHING, PLASTIC | | 1 | | |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| | | | |

- ITEM NOT ILLUSTRATED

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10-2** | | **HC-B3TN-3(A, B, C, D, G, S) PROPELLER ASSEMBLY** | | | | |
| 360 | A-2051 | • BOLT, 5/16-24, HEX HEAD, REPLACED BY ITEM 360A | | OBS | | |
| 360A | A-2051-1 | • BOLT, 5/16-24, HEX HEAD, REPLACES ITEM 360 | | 9 | Y | |
| -365 | A-2037-1 | • SCREW, 5/16, CAP | | 1 | Y | |
| 380 | C-3003-2 | • PLATE, MOUNTING, SPINNER, SUPERSEDED BY ITEM 380A | | 1 | | |
| 380A | C-3003-1 | • PLATE, MOUNTING, SPINNER, SUPERSEDES ITEM 380 | | 1 | | |
| 390 | B-3843-56ZD | • SNAP RING, EXTERNAL | | 3 | Y | |
| 400 | C-3317-230 | • O-RING | | 1 | Y | |
| 410 | A-3439 | • NUT, 3/8-24, HEX, THIN | | 3 | Y | |
| 420 | B-3001 | • RING, BETA, REPLACED BY ITEM 420A | | OBS | | |
| 420A | B-3001-2 | • RING, BETA, REPLACES ITEM 420 | | 1 | | |
| 430 | B-3339 | • BOLT, MOUNTING, 9/16-18, 12 POINT | | 8 | Y | |
| 440 | A-2048-2 | • WASHER, MOUNTING, 9/16" CSK | | 8 | Y | |
| -450 | B-3808-4 | • NUT, HEX, SELF-LOCKING | | 12 | Y | |
| -460 | B-3851-0432 | • WASHER | | 24 | Y | |
| 500 | 840-60 | • PCP: HUB UNIT | | 1 | | PCP |
| 520 | B-3897-1 | • • PLUG, EXPANSION | | 3 | Y | |
| 530 | A-1891-A | • • PILOT TUBE | | 3 | | |
| 630 | B-3840-6 | • SCREW, 10-32, FILLISTER HEAD | | AR | Y | |
| 640 | A-1305 | • BALANCE WEIGHT | | AR | | |
| 650 | A-6119 | • BUSHING, LINK ARM | | 3 | Y | |
| 670 | B-3838-3-3 | • COTTER PIN | | 3 | Y | |
| 870 | B-3384-4 | • BOLT, 1/4-28, HEX HEAD | | 12 | Y | |
| 870A | B-3384-4H | • BOLT, 1/4-28, HEX HEAD, ALTERNATE | | 12 | Y | |
| 890 | C-3317-235 | • O-RING | | 1 | Y | |
| **10A-1** | | **BLADE RETENTION PARTS**<br>**REFER TO THE A-1851-(T) BLADE RETENTION PARTS IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST** | | | | |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| | | | |

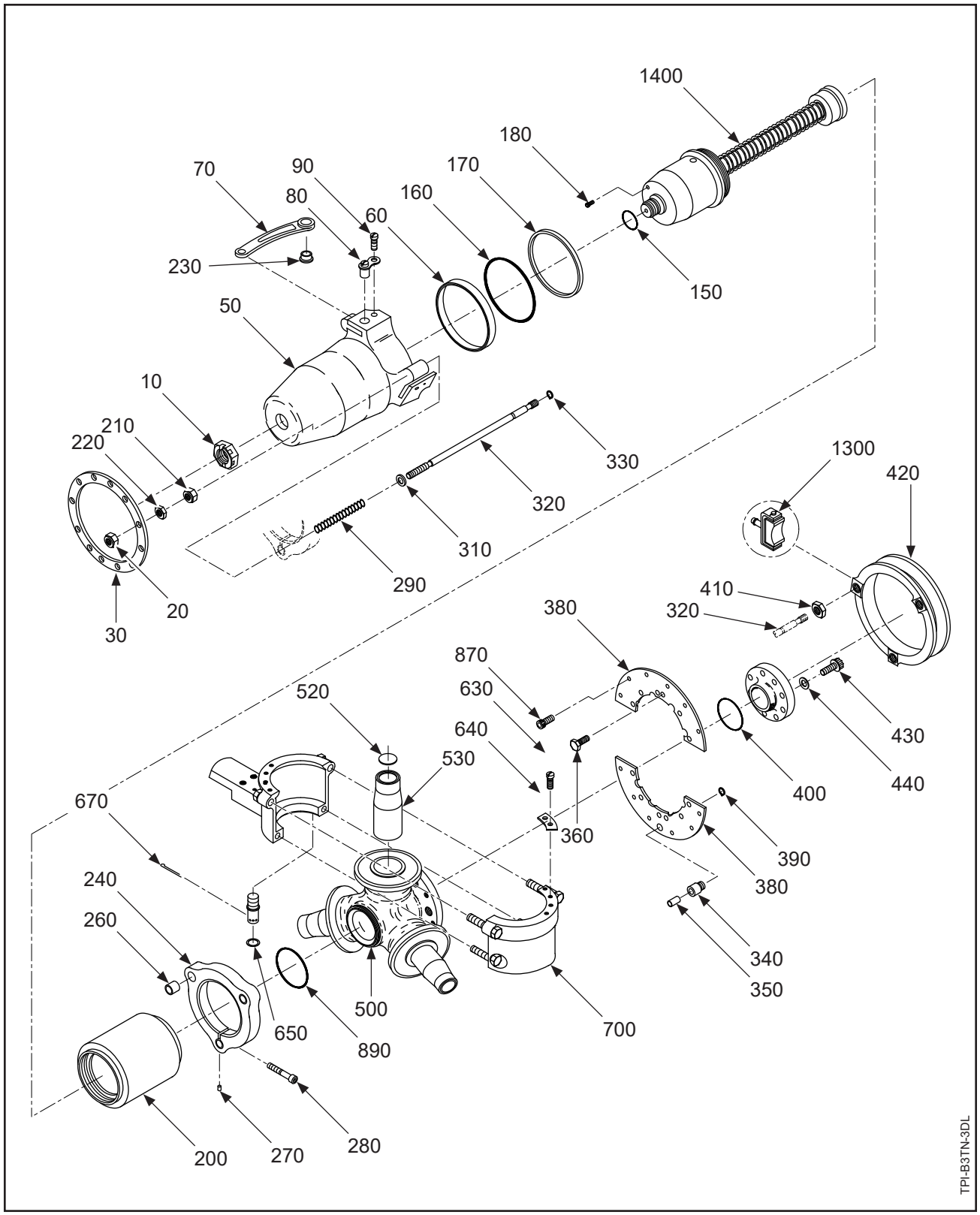
- ITEM NOT ILLUSTRATED

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| 10-2 | | **HC-B3TN-3(A, B, C, D, G, S) PROPELLER ASSEMBLY** | | | | |
| | | **CLAMP ASSEMBLY** | | | | |
| | | **REFER TO THE APPLICABLE CLAMP ASSEMBLY IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST** | | | | |
| 700 | 838-67 | • PCP: CLAMP ASSEMBLY | -3,-3A,-3B, -3C,-3D,-3S | 3 | | PCP |
| | 838-88 | • PCP: CLAMP ASSEMBLY | -3G | 3 | | PCP |
| 700A | 838-65 | • PCP: CLAMP ASSEMBLY, ALTERNATE FOR ITEM 700 | -3,-3A,-3B, -3C,-3D,-3S | 3 | | PCP |
| | | **BETA FEEDBACK BLOCK ASSEMBLY** | | | | |
| | | **REFER TO THE APPLICABLE BETA FEEDBACK BLOCK ASSEMBLY IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST.** | | | | |
| 1300 | | • BETA FEEDBACK BLOCK ASSEMBLIES ARE APPLICATION SPECIFIC. REFER TO HARTZELL PROPELLER APPLICATION GUIDE MANUAL 159 (61-02-59) FOR PART NUMBER AND PART QUANTITY.. | | | | |
| | | **SPRING ASSEMBLY** | | | | |
| | | **REFER TO THE APPLICABLE SPRING ASSEMBLY IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST** | | | | |
| 1400 | 831-47 | • SPRING ASSEMBLY, SUPERSEDED BY ITEM 1400A | -3A,-3C,-3D -3G | 1 | | |
| | 831-79 | • SPRING ASSEMBLY | -3,-3B | 1 | | |
| | 831-83 | • SPRING ASSEMBLY | -3S | 1 | | |
| 1400A | 831-82 | • SPRING ASSEMBLY, SUPERSEDES ITEM 1400 | -3A,-3C,-3D -3G | 1 | | |
| | | **COUNTERWEIGHT SLUGS/MOUNTING HARDWARE** | | | | |
| -9040 | | • COUNTERWEIGHT SLUG | | | | |
| -9050 | | • HEX HEAD BOLT APPLICATION SPECIFIC, REFER TO HARTZELL PROPELLER APPLICATION GUIDE MANUAL 159 (61-02-59) FOR PART NUMBER AND PROPELLER CRITICAL PART (PCP) IDENTIFICATION | | | Y | |
| | | **SPINNER PARTS** | | | | |
| | | • APPLICATION SPECIFIC REFER TO HARTZELL PROPELLER APPLICATION GUIDE MANUAL 159 (61-02-59) AND THE APPLICABLE HARTZELL PROPELLER SPINNER MAINTENANCE MANUAL: MANUAL 127 (61-16-27) - METAL SPINNER ASSEMBLIES MANUAL 148 (61-16-48) - COMPOSITE SPINNER ASSEMBLIES | | | | |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| -3 | HC-B3TN-3 | -3D | HC-B3TN-3D |
| -3A | HC-B3TN-3A | -3G | HC-B3TN-3G |
| -3B | HC-B3TN-3B | -3S | HC-B3TN-3S |
| -3C | HC-B3TN-3C | | |

- ITEM NOT ILLUSTRATED

**HC-B3TN-3(A, B, C, D, G, S), page 3 of 3**




**HC-B3TN-(3DL, 3UL): Exploded View**
**Figure 10-3**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10-3** | | **HC-B3TN-(3DL, -3UL) PROPELLER ASSEMBLY** | | | | |
| 10 | A-880-1 | • NUT, HEX, SELF-LOCKING, THIN | | 1 | Y | |
| 20 | B-3359 | • NUT, 3/8-24, HEX, SELF-LOCKING | | 3 | Y | |
| 20A | B-3599 | • NUT, 3/8-24, HEX, SELF-LOCKING, ALTERNATE FOR ITEM 20 | | 3 | Y | |
| 30 | B-3049 | • RING, SUPPORT, ROD, BETA | | 1 | | |
| 50 | C-3021L | • PISTON UNIT | | 1 | | |
| 60 | A-862-1 | • • BUSHING, PLASTIC | | 1 | | |
| 70 | B-4016L | • LINK ARM | | 3 | | |
| 70A | B-1901L | • LINK ARM, ALTERNATE FOR ITEM 70 | -3UL | 3 | | |
| 80 | A-1464 | • LINK PIN UNIT | | 3 | Y | |
| 90 | B-3840-6 | • SCREW, 10-32, FILLISTER HEAD | | 3 | Y | |
| 150 | C-3317-020 | • O-RING | | 1 | Y | |
| 160 | C-3317-347-2 | • O-RING | | 1 | Y | |
| 170 | A-863 | • SEAL, DUST, PISTON, REPLACED BY ITEM 170A | | OBS | | |
| 170A | B-1843 | • SEAL, DUST, PISTON, REPLACES ITEM 170 | | 1 | Y | |
| 180 | B-3840-5 | • SCREW, 10-32, FILLISTER HEAD | | 4 | Y | |
| 200 | B-1803-2 | • PCP: CYLINDER | | 1 | | PCP |
| 210 | A-2043 | • NUT, 3/8-24, HEX, SELF-LOCKING, REPLACED BY ITEM 210A | | OBS | | |
| 210A | A-2043-1 | • NUT, 3/8-24, HEX, SELF-LOCKING, REPLACES ITEM 210 | | 3 | Y | |
| 220 | A-3439 | • NUT, 3/8-24, HEX, THIN | | 3 | Y | |
| 220A | B-3382 | • NUT, 3/8-24, HEX, THIN, ALTERNATE FOR ITEM 220 | | 3 | Y | |
| 230 | A-944 | • SLEEVE, LINKSCREW | | 3 | Y | |
| 240 | 834-12 | • GUIDE COLLAR UNIT | | 1 | | |
| 260 | A-3023 | • • BUSHING, PLASTIC | | 3 | | |
| 270 | A-114-6 | • • DOWEL PIN | | 1 | | |
| 280 | A-2038-12 | • • SCREW, 1/4-28, CAP | | 1 | Y | |
| 290 | A-3099 | • SPRING, COMPRESSION, BETA | | 3 | Y | |
| -295 | A-965 | • WASHER, 7/16, CRES - (USE WITH ITEM 300) | | 3 | Y | |
| -300 | B-3002-2 | • LOW STOP ROD UNIT - SUPERSEDED BY ITEM 300A | | 3 | | |
| -300A | B-3475A-2 | • ROD, BETA UNIT, SUPERSEDES ITEM 300 | | 3 | | |
| 310 | A-3478-1 | • • SPRING RETAINER, BETA (USE WITH ITEM 300A) | | 1 | | |
| 320 | B-3476A-2 | • • ROD, BETA (USE WITH ITEM 300A) | | 1 | | |
| 330 | A-3482 | • • RING, RETAINING, CRIMPED (USE WITH ITEM 300A) | | 2 | Y | |
| 340 | A-3067-2 | • LUG, GUIDE | | 3 | | |
| 350 | A-3023-2 | • • BUSHING, PLASTIC | | 1 | | |
| 360 | A-2051 | • BOLT, 5/16-24, HEX HEAD, REPLACED BY ITEM 360A | | OBS | | |
| 360A | A-2051-1 | • BOLT, 5/16-24, HEX HEAD, REPLACES ITEM 360 | | 9 | Y | |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| -3UL | HC-B3TN-3UL | | |

- ITEM NOT ILLUSTRATED

**HC-B3TN-(3DL, 3UL), page 1 of 3**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10-3** | | **HC-B3TN-(3DL, -3UL) PROPELLER ASSEMBLY** | | | | |
| -365 | A-2037-1 | • SCREW, 5/16, CAP | | 1 | Y | |
| 380 | C-3003-2 | • PLATE, MOUNTING, SPINNER, SUPERSEDED BY ITEM 380A | | 1 | | |
| 380A | C-3003-1 | • PLATE, MOUNTING, SPINNER, SUPERSEDES ITEM 380 | | 1 | | |
| 390 | B-3843-56ZD | • SNAP RING, EXTERNAL | | 3 | Y | |
| 400 | C-3317-230 | • O-RING | | 1 | Y | |
| 410 | A-3439 | • NUT, 3/8-24, HEX, THIN | | 3 | Y | |
| 420 | B-3001 | • RING, BETA, REPLACED BY ITEM 420A | | OBS | | |
| 420A | B-3001-2 | • RING, BETA, REPLACES ITEM 420 | | 1 | | |
| 430 | B-3339 | • BOLT, MOUNTING, 9/16-18, 12 POINT | | 8 | Y | |
| 440 | A-2048-2 | • WASHER, MOUNTING, 9/16" CSK | | 8 | Y | |
| -450 | B-3808-4 | • NUT, HEX, SELF-LOCKING | | 12 | Y | |
| -460 | B-3851-0432 | • WASHER | -3DL | 24 | Y | |
| -460A | B-3851-0463 | • WASHER | -3UL | 12 | Y | |
| 500 | 840-60 | • PCP: HUB UNIT | | 1 | | PCP |
| 520 | B-3897-1 | • • PLUG, EXPANSION | | 3 | Y | |
| 530 | A-1891-A | • • PILOT TUBE | | 3 | | |
| 630 | B-3840-6 | • SCREW, 10-32, FILLISTER HEAD | | AR | Y | |
| 640 | A-1305 | • BALANCE WEIGHT | | AR | | |
| 650 | A-6119 | • BUSHING, LINK ARM | | 3 | Y | |
| 670 | B-3838-3-3 | • COTTER PIN | | 3 | Y | |
| 870 | B-3384-4 | • BOLT, 1/4-28, HEX HEAD | | 12 | Y | |
| 870A | B-3384-4H | • BOLT, 1/4-28, HEX HEAD, ALTERNATE FOR ITEM 870 | | 12 | Y | |
| 890 | C-3317-235 | • O-RING | | 1 | Y | |

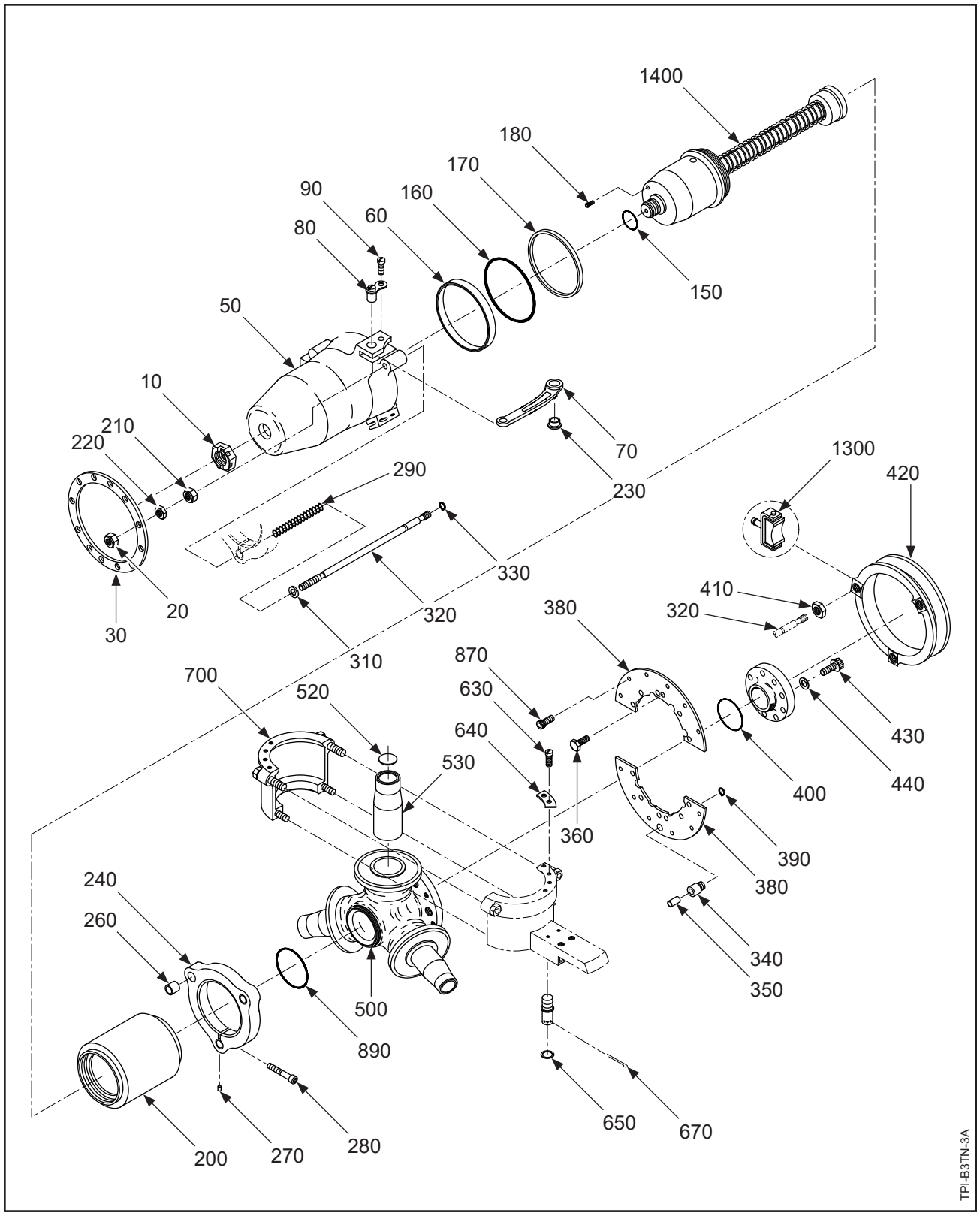
| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| -3DL | HC-B3TN-3DL | | |
| -3UL | HC-B3TN-3UL | | |

- ITEM NOT ILLUSTRATED

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| 10-3 | | **HC-B3TN-(3DL, -3UL) PROPELLER ASSEMBLY** | | | | |
| 10A-1 | | **BLADE RETENTION PARTS** | | | | |
| | | **REFER TO THE A-1851-(T) BLADE RETENTION PARTS IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST** | | | | |
| | | **CLAMP ASSEMBLY** | | | | |
| | | **REFER TO THE APPLICABLE CLAMP ASSEMBLY IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST** | | | | |
| 700 | 838-67L | • PCP: CLAMP ASSEMBLY | | 3 | | PCP |
| | | **BETA FEEDBACK BLOCK ASSEMBLY** | | | | |
| | | **REFER TO THE APPLICABLE BETA FEEDBACK BLOCK ASSEMBLY IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST** | | | | |
| 1300 | | • BETA FEEDBACK BLOCK ASSEMBLIES<br>ARE APPLICATION SPECIFIC. REFER TO HARTZELL PROPELLER APPLICATION GUIDE MANUAL 159 (61-02-59) FOR PART NUMBER AND PART QUANTITY. | | | | |
| | | **SPRING ASSEMBLY** | | | | |
| | | **REFER TO THE APPLICABLE SPRING ASSEMBLY IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST** | | | | |
| 1400 | 831-47 | • SPRING ASSEMBLY, SUPERSEDED BY ITEM 1400A | | 1 | | |
| 1400A | 831-82 | • SPRING ASSEMBLY, SUPERSEDES ITEM 1400 | | 1 | | |
| | | **COUNTERWEIGHT SLUGS/MOUNTING HARDWARE** | | | | |
| -9040<br>-9050 | | • COUNTERWEIGHT SLUG<br>• HEX HEAD BOLT<br>APPLICATION SPECIFIC,<br>REFER TO HARTZELL PROPELLER APPLICATION GUIDE MANUAL 159 (61-02-59) FOR PART NUMBER AND PROPELLER CRITICAL PART (PCP) IDENTIFICATION | | | Y | |
| | | **SPINNER PARTS** | | | | |
| | | • APPLICATION SPECIFIC<br>REFER TO HARTZELL PROPELLER APPLICATION GUIDE MANUAL 159 (61-02-59) AND THE APPLICABLE HARTZELL PROPELLER SPINNER MAINTENANCE MANUAL:<br>MANUAL 127 (61-16-27) - METAL SPINNER ASSEMBLIES<br>MANUAL 148 (61-16-48) - COMPOSITE SPINNER ASSEMBLIES | | | | |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| | | | |

- ITEM NOT ILLUSTRATED




**HC-B3TN-(3E, 3F): Exploded View**
**Figure 10-4**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10-4** | | **HC-B3TN-(3E, 3F) PROPELLER ASSEMBLY** | | | | |
| 10 | A-880-1 | • NUT, HEX, SELF-LOCKING, THIN | | 1 | Y | |
| 20 | B-3359 | • NUT, 3/8-24, HEX, SELF-LOCKING | | 3 | Y | |
| 20A | B-3599 | • NUT, 3/8-24, HEX, SELF-LOCKING<br>ALTERNATE FOR ITEM 20, POST HC-SL-61-244 | | 3 | Y | |
| 30 | B-3049 | • RING, SUPPORT, ROD, BETA | | 1 | | |
| 50 | C-3021-5 | • PISTON UNIT | | 1 | | |
| 50A | C-3021 | • PISTON UNIT, ALTERNATE FOR ITEM 50 | | 1 | | |
| 60 | A-862-1 | • • BUSHING, PLASTIC | | 1 | | |
| 70 | B-4016 | • LINK ARM | | 3 | | |
| 70A | B-1901 | • LINK ARM, ALTERNATE FOR ITEM 70 | | 3 | | |
| 80 | A-1464 | • LINK PIN UNIT | | 3 | Y | |
| 90 | B-3840-6 | • SCREW, 10-32, FILLISTER HEAD | | 3 | Y | |
| 150 | C-3317-020 | • O-RING | | 1 | Y | |
| 160 | C-3317-347-2 | • O-RING | | 1 | Y | |
| 170 | A-863 | • SEAL, DUST, PISTON, REPLACED BY ITEM 170A | | OBS | | |
| 170A | B-1843 | • SEAL, DUST, PISTON, REPLACES ITEM 170 | | 1 | Y | |
| 180 | B-3840-5 | • SCREW, 10-32, FILLISTER HEAD | | 4 | Y | |
| 200 | B-1803-2 | • PCP: CYLINDER | | 1 | | PCP |
| 210 | A-2043 | • NUT, 3/8-24, HEX, SELF-LOCKING, REPLACED BY ITEM 210A | | OBS | | |
| 210A | A-2043-1 | • NUT, 3/8-24, HEX, SELF-LOCKING, REPLACES ITEM 210 | | 3 | Y | |
| 220 | A-3439 | • NUT, 3/8-24, HEX, THIN | | 3 | Y | |
| 220A | B-3382 | • NUT, 3/8-24, HEX, THIN, ALTERNATE FOR ITEM 220 | | 3 | Y | |
| 230 | A-944 | • SLEEVE, LINKSCREW | | 3 | Y | |
| 240 | 834-12 | • GUIDE COLLAR UNIT | | 1 | | |
| 260 | A-3023 | • • BUSHING, PLASTIC | | 3 | | |
| 270 | A-114-6 | • • DOWEL PIN | | 1 | | |
| 280 | A-2038-12 | • • SCREW, 1/4-28, CAP | | 1 | Y | |
| 290 | A-3099 | • SPRING, COMPRESSION, BETA | | 3 | Y | |
| -295 | A-965 | • WASHER, 7/16, CRES (USE WITH ITEM 300) | | 3 | Y | |
| -300 | B-3002-10 | • LOW STOP ROD UNIT, SUPERSEDED BY ITEM 300A | | 3 | | |
| -300A | B-3475A-10 | • ROD, BETA-UNIT, SUPERSEDES ITEM 300 | | 3 | | |
| 310 | A-3478-1 | • • SPRING RETAINER, BETA | | 1 | | |
| 320 | B-3476A-10 | • • ROD, BETA | | 1 | | |
| 330 | A-3482 | • • RING, RETAINING, CRIMPED | | 2 | Y | |
| 340 | A-3067-2 | • LUG, GUIDE | | 3 | | |
| 350 | A-3023-2 | • • BUSHING, PLASTIC | | 1 | | |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| | | | |

- ITEM NOT ILLUSTRATED

**HC-B3TN-(3E, 3F), page 1 of 3**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10-4** | | **HC-B3TN-(3E, 3F) PROPELLER ASSEMBLY** | | | | |
| 360 | A-2051 | • BOLT, 5/16-24, HEX HEAD, REPLACED BY ITEM 360A | | OBS | | |
| 360A | A-2051-1 | • BOLT, 5/16-24, HEX HEAD, REPLACES ITEM 360 | | 9 | Y | |
| -365 | A-2037-1 | • SCREW, 5/16, CAP | | 1 | Y | |
| 380 | C-3003-2 | • PLATE, MOUNTING, SPINNER, SUPERSEDED BY ITEM 380A | | 1 | | |
| 380A | C-3003-1 | • PLATE, MOUNTING, SPINNER, SUPERSEDES ITEM 380 | | 1 | | |
| 390 | B-3843-56ZD | • SNAP RING, EXTERNAL | | 3 | Y | |
| 400 | C-3317-230 | • O-RING | | 1 | Y | |
| 410 | A-3439 | • NUT, 3/8-24, HEX, THIN | | 3 | Y | |
| 420 | B-3001 | • RING, BETA, REPLACED BY ITEM 420A | | OBS | | |
| 420A | B-3001-2 | • RING, BETA, REPLACES ITEM 420 | | 1 | | |
| 430 | B-3339 | • BOLT, MOUNTING, 9/16-18, 12 POINT | | 8 | Y | |
| 440 | A-2048-2 | • WASHER, MOUNTING, 9/16" CSK | | 8 | Y | |
| -450 | B-3808-4 | • NUT, HEX, SELF-LOCKING | | 12 | Y | |
| -460 | B-3851-0432 | • WASHER | | 24 | Y | |
| 500 | 840-60 | • PCP: HUB UNIT | | 1 | | PCP |
| 520 | B-3897-1 | • • PLUG, EXPANSION | | 3 | Y | |
| 530 | A-1891-A | • • PILOT TUBE | | 3 | | |
| 630 | B-3840-6 | • SCREW, 10-32, FILLISTER HEAD | | AR | Y | |
| 640 | A-1305 | • BALANCE WEIGHT | | AR | | |
| 650 | A-6119 | • BUSHING, LINK ARM | | 3 | Y | |
| 670 | B-3838-3-3 | • COTTER PIN | | 3 | Y | |
| 870 | B-3384-4 | • BOLT, 1/4-28, HEX HEAD | | 12 | Y | |
| 870A | B-3384-4H | • BOLT, 1/4-28, HEX HEAD, ALTERNATE FOR ITEM 870 | | 12 | Y | |
| 890 | C-3317-235 | • O-RING | | 1 | Y | |

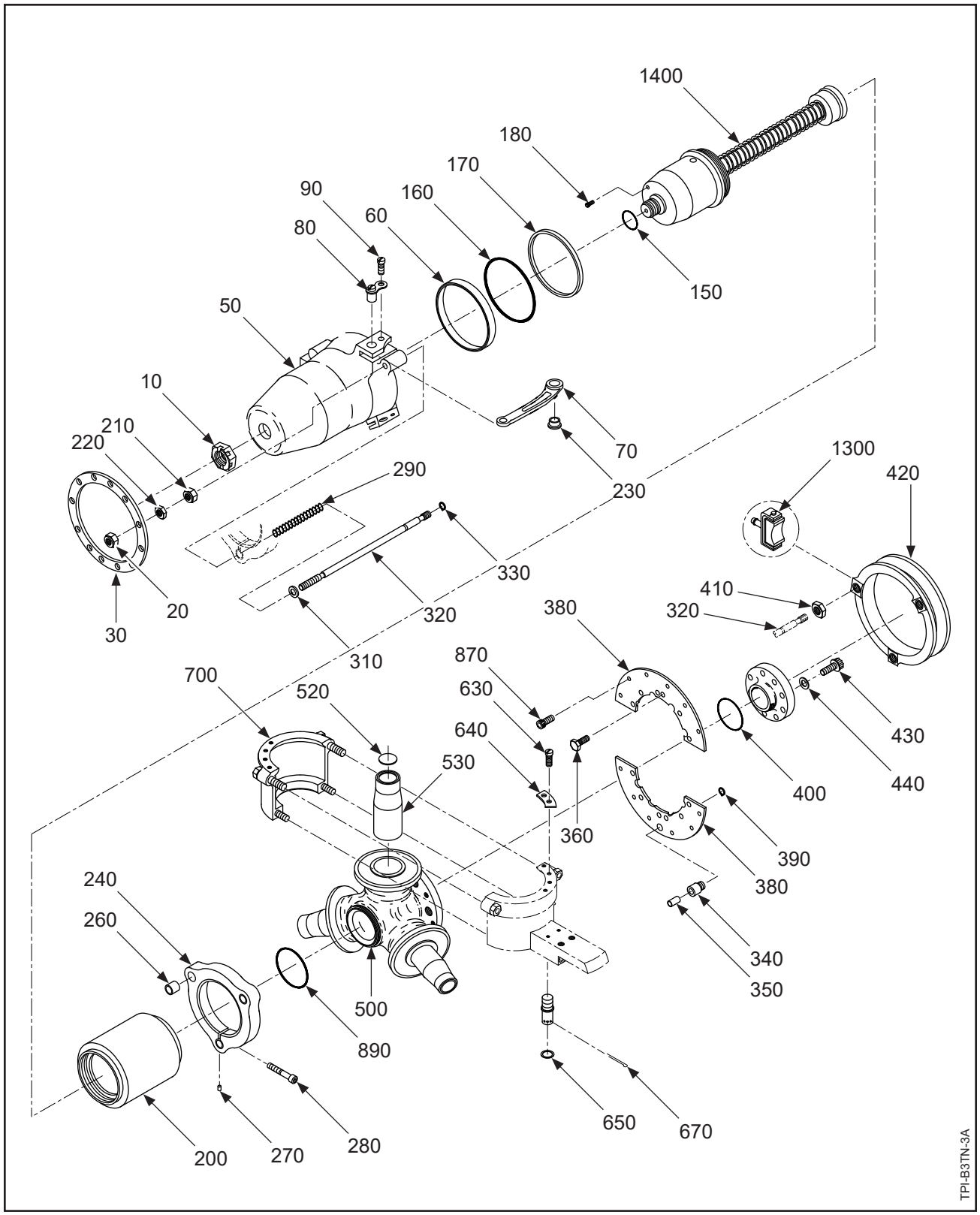
| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| | | | |

- ITEM NOT ILLUSTRATED

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| 10-4 | | **HC-B3TN-(3E, 3F) PROPELLER ASSEMBLY** | | | | |
| 10A-1 | | **BLADE RETENTION PARTS** | | | | |
| | | **REFER TO THE A-1851-(T) BLADE RETENTION PARTS IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST** | | | | |
| | | **CLAMP ASSEMBLY** | | | | |
| | | **REFER TO THE APPLICABLE CLAMP ASSEMBLY IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST** | | | | |
| 700 | 838-67 | • PCP: CLAMP ASSEMBLY | -3E | 3 | | PCP |
| | 838-88 | • PCP: CLAMP ASSEMBLY | -3F | 3 | | PCP |
| 700A | 838-65 | • PCP: CLAMP ASSEMBLY, ALTERNATE FOR ITEM 700 | -3E | 3 | | PCP |
| | | **BETA FEEDBACK BLOCK ASSEMBLY** | | | | |
| | | **REFER TO THE APPLICABLE BETA FEEDBACK BLOCK ASSEMBLY IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST** | | | | |
| 1300 | | • BETA FEEDBACK BLOCK ASSEMBLIES ARE APPLICATION SPECIFIC. REFER TO HARTZELL PROPELLER APPLICATION GUIDE MANUAL 159 (61-02-59) FOR PART NUMBER AND PART QUANTITY. | | | | |
| | | **SPRING ASSEMBLY** | | | | |
| | | **REFER TO THE APPLICABLE SPRING ASSEMBLY IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST** | | | | |
| 1400 | 831-47 | • SPRING ASSEMBLY, SUPERSEDED BY ITEM 1400A | | 1 | | |
| 1400A | 831-82 | • SPRING ASSEMBLY, SUPERSEDES ITEM 1400 | | 1 | | |
| | | **COUNTERWEIGHT SLUGS/MOUNTING HARDWARE** | | | | |
| -9040 | | • COUNTERWEIGHT SLUG | | | | |
| -9050 | | • HEX HEAD BOLT APPLICATION SPECIFIC, REFER TO HARTZELL PROPELLER APPLICATION GUIDE MANUAL 159 (61-02-59) FOR PART NUMBER AND PROPELLER CRITICAL PART (PCP) IDENTIFICATION | | | Y | |
| | | **SPINNER PARTS** | | | | |
| | | • APPLICATION SPECIFIC REFER TO HARTZELL PROPELLER APPLICATION GUIDE MANUAL 159 (61-02-59) AND THE APPLICABLE HARTZELL PROPELLER SPINNER MAINTENANCE MANUAL: MANUAL 127 (61-16-27) - METAL SPINNER ASSEMBLIES MANUAL 148 (61-16-48) - COMPOSITE SPINNER ASSEMBLIES | | | | |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| -3E | HC-B3TN-3E | | |
| -3F | HC-B3TN-3F | | |

- ITEM NOT ILLUSTRATED




**HC-B3TN-3H: Exploded View**
**Figure 10-5**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10-5** | | **HC-B3TN-3H PROPELLER ASSEMBLY** | | | | |
| 10 | A-880-1 | • NUT, HEX, SELF-LOCKING, THIN | | 1 | Y | |
| 20 | B-3359 | • NUT, 3/8-24, HEX, SELF-LOCKING | | 3 | Y | |
| 20A | B-3599 | • NUT, 3/8-24, HEX, SELF-LOCKING, ALTERNATE FOR ITEM 20 | | 3 | Y | |
| 30 | B-3049 | • RING, SUPPORT, ROD, BETA | | 1 | | |
| 50 | C-3021-5 | • PISTON UNIT | | 1 | | |
| 50A | C-3021 | • PISTON UNIT, ALTERNATE FOR ITEM 50 | | 1 | | |
| 60 | A-862-1 | • • BUSHING, PLASTIC | | 1 | | |
| 70 | B-4016 | • LINK ARM | | 3 | | |
| 70A | B-1901 | • LINK ARM, ALTERNATE FOR ITEM 70 | | 3 | | |
| 80 | A-1464 | • LINK PIN UNIT | | 3 | Y | |
| 90 | B-3840-6 | • SCREW, 10-32, FILLISTER HEAD | | 3 | Y | |
| 150 | C-3317-020 | • O-RING | | 1 | Y | |
| 160 | C-3317-347-2 | • O-RING | | 1 | Y | |
| 170 | A-863 | • SEAL, DUST, PISTON, REPLACED BY ITEM 170A | | OBS | | |
| 170A | B-1843 | • SEAL, DUST, PISTON, REPLACES ITEM 170 | | 1 | Y | |
| 180 | B-3840-5 | • SCREW, 10-32, FILLISTER HEAD | | 4 | Y | |
| 200 | B-1803-2 | • PCP: CYLINDER | | 1 | | PCP |
| 210 | A-2043 | • NUT, 3/8-24, HEX, SELF-LOCKING, REPLACED BY ITEM 210A | | OBS | | |
| 210A | A-2043-1 | • NUT, 3/8-24, HEX, SELF-LOCKING, REPLACES ITEM 210 | | 3 | Y | |
| 220 | A-3439 | • NUT, 3/8-24, HEX, THIN | | 3 | Y | |
| 220A | B-3382 | • NUT, 3/8-24, HEX, THIN, ALTERNATE FOR ITEM 220 | | 3 | Y | |
| 230 | A-944 | • SLEEVE, LINKSCREW | | 3 | Y | |
| 240 | 834-12 | • GUIDE COLLAR UNIT | | 1 | | |
| 260 | A-3023 | • • BUSHING, PLASTIC | | 3 | | |
| 270 | A-114-6 | • • DOWEL PIN | | 1 | | |
| 280 | A-2038-12 | • • SCREW, 1/4-28, CAP | | 1 | Y | |
| 290 | A-3099 | • SPRING, COMPRESSION, BETA | | 3 | Y | |
| -295 | A-965 | • WASHER, 7/16, CRES (USE WITH ITEM 300) | | 3 | Y | |
| -300 | B-3002-2 | • LOW STOP ROD UNIT, SUPERSEDED BY ITEM 300A | | 3 | | |
| -300A | B-3475A-2 | • ROD, BETA UNIT, SUPERSEDES ITEM 300 | | 3 | | |
| 310 | A-3478-1 | • • SPRING RETAINER, BETA | | 1 | | |
| 320 | B-3476A-2 | • • ROD, BETA | | 1 | | |
| 330 | A-3482 | • • RING, RETAINING, CRIMPED | | 2 | Y | |
| 340 | A-3067-2 | • LUG, GUIDE | | 3 | | |
| 350 | A-3023-2 | • • BUSHING, PLASTIC | | 1 | | |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| | | | |

- ITEM NOT ILLUSTRATED

**HC-B3TN-3H, page 1 of 3**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10-5** | | **HC-B3TN-3H PROPELLER ASSEMBLY** | | | | |
| 360 | A-2051 | • BOLT, 5/16-24, HEX HEAD, REPLACED BY ITEM 360A | | OBS | | |
| 360A | A-2051-1 | • BOLT, 5/16-24, HEX HEAD, REPLACES ITEM 360 | | 9 | Y | |
| -365 | A-2037-1 | • SCREW, 5/16, CAP | | 1 | Y | |
| 380 | C-3003-2 | • PLATE, MOUNTING, SPINNER, SUPERSEDED BY ITEM 380A | | 1 | | |
| 380A | C-3003-1 | • PLATE, MOUNTING, SPINNER, SUPERSEDES ITEM 380 | | 1 | | |
| 390 | B-3843-56ZD | • SNAP RING, EXTERNAL | | 3 | Y | |
| 400 | C-3317-230 | • O-RING | | 1 | Y | |
| 410 | A-3439 | • NUT, 3/8-24, HEX, THIN | | 3 | Y | |
| 420 | B-3001 | • RING, BETA, REPLACED BY ITEM 420A | | OBS | | |
| 420A | B-3001-2 | • RING, BETA, REPLACES ITEM 420 | | 1 | | |
| 430 | B-3339 | • BOLT, MOUNTING, 9/16-18, 12 POINT | | 8 | Y | |
| 440 | A-2048-2 | • WASHER, MOUNTING, 9/16" CSK | | 8 | Y | |
| -450 | B-3808-4 | • NUT, HEX, SELF-LOCKING | | 12 | Y | |
| -460 | B-3851-0432 | • WASHER | | 24 | Y | |
| 500 | 840-60 | • PCP: HUB UNIT | | 1 | | PCP |
| 520 | B-3897-1 | • • PLUG, EXPANSION | | 3 | Y | |
| 530 | A-1891-A | • • PILOT TUBE | | 3 | | |
| 630 | B-3840-6 | • SCREW, 10-32, FILLISTER HEAD | | AR | Y | |
| 640 | A-1305 | • BALANCE WEIGHT | | AR | | |
| 650 | A-6119 | • BUSHING, LINK ARM | | 3 | Y | |
| 670 | B-3838-3-3 | • COTTER PIN | | 3 | Y | |
| 870 | B-3384-4 | • BOLT, 1/4-28, HEX HEAD | | 12 | Y | |
| 870A | B-3384-4H | • BOLT, 1/4-28, HEX HEAD, ALTERNATE FOR ITEM 870 | | 12 | Y | |
| 890 | C-3317-235 | • O-RING | | 1 | Y | |

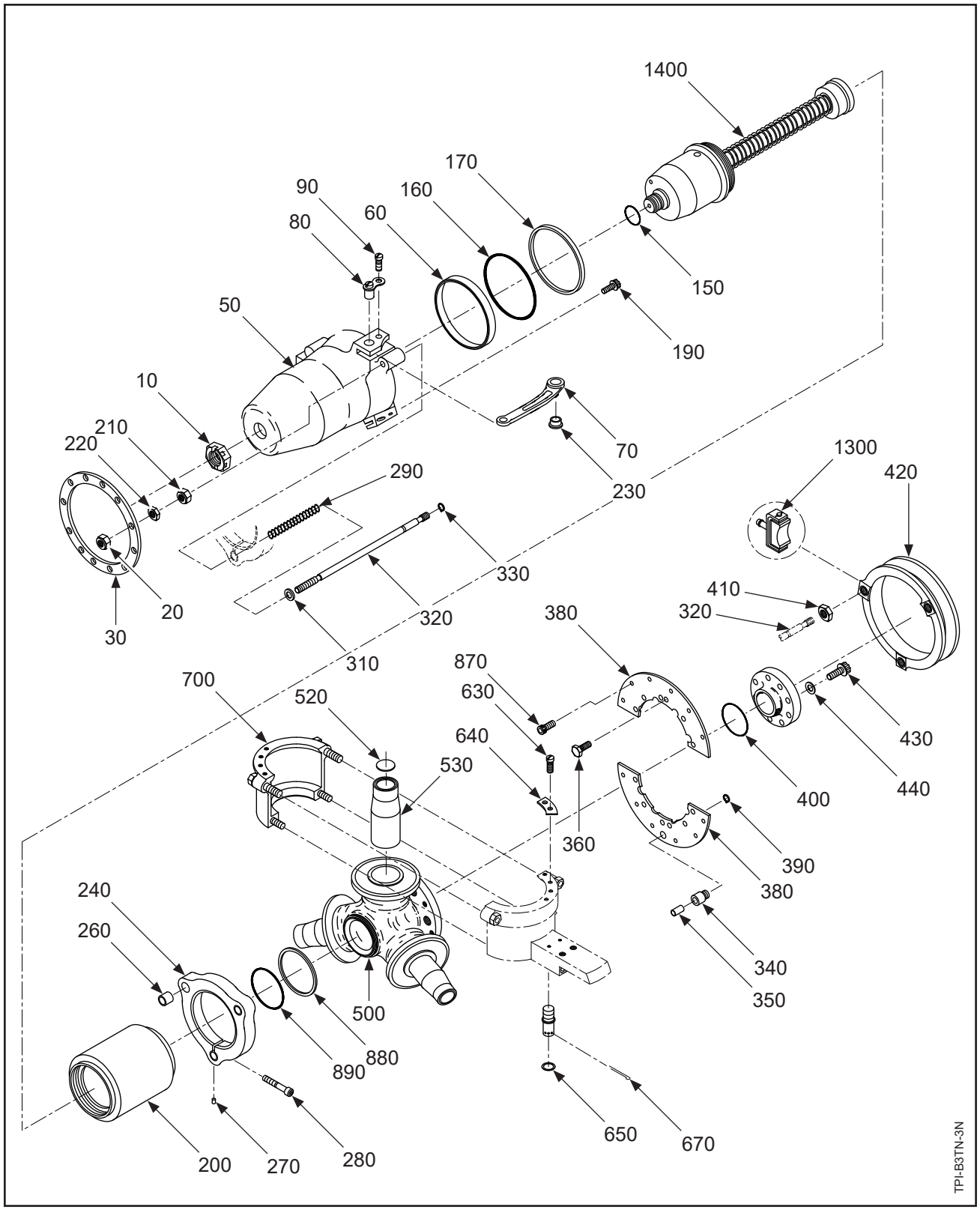
| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| | | | |

- ITEM NOT ILLUSTRATED

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| 10-5 | | HC-B3TN-3H PROPELLER ASSEMBLY | | | | |
| 10A-1 | | BLADE RETENTION PARTS | | | | |
| | | REFER TO THE A-1851-(T) BLADE RETENTION PARTS IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST | | | | |
| | | CLAMP ASSEMBLY | | | | |
| | | REFER TO THE APPLICABLE CLAMP ASSEMBLY IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST | | | | |
| 700 | 838-67 | • PCP: CLAMP ASSEMBLY | | 3 | | PCP |
| 700A | 838-65 | • PCP: CLAMP ASSEMBLY, ALTERNATE FOR ITEM 700 | | 3 | | PCP |
| | | BETA FEEDBACK BLOCK ASSEMBLY | | | | |
| | | REFER TO THE APPLICABLE BETA FEEDBACK BLOCK ASSEMBLY IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST | | | | |
| 1300 | | • BETA FEEDBACK BLOCK ASSEMBLIES ARE APPLICATION SPECIFIC. REFER TO HARTZELL PROPELLER APPLICATION GUIDE MANUAL 159 (61-02-59) FOR PART NUMBER AND PART QUANTITY. | | | | |
| | | SPRING ASSEMBLY | | | | |
| | | REFER TO THE APPLICABLE SPRING ASSEMBLY IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST | | | | |
| 1400 | 831-79 | • SPRING ASSEMBLY | | 1 | | |
| | | COUNTERWEIGHT SLUGS/MOUNTING HARDWARE | | | | |
| -9040 | | • COUNTERWEIGHT SLUG | | | | |
| -9050 | | • HEX HEAD BOLT APPLICATION SPECIFIC, REFER TO HARTZELL PROPELLER APPLICATION GUIDE MANUAL 159 (61-02-59) FOR PART NUMBER AND PROPELLER CRITICAL PART (PCP) IDENTIFICATION | | | Y | |
| | | SPINNER PARTS | | | | |
| | | • APPLICATION SPECIFIC REFER TO HARTZELL PROPELLER APPLICATION GUIDE MANUAL 159 (61-02-59) AND THE APPLICABLE HARTZELL PROPELLER SPINNER MAINTENANCE MANUAL: MANUAL 127 (61-16-27) - METAL SPINNER ASSEMBLIES MANUAL 148 (61-16-48) - COMPOSITE SPINNER ASSEMBLIES | | | | |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| | | | |

- ITEM NOT ILLUSTRATED




**HC-B3TN-(3AE, 3AF, 3K, 3M, 3N, 3P, 3Z): Exploded View**
**Figure 10-6**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10-6** | | **HC-B3TN-(3AE, 3AF, 3K, 3M, 3N, 3P, 3Z) PROPELLER ASSEMBLY** | | | | |
| 10 | A-880-1 | • NUT, HEX, SELF-LOCKING, THIN | | 1 | Y | |
| 20 | B-3359 | • NUT, 3/8-24, HEX, SELF-LOCKING | | 3 | Y | |
| 20A | B-3599 | • NUT, 3/8-24, HEX, SELF-LOCKING, ALTERNATE FOR ITEM 20 | | 3 | Y | |
| 30 | B-3049 | • RING, SUPPORT, ROD, BETA | | 1 | | |
| 50 | C-3021-5 | • PISTON UNIT | | 1 | | |
| 60 | A-862-1 | • • BUSHING, PLASTIC | | 1 | | |
| 70 | B-4016 | • LINK ARM | | 3 | | |
| 70A | B-1901 | • LINK ARM, ALTERNATE FOR ITEM 70 | | 3 | | |
| 80 | A-1464 | • LINK PIN UNIT | | 3 | Y | |
| 90 | B-3840-6 | • SCREW, 10-32, FILLISTER HEAD | | 3 | Y | |
| 150 | C-3317-020 | • O-RING | | 1 | Y | |
| 160 | C-3317-347-2 | • O-RING | | 1 | Y | |
| 170 | A-863 | • SEAL, DUST, PISTON, REPLACED BY ITEM 170A | | OBS | | |
| 170A | B-1843 | • SEAL, DUST, PISTON, REPLACES ITEM 170 | | 1 | Y | |
| 190 | A-2626-( ) | • SCREW, 10-32, CAP | | 3 | Y | |
| 200 | B-1803-4 | • PCP: CYLINDER | | 1 | | PCP |
| 210 | A-2043 | • NUT, 3/8-24, HEX, SELF-LOCKING, REPLACED BY ITEM 210A | | OBS | | |
| 210A | A-2043-1 | • NUT, 3/8-24, HEX, SELF-LOCKING, REPLACES ITEM 210 | | 3 | Y | |
| 220 | A-3439 | • NUT, 3/8-24, HEX, THIN | | 3 | Y | |
| 220A | B-3382 | • NUT, 3/8-24, HEX, THIN, ALTERNATE FOR ITEM 220 | | 3 | Y | |
| 230 | A-944 | • SLEEVE, LINKSCREW | | 3 | Y | |
| 240 | 834-22 | • GUIDE COLLAR UNIT | | 1 | | |
| 260 | A-3023 | • • BUSHING, PLASTIC | | 3 | | |
| 270 | A-114-6 | • • DOWEL PIN | | 1 | | |
| 280 | A-2038-12 | • • SCREW, 1/4-28, CAP | | 1 | Y | |
| 290 | A-3099 | • SPRING, COMPRESSION, BETA | | 3 | Y | |
| -295 | A-965 | • WASHER, 7/16, CRES (USE WITH ITEM 300 ONLY) | | 3 | Y | |
| -300 | B-3002-2 | • LOW STOP ROD UNIT, SUPERSEDED BY ITEM 300A | | 3 | | |
| -300A | B-3475A-2 | • ROD, BETA UNIT, SUPERSEDES ITEM 300 | | 3 | | |
| 310 | A-3478-1 | • • SPRING RETAINER, BETA | | 1 | | |
| 320 | B-3476A-2 | • • ROD, BETA | | 1 | | |
| 330 | A-3482 | • • RING, RETAINING, CRIMPED | | 2 | Y | |
| 340 | A-3067-2 | • LUG, GUIDE | | 3 | | |
| 350 | A-3023-2 | • • BUSHING, PLASTIC | | 1 | | |
| 360 | A-2051 | • BOLT, 5/16-24, HEX HEAD, REPLACED BY ITEM 360A | | OBS | | |
| 360A | A-2051-1 | • BOLT, 5/16-24, HEX HEAD, REPLACES ITEM 360 | | 9 | Y | |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| | | | |

- ITEM NOT ILLUSTRATED

**HC-B3TN-(3AE, 3AF, 3K, 3M, 3N, 3P, 3Z), page 1 of 3**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10-6** | | **HC-B3TN-(3AE, 3AF, 3K, 3M, 3N, 3P, 3Z) PROPELLER ASSEMBLY** | | | | |
| -365 | A-2037-1 | • SCREW, 5/16, CAP | | 1 | Y | |
| 380 | C-3003-2 | • PLATE, MOUNTING, SPINNER, SUPERSEDED BY ITEM 380A | | 1 | | |
| 380A | C-3003-1 | • PLATE, MOUNTING, SPINNER, SUPERSEDES ITEM 380 | | 1 | | |
| 390 | B-3843-56ZD | • SNAP RING, EXTERNAL | | 3 | Y | |
| 400 | C-3317-230 | • O-RING | | 1 | Y | |
| 410 | A-3439 | • NUT, 3/8-24, HEX, THIN | | 3 | Y | |
| 420 | B-3001 | • RING, BETA, REPLACED BY ITEM 420A | | OBS | | |
| 420A | B-3001-2 | • RING, BETA, REPLACES ITEM 420 | | 1 | | |
| 430 | B-3339 | • BOLT, MOUNTING, 9/16-18, 12 POINT | | 8 | Y | |
| 440 | A-2048-2 | • WASHER, MOUNTING, 9/16" CSK | | 8 | Y | |
| -450 | B-3808-4 | • NUT, HEX, SELF-LOCKING | | 12 | Y | |
| -460 | B-3851-0432 | • WASHER | | 24 | Y | |
| 500 | 840-60 | • PCP: HUB UNIT | | 1 | | PCP |
| 520 | B-3897-1 | • • PLUG, EXPANSION | | 3 | Y | |
| 530 | A-1891-A | • • PILOT TUBE | | 3 | | |
| 630 | B-3840-6 | • SCREW, 10-32, FILLISTER HEAD | | AR | Y | |
| 640 | A-1305 | • BALANCE WEIGHT | | AR | | |
| 650 | A-6119 | • BUSHING, LINK ARM | | 3 | Y | |
| 670 | B-3838-3-3 | • COTTER PIN | | 3 | Y | |
| 870 | B-3384-4 | • BOLT, 1/4-28, HEX HEAD | | 12 | Y | |
| 870A | B-3384-4H | • BOLT, 1/4-28, HEX HEAD, ALTERNATE FOR ITEM 870 | | 12 | Y | |
| 880 | A-2622-1 | • COLLAR SUPPORT RING | | 1 | | |
| 890 | C-3317-235 | • O-RING | | 1 | Y | |
| **10A-1** | | **BLADE RETENTION PARTS**<br>**REFER TO THE A-1851-(T) BLADE RETENTION PARTS IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST** | | | | |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| | | | |

- ITEM NOT ILLUSTRATED

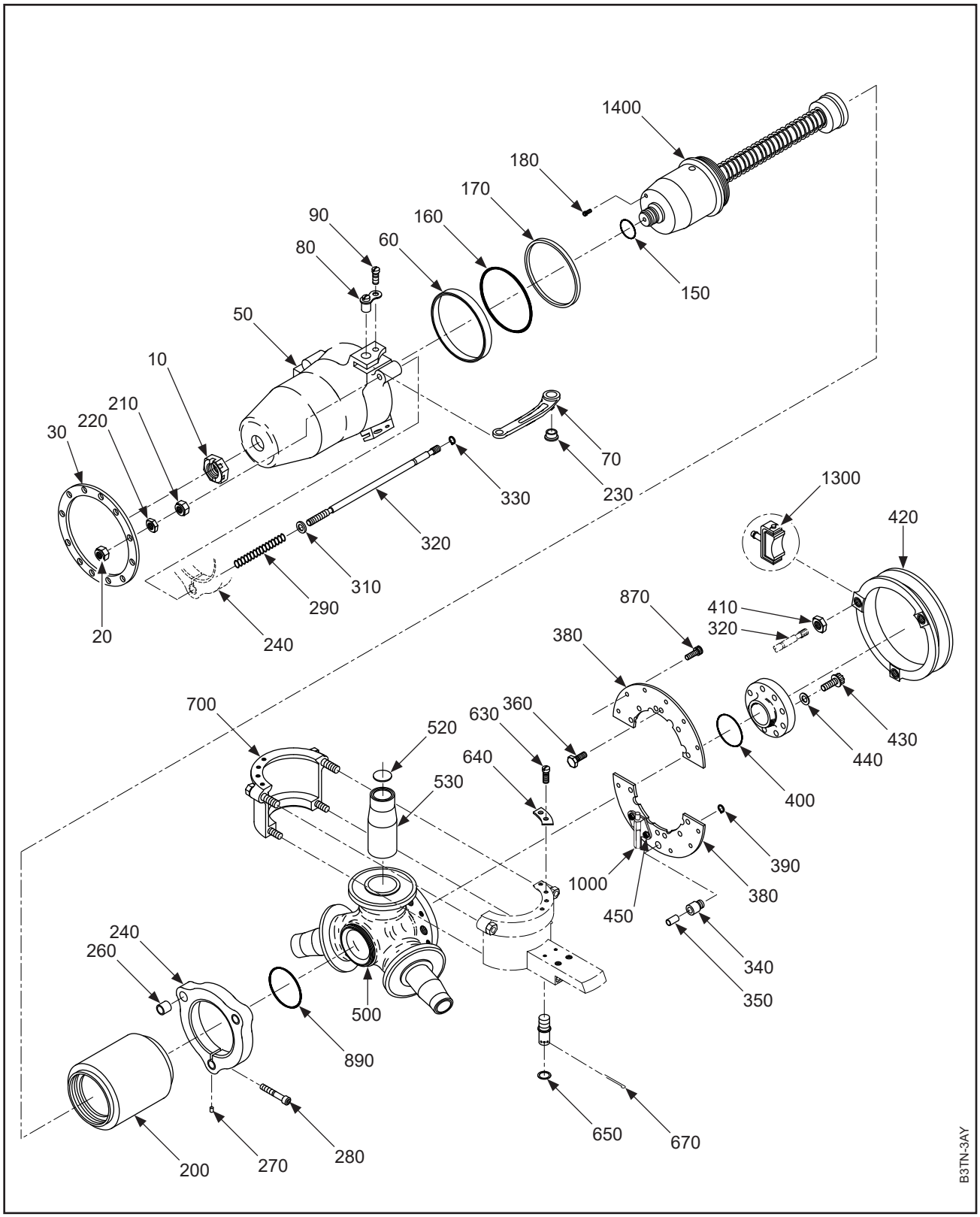
**HC-B3TN-(3AE, 3AF, 3K, 3M, 3N, 3P, 3Z), page 2 of 3**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| 10-6 | | **HC-B3TN-(3AE, 3AF, 3K, 3M, 3N, 3P, 3Z) PROPELLER ASSEMBLY** | | | | |
| | | **CLAMP ASSEMBLY**<br>**REFER TO THE APPLICABLE CLAMP ASSEMBLY IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST** | | | | |
| 700 | 838-67 | • PCP: CLAMP ASSEMBLY | -3K,-3M,-3P | 3 | | PCP |
| | 838-88 | • PCP: CLAMP ASSEMBLY | -3N,-3Z | 3 | | PCP |
| | 838-95 | • PCP: CLAMP ASSEMBLY | -3AE | 3 | | PCP |
| | 838-98 | • PCP: CLAMP ASSEMBLY | -3AF | 3 | | PCP |
| 700A | 838-65 | • PCP: CLAMP ASSEMBLY, ALTERNATE FOR ITEM 700 | -3K,-3M,-3P | 3 | | PCP |
| | | **BETA FEEDBACK BLOCK ASSEMBLY**<br>**REFER TO THE APPLICABLE BETA FEEDBACK BLOCK ASSEMBLY IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST** | | | | |
| 1300 | | • BETA FEEDBACK BLOCK ASSEMBLIES ARE APPLICATION SPECIFIC. REFER TO HARTZELL PROPELLER APPLICATION GUIDE MANUAL 159 (61-02-59) FOR PART NUMBER AND PART QUANTITY. | | | | |
| | | **SPRING ASSEMBLY**<br>**REFER TO THE APPLICABLE CLAMP ASSEMBLY IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST** | | | | |
| 1400 | 831-47 | • SPRING ASSEMBLY, SUPERSEDED BY ITEM 1400A | -3AE,-3AF, -3K,-3N,-3Z | 1 | | |
| | 831-79 | • SPRING ASSEMBLY | -3M,-3P | 1 | | |
| 1400A | 831-82 | • SPRING ASSEMBLY, SUPERSEDES ITEM 1400 | -3AE,-3AF, -3K,-3N,-3Z | 1 | | |
| | | **COUNTERWEIGHT SLUGS/MOUNTING HARDWARE** | | | | |
| -9040 | | • COUNTERWEIGHT SLUG | | | | |
| -9050 | | • HEX HEAD BOLT APPLICATION SPECIFIC, REFER TO HARTZELL PROPELLER APPLICATION GUIDE MANUAL 159 (61-02-59) FOR PART NUMBER AND PROPELLER CRITICAL PART (PCP) IDENTIFICATION | | | Y | |
| | | **SPINNER PARTS**<br>• APPLICATION SPECIFIC REFER TO HARTZELL PROPELLER APPLICATION GUIDE MANUAL 159 (61-02-59) AND THE APPLICABLE HARTZELL PROPELLER SPINNER MAINTENANCE MANUAL:<br>MANUAL 127 (61-16-27) - METAL SPINNER ASSEMBLIES<br>MANUAL 148 (61-16-48) - COMPOSITE SPINNER ASSEMBLIES | | | | |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| -3AE | C-B3TN-3AE | -3N | HC-B3TN-3N |
| -3AF | HC-B3TN-3AF | -3P | HC-B3TN-3P |
| -3K | HC-B3TN-3K | -3Z | HC-B3TN-3Z |
| -3M | HC-B3TN-3M | | |

- ITEM NOT ILLUSTRATED

**HC-B3TN-(3AE, 3AF, 3K, 3M, 3N, 3P, 3Z), page 3 of 3**




**HC-B3TN-(3BY, 3DY, 3SY): Exploded View**
**Figure 10-7**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10-7** | | **HC-B3TN-(3BY, 3DY, 3SY) PROPELLER ASSEMBLY** | | | | |
| 10 | A-880-1 | • NUT, HEX, SELF-LOCKING, THIN | | 1 | Y | |
| 20 | B-3359 | • NUT, 3/8-24, HEX, SELF-LOCKING | | 3 | Y | |
| 20A | B-3599 | • NUT, 3/8-24, HEX, SELF-LOCKING, ALTERNATE FOR ITEM 20 | | 3 | Y | |
| 30 | B-3049 | • RING, SUPPORT, ROD, BETA | | 1 | | |
| 50 | C-3021-5 | • PISTON UNIT | | 1 | | |
| 60 | A-862-1 | • • BUSHING, PLASTIC | | 1 | | |
| 70 | B-4016 | • LINK ARM | | 3 | | |
| 70A | B-1901 | • LINK ARM, ALTERNATE FOR ITEM 70 | | 3 | | |
| 80 | A-1464 | • LINK PIN UNIT | | 3 | Y | |
| 90 | B-3840-6 | • SCREW, 10-32, FILLISTER HEAD | | 3 | Y | |
| 150 | C-3317-020 | • O-RING | | 1 | Y | |
| 160 | C-3317-347-2 | • O-RING | | 1 | Y | |
| 170 | A-863 | • FELT PISTON SEAL, REPLACED BY ITEM 170A | | OBS | | |
| 170A | B-1843 | • SEAL, DUST, PISTON, REPLACES ITEM 170 | | 1 | Y | |
| 180 | B-3840-5 | • SCREW, 10-32, FILLISTER HEAD | | 4 | Y | |
| 200 | B-1803-2 | • PCP: CYLINDER | | 1 | | PCP |
| 210 | A-2043 | • NUT, 3/8-24, HEX, SELF-LOCKING, REPLACED BY ITEM 210A | | OBS | | |
| 210A | A-2043-1 | • NUT, 3/8-24, HEX, SELF-LOCKING, REPLACES ITEM 210 | | 3 | Y | |
| 220 | A-3439 | • NUT, 3/8-24, HEX, THIN | | 3 | Y | |
| 220A | B-3382 | • NUT, 3/8-24, HEX, THIN, ALTERNATE FOR ITEM 220 | | 3 | Y | |
| 230 | A-944 | • SLEEVE, LINKSCREW | | 3 | Y | |
| 240 | 834-12 | • GUIDE COLLAR UNIT | | 1 | | |
| 260 | A-3023 | • • BUSHING, PLASTIC | | 3 | | |
| 270 | A-114-6 | • • DOWEL PIN | | 1 | | |
| 280 | A-2038-12 | • • SCREW, 1/4-28, CAP | | 1 | Y | |
| 290 | A-3099 | • SPRING, COMPRESSION, BETA | | 3 | Y | |
| -295 | A-965 | • WASHER, 7/16, CRES (USE WITH ITEM 300 ONLY) | | 3 | Y | |
| -300 | B-3002-2 | • LOW STOP ROD UNIT, SUPERSEDED BY ITEM 300A | | 3 | | |
| -300A | B-3475A-2 | • ROD, BETA UNIT, SUPERSEDES ITEM 300 | | 3 | | |
| 310 | A-3478-1 | • • SPRING RETAINER, BETA | | 1 | | |
| 320 | B-3476A-2 | • • ROD, BETA | | 1 | | |
| 330 | A-3482 | • • RING, RETAINING, CRIMPED | | 2 | Y | |
| 340 | A-3067-2 | • LUG, GUIDE | | 3 | | |
| 350 | A-3023-2 | • • BUSHING, PLASTIC | | 1 | | |
| 360 | A-2051 | • BOLT, 5/16-24, HEX HEAD, REPLACED BY ITEM 360A | | OBS | | |
| 360A | A-2051-1 | • BOLT, 5/16-24, HEX HEAD, REPLACES ITEM 360 | | 9 | Y | |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| | | | |

- ITEM NOT ILLUSTRATED

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10-7** | | **HC-B3TN-(3BY, 3DY, 3SY) PROPELLER ASSEMBLY** | | | | |
| -365 | A-2037-1 | • SCREW, 5/16, CAP | | 1 | Y | |
| 380 | C-3003-2 | • PLATE, MOUNTING, SPINNER, SUPERSEDED BY ITEM 380A | | 1 | | |
| 380A | C-3003-1 | • PLATE, MOUNTING, SPINNER SUPERSEDES ITEM 380A | | 1 | | |
| 390 | B-3843-56ZD | • SNAP RING, EXTERNAL | | 3 | Y | |
| 400 | C-3317-230 | • O-RING | | 1 | Y | |
| 410 | A-3439 | • NUT, 3/8-24, HEX, THIN | | 3 | Y | |
| 420 | B-3001 | • RING, BETA, REPLACED BY ITEM 420A | | OBS | | |
| 420A | B-3001-2 | • RING, BETA, REPLACES ITEM 420 | | 1 | | |
| 430 | B-3339 | • BOLT, MOUNTING, 9/16-18, 12 POINT | | 8 | Y | |
| 440 | A-2048-2 | • WASHER, MOUNTING, 9/16" CSK | | 8 | Y | |
| 450 | B-3808-4 | • NUT, HEX, SELF-LOCKING | | 12 | Y | |
| -460 | B-3851-0432 | • WASHER | | 24 | Y | |
| 500 | 840-60 | • PCP: HUB UNIT | | 1 | | PCP |
| 520 | B-3897-1 | • • PLUG, EXPANSION | | 3 | Y | |
| 530 | A-1891-A | • • PILOT TUBE | | 3 | | |
| 630 | B-3840-6 | • SCREW, 10-32, FILLISTER HEAD | | AR | Y | |
| 640 | A-1305 | • BALANCE WEIGHT | | AR | | |
| 650 | A-6119 | • BUSHING, LINK ARM | | 3 | Y | |
| 670 | B-3838-3-3 | • COTTER PIN | | 3 | Y | |
| 870 | B-3384-4 | • BOLT, 1/4-28, HEX HEAD | | 12 | Y | |
| 870A | B-3384-4H | • BOLT, 1/4-28, HEX HEAD, ALTERNATE FOR ITEM 870 | | 12 | Y | |
| 890 | C-3317-235 | • O-RING | | 1 | Y | |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| | | | |

- ITEM NOT ILLUSTRATED

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| 10-7 | | HC-B3TN-(3BY, 3DY, 3SY) PROPELLER ASSEMBLY | | | | |
| 10A-1 | | BLADE RETENTION PARTS<br>REFER TO THE A-1851-(T) BLADE RETENTION PARTS IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST | | | | |
| | | CLAMP ASSEMBLY<br>REFER TO THE APPLICABLE CLAMP ASSEMBLY IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST | | | | |
| 700 | 838-67 | • PCP: CLAMP ASSEMBLY | | 3 | | PCP |
| | | START LOCK MOUNTING KIT<br>REFER TO THE APPLICABLE START LOCK MOUNTING KIT IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST | | | | |
| 1000 | A-3432 | • START LOCK - MOUNTING KIT, SUPERSEDED BY ITEM 1000B (DEHAVILLAND FACTORY INSTALLED DE-ICE) | -3BY | 1 | | |
| 1000A | A-3432-1 | • START LOCK - MOUNTING KIT (DEHAVILLAND FIELD ADJUST WITH DE-ICE) | -3BY | 1 | | |
| 1000B | A-3432-2 | • START LOCK - MOUNTING KIT, SUPERSEDES ITEM 1000 (DEHAVILLAND FACTORY INSTALLED WITH DE-ICE) | -3BY | 1 | | |
| 1000C | A-3432-3 | • START LOCK - MOUNTING KIT | -3SY | 1 | | |
| 1000D | A-3433 | • START LOCK [HC-B3TN( )] - MTG KIT (KENMORE, AIR HARBOR, DEHAVILLAND) | -3DY | 1 | | |
| 1000E | A-3433 | • START LOCK [HC-B3TN( )] - MTG KIT SUPERSEDED BY ITEM 1000H (DEHAVILLAND FACTORY INSTALLED NO DE-ICE) | -3BY | 1 | | |
| 1000F | A-3433-1 | • START LOCK [(HC-B3TN( )] - MTG KIT (DEHAVILLAND FIELD ADJUST NO DE-ICE) | -3BY | 1 | | |
| 1000G | A-3433-2 | • START LOCK [HC-B3TN( )] - MTG KIT (EXCEPT KENMORE, AIR HARBOR, DEHAVILLAND) | -3DY | 1 | | |
| 1000H | A-3433-2 | • START LOCK [HC-B3TN( )] - MTG KIT, SUPERSEDES ITEM 1000E (DEHAVILLAND FACTORY INSTALLED NO DE-ICE) | -3BY | 1 | | |
| 1000J | A-3433-4 | • START LOCK [HC-B3TN( )] - MTG KIT (VIKING AIR) | -3DY | 1 | | |
| | | BETA FEEDBACK BLOCK ASSEMBLY<br>REFER TO THE APPLICABLE BETA FEEDBACK BLOCK ASSEMBLY IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST | | | | |
| 1300 | | • BETA FEEDBACK BLOCK ASSEMBLIES ARE APPLICATION SPECIFIC. REFER TO HARTZELL PROPELLER APPLICATION GUIDE MANUAL 159 (61-02-59) FOR PART NUMBER AND PART QUANTITY. | | | | |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| -3BY | HC-B3TN-3BY | | |
| -3DY | HC-B3TN-3DY | | |
| -3SY | HC-B3TN-3SY | | |

- ITEM NOT ILLUSTRATED

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| 10-7 | | **HC-B3TN-(3BY, 3DY, 3SY) PROPELLER ASSEMBLY** | | | | |
| | | **SPRING ASSEMBLY** | | | | |
| | | **REFER TO THE APPLICABLE CLAMP ASSEMBLY IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST** | | | | |
| 1400 | 831-19 | • SPRING ASSEMBLY, SUPERSEDED BY ITEM 1400A | -3BY | 1 | | |
| | 831-47 | • SPRING ASSEMBLY, SUPERSEDED BY ITEM 1400A | -3DY | 1 | | |
| | 831-59 | • SPRING ASSEMBLY, SUPERSEDED BY ITEM 1400A | -3SY | 1 | | |
| 1400A | 831-79 | • SPRING ASSEMBLY, SUPERSEDES ITEM 1400 | -3BY | 1 | | |
| | 831-82 | • SPRING ASSEMBLY, SUPERSEDES ITEM 1400 | -3DY | 1 | | |
| | 831-83 | • SPRING ASSEMBLY, SUPERSEDES ITEM 1400 | -3SY | 1 | | |
| | | **COUNTERWEIGHT SLUGS/MOUNTING HARDWARE** | | | | |
| -9040 | | • COUNTERWEIGHT SLUG | | | | |
| -9050 | | • HEX HEAD BOLT<br>APPLICATION SPECIFIC,<br>REFER TO HARTZELL PROPELLER APPLICATION GUIDE MANUAL 159 (61-02-59) FOR PART NUMBER AND PROPELLER CRITICAL PART (PCP) IDENTIFICATION | | | Y | |
| | | **SPINNER PARTS** | | | | |
| | | • APPLICATION SPECIFIC<br>REFER TO HARTZELL PROPELLER APPLICATION GUIDE MANUAL 159 (61-02-59) AND THE APPLICABLE HARTZELL PROPELLER SPINNER MAINTENANCE MANUAL:<br>MANUAL 127 (61-16-27) - METAL SPINNER ASSEMBLIES<br>MANUAL 148 (61-16-48) - COMPOSITE SPINNER ASSEMBLIES | | | | |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| -3BY | HC-B3TN-3BY | | |
| -3DY | HC-B3TN-3DY | | |
| -3SY | HC-B3TN-3SY | | |

- ITEM NOT ILLUSTRATED

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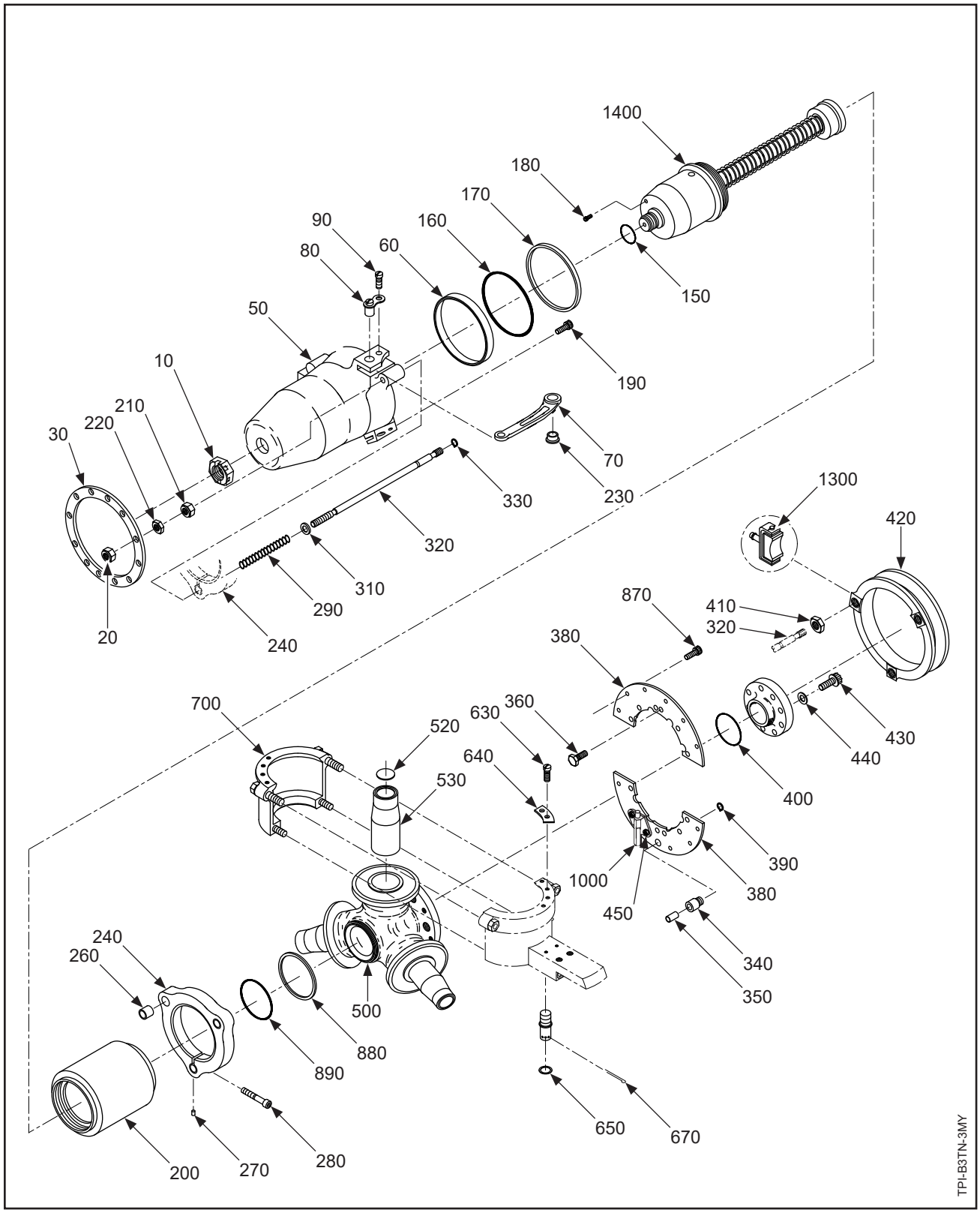



**HC-B3TN-(3AEY, 3AFY, 3NY): Exploded View**
**Figure 10-8**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10-8** | | **HC-B3TN-(3AEY, 3AFY, 3NY) PROPELLER ASSEMBLY** | | | | |
| 10 | A-880-1 | • NUT, HEX, SELF-LOCKING, THIN | | 1 | Y | |
| 20 | B-3359 | • NUT, 3/8-24, HEX, SELF-LOCKING | | 3 | Y | |
| 20A | B-3599 | • NUT, 3/8-24, HEX, SELF-LOCKING, ALTERNATE FOR ITEM 20 | | 3 | Y | |
| 30 | B-3049 | • RING, SUPPORT, ROD, BETA | | 1 | | |
| 50 | C-3021-5 | • PISTON UNIT | | 1 | | |
| 60 | A-862-1 | • • BUSHING, PLASTIC | | 1 | | |
| 70 | B-4016 | • LINK ARM | | 3 | | |
| 70A | B-1901 | • LINK ARM, ALTERNATE FOR ITEM 70 | | 3 | | |
| 80 | A-1464 | • LINK PIN UNIT | | 3 | Y | |
| 90 | B-3840-6 | • SCREW, 10-32, FILLISTER HEAD | | 3 | Y | |
| 150 | C-3317-020 | • O-RING | | 1 | Y | |
| 160 | C-3317-347-2 | • O-RING | | 1 | Y | |
| 170 | A-863 | • SEAL, DUST, PISTON, REPLACED BY ITEM 170A | | OBS | | |
| 170A | B-1843 | • SEAL, DUST, PISTON, REPLACES ITEM 170 | | 1 | Y | |
| 190 | A-2626-( ) | • SCREW, 10-32, CAP | | 3 | Y | |
| 200 | B-1803-4 | • PCP: CYLINDER | | 1 | | PCP |
| 210 | A-2043 | • NUT, 3/8-24, HEX, SELF-LOCKING, REPLACED BY ITEM 210A | | OBS | | |
| 210A | A-2043-1 | • NUT, 3/8-24, HEX, SELF-LOCKING, REPLACES ITEM 210 | | 3 | Y | |
| 220 | A-3439 | • NUT, 3/8-24, HEX, THIN | | 3 | Y | |
| 220A | B-3382 | • NUT, 3/8-24, HEX, THIN, ALTERNATE FOR ITEM 220 | | 3 | Y | |
| 230 | A-944 | • SLEEVE, LINKSCREW | | 3 | Y | |
| 240 | 834-22 | • GUIDE COLLAR UNIT | | 1 | | |
| 260 | A-3023 | • • BUSHING, PLASTIC | | 3 | | |
| 270 | A-114-6 | • • DOWEL PIN | | 1 | | |
| 280 | A-2038-12 | • • SCREW, 1/4-28, CAP | | 1 | Y | |
| 290 | A-3099 | • SPRING, COMPRESSION, BETA | | 3 | Y | |
| -295 | A-965 | • WASHER, 7/16, CRES (USE WITH ITEM 300 ONLY) | | 3 | Y | |
| -300 | B-3002-2 | • LOW STOP ROD UNIT, SUPERSEDED BY ITEM 300A | | 3 | | |
| -300A | B-3475A-2 | • ROD, BETA UNIT, SUPERSEDES ITEM 300 | | 3 | | |
| 310 | A-3478-1 | • • SPRING RETAINER, BETA | | 1 | | |
| 320 | B-3476A-2 | • • ROD, BETA | | 1 | | |
| 330 | A-3482 | • • RING, RETAINING, CRIMPED | | 2 | Y | |
| 340 | A-3067-2 | • LUG, GUIDE | | 3 | | |
| 350 | A-3023-2 | • • BUSHING, PLASTIC | | 1 | | |
| 360 | A-2051 | • BOLT, 5/16-24, HEX HEAD, REPLACED BY ITEM 360A | | OBS | Y | |
| 360A | A-2051-1 | • BOLT, 5/16-24, HEX HEAD, REPLACES ITEM 360 | | 9 | Y | |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| | | | |

- ITEM NOT ILLUSTRATED

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10-8** | | **HC-B3TN-(3AEY, 3AFY, 3NY) PROPELLER ASSEMBLY** | | | | |
| -365 | A-2037-1 | • SCREW, 5/16, CAP | | 1 | Y | |
| 380 | C-3003-2 | • PLATE, MOUNTING, SPINNER, SUPERSEDED BY ITEM 380A | | 1 | | |
| 380A | C-3003-1 | • PLATE, MOUNTING, SPINNER, SUPERSEDES ITEM 380 | | 1 | | |
| 390 | B-3843-56ZD | • SNAP RING, EXTERNAL | | 3 | Y | |
| 400 | C-3317-230 | • O-RING | | 1 | Y | |
| 410 | A-3439 | • NUT, 3/8-24, HEX, THIN | | 3 | Y | |
| 420 | B-3001 | • RING, BETA, REPLACED BY ITEM 420A | | OBS | | |
| 420A | B-3001-2 | • RING, BETA, REPLACES ITEM 420 | | 1 | | |
| 430 | B-3339 | • BOLT, MOUNTING, 9/16-18, 12 POINT | | 8 | Y | |
| 440 | A-2048-2 | • WASHER, MOUNTING, 9/16" CSK | | 8 | Y | |
| 450 | B-3808-4 | • NUT, HEX, SELF-LOCKING | | 12 | Y | |
| -460 | B-3851-0432 | • WASHER | | 24 | Y | |
| 500 | 840-60 | • PCP: HUB UNIT | | 1 | | PCP |
| 520 | B-3897-1 | • • PLUG, EXPANSION | | 3 | Y | |
| 530 | A-1891-A | • • PILOT TUBE | | 3 | | |
| 630 | B-3840-6 | • SCREW, 10-32, FILLISTER HEAD | | AR | Y | |
| 640 | A-1305 | • BALANCE WEIGHT | | AR | | |
| 650 | A-6119 | • BUSHING, LINK ARM | | 3 | Y | |
| 670 | B-3838-3-3 | • COTTER PIN | | 3 | Y | |
| 870 | B-3384-4 | • BOLT, 1/4-28, HEX HEAD | -3AEY, -3NY | 12 | Y | |
| | B-3384-4 | • BOLT, 1/4-28, HEX HEAD | -3AFY | 6 | Y | |
| 870A | B-3384-4H | • BOLT, 1/4-28, HEX HEAD, ALTERNATE FOR ITEM 870 | -3AEY, -3NY | 12 | Y | |
| | B-3384-4H | • BOLT, 1/4-28, HEX HEAD, ALTERNATE FOR ITEM 870 | -3AFY | 6 | Y | |
| 880 | A-2622-1 | • COLLAR SUPPORT RING | | 1 | | |
| 890 | C-3317-235 | • O-RING | | 1 | Y | |
| **10A-1** | | **BLADE RETENTION PARTS**<br>**REFER TO THE A-1851-(T) BLADE RETENTION PARTS IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST**<br><br>**CLAMP ASSEMBLY**<br>**REFER TO THE APPLICABLE CLAMP ASSEMBLY IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST** | | | | |
| 700 | 838-95 | • PCP: CLAMP ASSEMBLY | -3AEY | 3 | | PCP |
| | 838-98 | • PCP: CLAMP ASSEMBLY | -3AFY | 3 | | PCP |
| | 838-88 | • PCP: CLAMP ASSEMBLY | -3NY | 3 | | PCP |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| -3AEY | HC-B3TN-3AEY | | |
| -3AFY | HC-B3TN-3AFY | | |
| -3NY | HC-B3TN-3NY | | |

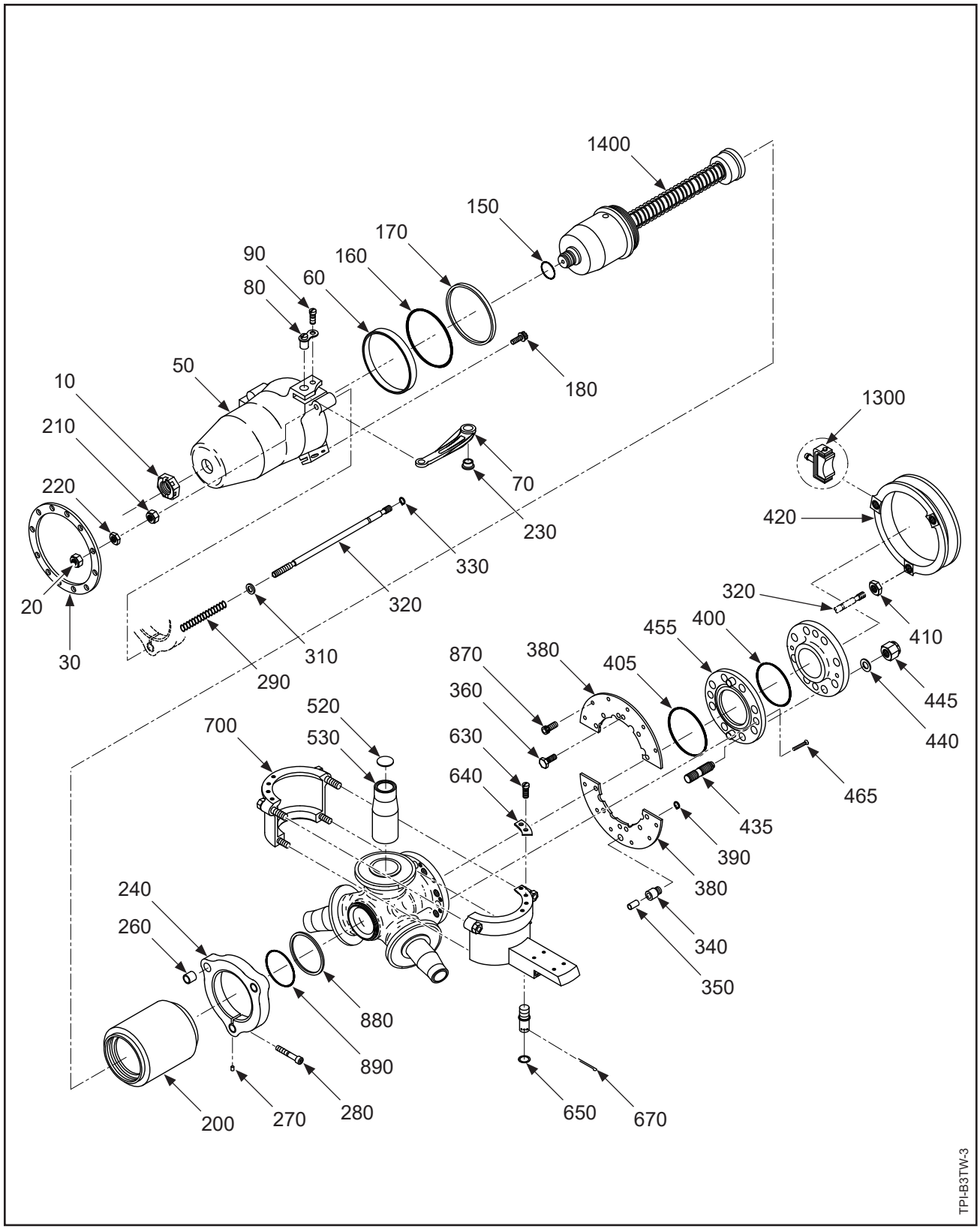
- ITEM NOT ILLUSTRATED

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| 10-8 | | **HC-B3TN-(3AEY, 3AFY, 3NY) PROPELLER ASSEMBLY** | | | | |
| | | **START LOCK MOUNTING KIT** | | | | |
| | | **REFER TO THE APPLICABLE START LOCK MOUNTING KIT IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST** | | | | |
| -1000 | A-3433 | • START LOCK [HC-B3TN( )] - MTG KIT (NO DE-ICE) | -3AFY | 1 | | |
| -1000A | A-3433 | • START LOCK [HC-B3TN( )] - MTG KIT SUPERSEDED BY ITEM -1000B | -3AEY | 1 | | |
| -1000B | A-3433-2 | • START LOCK [HC-B3TN( )] - MTG KIT SUPERSEDES ITEM -1000A | -3AEY, -3NY | 1 | | |
| -1000C | A-7780 | • STOP MTG. KIT (DE-ICE) | -3AFY | 1 | | |
| | | **BETA FEEDBACK BLOCK ASSEMBLY** | | | | |
| | | **REFER TO THE APPLICABLE BETA FEEDBACK BLOCK ASSEMBLY IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST** | | | | |
| 1300 | | • BETA FEEDBACK BLOCK ASSEMBLIES ARE APPLICATION SPECIFIC. REFER TO HARTZELL PROPELLER APPLICATION GUIDE MANUAL 159 (61-02-59) FOR PART NUMBER AND PART QUANTITY. | | | | |
| | | **SPRING ASSEMBLY** | | | | |
| | | **REFER TO THE APPLICABLE SPRING ASSEMBLY IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST** | | | | |
| 1400 | 831-47 | • SPRING ASSEMBLY, SUPERSEDED BY ITEM 1400A | | 1 | | |
| 1400A | 831-82 | • SPRING ASSEMBLY, SUPERSEDES ITEM 1400 | | 1 | | |
| | | **COUNTERWEIGHT SLUGS/MOUNTING HARDWARE** | | | | |
| -9040 | | • COUNTERWEIGHT SLUG | | | | |
| -9050 | | • HEX HEAD BOLT APPLICATION SPECIFIC, REFER TO HARTZELL PROPELLER APPLICATION GUIDE MANUAL 159 (61-02-59) FOR PART NUMBER AND PROPELLER CRITICAL PART (PCP) IDENTIFICATION | | | Y | |
| | | **SPINNER PARTS** | | | | |
| | | • APPLICATION SPECIFIC REFER TO HARTZELL PROPELLER APPLICATION GUIDE MANUAL 159 (61-02-59) AND THE APPLICABLE HARTZELL PROPELLER SPINNER MAINTENANCE MANUAL: MANUAL 127 (61-16-27) - METAL SPINNER ASSEMBLIES MANUAL 148 (61-16-48) - COMPOSITE SPINNER ASSEMBLIES | | | | |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| -3AEY | HC-B3TN-3AEY | | |
| -3AFY | HC-B3TN-3AFY | | |
| -3NY | HC-B3TN-3NY | | |

- ITEM NOT ILLUSTRATED

**HC-B3TN-(3AEY, 3AFY, 3NY), page 3 of 3**




**HC-B3TW-3: Exploded View**
**Figure 10-9**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10-9** | | **HC-B3TW-3 PROPELLER ASSEMBLY** | | | | |
| 10 | A-880-1 | • NUT, HEX, SELF-LOCKING, THIN | | 1 | Y | |
| 20 | B-3359 | • NUT, 3/8-24, HEX, SELF-LOCKING | | 3 | Y | |
| 20A | B-3599 | • NUT, 3/8-24, HEX, SELF-LOCKING, ALTERNATE FOR ITEM 20 | | 3 | Y | |
| 30 | B-3049 | • RING, SUPPORT, ROD, BETA | | 1 | | |
| 50 | C-3021-5 | • PISTON UNIT | | 1 | | |
| 60 | A-862-1 | • • BUSHING, PLASTIC | | 1 | | |
| 70 | B-4016 | • LINK ARM | | 3 | | |
| 80 | A-1464 | • LINK PIN UNIT | | 3 | Y | |
| 90 | B-3840-6 | • SCREW, 10-32, FILLISTER HEAD | | 3 | Y | |
| 150 | C-3317-020 | • O-RING | | 1 | Y | |
| 160 | C-3317-347-2 | • O-RING | | 1 | Y | |
| 170 | B-1843 | • SEAL, DUST, PISTON | | 1 | Y | |
| 190 | A-2626-( ) | • SCREW, 10-32, CAP | | 3 | Y | |
| 200 | B-1803-4 | • PCP: CYLINDER | | 1 | | PCP |
| 210 | A-2043-1 | • NUT, 3/8-24, HEX, SELF-LOCKING | | 3 | Y | |
| 220 | A-3439 | • NUT, 3/8-24, HEX, THIN | | 3 | Y | |
| 220A | B-3382 | • NUT, 3/8-24, HEX, THIN, ALTERNATE FOR ITEM 220 | | 3 | Y | |
| 230 | A-944 | • SLEEVE, LINKSCREW | | 3 | Y | |
| 240 | 834-22 | • GUIDE COLLAR UNIT | | 1 | | |
| 260 | A-3023 | • • BUSHING, PLASTIC | | 3 | | |
| 270 | A-114-6 | • • DOWEL PIN | | 1 | | |
| 280 | A-2038-12 | • • SCREW, 1/4-28, CAP | | 1 | Y | |
| 290 | A-3099 | • SPRING, COMPRESSION, BETA | | 3 | Y | |
| -300 | B-3475A-2 | • ROD, BETA UNIT | | 3 | | |
| 310 | A-3478-1 | • • SPRING RETAINER, BETA | | 1 | | |
| 320 | B-3476A-2 | • • ROD, BETA | | 1 | | |
| 330 | A-3482 | • • RING, RETAINING, CRIMPED | | 2 | Y | |
| 340 | A-3067-2 | • LUG, GUIDE | | 3 | | |
| 350 | A-3023-2 | • • BUSHING, PLASTIC | | 1 | | |
| 360 | A-2051 | • BOLT, 5/16-24, HEX HEAD, REPLACED BY ITEM 360A | | OBS | Y | |
| 360A | A-2051-1 | • BOLT, 5/16-24, HEX HEAD, REPLACES ITEM 360 | | 9 | Y | |
| -365 | A-2037-1 | • SCREW, 5/16, CAP | | 1 | Y | |
| 380 | C-3003-1 | • PLATE, MOUNTING, SPINNER | | 1 | | |
| 390 | B-3843-56ZD | • SNAP RING, EXTERNAL | | 3 | Y | |
| 400 | C-3317-230 | • O-RING | | 1 | Y | |
| 405 | C-3317-233 | • O-RING | | 1 | Y | |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| | | | |

- ITEM NOT ILLUSTRATED

**HC-B3TW-3, page 1 of 3**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10-9** | | **HC-B3TW-3 PROPELLER ASSEMBLY** | | | | |
| 410 | A-3439 | • NUT, 3/8-24, HEX, THIN | | 3 | Y | |
| 420 | B-3001-2 | • RING, BETA | | 1 | | |
| 435 | A-3254 | • STUD, MOUNTING, 9/16-18 | A | 8 | Y | |
| | B-7542 | • STUD, MOUNTING, 9/16-18 | A | 8 | Y | |
| 440 | 109514 | • WASHER | | 8 | Y | |
| 440A | B-7624 | • WASHER, ALTERNATE FOR ITEM 440 | | 8 | Y | |
| 445 | B-7458 | • NUT, 9/16-18, SELF-LOCKING | | 8 | Y | |
| -450 | B-3808-4 | • NUT, HEX, SELF-LOCKING | | 12 | Y | |
| 455 | C-7364-2 | • SPACER, MOUNTING | | 1 | | |
| -456 | B-6138-8-6 | • • DOWEL PIN | | 2 | Y | |
| -460 | B-3851-0432 | • WASHER | | 24 | Y | |
| -460A | B-3851-0463 | • WASHER, ALTERNATE FOR ITEM 460 | | 24 | Y | |
| 465 | B-3868-S52 | • SCREW, 8-32, 100° HEAD, CRES | | 2 | Y | |
| 500 | 840-152 | • PCP: HUB UNIT, SUPERSEDED BY ITEM 500A | | 1 | | PCP |
| 500A | 840-153 | • PCP: HUB UNIT, SUPERSEDES ITEM 500 | | 1 | | PCP |
| 520 | B-3897-1 | • • PLUG, EXPANSION | | 3 | Y | |
| 530 | A-1891-A | • • PILOT TUBE | | 3 | | |
| 630 | B-3840-6 | • SCREW, 10-32, FILLISTER HEAD | | AR | Y | |
| 640 | A-1305 | • BALANCE WEIGHT | | AR | | |
| 650 | A-6119 | • BUSHING, LINK ARM | | 3 | Y | |
| 670 | B-3838-3-3 | • COTTER PIN | | 3 | Y | |
| 870 | B-3384-4 | • BOLT, 1/4-28, HEX HEAD | | 12 | Y | |
| 870A | B-3384-4H | • BOLT, 1/4-28, HEX HEAD, ALTERNATE FOR ITEM 870 | | 12 | Y | |
| 880 | A-2622-1 | • COLLAR SUPPORT RING | | 1 | Y | |
| 890 | C-3317-235 | • O-RING | | 1 | Y | |

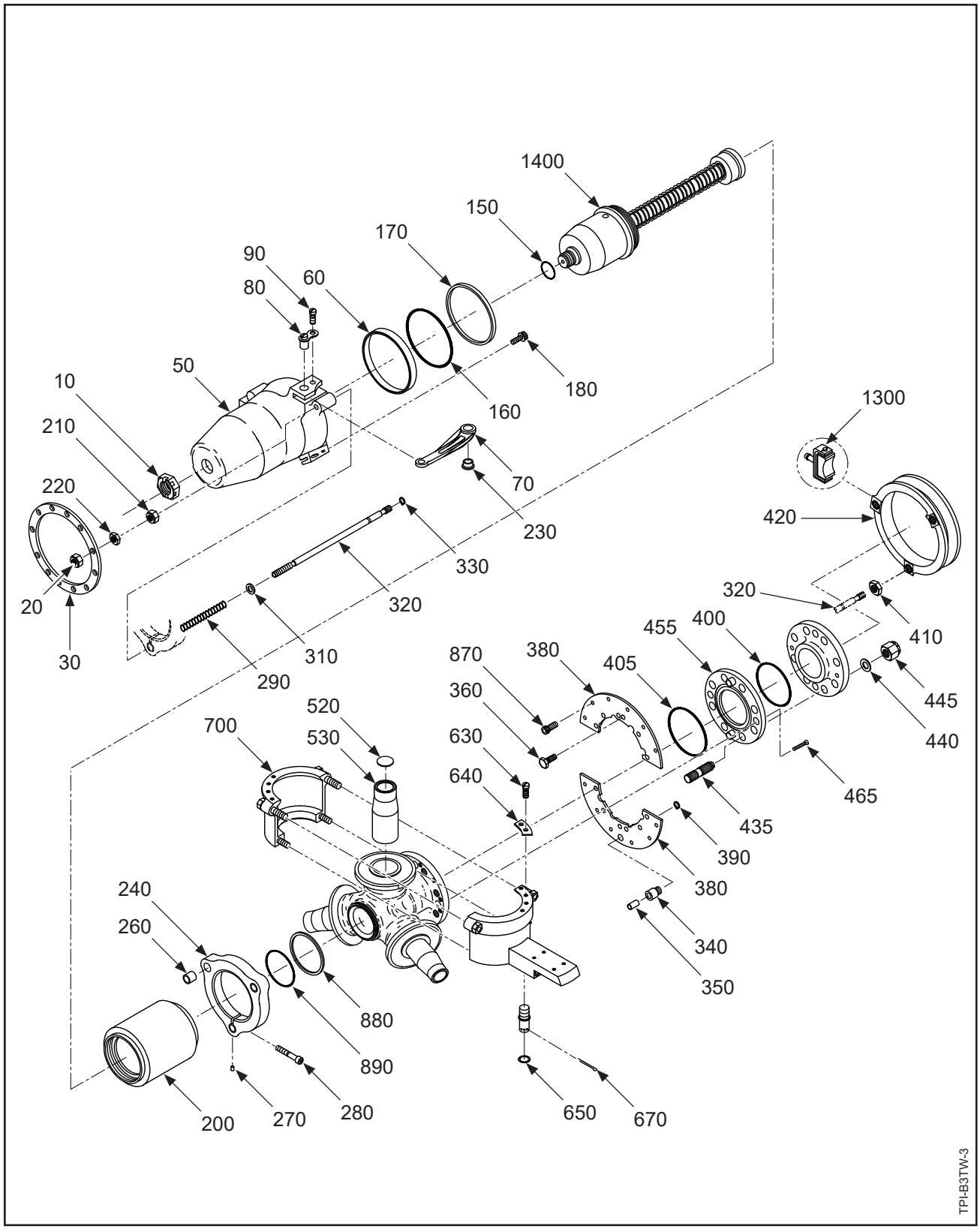
| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| A | MOUNTING STUD USAGE IS INSTALLATION SPECIFIC. REFER TO HARTZELL PROPELLER APPLICATION GUIDE MANUAL 159 (61-02-59) | | |

- ITEM NOT ILLUSTRATED

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| 10-9 | | **HC-B3TW-3 PROPELLER ASSEMBLY** | | | | |
| 10A-1 | | **BLADE RETENTION PARTS**<br>**REFER TO THE A-1851-(T) BLADE RETENTION PARTS IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST** | | | | |
| | | **CLAMP ASSEMBLY**<br>**REFER TO THE APPLICABLE CLAMP ASSEMBLY IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST** | | | | |
| 700 | 838-65 | • PCP: CLAMP ASSEMBLY, REPLACED BY ITEM 700A | | 3 | | PCP |
| 700A | 838-67 | • PCP: CLAMP ASSEMBLY, REPLACES ITEM 700 | | 3 | | PCP |
| | | **BETA FEEDBACK BLOCK ASSEMBLY**<br>**REFER TO THE APPLICABLE BETA FEEDBACK BLOCK ASSEMBLY IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST** | | | | |
| 1300 | | • BETA FEEDBACK BLOCK ASSEMBLIES ARE APPLICATION SPECIFIC. REFER TO HARTZELL PROPELLER APPLICATION GUIDE MANUAL 159 (61-02-59) FOR PART NUMBER AND PART QUANTITY. | | | | |
| | | **SPRING ASSEMBLY**<br>**REFER TO THE APPLICABLE CLAMP ASSEMBLY IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST** | | | | |
| 1400 | 831-82 | • SPRING ASSEMBLY | | 1 | | |
| | | **COUNTERWEIGHT SLUGS/MOUNTING HARDWARE** | | | | |
| -9040<br>-9050 | | • COUNTERWEIGHT SLUG<br>• HEX HEAD BOLT<br>APPLICATION SPECIFIC,<br>REFER TO HARTZELL PROPELLER APPLICATION GUIDE MANUAL 159 (61-02-59) FOR PART NUMBER AND PROPELLER CRITICAL PART (PCP) IDENTIFICATION | | | Y | |
| | | **SPINNER PARTS**<br>• APPLICATION SPECIFIC<br>REFER TO HARTZELL PROPELLER APPLICATION GUIDE MANUAL 159 (61-02-59) AND THE APPLICABLE HARTZELL PROPELLER SPINNER MAINTENANCE MANUAL:<br>MANUAL 127 (61-16-27) - METAL SPINNER ASSEMBLIES<br>MANUAL 148 (61-16-48) - COMPOSITE SPINNER ASSEMBLIES | | | | |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| | | | |

- ITEM NOT ILLUSTRATED




**HC-B3TW-3Y: Exploded View**
**Figure 10-10**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10-10** | | **HC-B3TW-3Y PROPELLER ASSEMBLY** | | | | |
| 10 | A-880-1 | • NUT, HEX, SELF-LOCKING, THIN | | 1 | Y | |
| 20 | B-3359 | • NUT, 3/8-24, HEX, SELF-LOCKING | | 3 | Y | |
| 20A | B-3599 | • NUT, 3/8-24, HEX, SELF-LOCKING, ALTERNATE FOR ITEM 20 | | 3 | Y | |
| 30 | B-3049 | • RING, SUPPORT, ROD, BETA | | 1 | | |
| 50 | C-3021-5 | • PISTON UNIT | | 1 | | |
| 60 | A-862-1 | • • BUSHING, PLASTIC | | 1 | | |
| 70 | B-4016 | • LINK ARM | | 3 | | |
| 70A | B-1901 | • LINK ARM, ALTERNATE FOR ITEM 70 | | 3 | | |
| 80 | A-1464 | • LINK PIN UNIT | | 3 | Y | |
| 90 | B-3840-6 | • SCREW, 10-32, FILLISTER HEAD | | 3 | Y | |
| 150 | C-3317-020 | • O-RING | | 1 | Y | |
| 160 | C-3317-347-2 | • O-RING | | 1 | Y | |
| 170 | B-1843 | • SEAL, DUST, PISTON | | 1 | Y | |
| 190 | A-2626-( ) | • SCREW, 10-32, CAP | | 3 | Y | |
| 200 | B-1803-4 | • PCP: CYLINDER | | 1 | | PCP |
| 210 | A-2043-1 | • NUT, 3/8-24, HEX, SELF-LOCKING | | 3 | Y | |
| 220 | A-3439 | • NUT, 3/8-24, HEX, THIN | | 3 | Y | |
| 220A | B-3382 | • NUT, 3/8-24, HEX, THIN, ALTERNATE FOR ITEM 220 | | 3 | Y | |
| 230 | A-944 | • SLEEVE, LINKSCREW | | 3 | Y | |
| 240 | 834-22 | • GUIDE COLLAR UNIT | | 1 | | |
| 260 | A-3023 | • • BUSHING, PLASTIC | | 3 | | |
| 270 | A-114-6 | • • DOWEL PIN | | 1 | | |
| 280 | A-2038-12 | • • SCREW, 1/4-28, CAP | | 1 | Y | |
| 290 | A-3099 | • SPRING, COMPRESSION, BETA | | 3 | Y | |
| -300 | B-3475A-2 | • ROD, BETA UNIT | | 3 | | |
| 310 | A-3478-1 | • • SPRING RETAINER, BETA | | 1 | | |
| 320 | B-3476A-2 | • • ROD, BETA | | 1 | | |
| 330 | A-3482 | • • RING, RETAINING, CRIMPED | | 2 | Y | |
| 340 | A-3067-2 | • LUG, GUIDE | | 3 | | |
| 350 | A-3023-2 | • • BUSHING, PLASTIC | | 1 | | |
| 360 | A-2051 | • BOLT, 5/16-24, HEX HEAD, REPLACED BY ITEM 360A | | OBS | Y | |
| 360A | A-2051-1 | • BOLT, 5/16-24, HEX HEAD, REPLACES ITEM 360 | | 9 | Y | |
| -365 | A-2037-1 | • SCREW, 5/16, CAP | | 1 | Y | |
| 380 | C-3003-1 | • PLATE, MOUNTING, SPINNER | | 1 | | |
| 390 | B-3843-56ZD | • SNAP RING, EXTERNAL | | 3 | Y | |
| 400 | C-3317-230 | • O-RING | | 1 | Y | |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| | | | |

- ITEM NOT ILLUSTRATED

**HC-B3TW-3Y, page 1 of 3**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10-10** | | **HC-B3TW-3Y PROPELLER ASSEMBLY** | | | | |
| 405 | C-3317-233 | • O-RING | | 1 | Y | |
| 410 | A-3439 | • NUT, 3/8-24, HEX, THIN | | 3 | Y | |
| 420 | B-3001-2 | • RING, BETA | | 1 | | |
| 435 | A-3254 | • STUD, MOUNTING, 9/16-18 | A | 8 | Y | |
| | B-7542 | • STUD, MOUNTING, 9/16-18 | A | 8 | Y | |
| 440 | 109514 | • WASHER | | 8 | Y | |
| 440A | B-7624 | • WASHER, ALTERNATE FOR ITEM 440 | | 8 | Y | |
| 445 | B-7458 | • NUT, 9/16-18, SELF-LOCKING | | 8 | Y | |
| -450 | B-3808-4 | • NUT, HEX, SELF-LOCKING | | 12 | Y | |
| 455 | C-7364-2 | • SPACER, MOUNTING | | 1 | | |
| -456 | B-6138-8-6 | • • DOWEL PIN | | 2 | Y | |
| -460 | B-3851-0432 | • WASHER (USE ONE ITEM 460 UNDER EACH ITEM 450; USE A/R UNDER HEAD OF ITEM 1145 OR 1155) (DE-ICE) | B | AR | Y | |
| -460A | B-3851-0463 | • WASHER, ALTERNATE FOR ITEM 460 (USE ONE ITEM 460A UNDER EACH ITEM 450; USE A/R UNDER HEAD OF ITEM 1145 OR ITEM 1155) (NO-DE-ICE) | C | AR | Y | |
| 465 | B-3868-S52 | • SCREW, 8-32, 100° HEAD, CRES | | 2 | Y | |
| -500 | 840-152 | • PCP: HUB UNIT, SUPERSEDED BY ITEM 500A | | 1 | | PCP |
| -500A | 840-153 | • PCP: HUB UNIT, SUPERSEDES ITEM 500 | | 1 | | PCP |
| 520 | B-3897-1 | • • PLUG, EXPANSION | | 3 | Y | |
| 530 | A-1891-A | • • PILOT TUBE | | 3 | | |
| 630 | B-3840-6 | • SCREW, 10-32, FILLISTER HEAD | | AR | Y | |
| 640 | A-1305 | • BALANCE WEIGHT | | AR | | |
| 650 | A-6119 | • BUSHING, LINK ARM | | 3 | Y | |
| 670 | B-3838-3-3 | • COTTER PIN | | 3 | Y | |
| 870 | B-3384-4 | • BOLT, 1/4-28, HEX HEAD | | 6 | Y | |
| 870A | B-3384-4H | • BOLT, 1/4-28, HEX HEAD, ALTERNATE FOR ITEM 870 | | 6 | Y | |
| 880 | A-2622-1 | • COLLAR SUPPORT RING | | 1 | | |
| 890 | C-3317-235 | • O-RING | | 1 | Y | |

| EFFECTIVITY | MODEL |
|---|---|
| A | MOUNTING STUD USAGE IS INSTALLATION SPECIFIC. REFER TO HARTZELL PROPELLER APPLICATION GUIDE MANUAL 159 (61-02-59) |

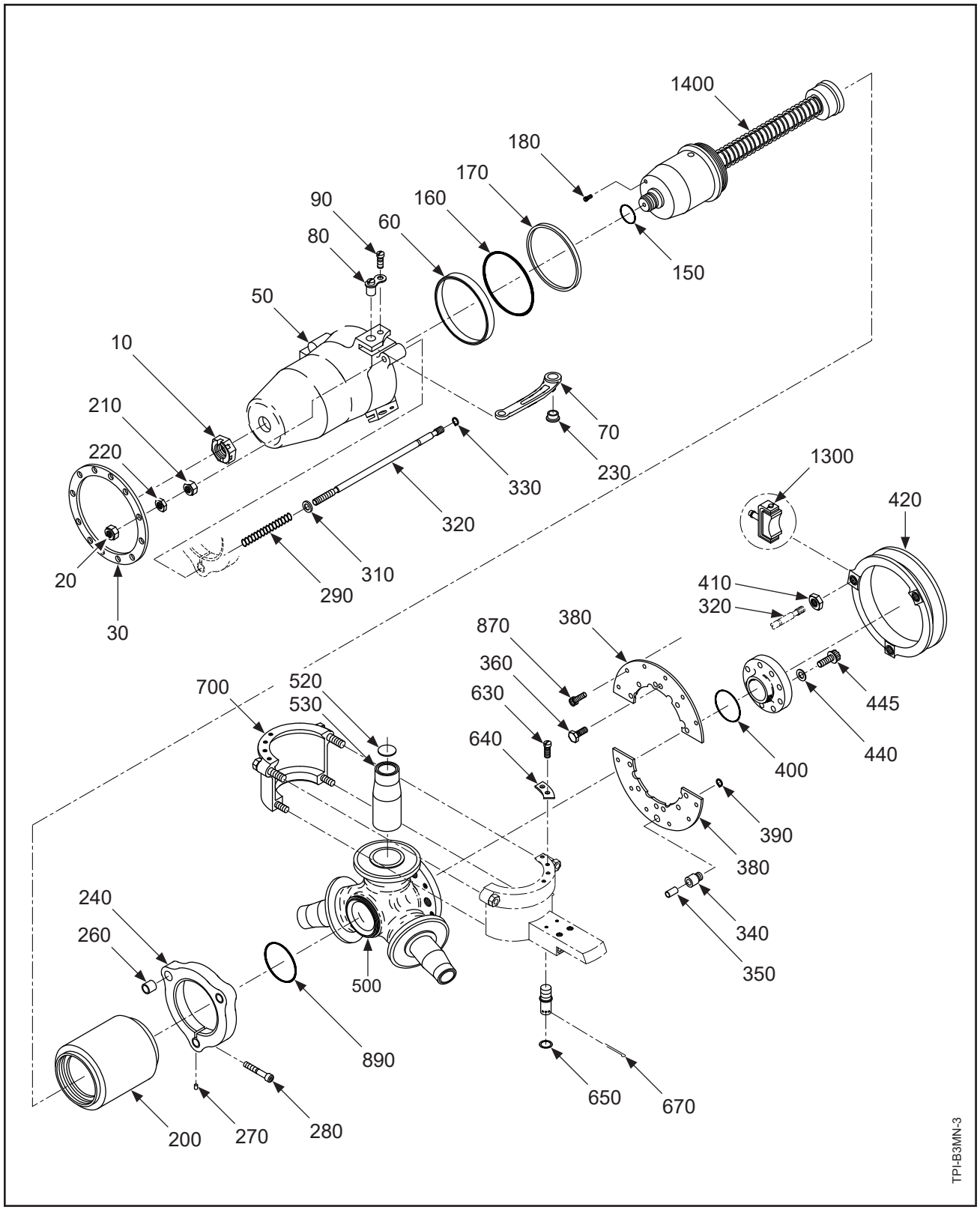
| EFFECTIVITY | MODEL |
|---|---|
| B | PROPELLER THAT HAS DE-ICE COMPONENTS |
| C | PROPELLER THAT DOES NOT HAVE DE-ICE COMPONENTS |

- ITEM NOT ILLUSTRATED

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| 10-10 | | HC-B3TW-3Y PROPELLER ASSEMBLY | | | | |
| 10A-1 | | BLADE RETENTION PARTS<br>REFER TO THE A-1851-(T) BLADE RETENTION PARTS IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST | | | | |
| | | CLAMP ASSEMBLY<br>REFER TO THE APPLICABLE CLAMP ASSEMBLY IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST | | | | |
| 700 | 838-67 | • PCP: CLAMP ASSEMBLY | | 3 | | PCP |
| | | START LOCK MOUNTING KIT<br>REFER TO THE APPLICABLE START LOCK MOUNTING KIT IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST | | | | |
| -1000 | A-3433-3 | • START LOCK [HC-B3TN( )] - MTG KIT | | 1 | | |
| | | BETA FEEDBACK BLOCK ASSEMBLY<br>REFER TO THE APPLICABLE BETA FEEDBACK BLOCK ASSEMBLY IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST | | | | |
| 1300 | | • BETA FEEDBACK BLOCK ASSEMBLIES ARE APPLICATION SPECIFIC. REFER TO HARTZELL PROPELLER APPLICATION GUIDE MANUAL 159 (61-02-59) FOR PART NUMBER AND PART QUANTITY. | | | | |
| | | SPRING ASSEMBLY<br>REFER TO THE APPLICABLE SPRING ASSEMBLY IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST | | | | |
| 1400 | 831-82 | • SPRING ASSEMBLY | | 1 | | |
| | | COUNTERWEIGHT SLUGS/MOUNTING HARDWARE | | | | |
| -9040<br>-9050 | | • COUNTERWEIGHT SLUG<br>• HEX HEAD BOLT<br>APPLICATION SPECIFIC, REFER TO HARTZELL PROPELLER APPLICATION GUIDE MANUAL 159 (61-02-59) FOR PART NUMBER AND PROPELLER CRITICAL PART (PCP) IDENTIFICATION | | | Y | |
| | | SPINNER PARTS | | | | |
| | | • APPLICATION SPECIFIC<br>REFER TO HARTZELL PROPELLER APPLICATION GUIDE MANUAL 159 (61-02-59) AND THE APPLICABLE HARTZELL PROPELLER SPINNER MAINTENANCE MANUAL:<br>MANUAL 127 (61-16-27) - METAL SPINNER ASSEMBLIES<br>MANUAL 148 (61-16-48) - COMPOSITE SPINNER ASSEMBLIES | | | | |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| | | | |

- ITEM NOT ILLUSTRATED




**HC-B3MN-3: Exploded View**
**Figure 10-11**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10-11** | | **HC-B3MN-3 PROPELLER ASSEMBLY** | | | | |
| 10 | A-880-1 | • NUT, HEX, SELF-LOCKING, THIN | | 1 | Y | |
| 20 | B-3359 | • NUT, 3/8-24, HEX, SELF-LOCKING | | 3 | Y | |
| 20A | B-3599 | • NUT, 3/8-24, HEX, SELF-LOCKING, ALTERNATE FOR ITEM 20 | | 3 | Y | |
| 30 | B-3049 | • RING, SUPPORT, ROD, BETA | | 1 | | |
| 50 | C-3021-5 | • PISTON UNIT | | 1 | | |
| 60 | A-862-1 | • • BUSHING, PLASTIC | | 1 | | |
| 70 | B-4016 | • LINK ARM | | 3 | | |
| 70A | B-1901 | • LINK ARM, ALTERNATE FOR ITEM 70 | | 3 | | |
| 80 | A-1464 | • LINK PIN UNIT | | 3 | Y | |
| 90 | B-3840-6 | • SCREW, 10-32, FILLISTER HEAD | | 3 | Y | |
| 150 | C-3317-020 | • O-RING | | 1 | Y | |
| 160 | C-3317-347-2 | • O-RING | | 1 | Y | |
| 170 | A-863 | • SEAL, DUST, PISTON, REPLACED BY ITEM 170A | | OBS | | |
| 170A | B-1843 | • SEAL, DUST, PISTON, REPLACES ITEM 170 | | 1 | Y | |
| 180 | B-3840-5 | • SCREW, 10-32, FILLISTER HEAD | | 4 | Y | |
| 200 | B-1803-2 | • PCP: CYLINDER | | 1 | | PCP |
| 210 | A-2043 | • NUT, 3/8-24, HEX, SELF-LOCKING, REPLACED BY ITEM 210A | | OBS | | |
| 210A | A-2043-1 | • NUT, 3/8-24, HEX, SELF-LOCKING, REPLACES ITEM 210 | | 3 | Y | |
| 220 | A-3439 | • NUT, 3/8-24, HEX, THIN | | 3 | Y | |
| 220A | B-3382 | • NUT, 3/8-24, HEX, THIN, ALTERNATE FOR ITEM 220 | | 3 | Y | |
| 230 | A-944 | • SLEEVE, LINKSCREW | | 3 | Y | |
| 240 | 834-12 | • GUIDE COLLAR UNIT | | 1 | | |
| 260 | A-3023 | • • BUSHING, PLASTIC | | 3 | | |
| 270 | A-114-6 | • • DOWEL PIN | | 1 | | |
| 280 | A-2038-12 | • • SCREW, 1/4-28, CAP | | 1 | Y | |
| 290 | A-3099 | • SPRING, COMPRESSION, BETA | | 3 | Y | |
| -295 | A-965 | • WASHER, 7/16, CRES (USE WITH ITEM 300 ONLY) | | 3 | Y | |
| -300 | B-3002-2 | • LOW STOP ROD UNIT, SUPERSEDED BY ITEM 300A | | RF | | |
| -300A | B-3475A-2 | • ROD, BETA UNIT, SUPERSEDES ITEM 300 | | 3 | | |
| 310 | A-3478-1 | • • SPRING RETAINER, BETA | | 1 | | |
| 320 | B-3476A-2 | • • ROD, BETA | | 1 | | |
| 330 | A-3482 | • • RING, RETAINING, CRIMPED | | 2 | Y | |
| 340 | A-3067-2 | • LUG, GUIDE | | 3 | | |
| 350 | A-3023-2 | • • BUSHING, PLASTIC | | 1 | | |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| | | | |

- ITEM NOT ILLUSTRATED

**HC-B3MN-3, page 1 of 3**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10-11** | | **HC-B3MN-3 PROPELLER ASSEMBLY** | | | | |
| 360 | A-2051 | • BOLT, 5/16-24, HEX HEAD, REPLACED BY ITEM 360A | | OBS | | |
| 360A | A-2051-1 | • BOLT, 5/16-24, HEX HEAD, REPLACES ITEM 360 | | 9 | Y | |
| 380 | C-3003-2 | • PLATE, MOUNTING, SPINNER, SUPERSEDED BY ITEM 380A | | 1 | | |
| 380A | C-3003-1 | • PLATE, MOUNTING, SPINNER, SUPERSEDES ITEM 380 | | 1 | | |
| 390 | B-3843-56ZD | • SNAP RING, EXTERNAL | | 3 | Y | |
| 400 | C-3317-230 | • O-RING | | 1 | Y | |
| 410 | A-3439 | • NUT, 3/8-24, HEX, THIN | | 3 | Y | |
| 420 | B-3001-2 | • RING, BETA | | 1 | | |
| 430 | B-3339 | • BOLT, MOUNTING, 9/16-18, 12 POINT | | 8 | Y | |
| 440 | A-2048-2 | • WASHER, MOUNTING, 9/16" CSK | | 8 | Y | |
| -500 | 840-60 | • PCP: HUB UNIT | | 1 | | PCP |
| 520 | B-3897-1 | • • PLUG, EXPANSION | | 3 | Y | |
| 530 | A-1891-A | • • PILOT TUBE | | 3 | | |
| 630 | B-3840-6 | • SCREW, 10-32, FILLISTER HEAD | | AR | Y | |
| 640 | A-1305 | • BALANCE WEIGHT | | AR | | |
| 650 | A-6119 | • BUSHING, LINK ARM | | 3 | Y | |
| 670 | B-3838-3-3 | • COTTER PIN | | 3 | Y | |
| 740 | A-304 | • • LINKSCREW, 1/2-20 | | 1 | Y | |
| 870 | A-2037-1 | • SCREW, 5/16, CAP | | 1 | Y | |
| 890 | C-3317-235 | • O-RING | | 1 | Y | |

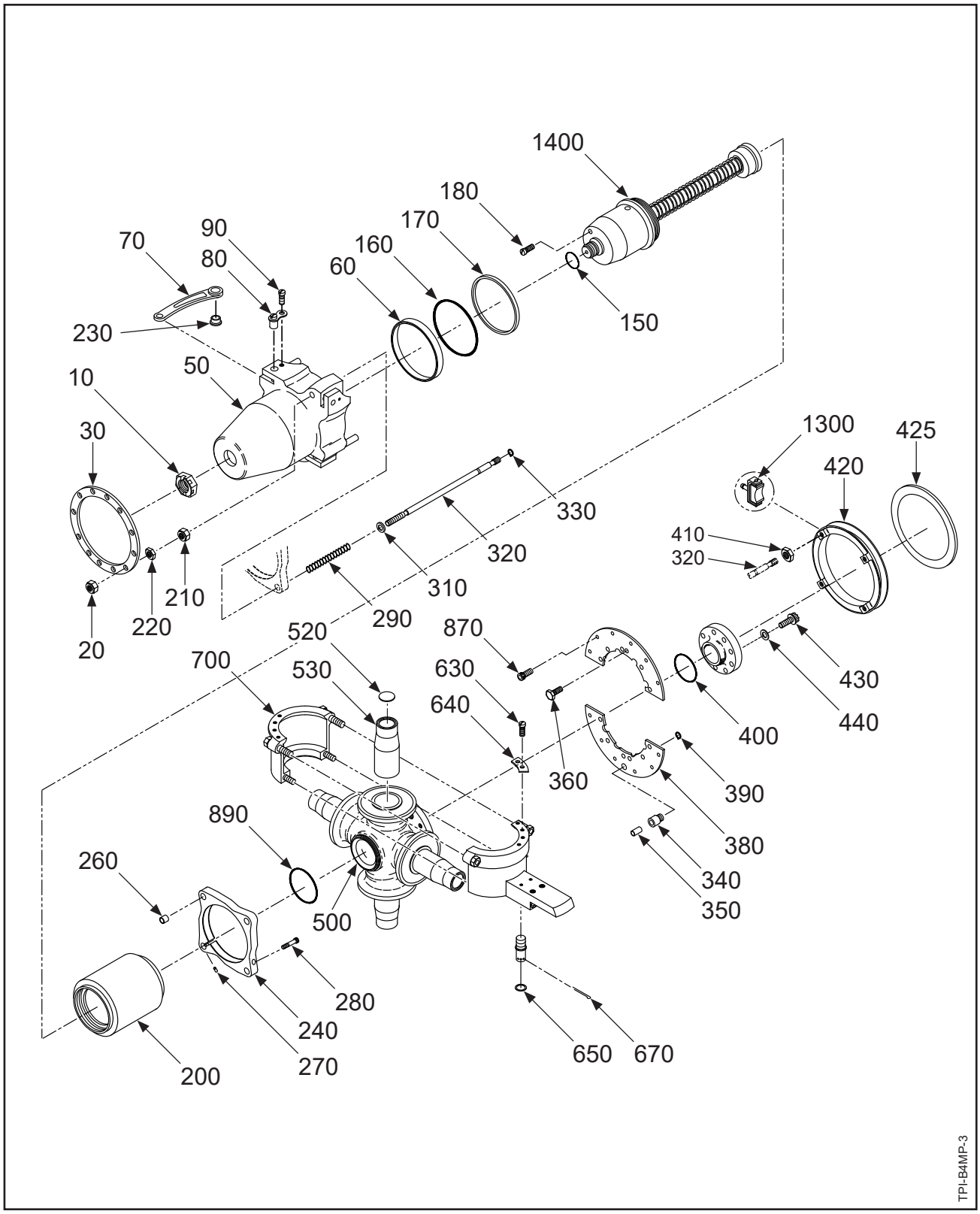
| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| | | | |

- ITEM NOT ILLUSTRATED

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| 10-11 | | **HC-B3MN-3 PROPELLER ASSEMBLY** | | | | |
| 10A-1 | | **BLADE RETENTION PARTS**<br>**REFER TO THE A-1851-(T) BLADE RETENTION PARTS IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST** | | | | |
| | | **CLAMP ASSEMBLY**<br>**REFER TO THE APPLICABLE CLAMP ASSEMBLY IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST** | | | | |
| 700 | 838-109 | • PCP: CLAMP ASSEMBLY | | 3 | | PCP |
| | | **BETA FEEDBACK BLOCK ASSEMBLY**<br>**REFER TO THE APPLICABLE BETA FEEDBACK BLOCK ASSEMBLY IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST** | | | | |
| 1300 | | • BETA FEEDBACK BLOCK ASSEMBLIES ARE APPLICATION SPECIFIC. REFER TO HARTZELL PROPELLER APPLICATION GUIDE MANUAL 159 (61-02-59) FOR PART NUMBER AND PART QUANTITY. | | | | |
| | | **SPRING ASSEMBLY**<br>**REFER TO THE APPLICABLE SPRING ASSEMBLY IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST** | | | | |
| 1400 | 831-47 | • SPRING ASSEMBLY, SUPERSEDED BY ITEM 1400A | | 1 | | |
| 1400A | 831-82 | • SPRING ASSEMBLY, SUPERSEDES ITEM 1400 | | 1 | | |
| | | **COUNTERWEIGHT SLUGS/MOUNTING HARDWARE** | | | | |
| -9040<br>-9050 | | • COUNTERWEIGHT SLUG<br>• HEX HEAD BOLT<br>APPLICATION SPECIFIC,<br>REFER TO HARTZELL PROPELLER APPLICATION GUIDE MANUAL 159 (61-02-59) FOR PART NUMBER AND PROPELLER CRITICAL PART (PCP) IDENTIFICATION | | | Y | |
| | | **SPINNER PARTS**<br>• APPLICATION SPECIFIC<br>REFER TO HARTZELL PROPELLER APPLICATION GUIDE MANUAL 159 (61-02-59) AND THE APPLICABLE HARTZELL PROPELLER SPINNER MAINTENANCE MANUAL:<br>MANUAL 127 (61-16-27) - METAL SPINNER ASSEMBLIES<br>MANUAL 148 (61-16-48) - COMPOSITE SPINNER ASSEMBLIES | | | | |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| | | | |

- ITEM NOT ILLUSTRATED




**HC-B4MP-3(A, B, C): Exploded View**
**Figure 10-12**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10-12** | | **HC-B4MP-3(A, B, C) PROPELLER ASSEMBLY** | | | | |
| 10 | A-880-1 | • NUT, HEX, SELF-LOCKING, THIN | | 1 | Y | |
| 20 | B-3359 | • NUT, 3/8-24, HEX, SELF-LOCKING | | 4 | Y | |
| 20A | B-3599 | • NUT, 3/8-24, HEX, SELF-LOCKING, ALTERNATE FOR ITEM 20 | | 4 | Y | |
| 30 | B-3049 | • RING, SUPPORT, ROD, BETA | | 1 | | |
| 50 | C-2303-3 | • PISTON UNIT | | 1 | | |
| 60 | A-862-7 | • • BUSHING, PLASTIC | | 1 | | |
| 70 | B-4016 | • LINK ARM | | 4 | | |
| 70A | B-1901 | • LINK ARM, ALTERNATE FOR ITEM 70 | | 4 | | |
| 80 | A-1464 | • LINK PIN UNIT | | 4 | Y | |
| 90 | B-3840-6 | • SCREW, 10-32, FILLISTER HEAD | | 4 | Y | |
| 150 | C-3317-020 | • O-RING | | 1 | Y | |
| 160 | C-3317-426-2 | • O-RING | | 1 | Y | |
| 170 | A-863 | • SEAL, DUST, PISTON, REPLACED BY ITEM 170A | | OBS | | |
| 170A | B-1843 | • SEAL, DUST, PISTON, REPLACES ITEM 170 | | 1 | Y | |
| 180 | B-3840-8 | • SCREW, 10-32, FILLISTER HEAD | | 4 | Y | |
| 200 | B-3406 | • CYLINDER | | 1 | | |
| 210 | A-2043 | • NUT, 3/8-24, HEX, SELF-LOCKING, REPLACED BY ITEM 210A | | OBS | | |
| 210A | A-2043-1 | • NUT, 3/8-24, HEX, SELF-LOCKING, REPLACES ITEM 210 | | 4 | Y | |
| 220 | A-3439 | • NUT, 3/8-24, HEX, THIN | | 4 | Y | |
| 220A | B-3382 | • NUT, 3/8-24, HEX, THIN, ALTERNATE FOR ITEM 220 | | 4 | Y | |
| 230 | A-944 | • SLEEVE, LINKSCREW | | 4 | Y | |
| 240 | 834-13 | • GUIDE COLLAR UNIT | | 1 | | |
| 260 | A-3023 | • • BUSHING, PLASTIC | | 4 | | |
| 270 | A-114-C | • • DOWEL PIN | | 1 | | |
| 280 | A-2038-14 | • • SCREW, 1/4-28, CAP | | 1 | Y | |
| 290 | A-3099 | • SPRING, COMPRESSION, BETA | | 4 | Y | |
| -295 | A-965 | • WASHER, 7/16, CRES (USE WITH ITEM 300 0NLY) | | 4 | Y | |
| -300 | B-3002-3 | • LOW STOP ROD UNIT, SUPERSEDED BY ITEM 300A | | RF | | |
| -300A | B-3475A-3 | • ROD, BETA-UNIT, SUPERSEDES ITEM 300 | | 4 | | |
| 310 | A-3478-1 | • • SPRING RETAINER, BETA | | 1 | | |
| 320 | B-3476A-3 | • • ROD, BETA | | 1 | | |
| 330 | A-3482 | • • RING, RETAINING, CRIMPED | | 2 | Y | |
| 340 | A-3067-2 | • LUG, GUIDE | | 4 | | |
| 350 | A-3023-2 | • • BUSHING, PLASTIC | | 1 | | |
| 360 | A-2051 | • BOLT, 5/16-24, HEX HEAD, REPLACED BY ITEM 360A | | OBS | | |
| 360A | A-2051-1 | • BOLT, 5/16-24, HEX HEAD, REPLACES ITEM 360 | | 6 | Y | |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| | | | |

- ITEM NOT ILLUSTRATED

**HC-B4MP-3(A, B, C), page 1 of 3**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10-12** | | **HC-B4MP-3(A, B, C) PROPELLER ASSEMBLY** | | | | |
| 380 | C-3404-3 | • PLATE, MOUNTING, SPINNER | | 1 | | |
| 390 | B-3843-56ZD | • SNAP RING, EXTERNAL | | 4 | Y | |
| 400 | C-3317-230 | • O-RING | | 1 | Y | |
| 410 | A-3439 | • NUT, 3/8-24, HEX, THIN | | 4 | Y | |
| 420 | B-3001-3 | • RING, BETA | -3, -3A | 1 | | |
| | B-3334 | • RING, BETA - UNIT | -3B, -3C | 1 | | |
| 425 | B-3333 | • • RING, INDICATOR, BETA SWITCH (USE WITH ITEM 420) | -3B, -3C | 1 | | |
| 430 | B-3339 | • BOLT, MOUNTING, 9/16-18, 12 POINT | | 8 | Y | |
| 440 | A-2048-2 | • WASHER, MOUNTING, 9/16" CSK | | 8 | Y | |
| 500 | 840-140 | • PCP: HUB UNIT | | 1 | | PCP |
| 520 | B-3897-1 | • • PLUG, EXPANSION | | 4 | Y | |
| 530 | A-1891-A | • • PILOT TUBE | | 4 | | |
| 630 | B-3840-6 | • SCREW, 10-32, FILLISTER HEAD | | AR | Y | |
| 640 | A-1305 | • BALANCE WEIGHT | | AR | | |
| 650 | A-6119 | • BUSHING, LINK ARM | | 4 | Y | |
| 670 | B-3838-3-3 | • COTTER PIN | | 4 | Y | |
| 870 | A-2037-1 | • SCREW, 5/16, CAP | | 4 | Y | |
| 890 | C-3317-240 | • O-RING | | 1 | Y | |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| -3 | HC-B4MP-3 | | |
| -3A | HC-B4MP-3A | | |
| -3B | HC-B4MP-3B | | |
| -3C | HC-B4MP-3C | | |

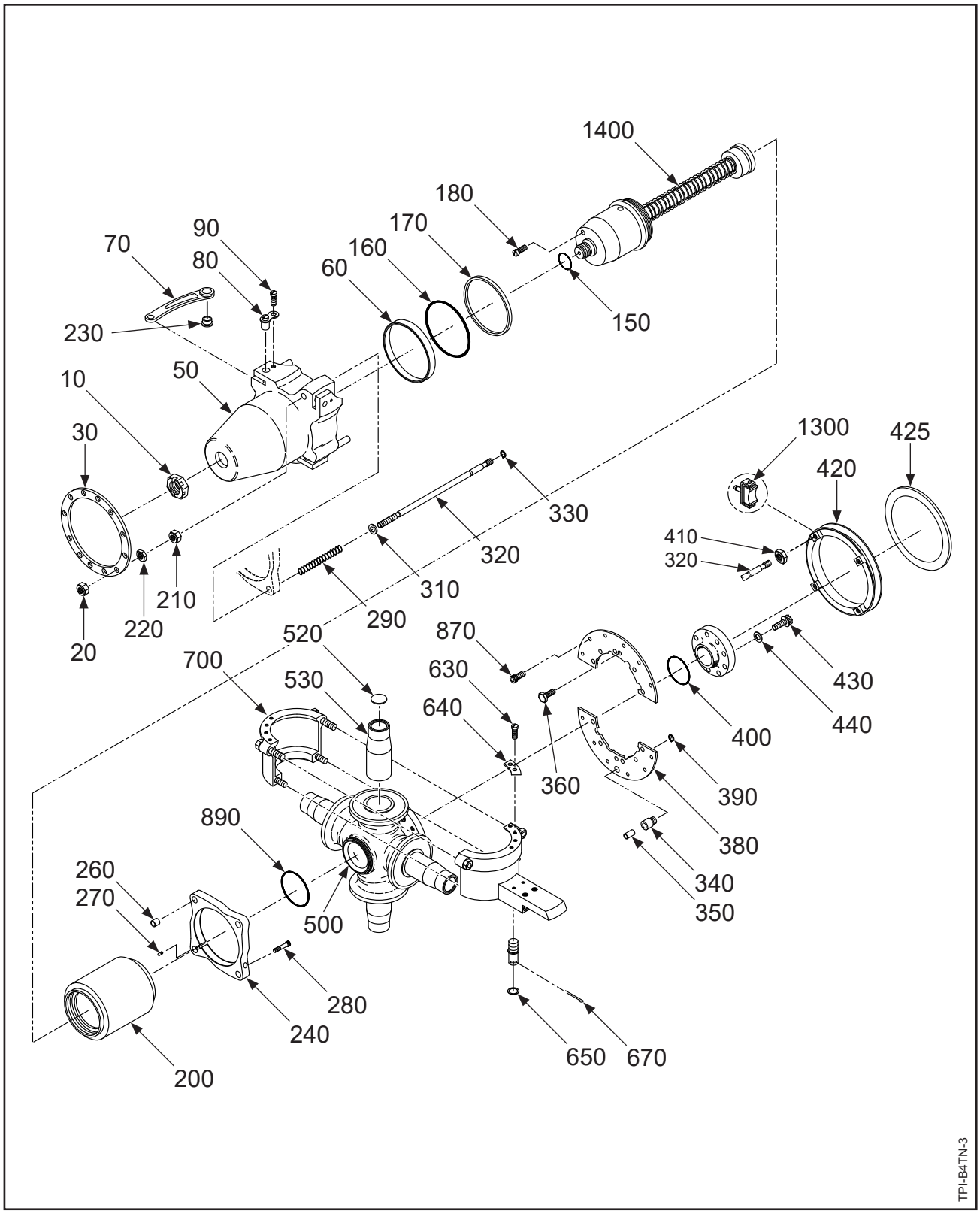
- ITEM NOT ILLUSTRATED

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| 10-12 | | **HC-B4MP-3(A, B, C) PROPELLER ASSEMBLY** | | | | |
| 10A-1 | | **BLADE RETENTION PARTS**<br>**REFER TO THE A-1851-(T) BLADE RETENTION PARTS IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST** | | | | |
| | | **CLAMP ASSEMBLY**<br>**REFER TO THE APPLICABLE CLAMP ASSEMBLY IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST** | | | | |
| 700 | 838-103 | • PCP: CLAMP ASSEMBLY | -3, -3B, -3C | 4 | | PCP |
| | 838-109 | • PCP: CLAMP ASSEMBLY | -3A | 4 | | PCP |
| | | **BETA FEEDBACK BLOCK ASSEMBLY**<br>**REFER TO THE APPLICABLE BETA FEEDBACK BLOCK ASSEMBLY IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST** | | | | |
| 1300 | | • BETA FEEDBACK BLOCK ASSEMBLIES ARE APPLICATION SPECIFIC. REFER TO HARTZELL PROPELLER APPLICATION GUIDE MANUAL 159 (61-02-59) FOR PART NUMBER AND PART QUANTITY. | | | | |
| | | **SPRING ASSEMBLY**<br>**REFER TO THE APPLICABLE SPRING ASSEMBLY IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST** | | | | |
| 1400 | 831-22 | • SPRING ASSEMBLY, REPLACED BY ITEM 1400A | | OBS | | |
| 1400A | 831-42 | • SPRING ASSEMBLY, REPLACED BY ITEM 1400B | | OBS | | |
| 1400B | 831-69 | • SPRING ASSEMBLY, REPLACED BY ITEM 1400C | | OBS | | |
| 1400C | 831-76 | • SPRING ASSEMBLY, REPLACES ITEMS 1400, 1400A, 1400B | | 1 | | |
| | | **COUNTERWEIGHT SLUGS/MOUNTING HARDWARE** | | | | |
| -9040<br>-9050 | | • COUNTERWEIGHT SLUG<br>• HEX HEAD BOLT APPLICATION SPECIFIC, REFER TO HARTZELL PROPELLER APPLICATION GUIDE MANUAL 159 (61-02-59) FOR PART NUMBER AND PROPELLER CRITICAL PART (PCP) IDENTIFICATION | | | Y | |
| | | **SPINNER PARTS**<br>• APPLICATION SPECIFIC REFER TO HARTZELL PROPELLER APPLICATION GUIDE MANUAL 159 (61-02-59) AND THE APPLICABLE HARTZELL PROPELLER SPINNER MAINTENANCE MANUAL:<br>MANUAL 127 (61-16-27) - METAL SPINNER ASSEMBLIES<br>MANUAL 148 (61-16-48) - COMPOSITE SPINNER ASSEMBLIES | | | | |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| -3 | HC-B4MP-3 | | |
| -3A | HC-B4MP-3A | | |
| -3B | HC-B4MP-3B | | |
| -3C | HC-B4MP-3C | | |

- ITEM NOT ILLUSTRATED

**HC-B4MP-3(A, B, C), page 3 of 3**




**HC-B4TN-3(A, B, C): Exploded View**
**Figure 10-13**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10-13** | | **HC-B4TN-3(A, B, C) PROPELLER ASSEMBLY** | | | | |
| 10 | A-880-1 | • NUT, HEX, SELF-LOCKING, THIN | | 1 | Y | |
| 20 | B-3359 | • NUT, 3/8-24, HEX, SELF-LOCKING | | 4 | Y | |
| 20A | B-3599 | • NUT, 3/8-24, HEX, SELF-LOCKING, ALTERNATE FOR ITEM 20 | | 4 | Y | |
| 30 | B-3049 | • RING, SUPPORT, ROD, BETA | | 1 | | |
| 50 | C-2303-3 | • PISTON UNIT | | 1 | | |
| 60 | A-862-7 | • • BUSHING, PLASTIC | | 1 | | |
| 70 | B-4016 | • LINK ARM | | 4 | | |
| 70A | B-1901 | • LINK ARM, ALTERNATE FOR ITEM 70 | | 4 | | |
| 80 | A-1464 | • LINK PIN UNIT | | 4 | Y | |
| 90 | B-3840-6 | • SCREW, 10-32, FILLISTER HEAD | | 4 | Y | |
| 150 | C-3317-020 | • O-RING | | 1 | Y | |
| 160 | C-3317-426-2 | • O-RING | | 1 | Y | |
| 170 | A-863 | • SEAL, DUST, PISTON, REPLACED BY ITEM 170A | | OBS | | |
| 170A | B-1843 | • SEAL, DUST, PISTON, REPLACES ITEM 170 | | 1 | Y | |
| 180 | B-3840-8 | • SCREW, 10-32, FILLISTER HEAD | | 4 | Y | |
| 200 | B-3406 | • CYLINDER | | 1 | | |
| 210 | A-2043 | • NUT, 3/8-24, HEX, SELF-LOCKING, REPLACED BY ITEM 210A | | OBS | | |
| 210A | A-2043-1 | • NUT, 3/8-24, HEX, SELF-LOCKING, REPLACES ITEM 210 | | 4 | Y | |
| 220 | A-3439 | • NUT, 3/8-24, HEX, THIN | | 4 | Y | |
| 220A | B-3382 | • NUT, 3/8-24, HEX, THIN, ALTERNATE FOR ITEM 220 | | 4 | Y | |
| 230 | A-944 | • SLEEVE, LINKSCREW | | 4 | Y | |
| 240 | 834-13 | • GUIDE COLLAR UNIT | | 1 | | |
| 260 | A-3023 | • • BUSHING, PLASTIC | | 4 | | |
| 270 | A-114-C | • • DOWEL PIN | | 1 | | |
| 280 | A-2038-14 | • • SCREW, 1/4-28, CAP | | 1 | Y | |
| 290 | A-3099 | • SPRING, COMPRESSION, BETA | | 4 | Y | |
| -295 | A-965 | • WASHER, 7/16, CRES (USE WITH ITEM 320A ONLY) | | 4 | Y | |
| -300 | B-3002-1 | • LOW STOP ROD UNIT, SUPERSEDED BY ITEM 300A | -3 | RF | | |
| | B-3002-3 | • LOW STOP ROD UNIT, SUPERSEDED BY ITEM 300A | -3A, -3B, -3C | RF | | |
| -300A | B-3475A-3 | • ROD, BETA-UNIT, SUPERSEDES ITEMS 300 | | 4 | | |
| 310 | A-3478-1 | • • SPRING RETAINER, BETA | | 1 | | |
| 320 | B-3476A-3 | • • ROD, BETA | | 1 | | |
| 320A | B-3002-1 | • • BETA ROD, ALTERNATE FOR ITEM 320 | -3A, -3B, -3C | 1 | | |
| | B-3002-3 | • • BETA ROD, ALTERNATE FOR ITEM 320 | -3 | 1 | | |
| 330 | A-3482 | • • RING, RETAINING, CRIMPED | | 2 | Y | |
| 340 | A-3067-2 | • LUG, GUIDE | | 4 | | |
| 350 | A-3023-2 | • • BUSHING, PLASTIC | | 1 | | |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| | | | |

- ITEM NOT ILLUSTRATED

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10-13** | | **HC-B4TN-3(A, B, C) PROPELLER ASSEMBLY** | | | | |
| 360 | A-2051 | • BOLT, 5/16-24, HEX HEAD, REPLACED BY ITEM 360A | | OBS | | |
| 360A | A-2051-1 | • BOLT, 5/16-24, HEX HEAD, REPLACES ITEM 360 | | 6 | Y | |
| 380 | C-3404-1 | • PLATE, MOUNTING, SPINNER, SUPERSEDED BY ITEM 380A | | 1 | | |
| 380A | C-3404-3 | • PLATE, MOUNTING, SPINNER, SUPERSEDES ITEM 380 | | 1 | | |
| 390 | B-3843-56ZD | • SNAP RING, EXTERNAL | | 4 | Y | |
| 400 | C-3317-230 | • O-RING | | 1 | Y | |
| 410 | A-3439 | • NUT, 3/8-24, HEX, THIN | | 4 | Y | |
| 420 | B-3001-1 | • RING, BETA, REPLACED BY ITEM 420A | -3 | OBS | | |
| 420A | B-3001-3 | • RING, BETA, REPLACES ITEM 420 | -3,-3A,-3C | 1 | | |
| 420B | B-3334 | • RING, BETA - UNIT | -3B | 1 | | |
| 425 | B-3333 | • • RING, INDICATOR, BETA SWITCH | | 1 | | |
| 430 | B-3339 | • BOLT, MOUNTING, 9/16-18, 12 POINT | | 8 | Y | |
| 440 | A-2048-2 | • WASHER, MOUNTING, 9/16" CSK | | 8 | Y | |
| 500 | 840-89 | • PCP: HUB UNIT, REPLACED BY ITEM 500A | | OBS | | PCP |
| 500A | 840-139 | • PCP: HUB UNIT, REPLACES ITEM 500 (AD 96-18-14) | | 1 | | PCP |
| 520 | B-3897-1 | • • PLUG, EXPANSION | | 4 | Y | |
| 530 | A-1891-A | • • PILOT TUBE | | 4 | | |
| 630 | B-3840-6 | • SCREW, 10-32, FILLISTER HEAD | | AR | Y | |
| 640 | A-1305 | • BALANCE WEIGHT | | AR | | |
| 650 | A-6119 | • BUSHING, LINK ARM | | 4 | Y | |
| 670 | B-3838-3-3 | • COTTER PIN | | 4 | Y | |
| 870 | A-2037-1 | • SCREW, 5/16, CAP | | 4 | Y | |
| 890 | C-3317-240 | • O-RING | | 1 | Y | |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| -3 | HC-B4TN-3 | | |
| -3A | HC-B4TN-3A | | |
| -3B | HC-B4TN-3B | | |
| -3C | HC-B4TN-3C | | |

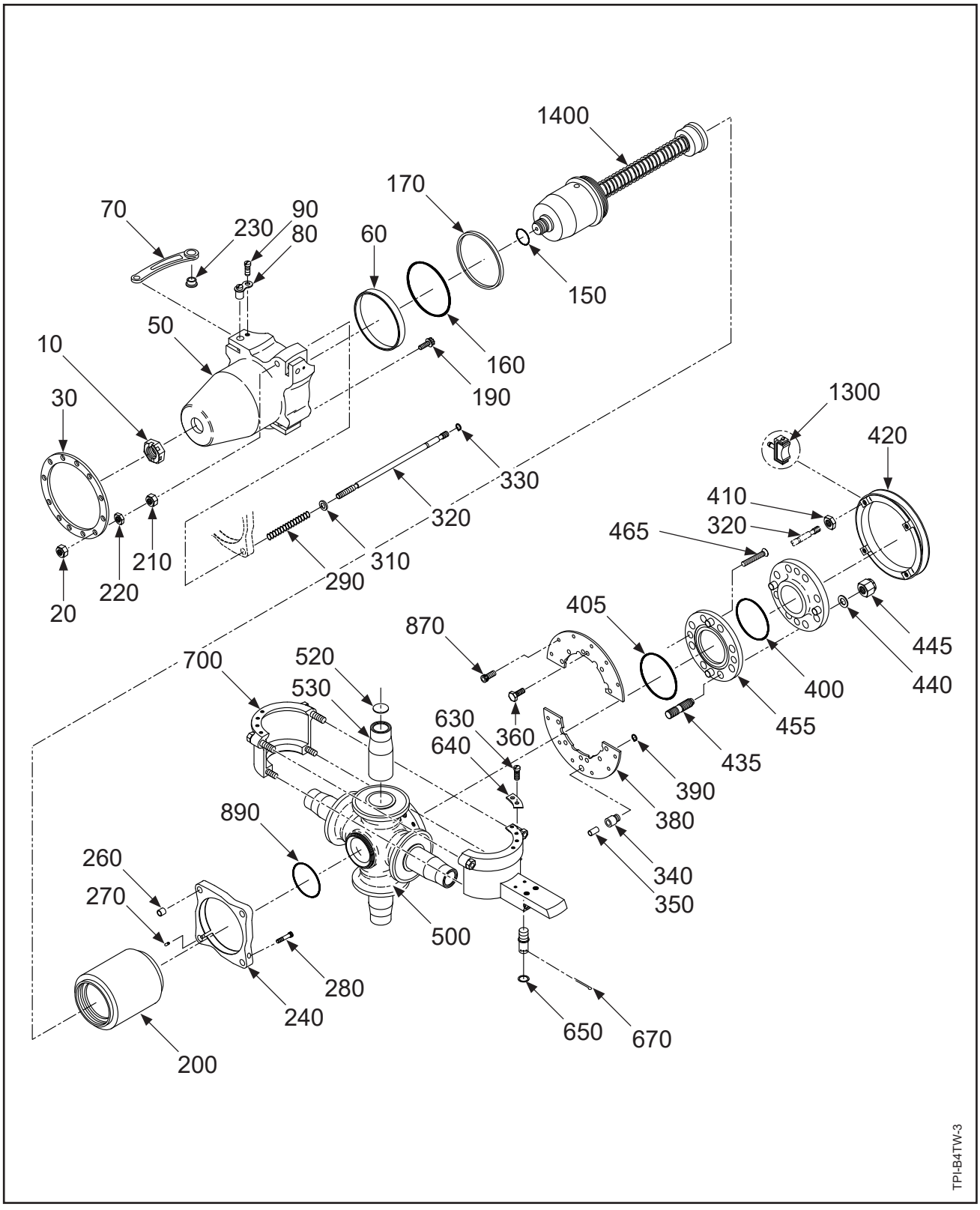
- ITEM NOT ILLUSTRATED

**HC-B4TN-3(A, B, C), page 2 of 3**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| 10-13 | | HC-B4TN-3(A, B, C) PROPELLER ASSEMBLY | | | | |
| 10A-1 | | BLADE RETENTION PARTS | | | | |
| | | REFER TO THE A-1851-(T) BLADE RETENTION PARTS IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST | | | | |
| | | CLAMP ASSEMBLY | | | | |
| | | REFER TO THE APPLICABLE CLAMP ASSEMBLY IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST | | | | |
| 700 | 838-82 | • PCP: CLAMP ASSEMBLY | -3, -3A, -3B | 4 | | PCP |
| | 838-105 | • PCP: CLAMP ASSEMBLY | -3C | 4 | | PCP |
| 700A | 838-89 | • PCP: CLAMP ASSEMBLY, ALTERNATE FOR ITEM 700 | -3, -3A, -3B | 4 | | PCP |
| | | BETA FEEDBACK BLOCK ASSEMBLY | | | | |
| | | REFER TO THE APPLICABLE BETA FEEDBACK BLOCK ASSEMBLY IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST | | | | |
| 1300 | | • BETA FEEDBACK BLOCK ASSEMBLIES ARE APPLICATION SPECIFIC. REFER TO HARTZELL PROPELLER APPLICATION GUIDE MANUAL 159 (61-02-59) FOR PART NUMBER AND PART QUANTITY. | | | | |
| | | SPRING ASSEMBLY | | | | |
| | | REFER TO THE APPLICABLE CLAMP ASSEMBLY IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST | | | | |
| 1400 | 831-22 | • SPRING ASSEMBLY, REPLACED BY ITEM 1400A | | OBS | | |
| 1400A | 831-42 | • SPRING ASSEMBLY, REPLACED BY ITEM 1400B | | OBS | | |
| 1400B | 831-69 | • SPRING ASSEMBLY, REPLACED BY ITEM 1400C | | OBS | | |
| 1400C | 831-76 | • SPRING ASSEMBLY, REPLACES ITEMS 1400, 1400A, 1400B | | 1 | | |
| | | COUNTERWEIGHT SLUGS/MOUNTING HARDWARE | | | | |
| -9040<br>-9050 | | • COUNTERWEIGHT SLUG<br>• HEX HEAD BOLT<br>APPLICATION SPECIFIC, REFER TO HARTZELL PROPELLER APPLICATION GUIDE MANUAL 159 (61-02-59) FOR PART NUMBER AND PROPELLER CRITICAL PART (PCP) IDENTIFICATION | | | Y | |
| | | SPINNER PARTS | | | | |
| | | • APPLICATION SPECIFIC REFER TO HARTZELL PROPELLER APPLICATION GUIDE MANUAL 159 (61-02-59) AND THE APPLICABLE HARTZELL PROPELLER SPINNER MAINTENANCE MANUAL:<br>MANUAL 127 (61-16-27) - METAL SPINNER ASSEMBLIES<br>MANUAL 148 (61-16-48) - COMPOSITE SPINNER ASSEMBLIES | | | | |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| -3 | HC-B4TN-3 | | |
| -3A | HC-B4TN-3A | | |
| -3B | HC-B4TN-3B | | |
| -3C | HC-B4TN-3C | | |

- ITEM NOT ILLUSTRATED




**HC-B4TW-3: Exploded View**
**Figure 10-14**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10-14** | | **HC-B4TW-3 PROPELLER ASSEMBLY** | | | | |
| 10 | A-880-1 | • NUT, HEX, SELF-LOCKING, THIN | | 1 | Y | |
| 20 | B-3599 | • NUT, 3/8-24, HEX, SELF-LOCKING | | 4 | Y | |
| 30 | B-3049 | • RING, SUPPORT, ROD, BETA | | 1 | | |
| 50 | C-2303-3 | • PISTON UNIT | | 1 | | |
| 60 | A-862-7 | • • BUSHING, PLASTIC | | 1 | | |
| 70 | B-4016 | • LINK ARM | | 4 | | |
| 80 | A-1464 | • LINK PIN UNIT | | 4 | Y | |
| 90 | B-3840-6 | • SCREW, 10-32, FILLISTER HEAD | | 4 | Y | |
| 150 | C-3317-020 | • O-RING | | 1 | Y | |
| 160 | C-3317-426-2 | • O-RING | | 1 | Y | |
| 170 | B-1843 | • SEAL, DUST, PISTON | | 1 | Y | |
| 190 | A-2626-( ) | • SCREW, 10-32, CAP | | 4 | Y | |
| 200 | B-3406 | • CYLINDER | | 1 | | |
| 210 | A-2043-1 | • NUT, 3/8-24, HEX, SELF-LOCKING | | 4 | Y | |
| 220 | A-3439 | • NUT, 3/8-24, HEX, THIN | | 4 | Y | |
| 230 | A-944 | • SLEEVE, LINKSCREW | | 4 | Y | |
| 240 | 834-13 | • GUIDE COLLAR UNIT | | 1 | | |
| 260 | A-3023 | • • BUSHING, PLASTIC | | 4 | | |
| 270 | A-114-C | • • DOWEL PIN | | 1 | | |
| 280 | A-2038-14 | • • SCREW, 1/4-28, CAP | | 1 | Y | |
| 290 | A-3099 | • SPRING, COMPRESSION, BETA | | 4 | Y | |
| -300 | B-3475A-3 | • ROD, BETA -UNIT | | 4 | | |
| 310 | A-3478-1 | • • SPRING RETAINER, BETA | | 1 | | |
| 320 | B-3476A-3 | • • ROD, BETA | | 1 | | |
| 330 | A-3482 | • • RING, RETAINING, CRIMPED | | 2 | Y | |
| 340 | A-3067-2 | • LUG, GUIDE | | 4 | | |
| 350 | A-3023-2 | • • BUSHING, PLASTIC | | 1 | | |
| 360 | A-2051 | • BOLT, 5/16-24, HEX HEAD, REPLACED BY ITEM 360A | | OBS | | |
| 360A | A-2051-1 | • BOLT, 5/16-24, HEX HEAD, REPLACES ITEM 360 | | 6 | Y | |
| -365 | A-2037-1 | • SCREW, 5/16, CAP | | 4 | Y | |
| 380 | C-3404-3 | • PLATE, MOUNTING, SPINNER | | 1 | | |
| 390 | B-3843-56ZD | • SNAP RING, EXTERNAL | | 4 | Y | |
| 400 | C-3317-230 | • O-RING | | 1 | Y | |
| 405 | C-3317-233 | • O-RING | | 1 | Y | |
| 410 | A-3439 | • NUT, 3/8-24, HEX, THIN | | 4 | Y | |
| 420 | B-3001-3 | • RING, BETA | | 1 | | |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| | | | |

- ITEM NOT ILLUSTRATED

**HC-B4TW-3, page 1 of 3**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10-14** | | **HC-B4TW-3 PROPELLER ASSEMBLY** | | | | |
| 435 | A-3254 | • STUD, MOUNTING, 9/16-18 | | 8 | Y | |
| 440 | 109514 | • WASHER | | 8 | Y | |
| 440A | B-7624 | • WASHER, ALTERNATE FOR ITEM 440 | | 8 | Y | |
| 445 | B-7458 | • NUT, 9/16-18, SELF-LOCKING | | 8 | Y | |
| -450 | B-3808-4 | • NUT, HEX, SELF-LOCKING | | 12 | Y | |
| 455 | C-7364-2 | • SPACER, MOUNTING | | 1 | | |
| -456 | B-6138-8-6 | • • DOWEL PIN | | 2 | Y | |
| -460 | B-3851-0432 | • WASHER | | 8 | Y | |
| -460A | B-3851-0463 | • WASHER, ALTERNATE FOR ITEM 460 | | 20 | Y | |
| 465 | B-3868-S52 | • SCREW, 8-32, 100° HEAD, CRES | | 2 | Y | |
| 500 | 840-158 | • PCP: HUB UNIT, HC-B4TW-3( ) | | 1 | | PCP |
| 520 | B-3897-1 | • • PLUG, EXPANSION | | 4 | Y | |
| 530 | A-1891-A | • • PILOT TUBE | | 4 | | |
| 630 | B-3840-6 | • SCREW, 10-32, FILLISTER HEAD | | AR | Y | |
| 640 | A-1305 | • BALANCE WEIGHT | | AR | | |
| 650 | A-6119 | • BUSHING, LINK ARM | | 4 | Y | |
| 670 | B-3838-3-3 | • COTTER PIN | | 4 | Y | |
| 870 | B-3384-4 | • BOLT, 1/4-28, HEX HEAD | | 12 | Y | |
| 890 | C-3317-240 | • O-RING | | 1 | Y | |

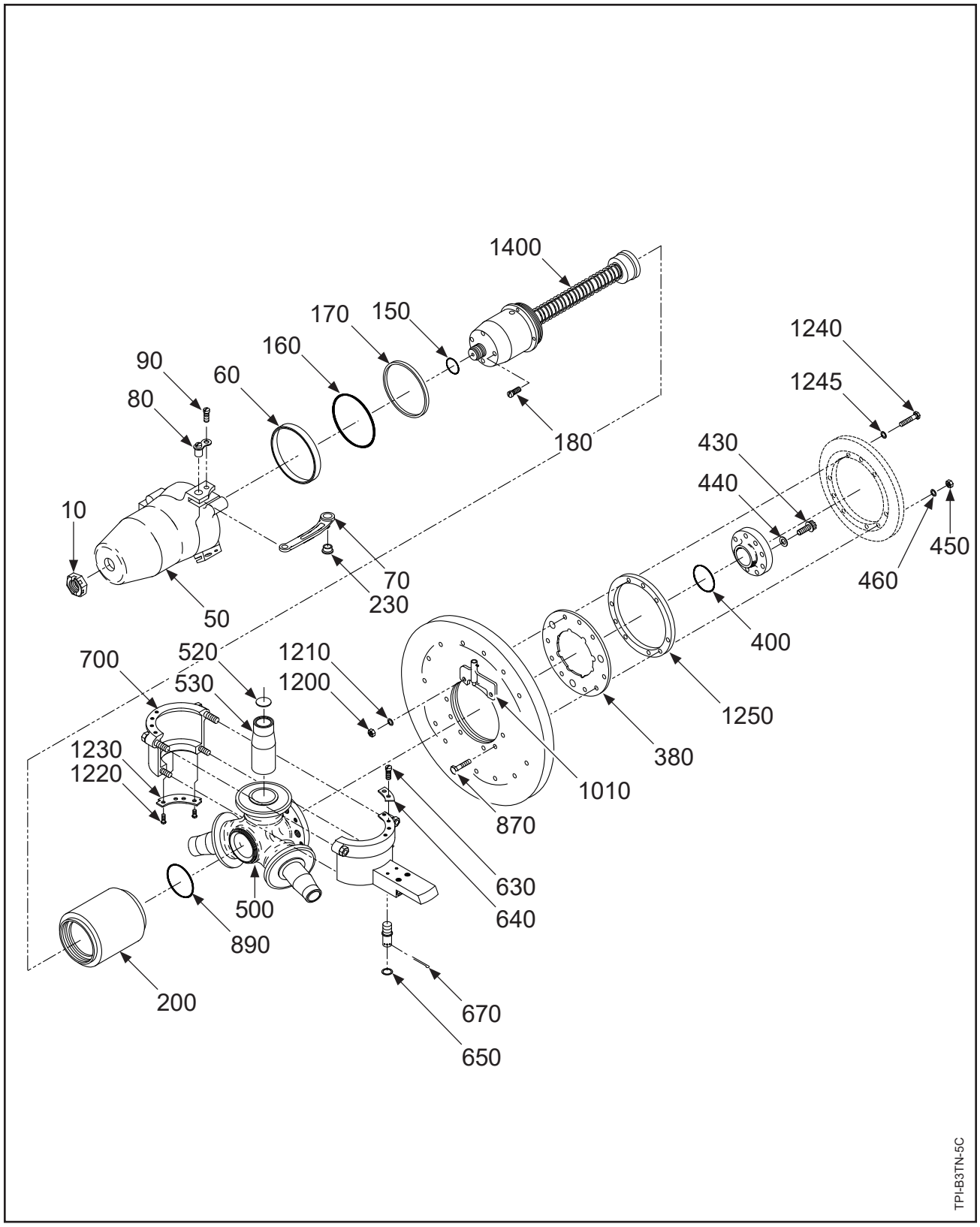
| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| | | | |

- ITEM NOT ILLUSTRATED

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10-14** | | **HC-B4TW-3 PROPELLER ASSEMBLY** | | | | |
| **10A-1** | | **BLADE RETENTION PARTS** | | | | |
| | | **REFER TO THE A-1851-(T) BLADE RETENTION PARTS IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST** | | | | |
| | | **CLAMP ASSEMBLY** | | | | |
| | | **REFER TO THE APPLICABLE CLAMP ASSEMBLY IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST** | | | | |
| 700 | 838-105 | • PCP: CLAMP ASSEMBLY | | 4 | | PCP |
| | | **BETA FEEDBACK BLOCK ASSEMBLY** | | | | |
| | | **REFER TO THE APPLICABLE BETA FEEDBACK BLOCK ASSEMBLY IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST** | | | | |
| 1300 | | • BETA FEEDBACK BLOCK ASSEMBLIES ARE APPLICATION SPECIFIC. REFER TO HARTZELL PROPELLER APPLICATION GUIDE MANUAL 159 (61-02-59) FOR PART NUMBER AND PART QUANTITY. | | | | |
| | | **SPRING ASSEMBLY** | | | | |
| | | **REFER TO THE APPLICABLE CLAMP ASSEMBLY IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST** | | | | |
| 1400 | 831-82 | • SPRING ASSEMBLY | | 1 | | |
| | | **COUNTERWEIGHT SLUGS/MOUNTING HARDWARE** | | | | |
| -9040 | | • COUNTERWEIGHT SLUG | | | | |
| -9050 | | • HEX HEAD BOLT APPLICATION SPECIFIC, REFER TO HARTZELL PROPELLER APPLICATION GUIDE MANUAL 159 (61-02-59) FOR PART NUMBER AND PROPELLER CRITICAL PART (PCP) IDENTIFICATION | | | Y | |
| | | **SPINNER PARTS** | | | | |
| | | • APPLICATION SPECIFIC REFER TO HARTZELL PROPELLER APPLICATION GUIDE MANUAL 159 (61-02-59) AND THE APPLICABLE HARTZELL PROPELLER SPINNER MAINTENANCE MANUAL: MANUAL 127 (61-16-27) - METAL SPINNER ASSEMBLIES MANUAL 148 (61-16-48) - COMPOSITE SPINNER ASSEMBLIES | | | | |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| | | | |

- ITEM NOT ILLUSTRATED




**HC-B3TN-(5C, 5D): Exploded View**
**Figure 10-15**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10-15** | | **HC-B3TN-(5C, 5D) PROPELLER ASSEMBLY** | | | | |
| 10 | A-880-2 | • NUT, HEX, SELF-LOCKING, THIN | | 1 | Y | |
| 50 | C-3021-1 | • PISTON UNIT | | 1 | | |
| 60 | A-862-1 | • • BUSHING, PLASTIC | | 1 | | |
| 70 | B-4016 | • LINK ARM | | 3 | | |
| 70A | B-1901 | • LINK ARM - ALTERNATE | | 3 | | |
| 80 | A-1464 | • LINK PIN UNIT | | 3 | Y | |
| 90 | B-3840-6 | • SCREW, 10-32, FILLISTER HEAD | | 3 | Y | |
| 150 | C-3317-121 | • O-RING | | 1 | Y | |
| 160 | C-3317-347-2 | • O-RING | | 1 | Y | |
| 170 | A-863 | • SEAL, DUST, PISTON, REPLACED BY ITEM 170A | | OBS | | |
| 170A | B-1843 | • SEAL, DUST, PISTON, REPLACES ITEM 170 | | 1 | Y | |
| 180 | B-3840-6 | • SCREW, 10-32, FILLISTER HEAD | | 4 | Y | |
| 200 | B-1803-2 | • PCP: CYLINDER | | 1 | | PCP |
| 230 | A-944 | • SLEEVE, LINKSCREW | | 3 | Y | |
| 380 | B-3029-1 | • PLATE, MOUNTING, SPINNER | | 1 | | |
| 400 | C-3317-230 | • O-RING | | 1 | Y | |
| 430 | B-3339 | • BOLT, MOUNTING, 9/16-18, 12 POINT | | 8 | Y | |
| 440 | A-2048-2 | • WASHER, MOUNTING, 9/16" CSK | | 8 | Y | |
| 450 | B-3808-4 | • NUT, HEX, SELF-LOCKING | | 3 | Y | |
| 460 | B-3851-0432 | • WASHER | X | AR | Y | |
| 500 | 840-87 | • PCP: HUB UNIT, HC-B3TN | | 1 | | PCP |
| 520 | B-3897-1 | • • PLUG, EXPANSION | | 3 | Y | |
| 530 | A-1891-A | • • PILOT TUBE | | 3 | | |
| 630 | B-3840-6 | • SCREW, 10-32, FILLISTER HEAD | | AR | Y | |
| 640 | A-1305 | • BALANCE WEIGHT | | AR | | |
| 650 | A-6119 | • BUSHING, LINK ARM | | 3 | Y | |
| 670 | B-3838-3-3 | • COTTER PIN | | 3 | Y | |

| EFFECTIVITY | MODEL |
|---|---|

| EFFECTIVITY | MODEL |
|---|---|
| X | MAY BE REMOVED TO ALLOW PROPER THREAD ENGAGEMENT AND CLAMP CLEARANCE. |

- ITEM NOT ILLUSTRATED

**HC-B3TN-(5C, 5D), page 1 of 3**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10-15** | | **HC-B3TN-(5C, 5D) PROPELLER ASSEMBLY** | | | | |
| 870 | B-3384-5H | • BOLT, 1/4-28, HEX HEAD | A | 3 | Y | |
| | B-3865-12 | • BOLT, 1/4-28, HEX HEAD | C | 3 | Y | |
| | B-3384-16H | • BOLT, 1/4-28, HEX HEAD | D | 3 | Y | |
| 870A | B-3384-17H | • BOLT, 1/4-28, HEX HEAD, ALTERNATE FOR ITEM 870 | D | 3 | Y | |
| 890 | C-3317-235 | • O-RING | | 1 | Y | |
| 1200 | B-3808-4 | • NUT, HEX, SELF-LOCKING | | 6 | Y | |
| 1210 | B-3851-0432 | • WASHER | X | AR | Y | |
| 1220 | A-2016 | • BOLT, 10-32, HEX HEAD | | 6 | Y | |
| 1220A | A-2016-2 | • BOLT, 10-32, HEX HEAD, ALTERNATE FOR ITEM 1220 | | 6 | Y | |
| -1225 | B-3851-0363 | • WASHER (USE ONLY WITH ITEM 1220A) | | 6 | Y | |
| 1230 | A-3079 | • PLATE, START LOCK | | 3 | | |
| 1240 | B-3384-10H | • BOLT, 1/4-28, HEX HEAD | A | 6 | Y | |
| | B-3865-15 | • BOLT, 1/4-28, HEX HEAD | C | 6 | Y | |
| | B-3384-21H | • BOLT, 1/4-28, HEX HEAD | D | 6 | Y | |
| 1245 | B-3851-0432 | • WASHER | | 6 | Y | |
| 1245A | B-3851-0632 | • WASHER, ALTERNATE FOR ITEM 1245 | | 6 | Y | |
| 1250 | B-2624 | • SPACER, BULKHEAD | A | 1 | | |
| | B-3068-1 | • SPACER, BULKHEAD | C | 1 | | |
| | B-3068 | • SPACER, BULKHEAD | D | 1 | | |
| 1250A | 4E1689 (BFG) | • RING, SPACER, DE-ICE, (V0AJJ0), ALTERNATE FOR ITEM 1250 | D | 1 | | |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| A | NO DE-ICE SYSTEM | | |
| C | DE-ICE SYSTEM W/836-49 SPINNER | | |
| D | DE-ICE SYSTEM W/836-57 SPINNER | | |
| X | MAY BE REMOVED TO ALLOW PROPER THREAD ENGAGEMENT AND CLAMP CLEARANCE. | | |

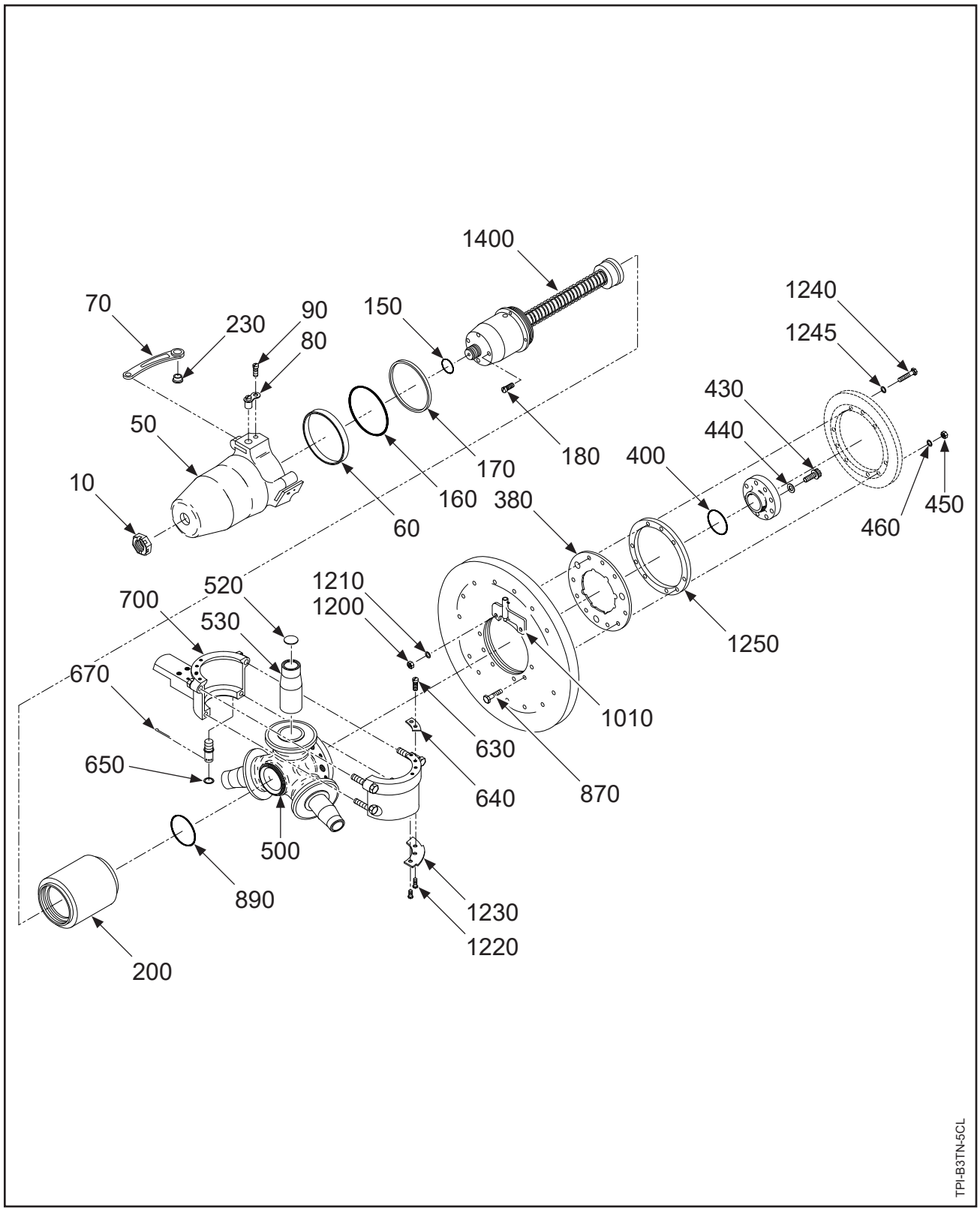
- ITEM NOT ILLUSTRATED

**HC-B3TN-(5C, 5D), page 2 of 3**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10-15** | | **HC-B3TN-(5C, 5D) PROPELLER ASSEMBLY** | | | | |
| **10A-1** | | **BLADE RETENTION PARTS**<br>**REFER TO THE A-1851-(T) BLADE RETENTION PARTS IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST** | | | | |
| | | **CLAMP ASSEMBLY**<br>**REFER TO THE APPLICABLE CLAMP ASSEMBLY IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST** | | | | |
| 700 | 838-67 | • PCP: CLAMP ASSEMBLY | -5C | 3 | | PCP |
| | 838-71 | • PCP: CLAMP ASSEMBLY | -5D | 3 | | PCP |
| | | **START LOCK ASSEMBLY**<br>**REFER TO THE APPLICABLE START LOCK ASSEMBLY IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST** | | | | |
| -1010 | 830-23 | • START LOCK - ASSEMBLY | | 3 | | |
| | | **SPRING ASSEMBLY**<br>**REFER TO THE APPLICABLE SPRING ASSEMBLY IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST** | | | | |
| 1400 | 831-20 | • SPRING ASSEMBLY, REPLACED BY ITEM 1400A | | OBS | | |
| 1400A | 831-30 | • SPRING ASSEMBLY, REPLACED BY ITEM 1400B | | OBS | | |
| 1400B | 831-38 | • SPRING ASSEMBLY, REPLACED BY ITEM 1400C | | OBS | | |
| 1400C | 831-45 | • SPRING ASSEMBLY, REPLACED BY ITEM 1400D | | OBS | | |
| 1400D | 831-48 | • SPRING ASSEMBLY, REPLACED BY ITEM 1400E | | OBS | | |
| 1400E | 831-75 | • SPRING ASSEMBLY, REPLACES ITEMS 1400, 1400A, 1400B, 1400C, 1400D | | 1 | | |
| | | **COUNTERWEIGHT SLUGS/MOUNTING HARDWARE** | | | | |
| -9040<br>-9050 | | • COUNTERWEIGHT SLUG<br>• HEX HEAD BOLT<br>APPLICATION SPECIFIC,<br>REFER TO HARTZELL PROPELLER APPLICATION GUIDE MANUAL 159 (61-02-59) FOR PART NUMBER AND PROPELLER CRITICAL PART (PCP) IDENTIFICATION | | | Y | |
| | | **SPINNER PARTS**<br>• APPLICATION SPECIFIC<br>REFER TO HARTZELL PROPELLER APPLICATION GUIDE MANUAL 159 (61-02-59) AND THE APPLICABLE HARTZELL PROPELLER SPINNER MAINTENANCE MANUAL:<br>MANUAL 127 (61-16-27) - METAL SPINNER ASSEMBLIES<br>MANUAL 148 (61-16-48) - COMPOSITE SPINNER ASSEMBLIES | | | | |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| -5C | HC-B3TN-5C | | |
| -5D | HC-B3TN-5D | | |

- ITEM NOT ILLUSTRATED




**HC-B3TN-(5CL, 5DL): Exploded View**
**Figure 10-16**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10-16** | | **HC-B3TN-(5CL, 5DL) PROPELLER ASSEMBLY** | | | | |
| 10 | A-880-2 | • NUT, HEX, SELF-LOCKING, THIN | | 1 | Y | |
| 50 | C-3021-1L | • PISTON UNIT | | 1 | | |
| 60 | A-862-1 | • • BUSHING, PLASTIC | | 1 | | |
| 70 | B-4016L | • LINK ARM | | 3 | | |
| 70A | B-1901L | • LINK ARM, ALTERNATE FOR ITEM 70 | | 3 | | |
| 80 | A-1464 | • LINK PIN UNIT | | 3 | Y | |
| 90 | B-3840-6 | • SCREW, 10-32, FILLISTER HEAD | | 3 | Y | |
| 150 | C-3317-121 | • O-RING | | 1 | Y | |
| 160 | C-3317-347-2 | • O-RING | | 1 | Y | |
| 170 | A-863 | • SEAL, DUST, PISTON, REPLACED BY ITEM 170A | | OBS | | |
| 170A | B-1843 | • SEAL, DUST, PISTON, REPLACES ITEM 170 | | 1 | Y | |
| 180 | B-3840-6 | • SCREW, 10-32, FILLISTER HEAD | | 4 | Y | |
| 200 | B-1803-2 | • PCP: CYLINDER | | 1 | | PCP |
| 230 | A-944 | • SLEEVE, LINKSCREW | | 3 | Y | |
| 380 | B-3029-1 | • PLATE, MOUNTING, SPINNER | | 1 | | |
| 400 | C-3317-230 | • O-RING | | 1 | Y | |
| 430 | B-3339 | • BOLT, MOUNTING, 9/16-18, 12 POINT | | 8 | Y | |
| 440 | A-2048-2 | • WASHER, MOUNTING, 9/16" CSK | | 8 | Y | |
| 450 | B-3808-4 | • NUT, HEX, SELF-LOCKING | | 3 | Y | |
| 460 | B-3851-0432 | • WASHER | X | AR | Y | |
| 500 | 840-87 | • PCP: HUB UNIT, HC-B3TN | | 1 | | PCP |
| 520 | B-3897-1 | • • PLUG, EXPANSION | | 3 | Y | |
| 530 | A-1891-A | • • PILOT TUBE | | 3 | | |
| 630 | B-3840-6 | • SCREW, 10-32, FILLISTER HEAD | | AR | Y | |
| 640 | A-1305 | • BALANCE WEIGHT | | AR | | |
| 650 | A-6119 | • BUSHING, LINK ARM | | 3 | Y | |
| 670 | B-3838-3-3 | • COTTER PIN | | 3 | Y | |
| 870 | B-3384-5H | • BOLT, 1/4-28, HEX HEAD | A | 3 | Y | |
| | B-3865-12 | • BOLT, 1/4-28, HEX HEAD | C | 3 | Y | |
| | B-3384-16H | • BOLT, 1/4-28, HEX HEAD | D | 3 | Y | |
| 870A | B-3384-17H | • BOLT, 1/4-28, HEX HEAD, ALTERNATE FOR ITEM 870 | D | 3 | Y | |
| 890 | C-3317-235 | • O-RING | | 1 | Y | |
| 1200 | B-3808-4 | • NUT, HEX, SELF-LOCKING | | 6 | Y | |
| 1210 | B-3851-0432 | • WASHER | X | AR | Y | |

| EFFECTIVITY | MODEL |
|---|---|
| A | NO DE-ICE SYSTEM |
| C | DE-ICE SYSTEM W/836-49 SPINNER |
| D | DE-ICE SYSTEM W/836-57 SPINNER |

| EFFECTIVITY | MODEL |
|---|---|
| X | MAY BE REMOVED TO ALLOW PROPER THREAD ENGAGEMENT AND CLAMP CLEARANCE. |

- ITEM NOT ILLUSTRATED

**HC-B3TN-(5CL, 5DL), page 1 of 3**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10-16** | | **HC-B3TN-(5CL, 5DL) PROPELLER ASSEMBLY** | | | | |
| 1220 | A-2016 | • BOLT, 10-32, HEX HEAD | | 6 | Y | |
| 1220A | A-2016-2 | • BOLT, 10-32, HEX HEAD, ALTERNATE FOR ITEM 1220 | | 6 | Y | |
| -1225 | B-3851-0363 | • WASHER (USE WITH ITEM 1220A ONLY) | | 6 | Y | |
| 1230 | A-3086-1 | • PLATE, START LOCK | -5CL | 3 | | |
| | A-3086-2 | • PLATE, START LOCK | -5DL | 3 | | |
| 1240 | B-3384-10 | • BOLT, 1/4-28, HEX HEAD, SUPERSEDED BY ITEM 1240A | A | 6 | Y | |
| | B-3865-15A | • BOLT, 1/4-28, HEX HEAD, CRES | C | 6 | Y | |
| | B-3384-21H | • BOLT, 1/4-28, HEX HEAD | D | 6 | Y | |
| 1240A | B-3384-10H | • BOLT, 1/4-28, HEX HEAD, SUPERSEDES ITEM 1240 | A | 6 | Y | |
| 1245 | B-3851-0432 | • WASHER | | 6 | Y | |
| 1245A | B-3851-0463 | • WASHER, ALTERNATE FOR ITEM 1245 | | 6 | Y | |
| 1250 | B-2624 | • SPACER, BULKHEAD | A | 1 | | |
| | B-3068-1 | • SPACER, BULKHEAD | C | 1 | | |
| | B-3068 | • SPACER, BULKHEAD | D | 1 | | |
| 1250A | 7931-4E1689 | • RING, SPACER, DE-ICE, ALTERNATE FOR ITEM 1250 | D | 1 | | |

| EFFECTIVITY | MODEL |
|---|---|
| -5CL | HC-B3TN-5CL |
| -5DL | HC-B3TN-5DL |

| EFFECTIVITY | MODEL |
|---|---|
| A | NO DE-ICE SYSTEM |
| C | DE-ICE SYSTEM W/836-49 SPINNER |
| D | DE-ICE SYSTEM W/836-57 SPINNER |

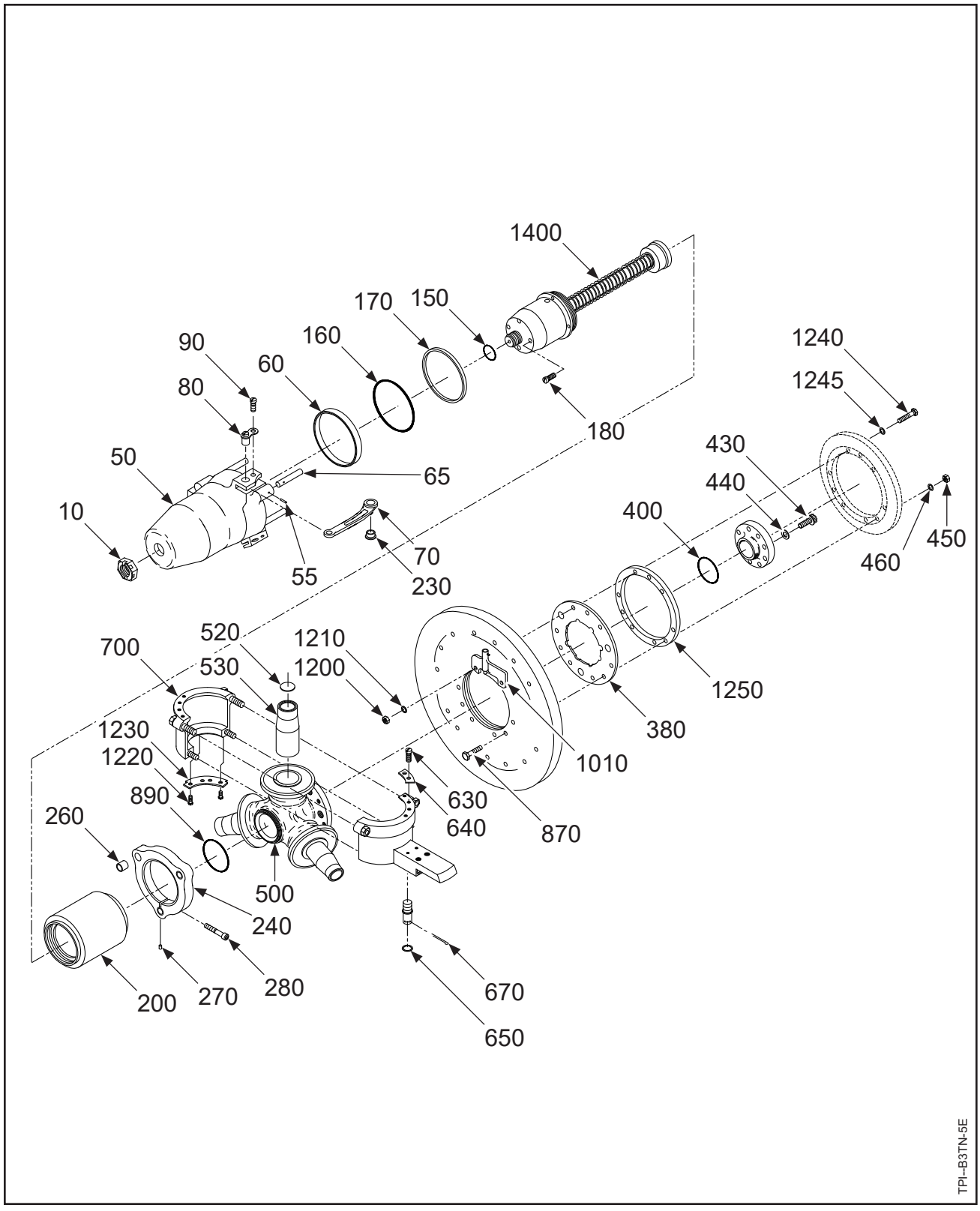
- ITEM NOT ILLUSTRATED

**HC-B3TN-(5CL, 5DL), page 2 of 3**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10-16** | | **HC-B3TN-(5CL, 5DL) PROPELLER ASSEMBLY** | | | | |
| **10A-1** | | **BLADE RETENTION PARTS**<br>**REFER TO THE A-1851-(T) BLADE RETENTION PARTS IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST** | | | | |
| | | **CLAMP ASSEMBLY**<br>**REFER TO THE APPLICABLE CLAMP ASSEMBLY IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST** | | | | |
| 700 | 838-67L | • PCP: CLAMP ASSEMBLY | -5CL | 3 | | PCP |
| | 838-71L | • PCP: CLAMP ASSEMBLY | -5DL | 3 | | PCP |
| | | **START LOCK ASSEMBLY**<br>**REFER TO THE APPLICABLE START LOCK ASSEMBLY IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST** | | | | |
| -1010 | 830-23L | • START LOCK - ASSEMBLY | | 3 | | |
| | | **SPRING ASSEMBLY**<br>**REFER TO THE APPLICABLE SPRING ASSEMBLY IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST** | | | | |
| 1400 | 831-20 | • SPRING ASSEMBLY, REPLACED BY ITEM 1400A | | OBS | | |
| 1400A | 831-30 | • SPRING ASSEMBLY, REPLACED BY ITEM 1400B | | OBS | | |
| 1400B | 831-38 | • SPRING ASSEMBLY, REPLACED BY ITEM 1400C | | OBS | | |
| 1400C | 831-45 | • SPRING ASSEMBLY, REPLACED BY ITEM 1400D | | OBS | | |
| 1400D | 831-48 | • SPRING ASSEMBLY, REPLACED BY ITEM 1400E | | OBS | | |
| 1400E | 831-75 | • SPRING ASSEMBLY, REPLACES ITEMS 1400, 1400A, 1400B, 1400C, 1400D | | 1 | | |
| | | **COUNTERWEIGHT SLUGS/MOUNTING HARDWARE** | | | | |
| -9040<br>-9050 | | • COUNTERWEIGHT SLUG<br>• HEX HEAD BOLT<br>APPLICATION SPECIFIC,<br>REFER TO HARTZELL PROPELLER APPLICATION GUIDE MANUAL 159 (61-02-59) FOR PART NUMBER AND PROPELLER CRITICAL PART (PCP) IDENTIFICATION | | | Y | |
| | | **SPINNER PARTS**<br>• APPLICATION SPECIFIC<br>REFER TO HARTZELL PROPELLER APPLICATION GUIDE MANUAL 159 (61-02-59) AND THE APPLICABLE HARTZELL PROPELLER SPINNER MAINTENANCE MANUAL:<br>MANUAL 127 (61-16-27) - METAL SPINNER ASSEMBLIES<br>MANUAL 148 (61-16-48) - COMPOSITE SPINNER ASSEMBLIES | | | | |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| -5CL | HC-B3TN-5CL | | |
| -5DL | HC-B3TN-5DL | | |

- ITEM NOT ILLUSTRATED




**HC-B3TN-(5E, 5F, 5G, 5K): Exploded View**
**Figure 10-17**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10-17** | | **HC-B3TN-(5E, 5F, 5G, 5K) PROPELLER ASSEMBLY** | | | | |
| 10 | A-880-2 | • NUT, HEX, SELF-LOCKING, THIN | | 1 | Y | |
| 50 | C-3021-4 | • PISTON UNIT | | 1 | | |
| 55 | A-717 | • • ROD, GUIDE, PISTON | | 3 | | |
| 60 | A-862-1 | • • BUSHING, PLASTIC | | 1 | | |
| 65 | B-6378-1750 | • • SPRING PIN, 1/8", CRES | | 3 | | |
| 70 | B-4016 | • LINK ARM | | 3 | | |
| 70A | B-1901 | • LINK ARM, ALTERNATE FOR ITEM 70 | | 3 | | |
| 90 | B-3840-6 | • SCREW, 10-32, FILLISTER HEAD | | 3 | Y | |
| 80 | A-1464 | • LINK PIN UNIT | | 3 | Y | |
| 150 | C-3317-121 | • O-RING | | 1 | Y | |
| 160 | C-3317-347-2 | • O-RING | | 1 | Y | |
| 170 | A-863 | • SEAL, DUST, PISTON, REPLACED BY ITEM 170A | | OBS | | |
| 170A | B-1843 | • SEAL, DUST, PISTON, REPLACES ITEM 170 | | 1 | Y | |
| 180 | B-3840-6 | • SCREW, 10-32, FILLISTER HEAD | | 4 | Y | |
| 200 | B-1803-2 | • PCP: CYLINDER | | 1 | | PCP |
| 230 | A-944 | • SLEEVE, LINKSCREW | | 3 | Y | |
| 240 | 834-12 | • GUIDE COLLAR UNIT | | 1 | | |
| 260 | A-3023 | • • BUSHING, PLASTIC | | 3 | | |
| 270 | A-114-6 | • • DOWEL PIN | | 1 | | |
| 280 | A-2038-12 | • • SCREW, 1/4-28, CAP | | 1 | Y | |
| 380 | B-3029-1 | • PLATE, MOUNTING, SPINNER | | 1 | | |
| 400 | C-3317-230 | • O-RING | | 1 | Y | |
| 430 | B-3339 | • BOLT, MOUNTING, 9/16-18, 12 POINT | | 8 | Y | |
| 440 | A-2048-2 | • WASHER, MOUNTING, 9/16" CSK | | 8 | Y | |
| 450 | B-3808-4 | • NUT, HEX, SELF-LOCKING | | 3 | Y | |
| 460 | B-3851-0432 | • WASHER | X | AR | Y | |
| 500 | 840-87 | • PCP: HUB UNIT, HC-B3TN | | 1 | | PCP |
| 520 | B-3897-1 | • • PLUG, EXPANSION | | 3 | Y | |
| 530 | A-1891-A | • • PILOT TUBE | | 3 | | |
| 630 | B-3840-6 | • SCREW, 10-32, FILLISTER HEAD | | AR | Y | |
| 640 | A-1305 | • BALANCE WEIGHT | | AR | | |
| 650 | A-6119 | • BUSHING, LINK ARM | | 3 | Y | |
| 670 | B-3838-3-3 | • COTTER PIN | | 3 | Y | |

| EFFECTIVITY | MODEL |
|---|---|

| EFFECTIVITY | MODEL |
|---|---|
| X | MAY BE REMOVED TO ALLOW PROPER THREAD ENGAGEMENT AND CLAMP CLEARANCE. |

- ITEM NOT ILLUSTRATED

**HC-B3TN-(5E, 5F, 5G, 5K), page 1 of 3**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10-17** | | **HC-B3TN-(5E, 5F, 5G, 5K) PROPELLER ASSEMBLY** | | | | |
| 870 | B-3384-5H | • BOLT, 1/4-28, HEX HEAD | A | 3 | Y | |
| | B-3865-12 | • BOLT, 1/4-28, HEX HEAD | C | 3 | Y | |
| | B-3384-16H | • BOLT, 1/4-28, HEX HEAD | D | 3 | Y | |
| 870A | B-3384-17H | • BOLT, 1/4-28, HEX HEAD, ALTERNATE FOR ITEM 870 | D | 3 | Y | |
| 890 | C-3317-235 | • O-RING | | 1 | Y | |
| 1200 | B-3808-4 | • NUT, HEX, SELF-LOCKING | | 6 | Y | |
| 1210 | B-3851-0432 | • WASHER | X | AR | Y | |
| 1220 | A-2016 | • BOLT, 10-32, HEX HEAD | | 6 | Y | |
| 1220A | A-2016-2 | • BOLT, 10-32, HEX HEAD, ALTERNATE FOR ITEM 1220 | | 6 | Y | |
| -1225 | B-3851-0363 | • WASHER (USE ONLY WITH ITEM 1220A) | | 6 | Y | |
| 1230 | A-3079 | • PLATE, START LOCK | -5E, -5F, -5K | 3 | | |
| | A-3757 | • PLATE, START LOCK | -5G | 3 | | |
| 1240 | B-3384-10 | • BOLT, 1/4-28, HEX HEAD, SUPERSEDED BY ITEM 1240A | A | 6 | Y | |
| | B-3865-15A | • BOLT, 1/4-28, HEX HEAD, CRES | C | 6 | Y | |
| | B-3384-21H | • BOLT, 1/4-28, HEX HEAD | D | 6 | Y | |
| 1240A | B-3384-10H | • BOLT, 1/4-28, HEX HEAD, SUPERSEDES ITEM 1240 | A | 6 | Y | |
| 1245 | B-3851-0432 | • WASHER | | 6 | Y | |
| 1245A | B-3851-0463 | • WASHER, ALTERNATE FOR ITEM 1245 | | 6 | Y | |
| 1250 | B-2624 | • SPACER, BULKHEAD | A | 1 | | |
| | B-3068-1 | • SPACER, BULKHEAD | C | 1 | | |
| | B-3068 | • SPACER, BULKHEAD | D | 1 | | |
| 1250A | 7931-4E1689 | • RING, SPACER, DE-ICE, ALTERNATE FOR ITEM 1250A | D | 1 | | |

| EFFECTIVITY | MODEL |
|---|---|
| -5E | HC-B3TN-5E |
| -5F | HC-B3TN-5F |
| -5G | HC-B3TN-5G |
| -5K | HC-B3TN-5K |

| EFFECTIVITY | MODEL |
|---|---|
| A | NO DE-ICE SYSTEM |
| C | DE-ICE SYSTEM W/836-49 SPINNER |
| D | DE-ICE SYSTEM W/836-57 SPINNER |
| X | MAY BE REMOVED TO ALLOW PROPER THREAD ENGAGEMENT AND CLAMP CLEARANCE. |

- ITEM NOT ILLUSTRATED

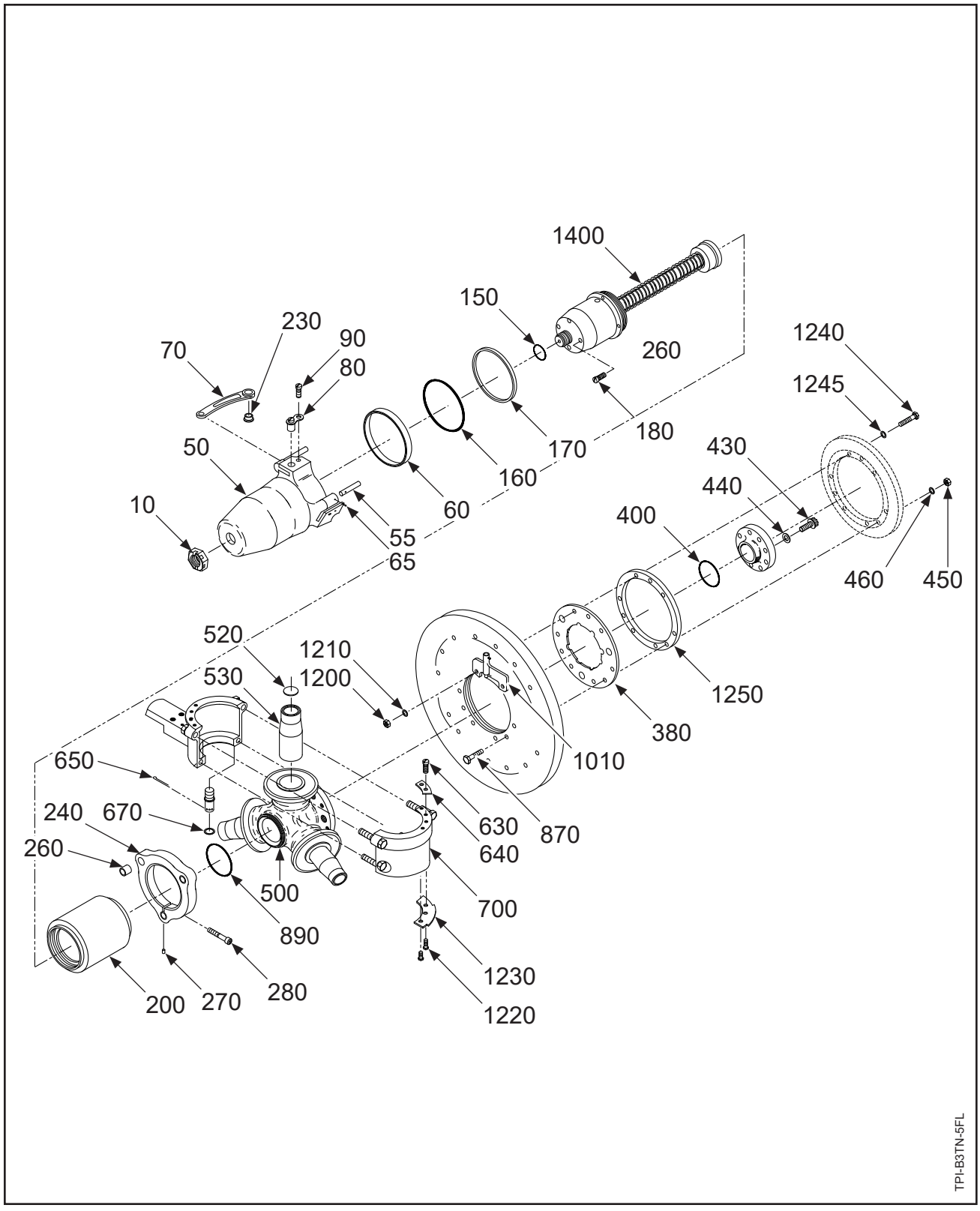
**HC-B3TN-(5E, 5F, 5G, 5K), page 2 of 3**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10-17** | | **HC-B3TN-(5E, 5F, 5G, 5K) PROPELLER ASSEMBLY** | | | | |
| **10A-1** | | **BLADE RETENTION PARTS**<br>**REFER TO THE A-1851-(T) BLADE RETENTION PARTS IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST** | | | | |
| | | **CLAMP ASSEMBLY**<br>**REFER TO THE APPLICABLE CLAMP ASSEMBLY IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST** | | | | |
| 700 | 838-67 | • PCP: CLAMP ASSEMBLY | -5E, -5G | 3 | | PCP |
| | 838-71 | • PCP: CLAMP ASSEMBLY | -5F | 3 | | PCP |
| | 838-95 | • PCP: CLAMP ASSEMBLY | -5K | 3 | | PCP |
| | | **START LOCK ASSEMBLY**<br>**REFER TO THE APPLICABLE START LOCK ASSEMBLY IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST** | | | | |
| 1010 | 830-23 | • START LOCK - ASSEMBLY | | 3 | | |
| | | **SPRING ASSEMBLY**<br>**REFER TO THE APPLICABLE SPRING ASSEMBLY IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST** | | | | |
| 1400 | 831-75 | • SPRING ASSEMBLY | | 1 | | |
| | | **COUNTERWEIGHT SLUGS/MOUNTING HARDWARE** | | | | |
| -9040 | | • COUNTERWEIGHT SLUG | | | | |
| -9050 | | • HEX HEAD BOLT<br>APPLICATION SPECIFIC,<br>REFER TO HARTZELL PROPELLER APPLICATION GUIDE MANUAL 159 (61-02-59) FOR PART NUMBER AND PROPELLER CRITICAL PART (PCP) IDENTIFICATION | | | Y | |
| | | **SPINNER PARTS**<br>• APPLICATION SPECIFIC<br>REFER TO HARTZELL PROPELLER APPLICATION GUIDE MANUAL 159 (61-02-59) AND THE APPLICABLE HARTZELL PROPELLER SPINNER MAINTENANCE MANUAL:<br>MANUAL 127 (61-16-27) - METAL SPINNER ASSEMBLIES<br>MANUAL 148 (61-16-48) - COMPOSITE SPINNER ASSEMBLIES | | | | |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| -5E | HC-B3TN-E | | |
| -5F | HC-B3TN-5F | | |
| -5G | HC-B3TN-5G | | |
| -5K | HC-B3TN-5K | | |

- ITEM NOT ILLUSTRATED

**HC-B3TN-(5E, 5F, 5G, 5K), page 3 of 3**




**HC-B3TN-5FL Exploded View**
**Figure 10-18**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10-18** | | **HC-B3TN-5FL PROPELLER ASSEMBLY** | | | | |
| 10 | A-880-2 | • NUT, HEX, SELF-LOCKING, THIN | | 1 | Y | |
| 50 | C-3021-4L | • PISTON UNIT | | 1 | | |
| 55 | A-717 | • • ROD, GUIDE, PISTON | | 3 | | |
| 60 | A-862-1 | • • BUSHING, PLASTIC | | 1 | | |
| 65 | B-6378-1750 | • • SPRING PIN, 1/8", CRES | | 3 | | |
| 70 | B-4016L | • LINK ARM | | 3 | | |
| 70A | B-1901L | • LINK ARM, ALTERNATE FOR ITEM 70 | | 3 | | |
| 90 | B-3840-6 | • SCREW, 10-32, FILLISTER HEAD | | 3 | Y | |
| 80 | A-1464 | • LINK PIN UNIT | | 3 | Y | |
| 150 | C-3317-121 | • O-RING | | 1 | Y | |
| 160 | C-3317-347-2 | • O-RING | | 1 | Y | |
| 170 | A-863 | • SEAL, DUST, PISTON, REPLACED BY ITEM 170A | | OBS | | |
| 170A | B-1843 | • SEAL, DUST, PISTON, REPLACES ITEM 170 | | 1 | Y | |
| 180 | B-3840-6 | • SCREW, 10-32, FILLISTER HEAD | | 4 | Y | |
| 200 | B-1803-2 | • PCP: CYLINDER | | 1 | | PCP |
| 230 | A-944 | • SLEEVE, LINKSCREW | | 3 | Y | |
| 240 | 834-12 | • GUIDE COLLAR UNIT | | 1 | | |
| 260 | A-3023 | • • BUSHING, PLASTIC | | 3 | | |
| 270 | A-114-6 | • • DOWEL PIN | | 1 | | |
| 280 | A-2038-12 | • • SCREW, 1/4-28, CAP | | 1 | Y | |
| 380 | B-3029-1 | • PLATE, MOUNTING, SPINNER | | 1 | | |
| 400 | C-3317-230 | • O-RING | | 1 | Y | |
| 430 | B-3339 | • BOLT, MOUNTING, 9/16-18, 12 POINT | | 8 | Y | |
| 440 | A-2048-2 | • WASHER, MOUNTING, 9/16" CSK | | 8 | Y | |
| 450 | B-3808-4 | • NUT, HEX, SELF-LOCKING | | 3 | Y | |
| 460 | B-3851-0432 | • WASHER | X | AR | Y | |
| 500 | 840-87 | • PCP: HUB UNIT, HC-B3TN | | 1 | | PCP |
| 520 | B-3897-1 | • • PLUG, EXPANSION | | 3 | Y | |
| 530 | A-1891-A | • • PILOT TUBE | | 3 | | |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| | | X | MAY BE REMOVED TO ALLOW PROPER THREAD ENGAGEMENT AND CLAMP CLEARANCE. |

- ITEM NOT ILLUSTRATED

**HC-B3TN-5FL, page 1 of 3**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10-18** | | **HC-B3TN-5FL PROPELLER ASSEMBLY** | | | | |
| 630 | B-3840-6 | • SCREW, 10-32, FILLISTER HEAD | | AR | Y | |
| 640 | A-1305 | • BALANCE WEIGHT | | AR | | |
| 650 | A-6119 | • BUSHING, LINK ARM | | 3 | Y | |
| 670 | B-3838-3-3 | • COTTER PIN | | 3 | Y | |
| 870 | B-3384-5H | • BOLT, 1/4-28, HEX HEAD | A | 3 | Y | |
| | B-3865-12 | • BOLT, 1/4-28, HEX HEAD | C | 3 | Y | |
| | B-3384-16H | • BOLT, 1/4-28, HEX HEAD | D | 3 | Y | |
| 870A | B-3384-17H | • BOLT, 1/4-28, HEX HEAD, ALTERNATE FOR ITEM 870 | D | 3 | Y | |
| 890 | C-3317-235 | • O-RING | | 1 | Y | |
| 1200 | B-3808-4 | • NUT, HEX, SELF-LOCKING | | 6 | Y | |
| 1210 | B-3851-0432 | • WASHER | X | AR | Y | |
| 1220 | A-2016 | • BOLT, 10-32, HEX HEAD | | 6 | Y | |
| 1220A | A-2016-2 | • BOLT, 10-32, HEX HEAD, ALTERNATE FOR ITEM 1220 | | 6 | Y | |
| -1225 | B-3851-0363 | • WASHER (USE WITH ITEM 1220A ONLY) | | 6 | Y | |
| 1230 | A-3086-2 | • PLATE, START LOCK | | 3 | | |
| 1240 | B-3384-10 | • BOLT, 1/4-28, HEX HEAD, SUPERSEDED BY ITEM 1240A | A | 6 | Y | |
| | B-3865-15 | • BOLT, 1/4-28, HEX HEAD, CRES | C | 6 | Y | |
| | B-3384-21H | • BOLT, 1/4-28, HEX HEAD | D | 6 | Y | |
| 1240A | B-3384-10H | • BOLT, 1/4-28, HEX HEAD, SUPERSEDES ITEM 1240 | A | 6 | Y | |
| 1245 | B-3851-0432 | • WASHER | | 6 | Y | |
| 1245A | B-3851-0632 | • WASHER, ALTERNATE FOR ITEM 1245 | | 6 | Y | |
| 1250 | B-2624 | • SPACER, BULKHEAD | A | 1 | | |
| | B-3068-1 | • SPACER, BULKHEAD | C | 1 | | |
| | B-3068 | • SPACER, BULKHEAD | D | 1 | | |
| 1250B | 7931-4E1689 | • RING, SPACER, DE-ICE, ALTERNATE FOR ITEM 1250 | D | 1 | | |

| EFFECTIVITY | MODEL |
|---|---|

| EFFECTIVITY | MODEL |
|---|---|
| A | NO DE-ICE SYSTEM |
| C | DE-ICE SYSTEM W/836-49 SPINNER |
| D | DE-ICE SYSTEM W/836-57 SPINNER |
| X | MAY BE REMOVED TO ALLOW PROPER THREAD ENGAGEMENT AND CLAMP CLEARANCE. |

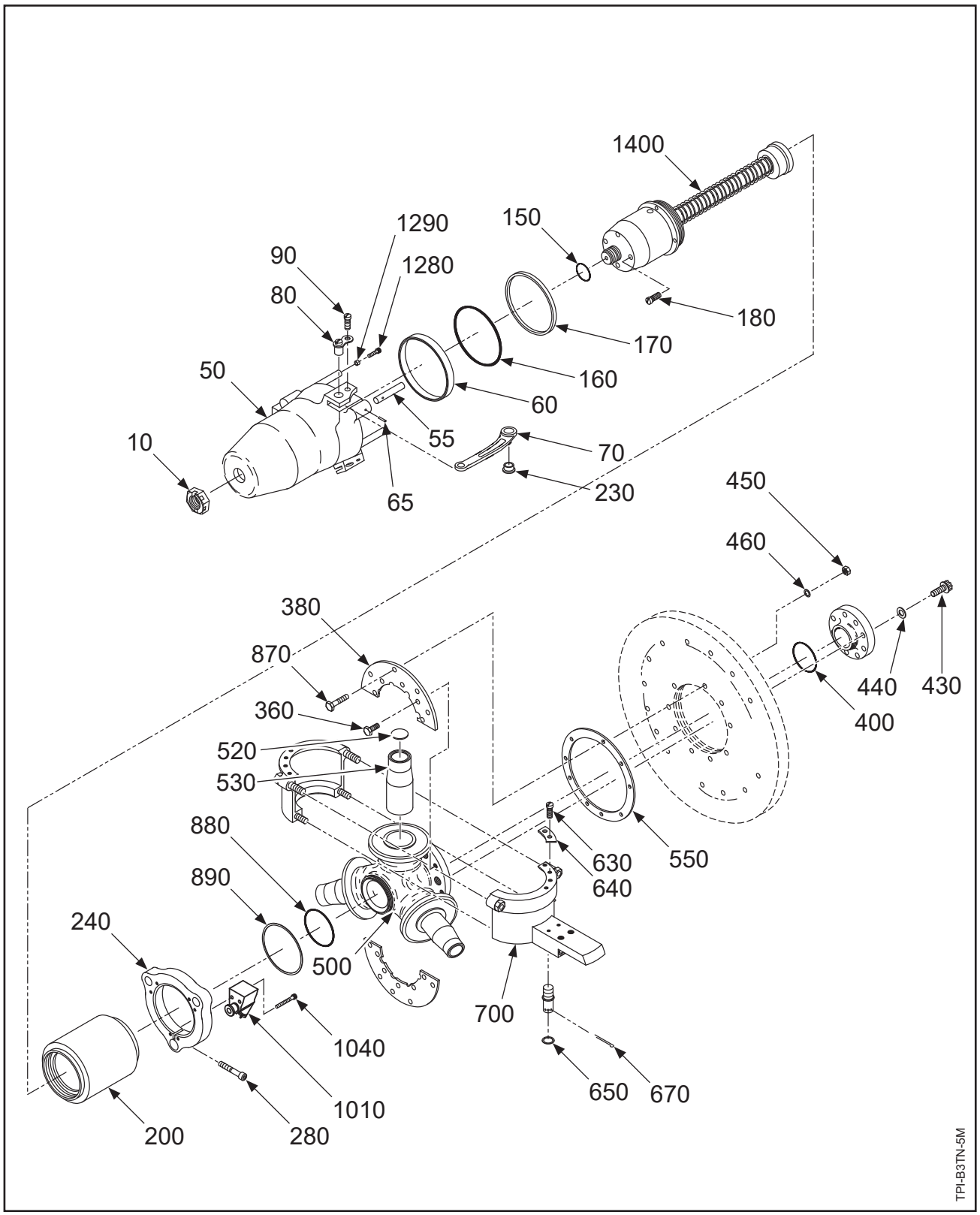
- ITEM NOT ILLUSTRATED

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10-18** | | **HC-B3TN-5FL PROPELLER ASSEMBLY** | | | | |
| **10A-1** | | **BLADE RETENTION PARTS**<br>**REFER TO THE A-1851-(T) BLADE RETENTION PARTS IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST** | | | | |
| | | **CLAMP ASSEMBLY**<br>**REFER TO THE APPLICABLE CLAMP ASSEMBLY IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST** | | | | |
| 700 | 838-71L | • PCP: CLAMP ASSEMBLY | | 3 | | PCP |
| | | **START LOCK ASSEMBLY**<br>**REFER TO THE APPLICABLE START LOCK ASSEMBLY IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST** | | | | |
| 1010 | 830-23L | • START LOCK - ASSEMBLY | | 3 | | |
| | | **SPRING ASSEMBLY**<br>**REFER TO THE APPLICABLE SPRING ASSEMBLY IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST** | | | | |
| 1400 | 831-75 | • SPRING ASSEMBLY | | 1 | | |
| | | **COUNTERWEIGHT SLUGS/MOUNTING HARDWARE** | | | | |
| -9040<br>-9050 | | • COUNTERWEIGHT SLUG<br>• HEX HEAD BOLT<br>APPLICATION SPECIFIC,<br>REFER TO HARTZELL PROPELLER APPLICATION GUIDE MANUAL 159 (61-02-59) FOR PART NUMBER AND PROPELLER CRITICAL PART (PCP) IDENTIFICATION | | | Y | |
| | | **SPINNER PARTS**<br>• APPLICATION SPECIFIC<br>REFER TO HARTZELL PROPELLER APPLICATION GUIDE MANUAL 159 (61-02-59) AND THE APPLICABLE HARTZELL PROPELLER SPINNER MAINTENANCE MANUAL:<br>MANUAL 127 (61-16-27) - METAL SPINNER ASSEMBLIES<br>MANUAL 148 (61-16-48) - COMPOSITE SPINNER ASSEMBLIES | | | | |

| EFFECTIVITY | MODEL |
|---|---|
| | |

| EFFECTIVITY | MODEL |
|---|---|
| A | NO DE-ICE SYSTEM |
| D | DE-ICE SYSTEM W/836-57 SPINNER |

- ITEM NOT ILLUSTRATED




**HC-B3TN-(5M, 5N, 5P, 5U, 5V, 5W): Exploded View**
**Figure 10-19**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10-19** | | **HC-B3TN-(5M, 5N, 5P, 5U, 5V, 5W) PROPELLER ASSEMBLY** | | | | |
| 10 | A-880-2 | • NUT, HEX, SELF-LOCKING, THIN | | 1 | Y | |
| 50 | C-3021-4 | • PISTON UNIT | | 1 | | |
| 55 | A-717 | • • ROD, GUIDE, PISTON | | 3 | | |
| 60 | A-862-1 | • • BUSHING, PLASTIC | | 1 | | |
| 65 | B-6378-1750 | • • SPRING PIN, 1/8", CRES | | 3 | | |
| 70 | B-4016 | • LINK ARM | | 3 | | |
| 70A | B-1901 | • LINK ARM, ALTERNATE FOR ITEM 70 | | 3 | | |
| 80 | A-1464 | • LINK PIN UNIT | | 3 | Y | |
| 90 | B-3840-6 | • SCREW, 10-32, FILLISTER HEAD | | 3 | Y | |
| 150 | C-3317-121 | • O-RING | | 1 | Y | |
| 160 | C-3317-347-2 | • O-RING | | 1 | Y | |
| 170 | A-863 | • SEAL, DUST, PISTON, REPLACED BY ITEM 170A | | OBS | | |
| 170A | B-1843 | • SEAL, DUST, PISTON, REPLACES ITEM 170 | | 1 | Y | |
| 180 | B-3840-6 | • SCREW, 10-32, FILLISTER HEAD | | 4 | Y | |
| 200 | B-1803-4 | • PCP: CYLINDER | | 1 | | PCP |
| 230 | A-944 | • SLEEVE, LINKSCREW | | 3 | Y | |
| 240 | 834-23 | • GUIDE COLLAR UNIT | | 1 | | |
| 280 | A-2038-12 | • • SCREW, 1/4-28, CAP | | 1 | Y | |
| 360 | A-2051 | • BOLT, 5/16-24, HEX HEAD, REPLACED BY ITEM 360A | | OBS | | |
| 360A | A-2051-1 | • BOLT, 5/16-24, HEX HEAD, REPLACES ITEM 360 | | 10 | Y | |
| 380 | C-2625 | • PLATE, MOUNTING, SPINNER | | 1 | | |
| 400 | C-3317-230 | • O-RING | | 1 | Y | |
| 430 | B-3339 | • BOLT, MOUNTING, 9/16-18, 12 POINT | | 8 | Y | |
| 440 | A-2048-2 | • WASHER, MOUNTING, 9/16" CSK | | 8 | Y | |
| 450 | B-3808-4 | • NUT, HEX, SELF-LOCKING | | 9 | Y | |
| 460 | B-3851-0432 | • WASHER | | 9 | Y | |
| 500 | 840-60 | • PCP: HUB UNIT | | 1 | | PCP |
| 520 | B-3897-1 | • • PLUG, EXPANSION | | 3 | Y | |
| 530 | A-1891-A | • • PILOT TUBE | | 3 | | |
| 550 | B-2624 | • SPACER, BULKHEAD | A | 1 | | |
| | B-3068-1 | • SPACER, BULKHEAD | C | 1 | | |
| | B-3068 | • SPACER, BULKHEAD | D | 1 | | |
| 630 | B-3840-6 | • SCREW, 10-32, FILLISTER HEAD | | AR | Y | |
| 640 | A-1305 | • BALANCE WEIGHT | | AR | | |
| 650 | A-6119 | • BUSHING, LINK ARM | | 3 | Y | |
| 670 | B-3838-3-3 | • COTTER PIN | | 3 | Y | |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| A | NO DE-ICE SYSTEM | | |
| C | DE-ICE SYSTEM W/836-49 SPINNER | | |
| D | DE-ICE SYSTEM W/836-57 SPINNER | | |

- ITEM NOT ILLUSTRATED

**HC-B3TN-(5M, 5N, 5P, 5U, 5V, 5W), page 1 of 3**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10-19** | | **HC-B3TN-(5M, 5N, 5P, 5U, 5V, 5W) PROPELLER ASSEMBLY** | | | | |
| 870 | B-3384-8H | • BOLT, 1/4-28, HEX HEAD | | 9 | Y | |
| 880 | A-2622 | • COLLAR SUPPORT RING | | 1 | | |
| 880A | A-2622-1 | • COLLAR SUPPORT RING, ALTERNATE FOR ITEM 880 | | 1 | | |
| 890 | C-3317-235 | • O-RING | | 1 | Y | |
| 1040 | A-2626-1 | • SCREW, 10-32, CAP | | 6 | Y | |
| 1280 | A-2626 | • SCREW, 10-32, CAP | | 3 | Y | |
| 1290 | A-319 | • COLLAR | | AR | | |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| | | | |

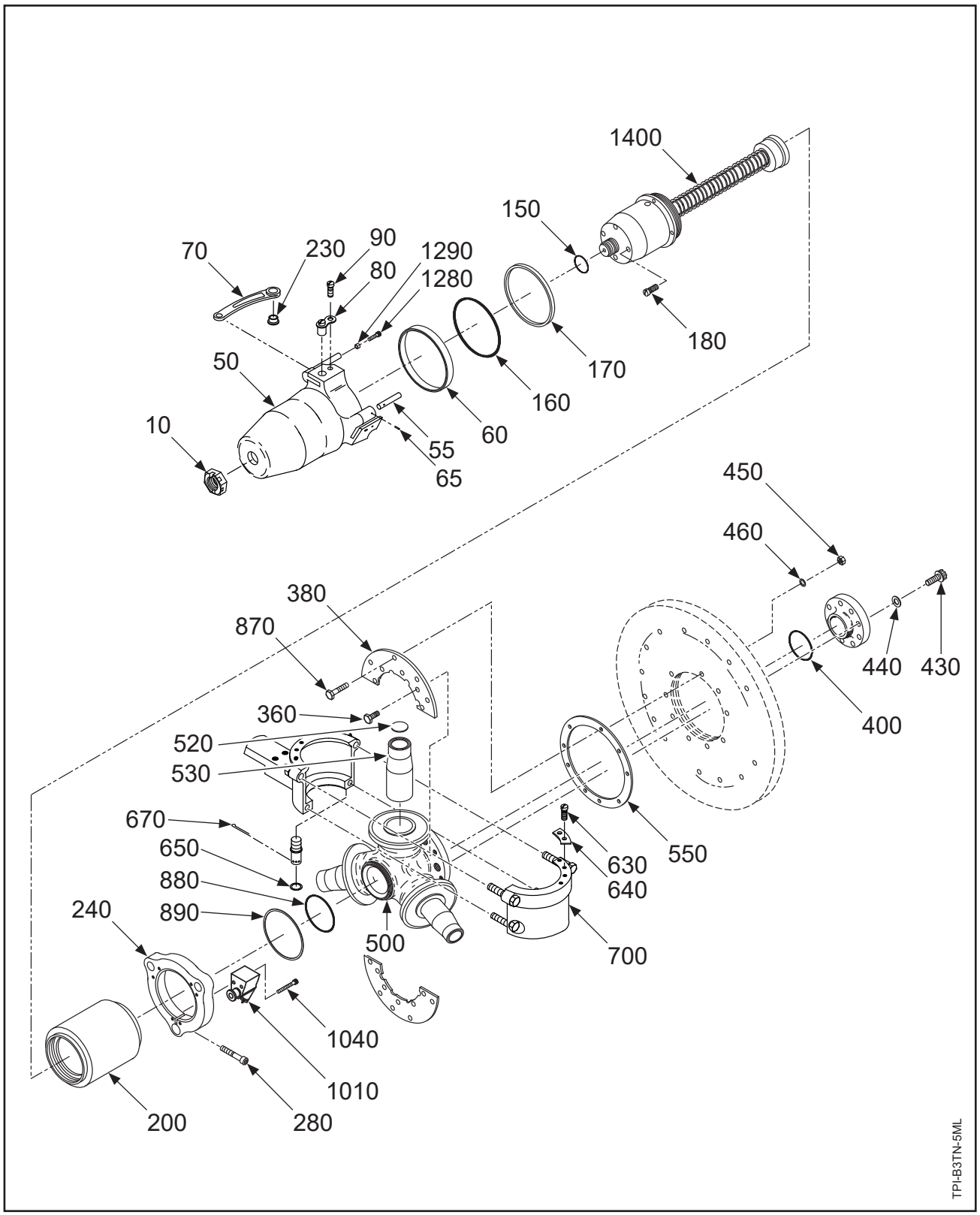
- ITEM NOT ILLUSTRATED

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| 10-19 | | HC-B3TN-(5M, 5N, 5P, 5U, 5V, 5W) PROPELLER ASSEMBLY | | | | |
| 10A-1 | | BLADE RETENTION PARTS | | | | |
| | | REFER TO THE A-1851-(T) BLADE RETENTION PARTS IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST | | | | |
| | | CLAMP ASSEMBLY | | | | |
| | | REFER TO THE APPLICABLE CLAMP ASSEMBLY IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST | | | | |
| 700 | 838-67 | • PCP: CLAMP ASSEMBLY | E | 3 | | PCP |
| | 838-71 | • PCP: CLAMP ASSEMBLY | F | 3 | | PCP |
| | 838-95 | • PCP: CLAMP ASSEMBLY | G | 3 | | PCP |
| | | START LOCK ASSEMBLY | | | | |
| | | REFER TO THE APPLICABLE START LOCK ASSEMBLY IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST | | | | |
| 1010 | 830-43 | • START LOCK - ASSEMBLY | E, G | 3 | | |
| | 100026 | • START LOCK - ASSEMBLY | F | 3 | | |
| | | SPRING ASSEMBLY | | | | |
| | | REFER TO THE APPLICABLE START LOCK ASSEMBLY IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST | | | | |
| 1400 | 831-75 | • SPRING ASSEMBLY | | 1 | | |
| | | COUNTERWEIGHT SLUGS/MOUNTING HARDWARE | | | | |
| -9040 | | • COUNTERWEIGHT SLUG | | | | |
| -9050 | | • HEX HEAD BOLT<br>APPLICATION SPECIFIC,<br>REFER TO HARTZELL PROPELLER APPLICATION GUIDE MANUAL 159 (61-02-59) FOR PART NUMBER AND PROPELLER CRITICAL PART (PCP) IDENTIFICATION | | | Y | |
| | | SPINNER PARTS | | | | |
| | | • APPLICATION SPECIFIC<br>REFER TO HARTZELL PROPELLER APPLICATION GUIDE MANUAL 159 (61-02-59) AND THE APPLICABLE HARTZELL PROPELLER SPINNER MAINTENANCE MANUAL:<br>MANUAL 127 (61-16-27) - METAL SPINNER ASSEMBLIES<br>MANUAL 148 (61-16-48) - COMPOSITE SPINNER ASSEMBLIES | | | | |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| E | HC-B3TN-5M | | |
| F | HC-B3TN-5N | | |
| G | HC-B3TN-(5P, 5U, 5V, 5W) | | |

- ITEM NOT ILLUSTRATED

**HC-B3TN-(5M, 5N, 5P, 5U, 5V, 5W), page 3 of 3**




**HC-B3TN-(5ML, 5NL, 5SL): Exploded View**
**Figure 10-20**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10-20** | | **HC-B3TN-(5ML, 5NL, 5SL) PROPELLER ASSEMBLY** | | | | |
| 10 | A-880-2 | • NUT, HEX, SELF-LOCKING, THIN | | 1 | Y | |
| 50 | C-3021-4L | • PISTON UNIT | | 1 | | |
| 55 | A-717 | • • ROD, GUIDE, PISTON | | 3 | | |
| 60 | A-862-1 | • • BUSHING, PLASTIC | | 1 | | |
| 65 | B-6378-1750 | • • SPRING PIN, 1/8", CRES | | 3 | | |
| 70 | B-4016L | • LINK ARM | | 3 | | |
| 70A | B-1901L | • LINK ARM, ALTERNATE FOR ITEM 70 | | 3 | | |
| 80 | A-1464 | • LINK PIN UNIT | | 3 | Y | |
| 90 | B-3840-6 | • SCREW, 10-32, FILLISTER HEAD | | 3 | Y | |
| 150 | C-3317-121 | • O-RING | | 1 | Y | |
| 160 | C-3317-347-2 | • O-RING | | 1 | Y | |
| 170 | A-863 | • SEAL, DUST, PISTON, REPLACED BY ITEM 170A | | OBS | | |
| 170A | B-1843 | • SEAL, DUST, PISTON, REPLACES ITEM 170 | | 1 | Y | |
| 180 | B-3840-6 | • SCREW, 10-32, FILLISTER HEAD | | 4 | Y | |
| 200 | B-1803-4 | • PCP: CYLINDER | | 1 | | PCP |
| 230 | A-944 | • SLEEVE, LINKSCREW | | 3 | Y | |
| 240 | 834-23 | • GUIDE COLLAR UNIT | | 1 | | |
| 280 | A-2038-12 | • • SCREW, 1/4-28, CAP | | 1 | Y | |
| 360 | A-2051 | • BOLT, 5/16-24, HEX HEAD, REPLACED BY ITEM 360A | | OBS | | |
| 360A | A-2051-1 | • BOLT, 5/16-24, HEX HEAD, REPLACES ITEM 360 | | 10 | Y | |
| 380 | C-2625 | • PLATE, MOUNTING, SPINNER | | 1 | | |
| 400 | C-3317-230 | • O-RING | | 1 | Y | |
| 430 | B-3339 | • BOLT, MOUNTING, 9/16-18, 12 POINT | | 8 | Y | |
| 440 | A-2048-2 | • WASHER, MOUNTING, 9/16" CSK | | 8 | Y | |
| 450 | B-3808-4 | • NUT, HEX, SELF-LOCKING | | 9 | Y | |
| 460 | B-3851-0432 | • WASHER | | 9 | Y | |
| 500 | 840-60 | • PCP: HUB UNIT | | 1 | | PCP |
| 520 | B-3897-1 | • • PLUG, EXPANSION | | 3 | Y | |
| 530 | A-1891-A | • • PILOT TUBE | | 3 | | |
| 550 | B-2624 | • SPACER, BULKHEAD | A | 1 | | |
| | B-3068-1 | • SPACER, BULKHEAD | C | 1 | | |
| | B-3068 | • SPACER, BULKHEAD | D | 1 | | |
| 630 | B-3840-6 | • SCREW, 10-32, FILLISTER HEAD | | AR | Y | |
| 640 | A-1305 | • BALANCE WEIGHT | | AR | | |
| 650 | A-6119 | • BUSHING, LINK ARM | | 3 | Y | |
| 670 | B-3838-3-3 | • COTTER PIN | | 3 | Y | |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| A | NO DE-ICE SYSTEM | | |
| C | DE-ICE SYSTEM W/836-49 SPINNER | | |
| D | DE-ICE SYSTEM W/836-57 SPINNER | | |

- ITEM NOT ILLUSTRATED

**HC-B3TN-(5ML, 5NL, 5SL), page 1 of 3**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10-20** | | **HC-B3TN-(5ML, 5NL, 5SL) PROPELLER ASSEMBLY** | | | | |
| 630 | B-3840-6 | • SCREW, 10-32, FILLISTER HEAD | | AR | Y | |
| 640 | A-1305 | • BALANCE WEIGHT | | AR | | |
| 650 | A-6119 | • BUSHING, LINK ARM | | 3 | Y | |
| 670 | B-3838-3-3 | • COTTER PIN | | 3 | Y | |
| 740 | A-304 | • • LINKSCREW, 1/2-20 | | 1 | Y | |
| 870 | B-3384-8H | • BOLT, 1/4-28, HEX HEAD | | 9 | Y | |
| 880 | A-2622 | • COLLAR SUPPORT RING | | 1 | | |
| 880A | A-2622-1 | • COLLAR SUPPORT RING, ALTERNATE FOR ITEM 880 | | 1 | | |
| 890 | C-3317-235 | • O-RING | | 1 | Y | |
| 1040 | A-2626-1 | • SCREW, 10-32, CAP | | 6 | Y | |
| 1280 | A-2626 | • SCREW, 10-32, CAP | | 3 | Y | |
| 1290 | A-319 | • COLLAR | | AR | | |

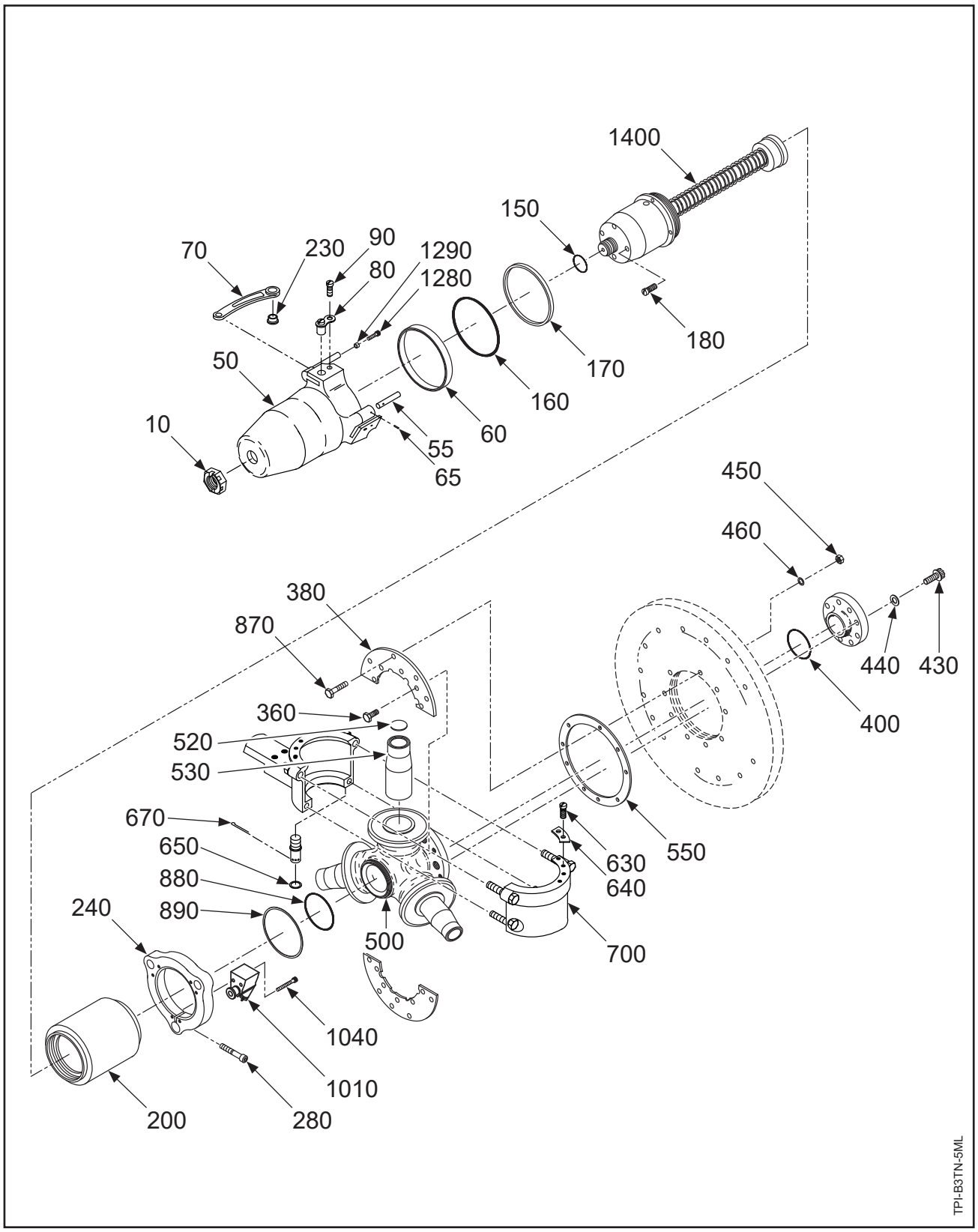
| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| | | | |

- ITEM NOT ILLUSTRATED

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| 10-20 | | HC-B3TN-5(ML, NL, SL) PROPELLER ASSEMBLY | | | | |
| 10A-1 | | BLADE RETENTION PARTS<br>REFER TO THE A-1851-(T) BLADE RETENTION PARTS IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST | | | | |
| | | CLAMP ASSEMBLY<br>REFER TO THE APPLICABLE CLAMP ASSEMBLY IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST | | | | |
| 700 | 838-67L | • PCP: CLAMP ASSEMBLY | -5ML,-5SL | 3 | | PCP |
| | 838-71L | • PCP: CLAMP ASSEMBLY | -5NL | 3 | | PCP |
| | | START LOCK ASSEMBLY<br>REFER TO THE APPLICABLE START LOCK ASSEMBLY IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST | | | | |
| -1010 | 830-43L | • START LOCK - ASSEMBLY | -5ML,-5SL | 3 | | |
| | 100026L | • START LOCK - ASSEMBLY | -5NL | 3 | | |
| | | SPRING ASSEMBLY<br>REFER TO THE APPLICABLE SPRING ASSEMBLY IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST | | | | |
| 1400 | 831-75 | • SPRING ASSEMBLY | | 1 | | |
| | | COUNTERWEIGHT SLUGS/MOUNTING HARDWARE | | | | |
| -9040<br>-9050 | | • COUNTERWEIGHT SLUG<br>• HEX HEAD BOLT<br>APPLICATION SPECIFIC,<br>REFER TO HARTZELL PROPELLER APPLICATION GUIDE MANUAL 159 (61-02-59) FOR PART NUMBER AND PROPELLER CRITICAL PART (PCP) IDENTIFICATION | | | Y | |
| | | SPINNER PARTS | | | | |
| | | • APPLICATION SPECIFIC<br>REFER TO HARTZELL PROPELLER APPLICATION GUIDE MANUAL 159 (61-02-59) AND THE APPLICABLE HARTZELL PROPELLER SPINNER MAINTENANCE MANUAL:<br>MANUAL 127 (61-16-27) - METAL SPINNER ASSEMBLIES<br>MANUAL 148 (61-16-48) - COMPOSITE SPINNER ASSEMBLIES | | | | |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| -5ML | HC-B3TN-5ML | | |
| -5NL | HC-B3TN-5NL | | |
| -5SL | HC-B3TN-5SL | | |

- ITEM NOT ILLUSTRATED




**HC-B3MN-5L: Exploded View**
**Figure 10-21**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10-21** | | **HC-B3MN-5L PROPELLER ASSEMBLY** | | | | |
| 10 | A-880-2 | • NUT, HEX, SELF-LOCKING, THIN | | 1 | Y | |
| 50 | C-3021-4L | • PISTON UNIT | | 1 | | |
| 55 | A-717 | • • ROD, GUIDE, PISTON | | 3 | | |
| 60 | A-862-1 | • • BUSHING, PLASTIC | | 1 | | |
| 65 | B-6378-1750 | • • SPRING PIN, 1/8", CRES | | 3 | | |
| 70 | B-4016 L | • LINK ARM | | 3 | | |
| 80 | A-1464 | • LINK PIN UNIT | | 3 | Y | |
| 90 | B-3840-6 | • SCREW, 10-32, FILLISTER HEAD | | 3 | Y | |
| 150 | C-3317-121 | • O-RING | | 1 | Y | |
| 160 | C-3317-347-2 | • O-RING | | 1 | Y | |
| 170 | B-1843 | • SEAL, DUST, PISTON | | 1 | Y | |
| 180 | B-3840-6 | • SCREW, 10-32, FILLISTER HEAD | | 4 | Y | |
| 200 | B-1803-4 | • PCP: CYLINDER | | 1 | | PCP |
| 230 | A-944 | • SLEEVE, LINKSCREW | | 3 | Y | |
| 240 | 834-23 | • GUIDE COLLAR UNIT | | 1 | | |
| 280 | A-2038-12 | • • SCREW, 1/4-28, CAP | | 1 | Y | |
| 360 | A-2051 | • BOLT, 5/16-24, HEX HEAD, REPLACED BY ITEM 360A | | OBS | | |
| 360A | A-2051-1 | • BOLT, 5/16-24, HEX HEAD, REPLACES ITEM 360 | | 10 | Y | |
| 380 | C-2625 | • PLATE, MOUNTING, SPINNER | | 1 | | |
| 400 | C-3317-230 | • O-RING | | 1 | Y | |
| 430 | B-3339 | • BOLT, MOUNTING, 9/16-18, 12 POINT | | 8 | Y | |
| 440 | A-2048-2 | • WASHER, MOUNTING, 9/16" CSK | | 8 | Y | |
| 450 | B-3808-4 | • NUT, HEX, SELF-LOCKING | | 9 | Y | |
| 460 | B-3851-0432 | • WASHER | | 9 | Y | |
| 500 | 840-60 | • PCP: HUB UNIT | | 1 | | PCP |
| 520 | B-3897-1 | • • PLUG, EXPANSION | | 3 | Y | |
| 530 | A-1891-A | • • PILOT TUBE | | 3 | | |
| 550 | B-2624 | • SPACER, BULKHEAD | | 1 | | |
| 630 | B-3840-6 | • SCREW, 10-32, FILLISTER HEAD | | AR | Y | |
| 640 | A-1305 | • BALANCE WEIGHT | | AR | | |
| 650 | A-6119 | • BUSHING, LINK ARM | | 3 | Y | |
| 670 | B-3838-3-3 | • COTTER PIN | | 3 | Y | |
| 870 | B-3384-8H | • BOLT, 1/4-28, HEX HEAD | | 9 | Y | |
| 880 | A-2622-1 | • COLLAR SUPPORT RING | | 1 | | |
| 890 | C-3317-235 | • O-RING | | 1 | Y | |
| 1040 | A-2626-1 | • SCREW, 10-32, CAP | | 6 | Y | |
| 1280 | A-2626 | • SCREW, 10-32, CAP | | 3 | Y | |
| 1290 | A-319 | • COLLAR | | AR | | |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| | | | |

- ITEM NOT ILLUSTRATED

**HC-B3MN-5L, page 1 of 2**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10-21** | | **HC-B3MN-5L PROPELLER ASSEMBLY** | | | | |
| **10A-1** | | **BLADE RETENTION PARTS**<br>**REFER TO THE A-1851-(T) BLADE RETENTION PARTS IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST** | | | | |
| | | **CLAMP ASSEMBLY**<br>**REFER TO THE APPLICABLE CLAMP ASSEMBLY IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST** | | | | |
| 700 | 838-119L | • PCP: CLAMP ASSEMBLY | | 3 | | PCP |
| | | **START LOCK ASSEMBLY**<br>**REFER TO THE APPLICABLE START LOCK ASSEMBLY IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST** | | | | |
| 1010 | 100026L | • START LOCK, LH - ASSEMBLY | | 3 | | |
| | | **SPRING ASSEMBLY**<br>**REFER TO THE APPLICABLE SPRING ASSEMBLY IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST** | | | | |
| 1400 | 831-75 | • SPRING ASSEMBLY | | 1 | | |
| | | **COUNTERWEIGHT SLUGS/MOUNTING HARDWARE** | | | | |
| -9040<br>-9050 | | • COUNTERWEIGHT SLUG<br>• HEX HEAD BOLT<br>APPLICATION SPECIFIC,<br>REFER TO HARTZELL PROPELLER APPLICATION GUIDE MANUAL 159 (61-02-59) FOR PART NUMBER AND PROPELLER CRITICAL PART (PCP) IDENTIFICATION | | | Y | |
| | | **SPINNER PARTS**<br>• APPLICATION SPECIFIC<br>REFER TO HARTZELL PROPELLER APPLICATION GUIDE MANUAL 159 (61-02-59) AND THE APPLICABLE HARTZELL PROPELLER SPINNER MAINTENANCE MANUAL:<br>MANUAL 127 (61-16-27) - METAL SPINNER ASSEMBLIES<br>MANUAL 148 (61-16-48) - COMPOSITE SPINNER ASSEMBLIES | | | | |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| | | | |

- ITEM NOT ILLUSTRATED

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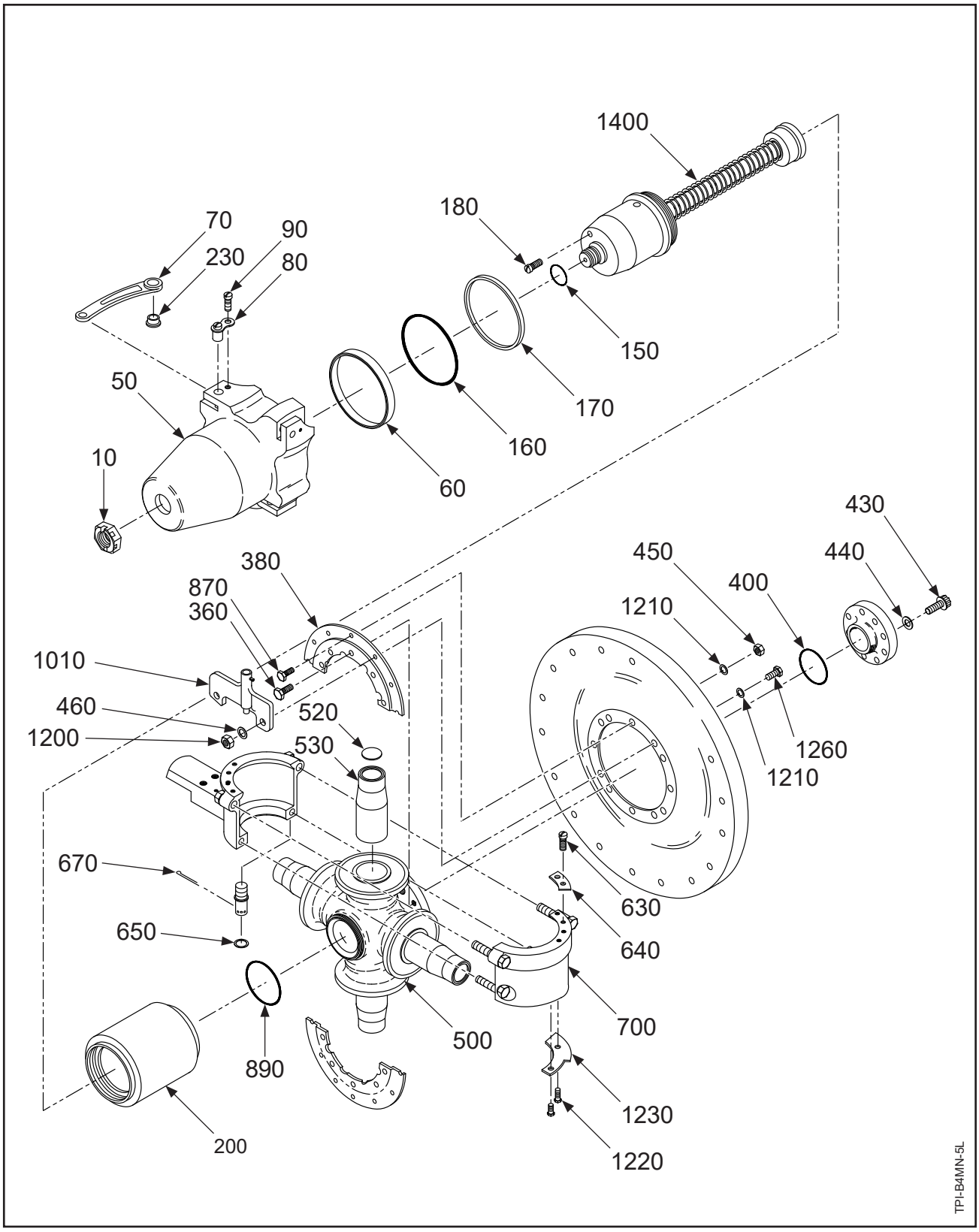


**HC-B4MN-5L: Exploded View**
**Figure 10-22**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10-22** | | **HC-B4MN-5L PROPELLER ASSEMBLY** | | | | |
| 10 | A-880-2 | • NUT, HEX, SELF-LOCKING, THIN | | 1 | Y | |
| 50 | C-2303-5L | • PISTON UNIT | | 1 | | |
| 60 | A-862-7 | • • BUSHING, PLASTIC | | 1 | | |
| 70 | B-4016 | • LINK ARM | | 4 | | |
| 70A | B-1901 | • LINK ARM, ALTERNATE FOR ITEM 70 | | 4 | | |
| 80 | A-1464 | • LINK PIN UNIT | | 4 | Y | |
| 90 | B-3840-6 | • SCREW, 10-32, FILLISTER HEAD | | 4 | Y | |
| 150 | C-3317-121 | • O-RING | | 1 | Y | |
| 160 | C-3317-426-2 | • O-RING | | 1 | Y | |
| 170 | A-863 | • SEAL, DUST, PISTON, REPLACED BY ITEM 170A | | OBS | | |
| 170A | B-1843 | • SEAL, DUST, PISTON, REPLACES ITEM 170 | | 1 | Y | |
| 180 | B-3840-6 | • SCREW, 10-32, FILLISTER HEAD | | 4 | Y | |
| 200 | B-3406 | • CYLINDER | | 1 | | |
| 230 | A-944 | • SLEEVE, LINKSCREW | | 3 | Y | |
| 360 | A-2051 | • BOLT, 5/16-24, HEX HEAD, REPLACED BY ITEM 360A | | OBS | | |
| 360A | A-2051-1 | • BOLT, 5/16-24, HEX HEAD, REPLACES ITEM 360 | | 10 | Y | |
| 380 | C-3492 | • PLATE, MOUNTING, SPINNER | | 1 | | |
| 400 | C-3317-230 | • O-RING | | 1 | Y | |
| 430 | B-3339 | • BOLT, MOUNTING, 9/16-18, 12 POINT | | 8 | Y | |
| 440 | A-2048-2 | • WASHER, MOUNTING, 9/16" CSK | | 8 | Y | |
| 450 | B-3808-4 | • NUT, HEX, SELF-LOCKING | | 8 | Y | |
| 460 | B-3851-0432 | • WASHER | | AR | Y | |
| 500 | 840-139 | • PCP: HUB UNIT | | 1 | | PCP |
| 520 | B-3897-1 | • • PLUG, EXPANSION | | 4 | Y | |
| 530 | A-1891-A | • • PILOT TUBE | | 4 | | |
| 630 | B-3840-6 | • SCREW, 10-32, FILLISTER HEAD | | AR | Y | |
| 640 | A-1305 | • BALANCE WEIGHT | | AR | | |
| 650 | A-6119 | • BUSHING, LINK ARM | | 4 | Y | |
| 670 | B-3838-3-3 | • COTTER PIN | | 4 | Y | |
| 870 | B-3384-12 | • BOLT, 1/4-28, HEX HEAD | | 8 | Y | |
| 890 | C-3317-240 | • O-RING | | 1 | Y | |
| 1200 | B-3808-4 | • NUT, HEX, SELF-LOCKING | | 4 | Y | |
| 1210 | B-3851-0432 | • WASHER | | AR | Y | |
| 1220 | A-2016 | • BOLT, 10-32, HEX HEAD | | 8 | Y | |
| 1220A | A-2016-2 | • BOLT, 10-32, HEX HEAD, ALTERNATE FOR ITEM 1220 | | 8 | Y | |
| -1225 | B-3851-0363 | • WASHER (USE WITH ITEM 1220A ONLY) | | 8 | Y | |
| 1230 | A-3486-1 | • START LOCK PLATE | | 4 | | |
| 1260 | B-3384-3 | • BOLT, 1/4-28, HEX HEAD | | 4 | Y | |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| | | | |

- ITEM NOT ILLUSTRATED

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| 10-22 | | HC-B4MN-5L PROPELLER ASSEMBLY | | | | |
| 10A-1 | | BLADE RETENTION PARTS<br>REFER TO THE A-1851-(T) BLADE RETENTION PARTS IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST | | | | |
| | | CLAMP ASSEMBLY<br>REFER TO THE APPLICABLE CLAMP ASSEMBLY IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST | | | | |
| 700 | 838-94L | • PCP: CLAMP ASSEMBLY | | 4 | | PCP |
| | | START LOCK ASSEMBLY<br>REFER TO THE APPLICABLE START LOCK ASSEMBLY IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST | | | | |
| 1010 | 830-34L | • START LOCK - ASSEMBLY | | 4 | | |
| | | SPRING ASSEMBLY<br>REFER TO THE APPLICABLE SPRING ASSEMBLY IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST | | | | |
| 1400 | 831-73 | • SPRING ASSEMBLY | | 1 | | |
| | | COUNTERWEIGHT SLUGS/MOUNTING HARDWARE | | | | |
| -9040<br>-9050 | | • COUNTERWEIGHT SLUG<br>• HEX HEAD BOLT<br>APPLICATION SPECIFIC,<br>REFER TO HARTZELL PROPELLER APPLICATION GUIDE MANUAL 159 (61-02-59) FOR PART NUMBER AND PROPELLER CRITICAL PART (PCP) IDENTIFICATION | | | Y | |
| | | SPINNER PARTS<br>• APPLICATION SPECIFIC<br>REFER TO HARTZELL PROPELLER APPLICATION GUIDE MANUAL 159 (61-02-59) AND THE APPLICABLE HARTZELL PROPELLER SPINNER MAINTENANCE MANUAL:<br>MANUAL 127 (61-16-27) - METAL SPINNER ASSEMBLIES<br>MANUAL 148 (61-16-48) - COMPOSITE SPINNER ASSEMBLIES | | | | |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| | | | |

- ITEM NOT ILLUSTRATED

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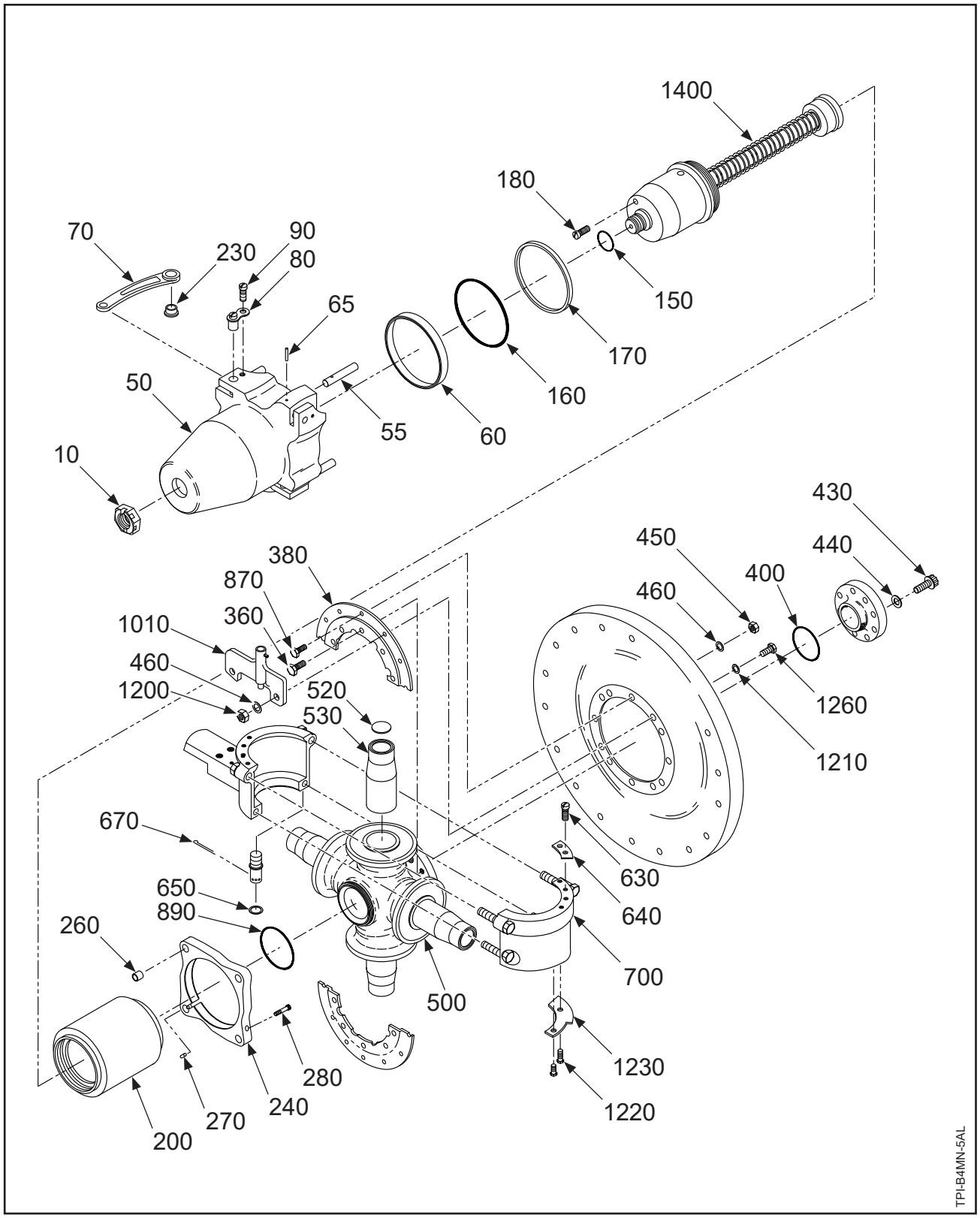



**HC-B4MN-5AL: Exploded View**
**Figure 10-23**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10-23** | | **HC-B4MN-5AL PROPELLER ASSEMBLY** | | | | |
| 10 | A-880-2 | • NUT, HEX, SELF-LOCKING, THIN | | 1 | Y | |
| 50 | C-2303-6L | • PISTON UNIT | | 1 | | |
| 55 | A-717 | • • ROD, GUIDE, PISTON | | 4 | | |
| 60 | A-862-7 | • • BUSHING, PLASTIC | | 1 | | |
| 65 | A-114-B | • • DOWEL PIN | | 4 | | |
| 70 | B-4016L | • LINK ARM | | 4 | | |
| 70A | B-1901L | • LINK ARM, ALTERNATE FOR ITEM 70 | | 4 | | |
| 80 | A-1464 | • LINK PIN UNIT | | 4 | Y | |
| 90 | B-3840-6 | • SCREW, 10-32, FILLISTER HEAD | | 4 | Y | |
| 150 | C-3317-121 | • O-RING | | 1 | Y | |
| 160 | C-3317-426-2 | • O-RING | | 1 | Y | |
| 170 | A-863 | • SEAL, DUST, PISTON, REPLACED BY ITEM 170A | | OBS | | |
| 170A | B-1843 | • SEAL, DUST, PISTON - REPLACES ITEM 170 | | 1 | Y | |
| 180 | B-3840-6 | • SCREW, 10-32, FILLISTER HEAD | | 4 | Y | |
| 200 | B-3406 | • CYLINDER | | 1 | | |
| 230 | A-944 | • SLEEVE, LINKSCREW | | 3 | Y | |
| 240 | 834-13 | • GUIDE COLLAR UNIT | | 1 | | |
| 260 | A-3023 | • • BUSHING, PLASTIC | | 4 | | |
| 270 | A-114-C | • • DOWEL PIN | | 1 | | |
| 280 | A-2038-14 | • • SCREW, 1/4-28, CAP | | 1 | Y | |
| 360 | A-2051 | • BOLT, 5/16-24, HEX HEAD, REPLACED BY ITEM 360A | | OBS | | |
| 360A | A-2051-1 | • BOLT, 5/16-24, HEX HEAD, REPLACES ITEM ITEM 360 | | 10 | Y | |
| 380 | C-3492 | • PLATE, MOUNTING, SPINNER | | 1 | | |
| 400 | C-3317-230 | • O-RING | | 1 | Y | |
| 430 | B-3339 | • BOLT, MOUNTING, 9/16-18, 12 POINT | | 8 | Y | |
| 440 | A-2048-2 | • WASHER, MOUNTING, 9/16" CSK | | 8 | Y | |
| 450 | B-3808-4 | • NUT, HEX, SELF-LOCKING | | 8 | Y | |
| 460 | B-3851-0432 | • WASHER | | AR | Y | |
| 500 | 840-139 | • PCP: HUB UNIT | | 1 | | PCP |
| 520 | B-3897-1 | • • PLUG, EXPANSION | | 4 | Y | |
| 530 | A-1891-A | • • PILOT TUBE | | 4 | | |
| 630 | B-3840-( ) | • SCREW, 10-32, FILLISTER HEAD | | AR | Y | |
| 630A | A-80-( ) | • BOLT, 10-32, HEX HEAD, ALTERNATE FOR ITEM 630 | | AR | Y | |
| 640 | A-1305 | • BALANCE WEIGHT | | AR | | |
| 650 | A-6119 | • BUSHING, LINK ARM | | 4 | Y | |
| 670 | B-3838-3-3 | • COTTER PIN | | 4 | Y | |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| | | | |

- ITEM NOT ILLUSTRATED

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10-23** | | **HC-B4MN-5AL PROPELLER ASSEMBLY** | | | | |
| 870 | B-3384-12 | • BOLT, 1/4-28, HEX HEAD | | 8 | Y | |
| 890 | C-3317-240 | • O-RING | | 1 | Y | |
| 1200 | B-3808-4 | • NUT, HEX, SELF-LOCKING | | 4 | Y | |
| 1210 | B-3851-0432 | • WASHER | | AR | Y | |
| 1220 | A-2016 | • BOLT, 10-32, HEX HEAD | | 8 | Y | |
| 1220A | A-2016-2 | • BOLT, 10-32, HEX HEAD, ALTERNATE FOR ITEM 1220 | | 8 | Y | |
| -1225 | B-3851-0363 | • WASHER, (USE WITH ITEM 1220A ONLY) | | 8 | Y | |
| 1230A | A-3495 | • PLATE, START LOCK | | 4 | | |
| 1260 | B-3384-3 | • BOLT, 1/4-28, HEX HEAD | | 4 | Y | |

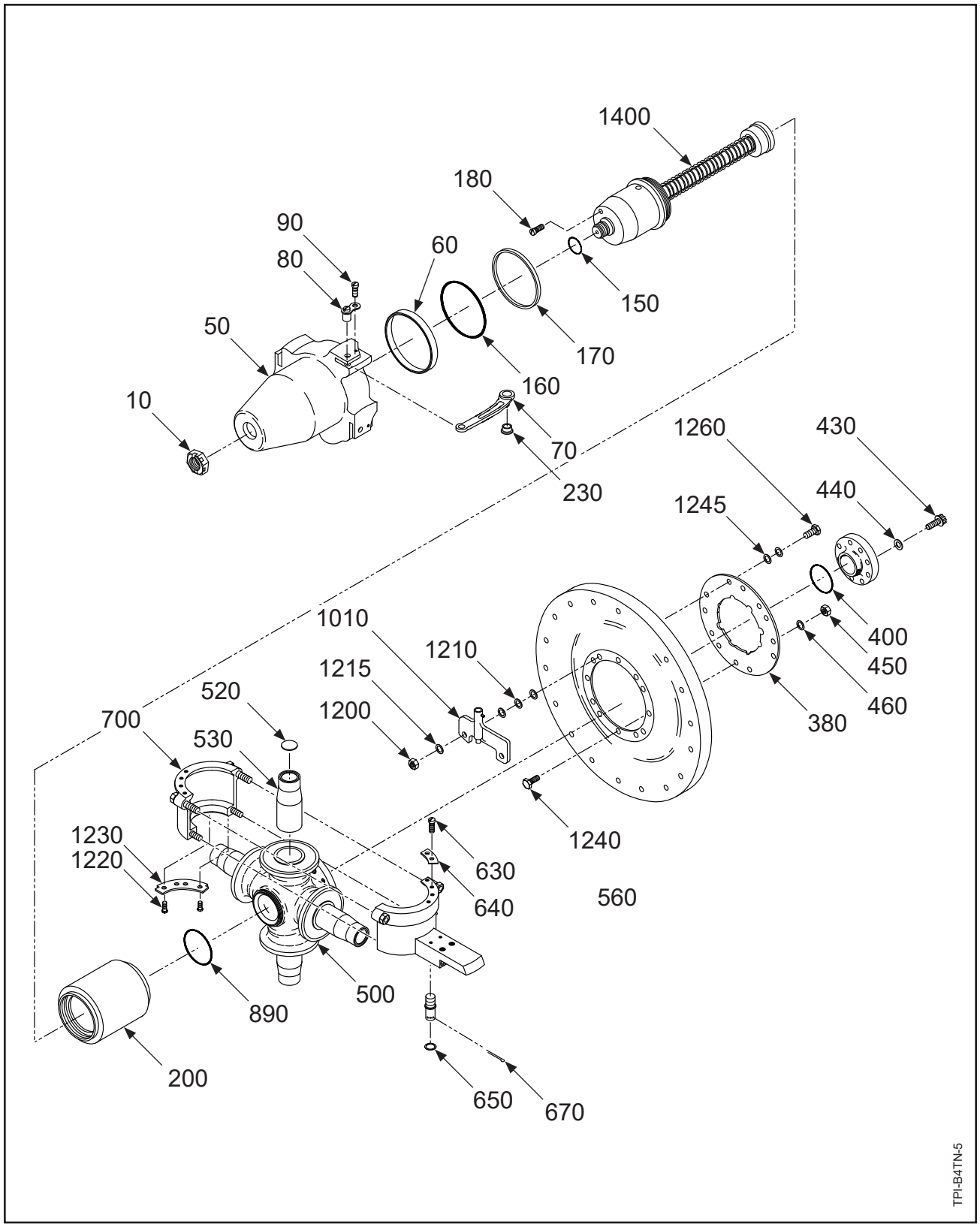
| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| | | | |

- ITEM NOT ILLUSTRATED

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| 10-23 | | HC-B4MN-5AL PROPELLER ASSEMBLY | | | | |
| 10A-1 | | BLADE RETENTION PARTS<br>REFER TO THE A-1851-(T) BLADE RETENTION PARTS IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST | | | | |
| | | CLAMP ASSEMBLY<br>REFER TO THE APPLICABLE CLAMP ASSEMBLY IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST | | | | |
| 700 | 838-97L | • PCP: CLAMP ASSEMBLY | | 4 | | PCP |
| | | START LOCK ASSEMBLY<br>REFER TO THE APPLICABLE START LOCK ASSEMBLY IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST | | | | |
| 1010 | 830-34L | • START LOCK - ASSEMBLY | | 4 | | |
| | | SPRING ASSEMBLY<br>REFER TO THE APPLICABLE CLAMP ASSEMBLY IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST | | | | |
| 1400 | 831-73 | • SPRING ASSEMBLY | | 1 | | |
| | | COUNTERWEIGHT SLUGS/MOUNTING HARDWARE | | | | |
| -9040<br>-9050 | | • COUNTERWEIGHT SLUG<br>• HEX HEAD BOLT<br>APPLICATION SPECIFIC,<br>REFER TO HARTZELL PROPELLER APPLICATION GUIDE MANUAL 159 (61-02-59) FOR PART NUMBER AND PROPELLER CRITICAL PART (PCP) IDENTIFICATION | | | Y | |
| | | SPINNER PARTS<br>• APPLICATION SPECIFIC<br>REFER TO HARTZELL PROPELLER APPLICATION GUIDE MANUAL 159 (61-02-59) AND THE APPLICABLE HARTZELL PROPELLER SPINNER MAINTENANCE MANUAL:<br>MANUAL 127 (61-16-27) - METAL SPINNER ASSEMBLIES<br>MANUAL 148 (61-16-48) - COMPOSITE SPINNER ASSEMBLIES | | | | |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| | | | |

- ITEM NOT ILLUSTRATED




**HC-B4TN-5(A, C): Exploded View**
**Figure 10-24**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10-24** | | **HC-B4TN-5(A, C) PROPELLER ASSEMBLY** | | | | |
| 10 | A-880-2 | • NUT, HEX, SELF-LOCKING, THIN | | 1 | Y | |
| 50 | C-2303-5 | • PISTON UNIT | | 1 | | |
| 60 | A-862-1 | • • BUSHING, PLASTIC | | 1 | | |
| 70 | B-4016 | • LINK ARM | | 4 | | |
| 70A | B-1901 | • LINK ARM, ALTERNATE FOR ITEM 70 | | 4 | | |
| 80 | A-1464 | • LINK PIN UNIT | | 4 | Y | |
| 90 | B-3840-6 | • SCREW, 10-32, FILLISTER HEAD | | 4 | Y | |
| 150 | C-3317-116 | • O-RING | -5(A) | 1 | Y | |
| | C-3317-121 | • O-RING | -5C | 1 | Y | |
| 160 | C-3317-426-2 | • O-RING | | 1 | Y | |
| 170 | A-863 | • SEAL, DUST, PISTON, REPLACED BY ITEM 170A | | OBS | | |
| 170A | B-1843 | • SEAL, DUST, PISTON, REPLACES ITEM 170 | | 1 | Y | |
| 180 | B-3840-6 | • SCREW, 10-32, FILLISTER HEAD | | 4 | Y | |
| 200 | B-3406 | • CYLINDER | | 1 | | |
| 230 | A-944 | • SLEEVE, LINKSCREW | | 3 | Y | |
| 380 | B-3408 | • PLATE, MOUNTING, SPINNER, REPLACED BY ITEM 380A | | OBS | | |
| 380A | C-3492 | • PLATE, MOUNTING, SPINNER, REPLACES ITEM 380 POST HC-SB-61-261 | | 1 | | |
| 400 | C-3317-230 | • O-RING | | 1 | Y | |
| 430 | B-3339 | • BOLT, MOUNTING, 9/16-18, 12 POINT | | 8 | Y | |
| 440 | A-2048-2 | • WASHER, MOUNTING, 9/16" CSK | | 8 | Y | |
| 450 | B-3808-4 | • NUT, HEX, SELF-LOCKING | | 4 | Y | |
| 460 | B-3851-0432 | • WASHER | | AR | Y | |
| 500 | 840-91 | • PCP: HUB UNIT, REPLACED BY ITEM 500A | | OBS | | PCP |
| 500A | 840-139 | • PCP: HUB UNIT, REPLACES ITEM 500, POST HC-SB-61-261 | | 1 | | PCP |
| 520 | B-3897-1 | • • PLUG, EXPANSION | | 4 | Y | |
| 530 | A-1891-A | • • PILOT TUBE | | 4 | | |
| 630 | B-3840-6 | • SCREW, 10-32, FILLISTER HEAD | | AR | Y | |
| 640 | A-1305 | • BALANCE WEIGHT | | AR | | |
| 650 | A-6119 | • BUSHING, LINK ARM | | 4 | Y | |
| 670 | B-3838-3-3 | • COTTER PIN | | 4 | Y | |
| 890 | C-3317-240 | • O-RING | | 1 | Y | |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| -5(A) | HC-B4TN-5(A) | | |
| -5C | HC-B4TN-5C | | |

- ITEM NOT ILLUSTRATED

**HC-B4TN-5(A, C), page 1 of 3**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10-24** | | **HC-B4TN-5(A, C) PROPELLER ASSEMBLY** | | | | |
| 1200 | H10-4 | • NUT, KAYLOCK, REPLACED BY ITEM 1200A | | OBS | | |
| 1200A | B-3808-4 | • NUT, HEX, SELF-LOCKING, REPLACES ITEM 1200 | | 8 | Y | |
| 1210 | B-3851-0463 | • WASHER | | AR | Y | |
| 1215 | B-3851-0432 | • WASHER | | 8 | Y | |
| 1220 | A-2016 | • BOLT, 10-32, HEX HEAD, PLATE | | 8 | Y | |
| 1220A | A-2016-2 | • BOLT, 10-32, HEX HEAD, ALTERNATE FOR ITEM 1220 | | 8 | Y | |
| -1225 | B-3851-0363 | • WASHER (USE WITH ITEM 1220A ONLY) | | 8 | Y | |
| 1230 | A-3079 | • PLATE, START LOCK | | 4 | | |
| 1240 | B-3384-3H | • BOLT, 1/4-28, HEX HEAD | F | 4 | Y | |
| | B-3384-5H | • BOLT, 1/4-28, HEX HEAD | G | 4 | Y | |
| 1245 | B-3851-0432 | • WASHER | | 16 | Y | |
| 1260 | B-3384-10H | • BOLT, 1/4-28, HEX HEAD | H | 8 | Y | |
| | B-3384-12H | • BOLT, 1/4-28, HEX HEAD | I | 8 | Y | |

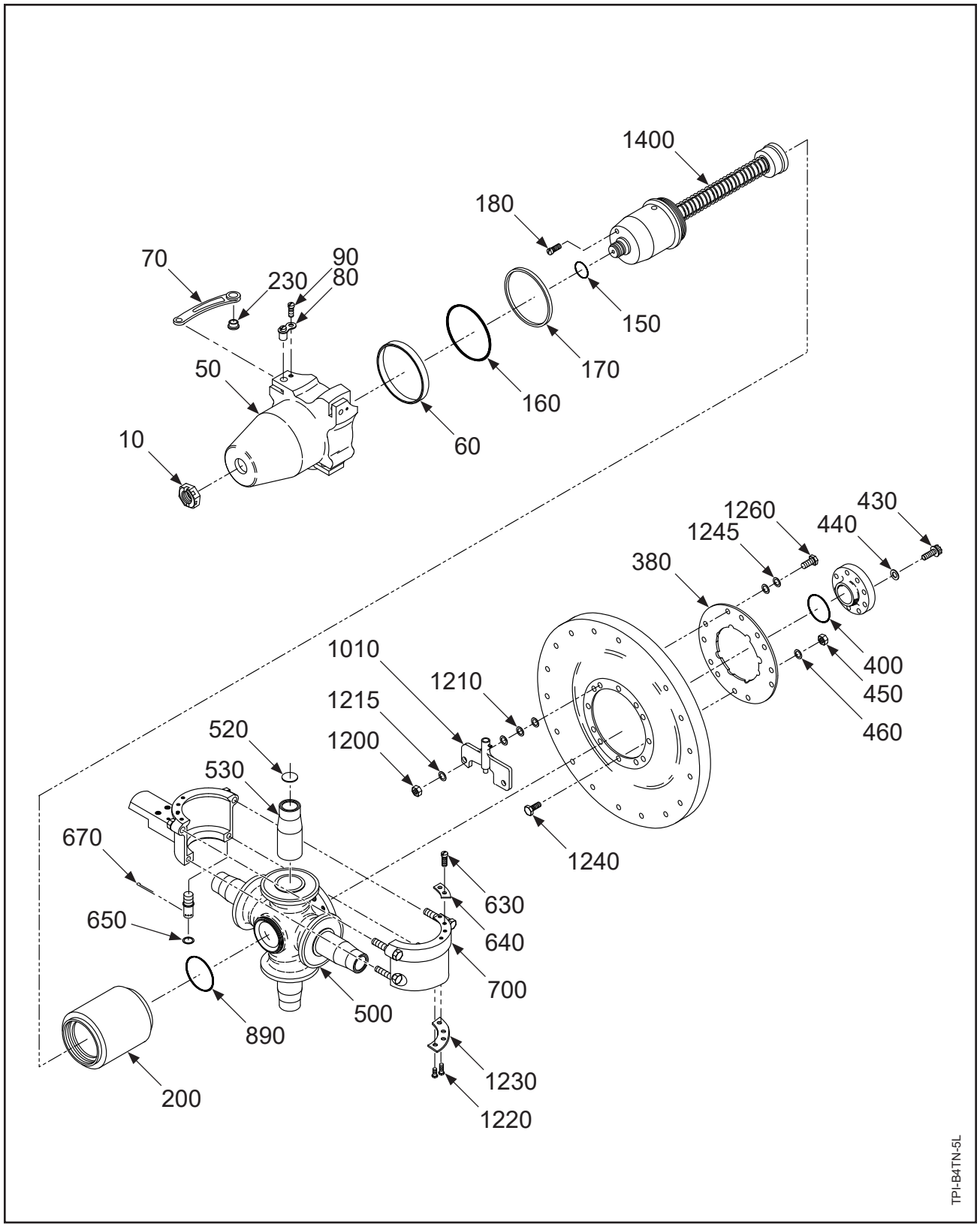
| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| F | WITH C-3410( )-( ) SPINNER | | |
| G | WITH C-3434( )-( ) SPINNER | | |
| H | WITH C-3410-( )( ) OR 5798( ) SPINNER | | |
| I | WITH C-3434( ) SPINNER | | |

- ITEM NOT ILLUSTRATED

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10-24** | | **HC-B4TN-5(A, C) PROPELLER ASSEMBLY** | | | | |
| **10A-1** | | **BLADE RETENTION PARTS**<br>**REFER TO THE A-1851-(T) BLADE RETENTION PARTS IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST** | | | | |
| | | **CLAMP ASSEMBLY**<br>**REFER TO THE APPLICABLE CLAMP ASSEMBLY IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST** | | | | |
| 700 | 838-67 | • PCP: CLAMP ASSEMBLY | | 4 | | PCP |
| | | **START LOCK ASSEMBLY**<br>**REFER TO THE APPLICABLE START LOCK ASSEMBLY IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST** | | | | |
| 1010 | 830-32 | • START LOCK - ASSEMBLY, REPLACED BY ITEM 1010A | | 4 | | |
| 1010A | 830-34 | • START LOCK - ASSEMBLY, REPLACES ITEM 1010<br>POST HC-SB-61-261 | | 4 | | |
| | | **SPRING ASSEMBLY**<br>**REFER TO THE APPLICABLE SPRING ASSEMBLY IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST** | | | | |
| 1400 | 831-72 | • SPRING ASSEMBLY | | 1 | | |
| | | **COUNTERWEIGHT SLUGS/MOUNTING HARDWARE** | | | | |
| -9040<br>-9050 | | • COUNTERWEIGHT SLUG<br>• HEX HEAD BOLT<br>APPLICATION SPECIFIC,<br>REFER TO HARTZELL PROPELLER APPLICATION GUIDE MANUAL 159 (61-02-59) FOR PART NUMBER AND PROPELLER CRITICAL PART (PCP) IDENTIFICATION | | | Y | |
| | | **SPINNER PARTS**<br>• APPLICATION SPECIFIC<br>REFER TO HARTZELL PROPELLER APPLICATION GUIDE MANUAL 159 (61-02-59) AND THE APPLICABLE HARTZELL PROPELLER SPINNER MAINTENANCE MANUAL:<br>MANUAL 127 (61-16-27) - METAL SPINNER ASSEMBLIES<br>MANUAL 148 (61-16-48) - COMPOSITE SPINNER ASSEMBLIES | | | | |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| | | | |

- ITEM NOT ILLUSTRATED




**HC-B4TN-(5AL, 5CL, 5DL, 5EL): Exploded View**
**Figure 10-25**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10-25** | | **HC-B4TN-(5AL, 5CL, 5DL, 5EL) PROPELLER ASSEMBLY** | | | | |
| 10 | A-880-2 | • NUT, HEX, SELF-LOCKING, THIN | | 1 | Y | |
| 50 | C-2303-5L | • PISTON UNIT | | 1 | | |
| 60 | A-862-1 | • • BUSHING, PLASTIC | | 1 | | |
| 70 | B-4016L | • LINK ARM | | 4 | | |
| 70A | B-1901L | • LINK ARM, ALTERNATE FOR ITEM 70 | | 4 | | |
| 80 | A-1464 | • LINK PIN UNIT | | 4 | Y | |
| 90 | B-3840-6 | • SCREW, 10-32, FILLISTER HEAD | | 4 | Y | |
| 150 | C-3317-116 | • O-RING | A | 1 | Y | |
| | C-3317-121 | • O-RING | B | 1 | Y | |
| 160 | C-3317-426-2 | • O-RING | | 1 | Y | |
| 170 | A-863 | • SEAL, DUST, PISTON, REPLACED BY ITEM 170A | | OBS | | |
| 170A | B-1843 | • SEAL, DUST, PISTON, REPLACES ITEM 170 | | 1 | Y | |
| 180 | B-3840-6 | • SCREW, 10-32, FILLISTER HEAD | | 4 | Y | |
| 200 | B-3406 | • CYLINDER | | 1 | | |
| 230 | A-944 | • SLEEVE, LINKSCREW | | 3 | Y | |
| 380 | B-3408 | • PLATE, MOUNTING, SPINNER, REPLACED BY ITEM 380A | | OBS | | |
| 380A | C-3492 | • PLATE, MOUNTING, SPINNER, REPLACES ITEM 380 POST HC-SB-61-261 | | 1 | | |
| 400 | C-3317-230 | • O-RING | | 1 | Y | |
| 430 | B-3339 | • BOLT, MOUNTING, 9/16-18, 12 POINT | | 8 | Y | |
| 440 | A-2048-2 | • WASHER, MOUNTING, 9/16" CSK | | 8 | Y | |
| 450 | B-3808-4 | • NUT, HEX, SELF-LOCKING | | 4 | Y | |
| 460 | B-3851-0432 | • WASHER | | AR | Y | |
| 500 | 840-91 | • PCP: HUB UNIT, REPLACED BY ITEM 500A | | OBS | | PCP |
| 500A | 840-139 | • PCP: HUB UNIT, REPLACES ITEM 500, POST HC-SB-61-261 | | 1 | | PCP |
| 520 | B-3897-1 | • • PLUG, EXPANSION | | 4 | Y | |
| 530 | A-1891-A | • • PILOT TUBE | | 4 | | |
| 630 | B-3840-6 | • SCREW, 10-32, FILLISTER HEAD | | AR | Y | |
| 640 | A-1305 | • BALANCE WEIGHT | | AR | | |
| 650 | A-6119 | • BUSHING, LINK ARM | | 4 | Y | |
| 670 | B-3838-3-3 | • COTTER PIN | | 4 | Y | |
| 890 | C-3317-240 | • O-RING | | 1 | Y | |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| A | HC-B4TN-5AL | | |
| B | HC-B4TN-(5C,5D,5E)L | | |

- ITEM NOT ILLUSTRATED

**HC-B4TN-(5AL, 5CL, 5DL, 5EL), page 1 of 3**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10-25** | | **HC-B4TN-(5AL, 5CL, 5DL, 5EL) PROPELLER ASSEMBLY** | | | | |
| 1200 | H10-4 | • NUT, KAYLOCK, REPLACED BY ITEM 1200A | | OBS | | |
| 1200A | B-3808-4 | • NUT, HEX, SELF-LOCKING, REPLACES ITEM 1200 | | 8 | Y | |
| 1210 | B-3851-0463 | • WASHER | | AR | Y | |
| 1215 | B-3851-0432 | • WASHER | | 8 | Y | |
| 1220 | A-2016 | • BOLT, 10-32, HEX HEAD, PLATE | | 8 | Y | |
| 1220A | A-2016-2 | • BOLT, 10-32, HEX HEAD, ALTERNATE FOR ITEM 1220 | | 8 | Y | |
| -1225 | B-3851-0363 | • WASHER (USE WITH ITEM 1220A ONLY) | | 8 | Y | |
| 1230 | A-3086-1 | • PLATE, START LOCK, REPLACED BY ITEM 1230A | A | 4 | | |
| | A-3486 | • PLATE, START LOCK, REPLACED BY ITEM 1230A | B | 4 | | |
| 1230A | A-3495 | • PLATE, START LOCK, REPLACES ITEM 1230 POST HC-SB-61-261 | | 4 | | |
| 1240 | B-3384-3H | • BOLT, 1/4-28, HEX HEAD | F | 4 | Y | |
| | B-3384-5H | • BOLT, 1/4-28, HEX HEAD | G | 4 | Y | |
| 1245 | B-3851-0432 | • WASHER | | 16 | Y | |
| 1260 | B-3384-10H | • BOLT, 1/4-28, HEX HEAD | H | 8 | Y | |
| | B-3384-12H | • BOLT, 1/4-28, HEX HEAD | I | 8 | Y | |

| EFFECTIVITY | MODEL |
|---|---|
| A | HC-B4TN-5AL |
| B | HC-B4TN-(5C,5D,5E)L |

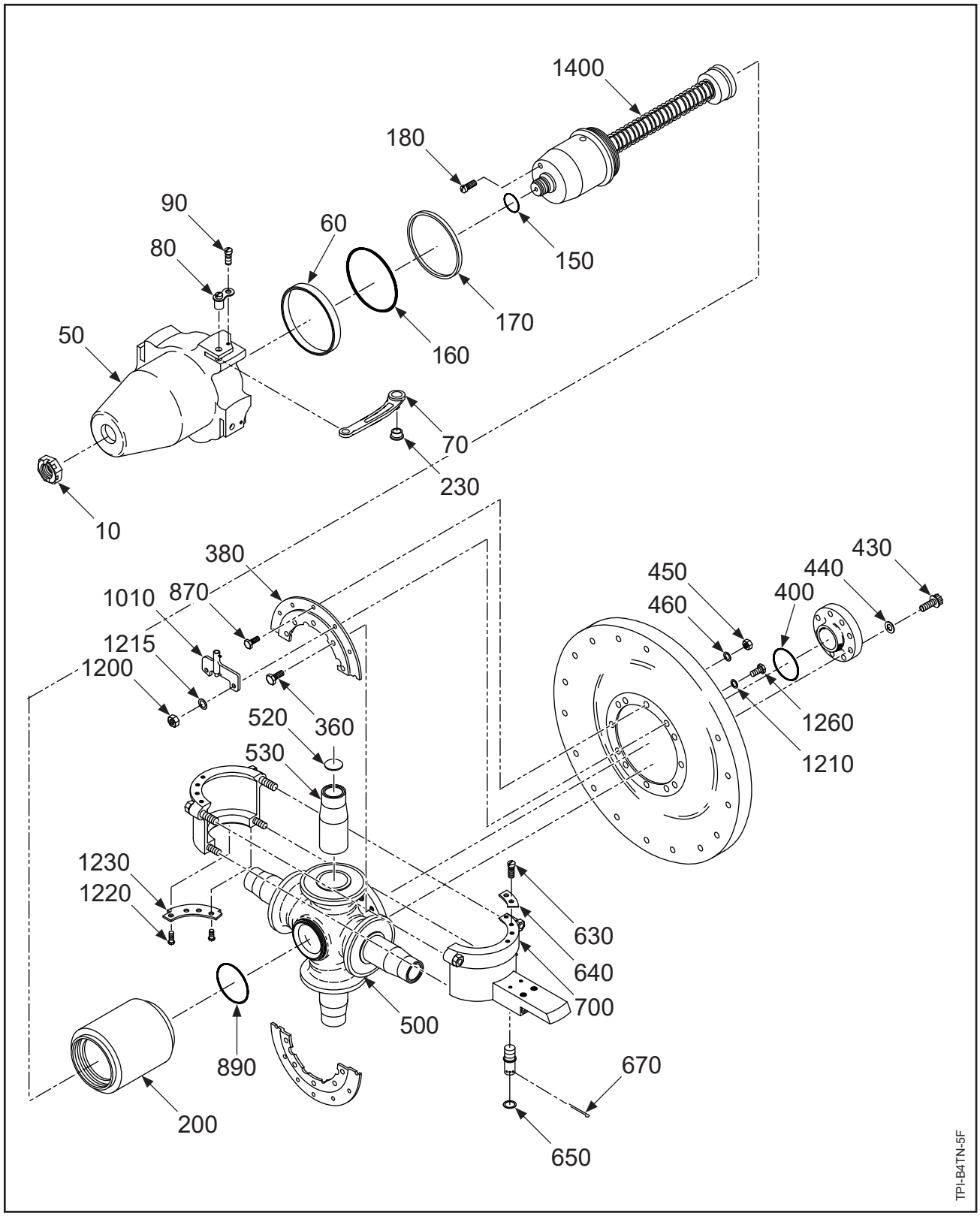
| EFFECTIVITY | MODEL |
|---|---|
| F | WITH C-3410-( )( ) SPINNER |
| G | WITH C-3434( )-( ) SPINNER |
| H | WITH C-3410-( )( ) OR 5798( ) SPINNER |
| I | WITH C-3434( )-( ) SPINNER |

- ITEM NOT ILLUSTRATED

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10-25** | | **HC-B4TN-(5AL, 5CL, 5DL, 5EL) PROPELLER ASSEMBLY** | | | | |
| **10A-1** | | **BLADE RETENTION PARTS**<br>**REFER TO THE A-1851-(T) BLADE RETENTION PARTS IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST** | | | | |
| | | **CLAMP ASSEMBLY**<br>**REFER TO THE APPLICABLE CLAMP ASSEMBLY IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST** | | | | |
| 700 | 838-67L | • PCP: CLAMP ASSEMBLY | A | 4 | | PCP |
| | 838-92L | • PCP: CLAMP ASSEMBLY | B | 4 | | PCP |
| | 838-98L | • PCP: CLAMP ASSEMBLY | C | 4 | | PCP |
| | | **START LOCK ASSEMBLY**<br>**REFER TO THE APPLICABLE START LOCK ASSEMBLY IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST** | | | | |
| 1010 | 830-32L | • START LOCK - ASSEMBLY, REPLACED BY ITEM 1010A | | 4 | | |
| 1010A | 830-34L | • START LOCK - ASSEMBLY, REPLACES ITEM 1010<br>POST HC-SB-61-261 | | 4 | | |
| | | **SPRING ASSEMBLY**<br>**REFER TO THE APPLICABLE SPRING ASSEMBLY IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST** | | | | |
| 1400 | 831-72 | • SPRING ASSEMBLY | | 1 | | |
| | | **COUNTERWEIGHT SLUGS/MOUNTING HARDWARE** | | | | |
| -9040<br>-9050 | | • COUNTERWEIGHT SLUG<br>• HEX HEAD BOLT<br>APPLICATION SPECIFIC,<br>REFER TO HARTZELL PROPELLER APPLICATION GUIDE MANUAL 159 (61-02-59) FOR PART NUMBER AND PROPELLER CRITICAL PART (PCP) IDENTIFICATION | | | Y | |
| | | **SPINNER PARTS**<br>• APPLICATION SPECIFIC<br>REFER TO HARTZELL PROPELLER APPLICATION GUIDE MANUAL 159 (61-02-59) AND THE APPLICABLE HARTZELL PROPELLER SPINNER MAINTENANCE MANUAL:<br>MANUAL 127 (61-16-27) - METAL SPINNER ASSEMBLIES<br>MANUAL 148 (61-16-48) - COMPOSITE SPINNER ASSEMBLIES | | | | |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| A | HC-B4TN-(5A,5C)L | | |
| B | HC-B4TN-5DL | | |
| C | HC-B4TN-5EL | | |

- ITEM NOT ILLUSTRATED




**HC-B4TN-5F: Exploded View**
**Figure 10-26**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10-26** | | **HC-B4TN-5F PROPELLER ASSEMBLY** | | | | |
| 10 | A-880-2 | • NUT, HEX, SELF-LOCKING, THIN | | 1 | Y | |
| 50 | C-2303-5 | • PISTON UNIT | | 1 | | |
| 60 | A-862-7 | • • BUSHING, PLASTIC | | 1 | | |
| 70 | B-4016 | • LINK ARM | | 4 | | |
| 70A | B-1901 | • LINK ARM, ALTERNATE FOR ITEM 70 | | 4 | | |
| 80 | A-1464 | • LINK PIN UNIT | | 4 | Y | |
| 90 | B-3840-6 | • SCREW, 10-32, FILLISTER HEAD | | 4 | Y | |
| 150 | C-3317-121 | • O-RING | | 1 | Y | |
| 160 | C-3317-426-2 | • O-RING | | 1 | Y | |
| 170 | A-863 | • SEAL, DUST, PISTON, REPLACED BY ITEM 170A | | OBS | | |
| 170A | B-1843 | • SEAL, DUST, PISTON, REPLACES ITEM 170 | | 1 | Y | |
| 180 | B-3840-6 | • SCREW, 10-32, FILLISTER HEAD | | 4 | Y | |
| 200 | B-3406 | • CYLINDER | | 1 | | |
| 230 | A-944 | • SLEEVE, LINKSCREW | | 4 | Y | |
| 360 | A-2051 | • BOLT, 5/16-24, HEX HEAD, REPLACED BY ITEM 360A | | OBS | | |
| 360A | A-2051-1 | • BOLT, 5/16-24, HEX HEAD, REPLACES ITEM 360 | | 10 | Y | |
| 380 | C-3492 | • PLATE, MOUNTING, SPINNER | | 1 | | |
| 400 | C-3317-230 | • O-RING | | 1 | Y | |
| 430 | B-3339 | • BOLT, MOUNTING, 9/16-18, 12 POINT | | 8 | Y | |
| 440 | A-2048-2 | • WASHER, MOUNTING, 9/16" CSK | | 8 | Y | |
| 450 | B-3808-4 | • NUT, HEX, SELF-LOCKING | | 4 | Y | |
| 460 | B-3851-0432 | • WASHER | | AR | Y | |
| 500 | 840-139 | • PCP: HUB UNIT | | 1 | | PCP |
| 520 | B-3897-1 | • • PLUG, EXPANSION | | 4 | Y | |
| 530 | A-1891-A | • • PILOT TUBE | | 4 | | |
| 630 | B-3840-6 | • SCREW, 10-32, FILLISTER HEAD | | AR | Y | |
| 640 | A-1305 | • BALANCE WEIGHT | | AR | | |
| 650 | A-6119 | • BUSHING, LINK ARM | | 4 | Y | |
| 670 | B-3838-3-3 | • COTTER PIN | | 4 | Y | |
| 870 | B-3384-3H | • BOLT, 1/4-28, HEX HEAD | H | 4 | Y | |
| | B-3384-5H | • BOLT, 1/4-28, HEX HEAD | I | 4 | Y | |
| 890 | C-3317-240 | • O-RING | | 1 | Y | |
| 1200 | B-3808-4 | • NUT, HEX, SELF-LOCKING | | 8 | Y | |
| 1210 | B-3851-0463 | • WASHER | | AR | Y | |
| 1215 | B-3851-0432 | • WASHER | | 8 | Y | |
| 1220 | A-2016 | • BOLT, 10-32, HEX HEAD, PLATE | | 8 | Y | |
| 1220A | A-2016-2 | • BOLT, 10-32, HEX HEAD, ALTERNATE FOR ITEM 1220 | | 8 | Y | |
| -1225 | B-3851-0363 | • WASHER (USE WITH ITEM 1220A ONLY) | | 8 | Y | |
| 1230 | A-3079 | • PLATE, START LOCK | | 4 | | |
| 1260 | B-3384-10H | • BOLT, 1/4-28, HEX HEAD | H | 8 | Y | |
| | B-3384-12H | • BOLT, 1/4-28, HEX HEAD | I | 8 | Y | |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| H | WITH C-3410-( ) OR D-5798( ) SPINNER | | |
| I | WITH D-3434( ) SPINNER | | |

- ITEM NOT ILLUSTRATED

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10-26** | | **HC-B4TN-5F PROPELLER ASSEMBLY** | | | | |
| **10A-1** | | **BLADE RETENTION PARTS** | | | | |
| | | **REFER TO THE A-1851-(T) BLADE RETENTION PARTS IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST** | | | | |
| | | **CLAMP ASSEMBLY** | | | | |
| | | **REFER TO THE APPLICABLE CLAMP ASSEMBLY IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST** | | | | |
| 700 | 838-67 | • PCP: CLAMP ASSEMBLY | | 4 | | PCP |
| | | **START LOCK ASSEMBLY** | | | | |
| | | **REFER TO THE APPLICABLE START LOCK ASSEMBLY IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST** | | | | |
| 1010 | 830-34 | • START LOCK - ASSEMBLY | | 4 | | |
| | | **SPRING ASSEMBLY** | | | | |
| | | **REFER TO THE APPLICABLE SPRING ASSEMBLY IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST** | | | | |
| 1400 | 831-72 | • SPRING ASSEMBLY | | 1 | | |
| | | **COUNTERWEIGHT SLUGS/MOUNTING HARDWARE** | | | | |
| -9040 | | • COUNTERWEIGHT SLUG | | | | |
| -9050 | | • HEX HEAD BOLT<br>APPLICATION SPECIFIC,<br>REFER TO HARTZELL PROPELLER APPLICATION GUIDE MANUAL 159 (61-02-59) FOR PART NUMBER AND PROPELLER CRITICAL PART (PCP) IDENTIFICATION | | | Y | |
| | | **SPINNER PARTS** | | | | |
| | | • APPLICATION SPECIFIC<br>REFER TO HARTZELL PROPELLER APPLICATION GUIDE MANUAL 159 (61-02-59) AND THE APPLICABLE HARTZELL PROPELLER SPINNER MAINTENANCE MANUAL:<br>MANUAL 127 (61-16-27) - METAL SPINNER ASSEMBLIES<br>MANUAL 148 (61-16-48) - COMPOSITE SPINNER ASSEMBLIES | | | | |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| | | | |

- ITEM NOT ILLUSTRATED

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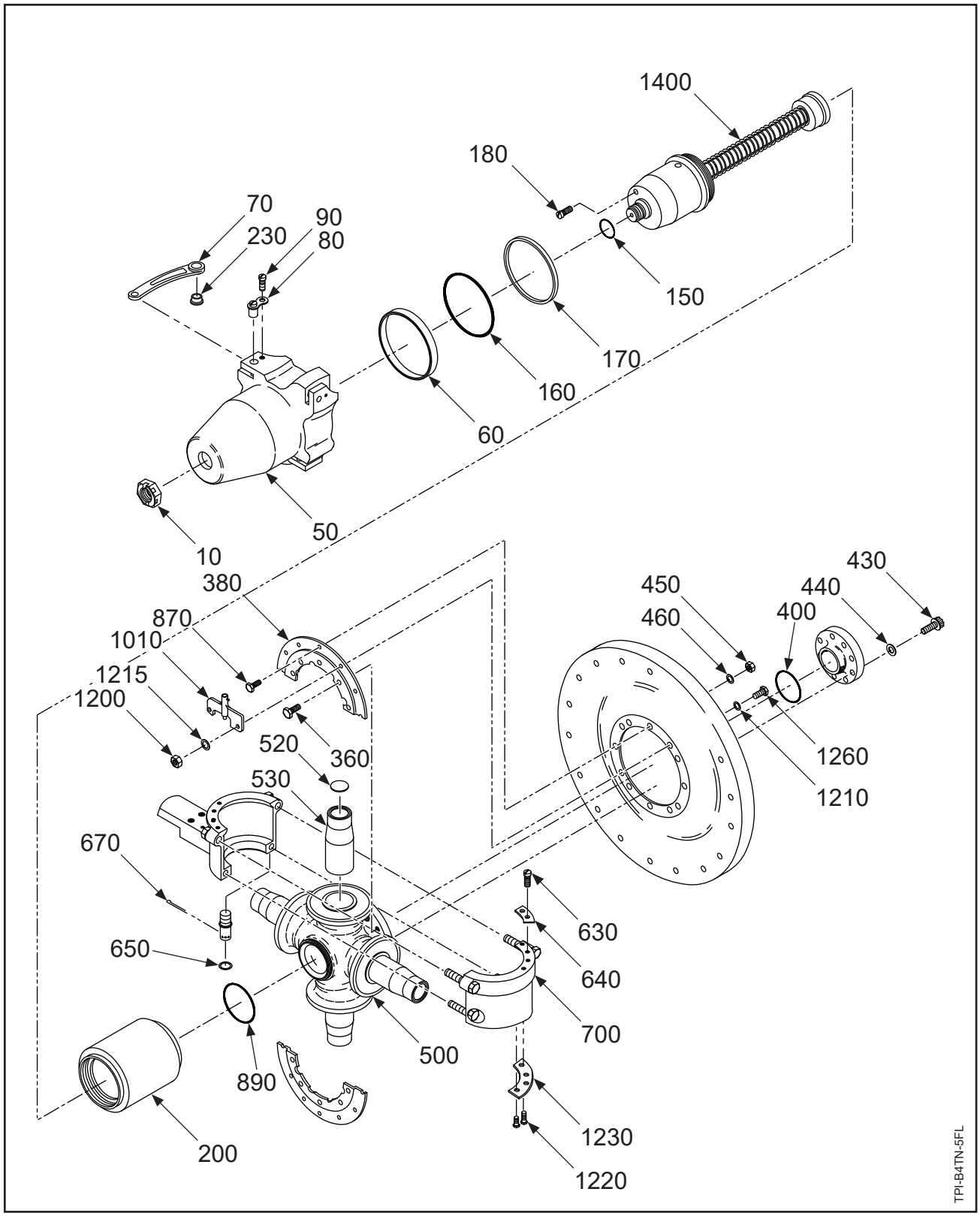


**HC-B4TN-(5FL, 5GL, 5HL): Exploded View**
**Figure 10-27**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10-27** | | **HC-B4TN-(5FL, 5GL, 5HL) PROPELLER ASSEMBLY** | | | | |
| 10 | A-880-2 | • NUT, HEX, SELF-LOCKING, THIN | | 1 | Y | |
| 50 | C-2303-5L | • PISTON UNIT | | 1 | | |
| 60 | A-862-7 | • • BUSHING, PLASTIC | | 1 | | |
| 70 | B-4016L | • LINK ARM | | 4 | | |
| 70A | B-1901L | • LINK ARM - ALTERNATE FOR ITEM 70 | | 4 | | |
| 80 | A-1464 | • LINK PIN UNIT | | 4 | Y | |
| 90 | B-3840-6 | • SCREW, 10-32, FILLISTER HEAD | | 4 | Y | |
| 150 | C-3317-121 | • O-RING | | 1 | Y | |
| 160 | C-3317-426-2 | • O-RING | | 1 | Y | |
| 170 | A-863 | • SEAL, DUST, PISTON, REPLACED BY ITEM 170A | | OBS | | |
| 170A | B-1843 | • SEAL, DUST, PISTON, REPLACES ITEM 170 | | 1 | Y | |
| 180 | B-3840-6 | • SCREW, 10-32, FILLISTER HEAD | | 4 | Y | |
| 200 | B-3406 | • CYLINDER | | 1 | | |
| 230 | A-944 | • SLEEVE, LINKSCREW | | 4 | Y | |
| 360 | A-2051 | • BOLT, 5/16-24, HEX HEAD, REPLACED BY ITEM 360A | | OBS | | |
| 360A | A-2051-1 | • BOLT, 5/16-24, HEX HEAD, REPLACES ITEM 360 | | 10 | Y | |
| 380 | C-3492 | • PLATE, MOUNTING, SPINNER | | 1 | | |
| 400 | C-3317-230 | • O-RING | | 1 | Y | |
| 430 | B-3339 | • BOLT, MOUNTING, 9/16-18, 12 POINT | | 8 | Y | |
| 440 | A-2048-2 | • WASHER, MOUNTING, 9/16" CSK | | 8 | Y | |
| 450 | B-3808-4 | • NUT, HEX, SELF-LOCKING | | 4 | Y | |
| 460 | B-3851-0432 | • WASHER | | AR | Y | |
| 500 | 840-139 | • PCP: HUB UNIT | | RF | | PCP |
| 520 | B-3897-1 | • • PLUG, EXPANSION | | 4 | Y | |
| 530 | A-1891-A | • • PILOT TUBE | | 4 | | |
| 630 | B-3840-6 | • SCREW, 10-32, FILLISTER HEAD | | AR | Y | |
| 640 | A-1305 | • BALANCE WEIGHT | | AR | | |
| 650 | A-6119 | • BUSHING, LINK ARM | | 4 | Y | |
| 670 | B-3838-3-3 | • COTTER PIN | | 4 | Y | |
| 870 | B-3384-3H | • BOLT, 1/4-28, HEX HEAD | H | 4 | Y | |
| | B-3384-5H | • BOLT, 1/4-28, HEX HEAD | I | 4 | Y | |
| 890 | C-3317-240 | • O-RING | | 1 | Y | |
| 1200 | B-3808-4 | • NUT, HEX, SELF-LOCKING | | 8 | Y | |
| 1210 | B-3851-0463 | • WASHER | | AR | Y | |
| 1215 | B-3851-0432 | • WASHER | | 8 | Y | |
| 1220 | A-2016 | • BOLT, 10-32, HEX HEAD | | 8 | Y | |
| 1220A | A-2016-2 | • BOLT, 10-32, HEX HEAD, ALTERNATE FOR ITEM 1220 | | 8 | Y | |
| -1225 | B-3851-0363 | • WASHER (USE ONLY WITH ITEM 1220A) | | 8 | Y | |
| 1230 | A-3495 | • PLATE, START LOCK | | 4 | | |
| 1260 | B-3384-10H | • BOLT, 1/4-28, HEX HEAD | H | 8 | Y | |
| | B-3384-12H | • BOLT, 1/4-28, HEX HEAD | I | 8 | Y | |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| H | WITH C-3410-( ) OR D-5798( ) SPINNER | | |
| I | WITH D-3434( ) SPINNER | | |

- ITEM NOT ILLUSTRATED

**HC-B4TN-(5FL, 5GL, 5HL), page 1 of 2**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| 10-27 | | HC-B4TN-(5FL, 5GL, 5HL) PROPELLER ASSEMBLY | | | | |
| 10A-1 | | BLADE RETENTION PARTS | | | | |
| | | REFER TO THE A-1851-(T) BLADE RETENTION PARTS IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST | | | | |
| | | CLAMP ASSEMBLY | | | | |
| | | REFER TO THE APPLICABLE CLAMP ASSEMBLY IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST | | | | |
| 700 | 838-67L | • PCP: CLAMP ASSEMBLY | A | 4 | | PCP |
| | 838-92L | • PCP: CLAMP ASSEMBLY | B | 4 | | PCP |
| | 838-98L | • PCP: CLAMP ASSEMBLY | C | 4 | | PCP |
| | | START LOCK ASSEMBLY | | | | |
| | | REFER TO THE APPLICABLE START LOCK ASSEMBLY IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST | | | | |
| 1010 | 830-34L | • START LOCK - ASSEMBLY | | 4 | | |
| | | SPRING ASSEMBLY | | | | |
| | | REFER TO THE APPLICABLE SPRING ASSEMBLY IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST | | | | |
| 1400 | 831-72 | • SPRING ASSEMBLY | | 1 | | |
| | | COUNTERWEIGHT SLUGS/MOUNTING HARDWARE | | | | |
| -9040 | | • COUNTERWEIGHT SLUG | | | | |
| -9050 | | • HEX HEAD BOLT<br>APPLICATION SPECIFIC,<br>REFER TO HARTZELL PROPELLER APPLICATION GUIDE MANUAL 159 (61-02-59) FOR PART NUMBER AND PROPELLER CRITICAL PART (PCP) IDENTIFICATION | | | Y | |
| | | SPINNER PARTS | | | | |
| | | • APPLICATION SPECIFIC<br>REFER TO HARTZELL PROPELLER APPLICATION GUIDE MANUAL 159 (61-02-59) AND THE APPLICABLE HARTZELL PROPELLER SPINNER MAINTENANCE MANUAL:<br>MANUAL 127 (61-16-27) - METAL SPINNER ASSEMBLIES<br>MANUAL 148 (61-16-48) - COMPOSITE SPINNER ASSEMBLIES | | | | |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| A | HC-B4TN-5FL | | |
| B | HC-B4TN-5GL | | |
| C | HC-B4TN-5HL | | |

- ITEM NOT ILLUSTRATED

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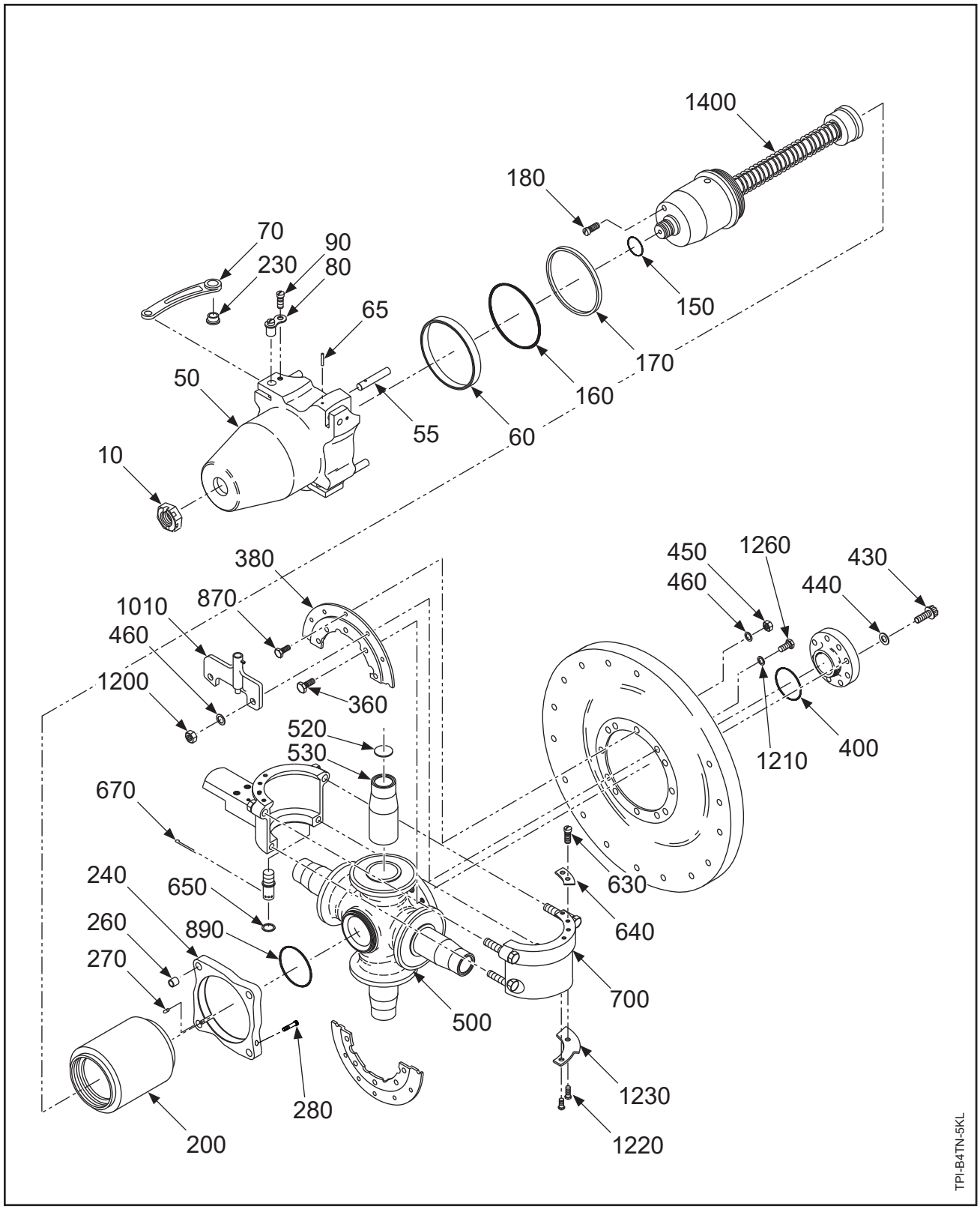



**HC-B4TN-(5JL, 5KL, 5ML, 5NL, 5PL, 5QL): Exploded View**
**Figure 10-28**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10-28** | | **HC-B4TN-(5JL, 5KL, 5ML, 5NL, 5PL, 5QL) PROPELLER ASSEMBLY** | | | | |
| 10 | A-880-2 | • NUT, HEX, SELF-LOCKING, THIN | | 1 | Y | |
| 50 | C-2303-6L | • PISTON UNIT | | 1 | | |
| 55 | A-717 | • • ROD, GUIDE, PISTON | | 4 | | |
| 60 | A-862-7 | • • BUSHING, PLASTIC | | 1 | | |
| 65 | A-114-A | • • DOWEL PIN | | 4 | | |
| 70 | B-4016L | • LINK ARM | | 4 | | |
| 70A | B-1901L | • LINK ARM, ALTERNATE FOR ITEM 70 | | 4 | | |
| 80 | A-1464 | • LINK PIN UNIT | | 4 | Y | |
| 90 | B-3840-6 | • SCREW, 10-32, FILLISTER HEAD | | 4 | Y | |
| 150 | C-3317-121 | • O-RING | | 1 | Y | |
| 160 | C-3317-426-2 | • O-RING | | 1 | Y | |
| 170 | A-863 | • SEAL, DUST, PISTON, REPLACED BY ITEM 170A | | OBS | | |
| 170A | B-1843 | • SEAL, DUST, PISTON, REPLACES ITEM 170 | | 1 | Y | |
| 180 | B-3840-6 | • SCREW, 10-32, FILLISTER HEAD | | 4 | Y | |
| 200 | B-3406 | • CYLINDER | | 1 | | |
| 230 | A-944 | • SLEEVE, LINKSCREW | | 4 | Y | |
| 240 | 834-13 | • GUIDE COLLAR UNIT | | 1 | | |
| 260 | A-3023 | • • BUSHING, PLASTIC | | 4 | | |
| 270 | A-114-C | • • DOWEL PIN | | 1 | | |
| 280 | A-2038-14 | • • SCREW, 1/4-28, CAP | | 1 | Y | |
| 360 | A-2051 | • BOLT, 5/16-24, HEX HEAD, REPLACED BY ITEM 360A | | OBS | | |
| 360A | A-2051-1 | • BOLT, 5/16-24, HEX HEAD, REPLACES ITEM 360 | | 10 | Y | |
| 380 | C-3492 | • PLATE, MOUNTING, SPINNER | | 1 | | |
| 400 | C-3317-230 | • O-RING | | 1 | Y | |
| 430 | B-3339 | • BOLT, MOUNTING, 9/16-18, 12 POINT | | 8 | Y | |
| 440 | A-2048-2 | • WASHER, MOUNTING, 9/16" CSK | | 8 | Y | |
| 450 | B-3808-4 | • NUT, HEX, SELF-LOCKING | | 4 | Y | |
| 460 | B-3851-0432 | • WASHER | | AR | Y | |
| 500 | 840-139 | • PCP: HUB UNIT | | RF | | PCP |
| 520 | B-3897-1 | • • PLUG, EXPANSION | | 4 | Y | |
| 530 | A-1891-( )A | • • PILOT TUBE | | 4 | | |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| | | | |

- ITEM NOT ILLUSTRATED

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10-28** | | **HC-B4TN-(5JL, 5KL, 5ML, 5NL, 5PL, 5QL) PROPELLER ASSEMBLY** | | | | |
| 630 | B-3840-6 | • SCREW, 10-32, FILLISTER HEAD | | AR | Y | |
| 640 | A-1305 | • BALANCE WEIGHT | | AR | | |
| 650 | A-6119 | • BUSHING, LINK ARM | | 4 | Y | |
| 670 | B-3838-3-3 | • COTTER PIN | | 4 | Y | |
| 870 | B-3384-3H | • BOLT, 1/4-28, HEX HEAD | H | 4 | Y | |
| | B-3384-5H | • BOLT, 1/4-28, HEX HEAD | I | 4 | Y | |
| 890 | C-3317-240 | • O-RING | | 1 | Y | |
| 1200 | B-3808-4 | • NUT, HEX, SELF-LOCKING | | 8 | Y | |
| 1210 | B-3851-0463 | • WASHER | | AR | Y | |
| 1220 | A-2016 | • BOLT, 10-32, HEX HEAD, PLATE | | 8 | Y | |
| 1220A | A-2016-2 | • BOLT, 10-32, HEX HEAD, ALTERNATE FOR ITEM 1220 | | 8 | Y | |
| -1225 | B-3851-0363 | • WASHER (USE ONLY WITH ITEM 1220A) | | 8 | Y | |
| 1230 | A-3495 | • PLATE, START LOCK | | 4 | | |
| 1260 | B-3384-10H | • BOLT, 1/4-28, HEX HEAD | H | 8 | Y | |
| | B-3384-12H | • BOLT, 1/4-28, HEX HEAD | I | 8 | Y | |

| EFFECTIVITY | MODEL |
|---|---|

| EFFECTIVITY | MODEL |
|---|---|
| H | WITH C-3410-( ) OR D-5798-( ) SPINNER |
| I | WITH D-3434-( ) SPINNER |

- ITEM NOT ILLUSTRATED

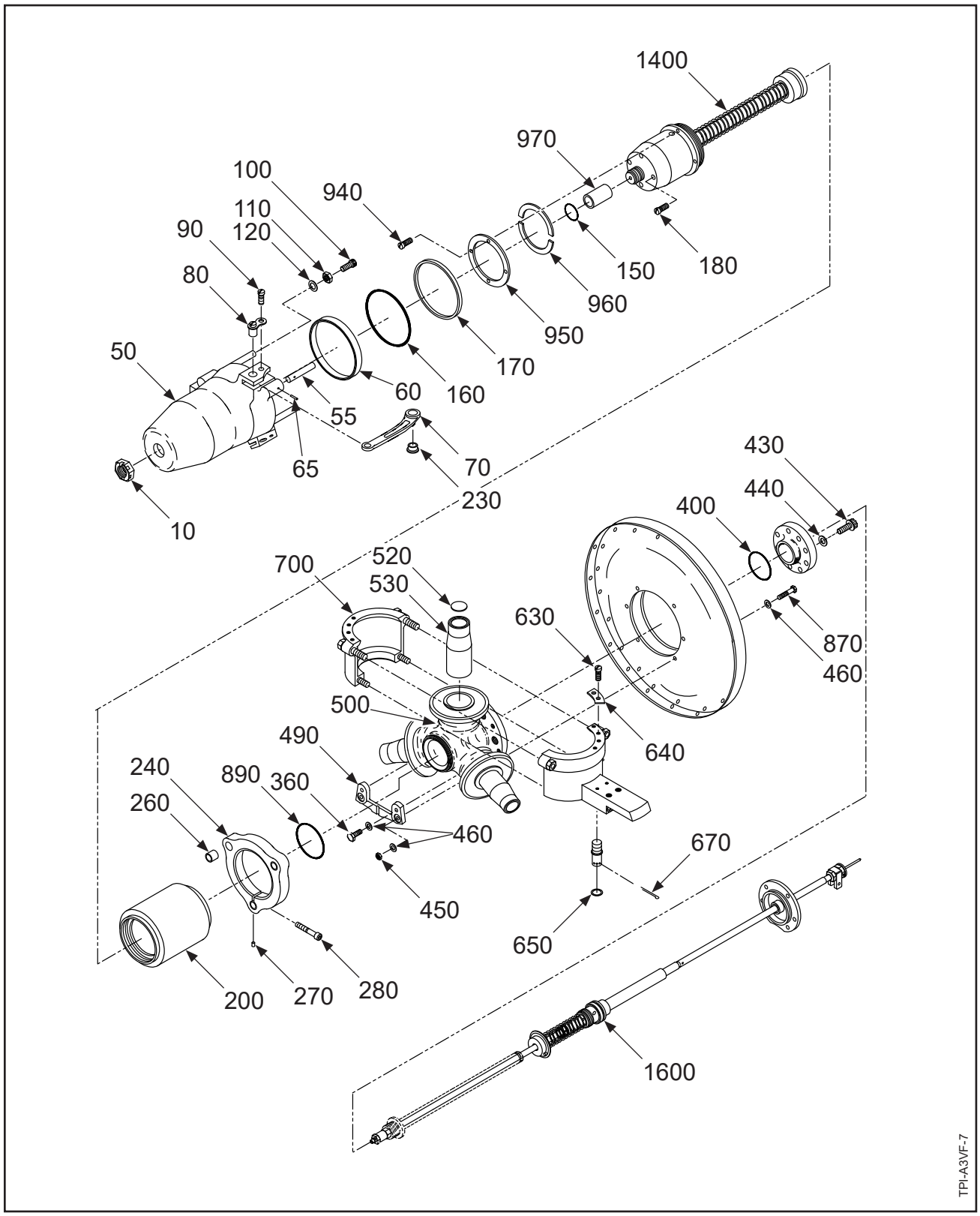
| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10-28** | | **HC-B4TN-(5JL, 5KL, 5ML, 5NL, 5PL, 5QL) PROPELLER ASSEMBLY** | | | | |
| **10A-1** | | **BLADE RETENTION PARTS**<br>**REFER TO THE A-1851-(T) BLADE RETENTION PARTS IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST** | | | | |
| | | **CLAMP ASSEMBLY**<br>**REFER TO THE APPLICABLE CLAMP ASSEMBLY IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST** | | | | |
| 700 | 838-92L | • PCP: CLAMP ASSEMBLY | -5JL,-5ML, -5PL | 4 | | PCP |
| | 838-98L | • PCP: CLAMP ASSEMBLY | -5KL,-5NL, -5QL | 4 | | PCP |
| | | **START LOCK ASSEMBLY**<br>**REFER TO THE APPLICABLE START LOCK ASSEMBLY IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST** | | | | |
| -1010 | 830-34L | • START LOCK - ASSEMBLY | | 4 | | |
| | | **SPRING ASSEMBLY**<br>**REFER TO THE APPLICABLE SPRING ASSEMBLY IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST** | | | | |
| 1400 | 831-72 | • SPRING ASSEMBLY | -5JL,-5KL, -5ML,-5NL, -5PL, B | 1 | | |
| | 831-73 | • SPRING ASSEMBLY | -5QL, A | 1 | | |
| | | **COUNTERWEIGHT SLUGS/MOUNTING HARDWARE** | | | | |
| -9040 | | • COUNTERWEIGHT SLUG | | | | |
| -9050 | | • HEX HEAD BOLT<br>APPLICATION SPECIFIC,<br>REFER TO HARTZELL PROPELLER APPLICATION GUIDE MANUAL 159 (61-02-59) FOR PART NUMBER AND PROPELLER CRITICAL PART (PCP) IDENTIFICATION | | | Y | |
| | | **SPINNER PARTS**<br>• APPLICATION SPECIFIC<br>REFER TO HARTZELL PROPELLER APPLICATION GUIDE MANUAL 159 (61-02-59) AND THE APPLICABLE HARTZELL PROPELLER SPINNER MAINTENANCE MANUAL:<br>MANUAL 127 (61-16-27) - METAL SPINNER ASSEMBLIES<br>MANUAL 148 (61-16-48) - COMPOSITE SPINNER ASSEMBLIES | | | | |

| EFFECTIVITY | MODEL |
|---|---|
| -5JL | HC-B4TN-5JL |
| -5KL | HC-B4TN-5KL |
| -5ML | HC-B4TN-5ML |
| -5NL | HC-B4TN-5NL |
| -5PL | HC-B4TN-5PL |
| -5QL | HC-B4TN-5QL |

| EFFECTIVITY | MODEL |
|---|---|
| A | HC-B4TN-5NL DEHAVILLAND<br>STC-SA09866SC TEXAS TURBINES ONLY. |
| B | DOES NOT INCLUDE HC-B4TN-5NL DEHAVILLAND<br>STC-SA09866SC TEXAS TURBINES. |

- ITEM NOT ILLUSTRATED

**HC-B4TN-(5JL, 5KL, 5ML, 5NL, 5PL, 5QL), page 3 of 3**




**HC-A3(MV,V)F-7(A, B): Exploded View**
**Figure 10-29**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10-29** | | **HC-A3(MV,V)F-7(A, B) PROPELLER ASSEMBLY** | | | | |
| 10 | A-880-1 | • NUT, HEX, SELF-LOCKING, THIN | | 1 | Y | |
| 50 | C-1451-2 | • PISTON UNIT | | 1 | | |
| 55 | A-817-1 | • • ROD, GUIDE, PISTON | | 3 | | |
| 60 | A-862 | • • BUSHING, PLASTIC | | 1 | | |
| 65 | A-114-B | • • DOWEL PIN, SUPERSEDED BY ITEM 65A | | 3 | | |
| 65A | B-6582-0875 | • • SPRING PIN, 3/16", CRES, SUPERSEDES ITEM 65 | | 3 | | |
| 70 | B-1901 | • LINK ARM | | 3 | | |
| 80 | A-1464 | • LINK PIN UNIT | | 3 | Y | |
| 90 | B-3840-6 | • SCREW, 10-32, FILLISTER HEAD | | 3 | Y | |
| 100 | A-2037 | • SCREW, 5/16, CAP | | 3 | Y | |
| 110 | B-3368 | • NUT, 5/16-24, HEX, THIN | | 3 | Y | |
| 120 | A-1444 | • WASHER, 5/16", REPLACED BY ITEM 120A | | OBS | | |
| 120A | A-1444-1 | • WASHER, 5/16", REPLACES ITEM 120 | | 3 | Y | |
| 150 | C-3317-020 | • O-RING, PILOT TUBE | | 1 | Y | |
| -155 | C-3317-012-2 | • O-RING, ROD | | 1 | Y | |
| 160 | C-3317-343-2 | • O-RING, PISTON | | 1 | Y | |
| 170 | A-863 | • SEAL, DUST, PISTON, REPLACED BY ITEM 170A | | OBS | | |
| 170A | B-1843 | • SEAL, DUST, PISTON, REPLACES ITEM 170 | | 1 | Y | |
| 180 | B-3720 | • BOLT, 10-32, HEX HEAD | | 4 | Y | |
| 200 | B-854-1 | • CYLINDER | | 1 | | |
| 230 | A-944 | • SLEEVE, LINKSCREW | | 3 | Y | |
| 240 | 834-1A | • GUIDE COLLAR UNIT | | 1 | | |
| 260 | A-116-D1 | • • BUSHING, PLASTIC | | 3 | | |
| 270 | A-114-C | • • DOWEL PIN | | 1 | | |
| 280 | A-2038-12 | • • SCREW, 1/4-28, CAP | | 1 | Y | |
| 240A | 834-1B | • GUIDE COLLAR UNIT, ALTERNATE FOR ITEM 240 | | 1 | | |
| 260 | A-116-D1 | • • BUSHING, PLASTIC | | 3 | | |
| 270 | A-114-C | • • DOWEL PIN | | 1 | | |
| 280A | A-2038-10 | • • SCREW, 1/4-28, CAP | | 1 | Y | |
| 360 | B-3384-4H | • BOLT, 1/4-28, HEX HEAD | | 6 | Y | |
| 400 | C-3317-228 | • O-RING, SHAFT | | 1 | Y | |
| 430 | A-1328-1 | • BOLT, MOUNTING, 1/2-20, 12 POINT | | 6 | Y | |
| 440 | A-1381 | • STEEL WASHER, 1/2" CRES | | 6 | Y | |
| 450 | B-3808-4 | • NUT, HEX, SELF-LOCKING | | 6 | Y | |
| 460 | B-3851-0432 | • WASHER | | 18 | Y | |
| 490 | B-3490 | • BRACKET, SPINNER MOUNTING, SUPERSEDED BY ITEM 490A | | 3 | | |
| 490A | C-6932 | • BRACKET, SPINNER MOUNTING, SUPERSEDES ITEM 490 | | 3 | | |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| | | | |

- ITEM NOT ILLUSTRATED

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10-29** | | **HC-A3(MV,V)F-7(A, B) PROPELLER ASSEMBLY** | | | | |
| 500 | 840-82 | • PCP: HUB UNIT, HC-A3_F-, SUPERSEDED BY ITEM 500A | | 1 | | PCP |
| 500A | 840-159 | • PCP: HUB UNIT, HC-A3( )F-( ), SUPERSEDES ITEM 500 | | 1 | | PCP |
| 520 | B-7070-17 | • • PLUG, CUPPED, STEEL | | | 3 | Y |
| 530 | A-1496 | • • PILOT TUBE, SUPERSEDED BY ITEM 530A | | 3 | | |
| 530A | C-7080 | • • PILOT TUBE, SUPERSEDES ITEM 530 | | 3 | | |
| -540 | B-6138-8-8 | • DOWEL PIN | | 2 | Y | |
| 630 | B-3840-6 | • SCREW, 10-32, FILLISTER HEAD | | AR | Y | |
| 640 | A-48 | • BALANCE WEIGHT | | AR | | |
| 650 | A-6119 | • BUSHING, LINK ARM | | 3 | Y | |
| 670 | B-3838-3-3 | • COTTER PIN | | 3 | Y | |
| 870 | B-3384-18 | • BOLT, 1/4-28, HEX HEAD, SUPERSEDED BY ITEM 870A | | 6 | Y | |
| 870A | B-3384-18H | • BOLT, 1/4-28, HEX HEAD, SUPERSEDES ITEM 870 | | 6 | Y | |
| 890 | C-3317-235 | • O-RING | | 1 | Y | |
| 940 | B-3840-8 | • SCREW, 10-32, FILLISTER HEAD | | 4 | Y | |
| 950 | A-1467 | • RING, RETAINING | | 1 | | |
| 960 | A-859 | • KEEPER, SPLIT | | 1 | | |
| 960A | 106411 | • KEEPER, SPLIT, ALTERNATE FOR ITEM 960 | B | 1 | | |
| 970 | A-1869 | • SPACER, SPRING | A | 1 | | |

| EFFECTIVITY | MODEL |
|---|---|
| A | HC-A3(MV,V)F-7A |

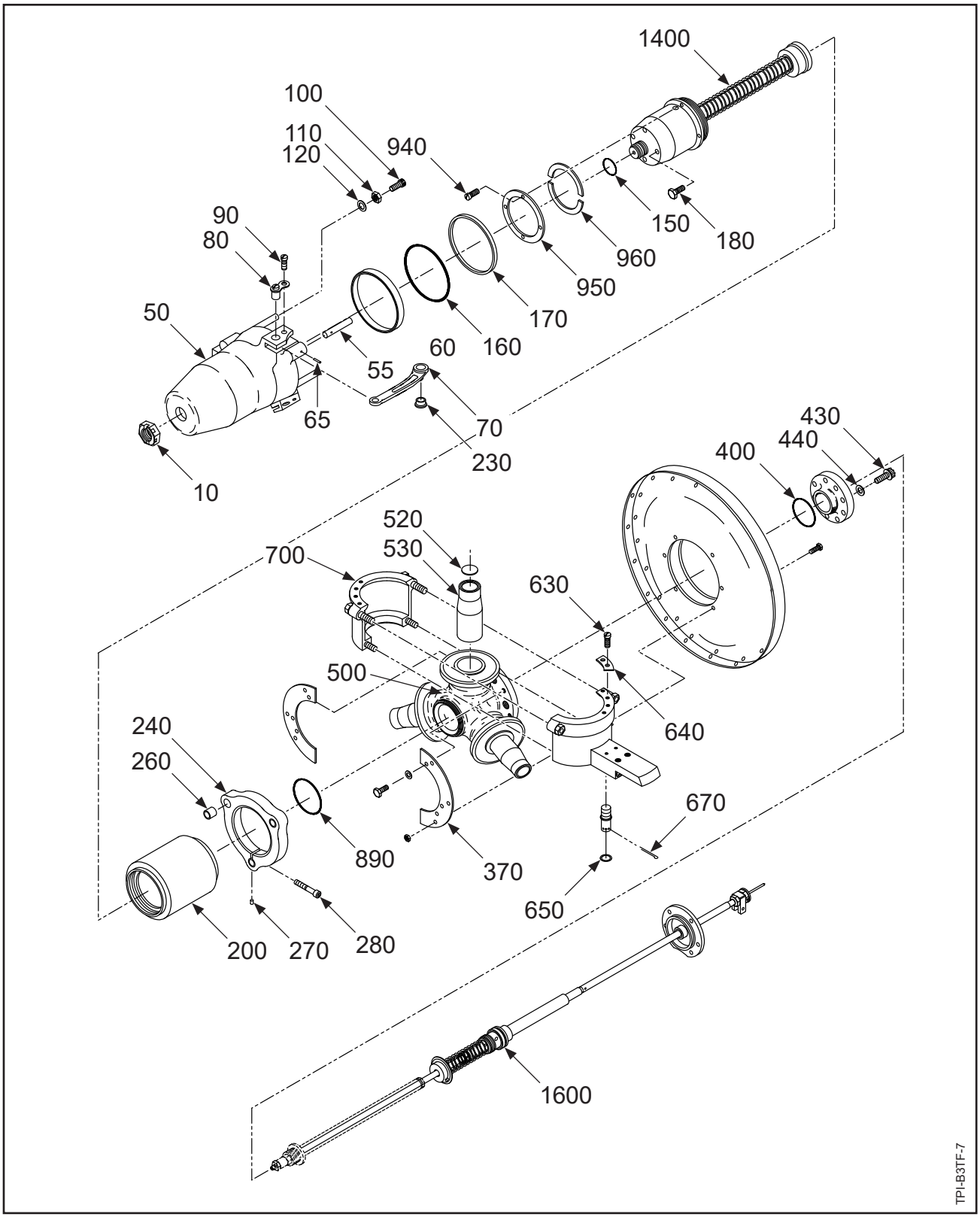
| EFFECTIVITY | MODEL |
|---|---|
| B | MUST BE USED IF INSTALLING ITEM 1440 106412 SPRING RETAINER CUP (HC-SB-61-370). REFER TO "831-37 FEATHERING AND REVERSING SPRING" IN THIS CHAPTER FOR EXPLODED VIEW/PARTS LIST. |

- ITEM NOT ILLUSTRATED

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| 10-29 | | HC-A3(MV,V)F-7(A, B) PROPELLER ASSEMBLY | | | | |
| 10A-1 | | BLADE RETENTION PARTS<br>REFER TO THE A-971 BLADE RETENTION PARTS IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST | | | | |
| | | CLAMP ASSEMBLY<br>REFER TO THE APPLICABLE CLAMP ASSEMBLY IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST | | | | |
| 700 | 838-80 | • PCP: CLAMP ASSEMBLY | A | 3 | | PCP |
| | 838-113 | • PCP: CLAMP ASSEMBLY | B | 3 | | PCP |
| | 838-1080 | • PCP: CLAMP ASSEMBLY | C | 3 | | PCP |
| | 838-1113 | • PCP: CLAMP ASSEMBLY | D | 3 | | PCP |
| | | SPRING ASSEMBLY<br>REFER TO THE APPLICABLE SPRING ASSEMBLY IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST | | | | |
| 1400 | 831-37 | • PCP: FEATHERING & REVERSING SPRING | | 1 | | PCP |
| | | BETA VALVE ASSEMBLY<br>REFER TO THE APPLICABLE BETA VALVE ASSEMBLY IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST | | | | |
| 1600 | C-3630-1 | • PCP: BETA VALVE - ASSEMBLY, SUPERSEDED BY ITEM 1600A | | 1 | | PCP |
| 1600A | C-3630-2 | • PCP: BETA VALVE - ASSEMBLY, SUPERSEDES ITEM 1600 | | 1 | | PCP |
| | | COUNTERWEIGHT SLUGS/MOUNTING HARDWARE | | | | |
| -9040 | | • COUNTERWEIGHT SLUG | | | | |
| -9050 | | • HEX HEAD BOLT<br>APPLICATION SPECIFIC,<br>REFER TO HARTZELL PROPELLER APPLICATION GUIDE MANUAL 159 (61-02-59) FOR PART NUMBER AND PROPELLER CRITICAL PART (PCP) IDENTIFICATION | | | Y | |
| | | SPINNER PARTS | | | | |
| | | • APPLICATION SPECIFIC<br>REFER TO HARTZELL PROPELLER APPLICATION GUIDE MANUAL 159 (61-02-59) AND THE APPLICABLE HARTZELL PROPELLER SPINNER MAINTENANCE MANUAL:<br>MANUAL 127 (61-16-27) - METAL SPINNER ASSEMBLIES<br>MANUAL 148 (61-16-48) - COMPOSITE SPINNER ASSEMBLIES | | | | |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| A | HC-A3VF-7(A) | | |
| B | HC-A3VF-7B | | |
| C | HC-A3MVF-7(A) | | |
| D | HC-A3MVF-7B | | |

- ITEM NOT ILLUSTRATED




**HC-B3TF-7(A, B, C): Exploded View**
**Figure 10-30**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10-30** | | **HC-B3TF-7(A, B, C) PROPELLER ASSEMBLY** | | | | |
| 10 | A-880-1 | • NUT, HEX, SELF-LOCKING, THIN | | 1 | Y | |
| 50 | C-1451-2 | • PISTON UNIT | | 1 | | |
| 55 | A-817-1 | • ROD, GUIDE, PISTON | | 3 | | |
| 60 | A-862 | • • BUSHING, PLASTIC | | 1 | | |
| 65 | A-114-B | • • DOWEL PIN, SUPERSEDED BY ITEM 65A | | 3 | | |
| 65A | B-6582-0875 | • • SPRING PIN, 3/16", CRES, SUPERSEDES ITEM 65 | | 3 | | |
| 70 | B-1901 | • LINK ARM | | 3 | | |
| 80 | A-1464 | • LINK PIN UNIT | | 3 | Y | |
| 90 | B-3840-6 | • SCREW, 10-32, FILLISTER HEAD | | 3 | Y | |
| 100 | A-2037 | • SCREW, 5/16, CAP | | 3 | Y | |
| 110 | B-3368 | • NUT, 5/16-24, HEX, THIN | | 3 | Y | |
| 120 | A-1444 | • WASHER, 5/16", REPLACED BY ITEM 120A | -7 | OBS | | |
| | A-719 | • WASHER | -7C | 3 | Y | |
| 120A | A-1444-1 | • WASHER, 5/16", REPLACES ITEM 120 | -7 | 3 | Y | |
| 150 | C-3317-020 | • O-RING | | 1 | Y | |
| 160 | C-3317-343-2 | • O-RING | | 1 | Y | |
| 170 | A-863 | • SEAL, DUST, PISTON, REPLACED BY ITEM 170A | | OBS | | |
| 170A | B-1843 | • SEAL, DUST, PISTON, REPLACES ITEM 170 | | 1 | Y | |
| 180 | B-3720 | • BOLT, 10-32, HEX HEAD | | 4 | Y | |
| 200 | B-854-1 | • CYLINDER | | 1 | | |
| 230 | A-944 | • SLEEVE, LINKSCREW | | 3 | Y | |
| 240 | 834-1A | • GUIDE COLLAR UNIT | | 1 | | |
| 240A | 834-1B | • GUIDE COLLAR UNIT, ALTERNATE FOR ITEM 240 | | 1 | | |
| 260 | A-116-D1 | • • BUSHING, PLASTIC | | 3 | | |
| 270 | A-114-C | • • DOWEL PIN | | 1 | | |
| 280 | A-2038-12 | • • SCREW, 1/4-28, CAP | | 1 | Y | |
| 280A | A-2038-10 | • • SCREW, 1/4-28, CAP, ALTERNATE FOR ITEM 280 | | 1 | Y | |
| 370 | A-3648 | • SPINNER MOUNTING KIT (REFER TO HARTZELL PROPELLER APPLICATION GUIDE MANUAL 159 (61-02-59) FOR SPINNER MOUNTING KIT COMPONENTS AND FIGURES.) | K | 1 | | |
| | A-3491 | • SPINNER MOUNTING KIT (REFER TO HARTZELL PROPELLER APPLICATION GUIDE MANUAL 159 (61-02-59) FOR SPINNER MOUNTING KIT COMPONENTS AND FIGURES.) | L | 1 | | |
| 400 | C-3317-228 | • O-RING | | 1 | Y | |
| 430 | A-1328-1 | • BOLT, MOUNTING, 1/2-20, 12 POINT | | 6 | Y | |
| 440 | A-1381 | • STEEL WASHER, 1/2" CRES | | 6 | Y | |

| EFFECTIVITY | MODEL |
|---|---|
| -7 | HC-B3TF-7(A, B) |
| -7C | HC-B3TF-7C |

| EFFECTIVITY | MODEL |
|---|---|
| K | SPINNER A-3640( ) |
| L | SPINNER 835-39( ) |

- ITEM NOT ILLUSTRATED

**HC-B3TF-7(A, B, C), page 1 of 3**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10-30** | | **HC-B3TF-7(A, B, C) PROPELLER ASSEMBLY** | | | | |
| 500 | 840-116 | • PCP: HUB UNIT | | 1 | | PCP |
| 520 | B-3897-1 | • • PLUG, EXPANSION | | 3 | Y | |
| 530 | A-1891-A | • • PILOT TUBE | | 3 | | |
| -540 | B-6138-8-8 | • DOWEL PIN | | 2 | Y | |
| 630 | B-3840-6 | • SCREW, 10-32, FILLISTER HEAD | | AR | Y | |
| 640 | A-1305 | • BALANCE WEIGHT | | AR | | |
| 650 | A-6119 | • BUSHING, LINK ARM | | 3 | Y | |
| 670 | B-3838-3-3 | • COTTER PIN | | 3 | Y | |
| 890 | C-3317-235 | • O-RING | | 1 | Y | |
| 940 | B-3840-8 | • SCREW, 10-32, FILLISTER HEAD | | 4 | Y | |
| 950 | A-1467 | • RING, RETAINING | | 1 | | |
| 960 | A-859 | • KEEPER, SPLIT | | 1 | | |
| 960A | 106411 | • KEEPER, SPLIT, ALTERNATE FOR ITEM 960 | | 1 | | |

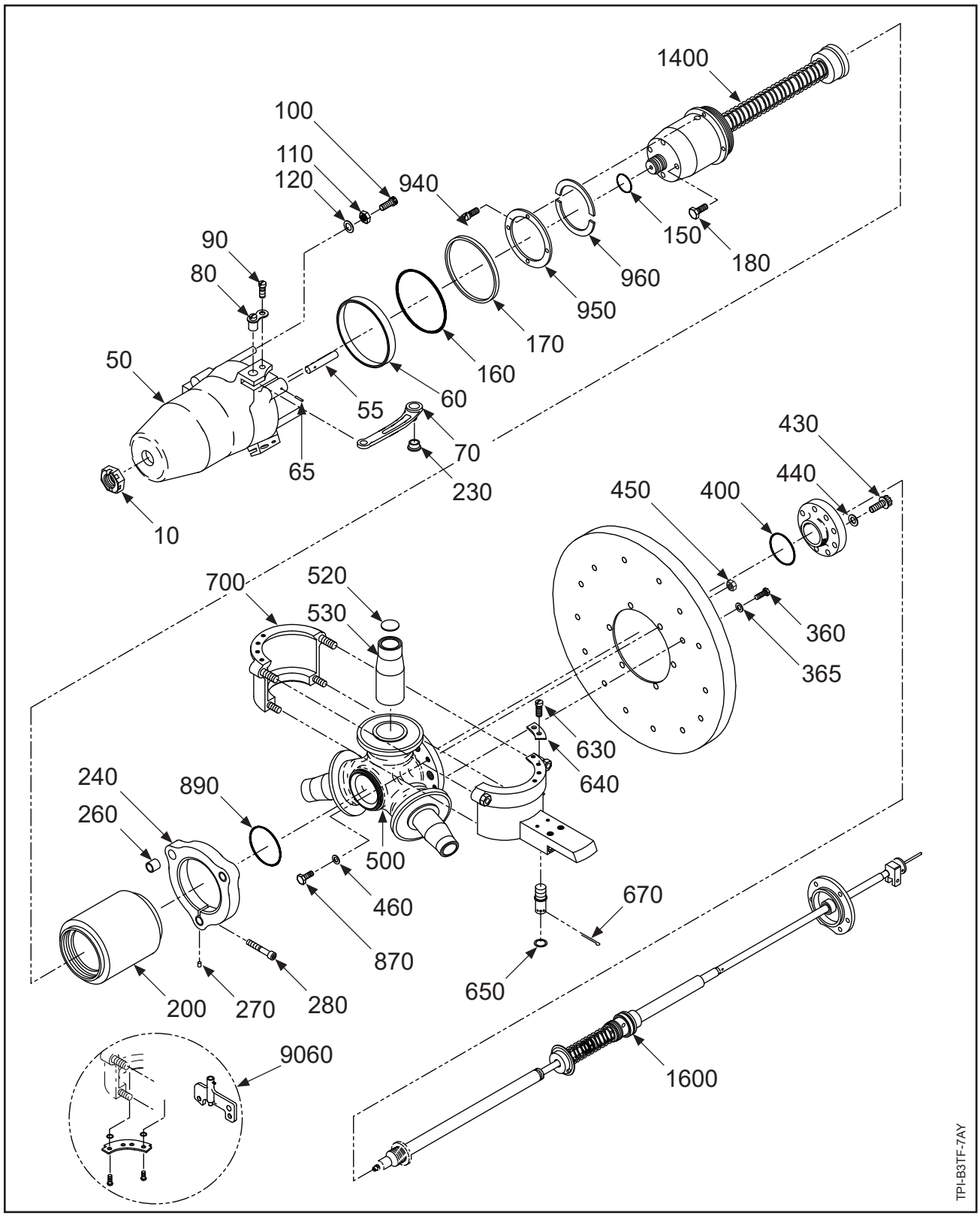
| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| | | | |

- ITEM NOT ILLUSTRATED

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| 10-30 | | **HC-B3TF-7(A, B, C) PROPELLER ASSEMBLY** | | | | |
| 10A-1 | | **BLADE RETENTION PARTS**<br>**REFER TO THE A-1851-(T) BLADE RETENTION PARTS IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST** | | | | |
| | | **CLAMP ASSEMBLY**<br>**REFER TO THE APPLICABLE CLAMP ASSEMBLY IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST** | | | | |
| 700 | 838-85 | • PCP: CLAMP ASSEMBLY | B | 3 | | PCP |
| | 838-93 | • PCP: CLAMP ASSEMBLY | A | 3 | | PCP |
| | | **SPRING ASSEMBLY**<br>**REFER TO THE APPLICABLE SPRING ASSEMBLY IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST** | | | | |
| 1400 | 831-37 | • PCP: FEATHERING & REVERSING SPRING - | | 1 | | PCP |
| | | **BETA VALVE ASSEMBLY**<br>**REFER TO THE APPLICABLE BETA VALVE ASSEMBLY IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST** | | | | |
| 1600 | C-3630-1 | • PCP: BETA VALVE - ASSEMBLY, SUPERSEDED BY ITEM 1600A | | 1 | | PCP |
| | C-3630-2 | • PCP: BETA VALVE - ASSEMBLY, SUPERSEDES ITEM 1600 | | 1 | | PCP |
| | | **COUNTERWEIGHT SLUGS/MOUNTING HARDWARE** | | | | |
| -9040 | | • COUNTERWEIGHT SLUG | | | | |
| -9050 | | • HEX HEAD BOLT<br>APPLICATION SPECIFIC,<br>REFER TO HARTZELL PROPELLER APPLICATION GUIDE MANUAL 159 (61-02-59) FOR PART NUMBER AND PROPELLER CRITICAL PART (PCP) IDENTIFICATION | | | Y | |
| | | **SPINNER PARTS** | | | | |
| | | • APPLICATION SPECIFIC<br>REFER TO HARTZELL PROPELLER APPLICATION GUIDE MANUAL 159 (61-02-59) AND THE APPLICABLE HARTZELL PROPELLER SPINNER MAINTENANCE MANUAL:<br>MANUAL 127 (61-16-27) - METAL SPINNER ASSEMBLIES<br>MANUAL 148 (61-16-48) - COMPOSITE SPINNER ASSEMBLIES | | | | |
| | | **START LOCK COMPONENTS (OPTIONAL)** | | | | |
| -9060 | | • START LOCK COMPONENTS AND HARDWARE ARE AN OPTIONAL ADD ON. REFER TO THE START LOCK COMPONENTS IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST | | | Y | |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| B | HC-B3TF-7(B, C) | | |
| A | HC-B3TF-7A | | |

- ITEM NOT ILLUSTRATED




**HC-B3TF-7AY: Exploded View**
**Figure 10-31**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10-31** | | **HC-B3TF-7AY PROPELLER ASSEMBLY** | | | | |
| 10 | A-880-1 | • NUT, HEX, SELF-LOCKING, THIN | | 1 | Y | |
| 50 | C-1451-2 | • PISTON UNIT | | 1 | | |
| 55 | A-817-1 | • • ROD, GUIDE, PISTON | | 3 | | |
| 60 | A-862 | • • BUSHING, PLASTIC | | 1 | | |
| 65 | A-114-C | • • DOWEL PIN | | 3 | | |
| 70 | B-1901 | • LINK ARM | | 3 | | |
| 80 | A-1464 | • LINK PIN UNIT | | 3 | Y | |
| 90 | B-3840-6 | • SCREW, 10-32, FILLISTER HEAD | | 3 | Y | |
| 100 | A-2037 | • SCREW, 5/16-24, CAP | | 3 | Y | |
| 110 | B-3368 | • NUT, 5/16-24, HEX, THIN | | 3 | Y | |
| 120 | A-1444-1 | • WASHER, 5/16" | | 3 | Y | |
| 150 | C-3317-020 | • O-RING (PILOT TUBE) | | 1 | Y | |
| 160 | C-3317-343-2 | • O-RING (PISTON) | | 1 | Y | |
| 170 | B-1843 | • SEAL, DUST, PISTON | | 1 | Y | |
| 180 | B-3720 | • BOLT, 10-32, HEX HEAD | | 4 | Y | |
| 200 | B-854-1 | • CYLINDER | | 1 | | |
| 230 | A-944 | • SLEEVE, LINKSCREW | | 3 | Y | |
| 240 | 834-1B | • GUIDE COLLAR UNIT | | 1 | | |
| 260 | A-116-D1 | • • BUSHING, PLASTIC | | 3 | | |
| 270 | A-114-C | • • DOWEL PIN | | 1 | | |
| 280 | A-2038-10 | • • SCREW, 1/4-28, CAP | | 1 | Y | |
| 360 | B-3384-17H | • BOLT, 1/4-28, HEX HEAD (NO DE-ICE) | | 6 | Y | |
| 360A | B-3384-21H | • BOLT, 1/4-28, HEX HEAD (DE-ICE) | | 6 | Y | |
| 365 | B-3851-0463 | • WASHER | | 6 | Y | |
| 365A | B-3837-0463 | • WASHER, CRES | | 6 | Y | |
| 400 | C-3317-228 | • O-RING | | 1 | Y | |
| 430 | A-1328-1 | • BOLT, MOUNTING, 1/2-20, 12 POINT | | 6 | Y | |
| 440 | A-1381 | • WASHER, 1/2" CRES | | 6 | Y | |
| 450 | B-3808-4 | • NUT, HEX, SELF-LOCKING | | 6 | Y | |
| 460 | B-3851-0432 | • WASHER | | 18 | Y | |
| 500 | 840-116 | • PCP: HUB UNIT | | 1 | | PCP |
| 520 | B-3897-1 | • • PLUG, EXPANSION | | 3 | Y | |
| 530 | A-1891-A | • • PILOT TUBE | | 3 | | |
| -540 | B-6138-8-8 | • DOWEL PIN | | 2 | Y | |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| | | | |

- ITEM NOT ILLUSTRATED

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10-31** | | **HC-B3TF-7AY PROPELLER ASSEMBLY** | | | | |
| 630 | B-3840-6 | • SCREW, 10-32, FILLISTER HEAD | | AR | Y | |
| 640 | A-1305 | • BALANCE WEIGHT | | 6 | | |
| 650 | A-6119 | • BUSHING, LINK ARM | | 3 | Y | |
| 670 | B-3838-3-3 | • COTTER PIN | | 3 | Y | |
| 870 | B-3384-4H | • BOLT, 1/4-28, HEX HEAD | | 6 | Y | |
| 890 | C-3317-235 | • O-RING | | 1 | Y | |
| 940 | B-3840-8 | • SCREW, 10-32, FILLISTER HEAD | | 4 | Y | |
| 950 | A-1467 | • RING, RETAINING | | 1 | | |
| 960 | A-859 | • KEEPER, SPLIT | | 1 | | |
| 960A | 106411 | • KEEPER, SPLIT, ALTERNATE FOR ITEM 960 | | 1 | | |

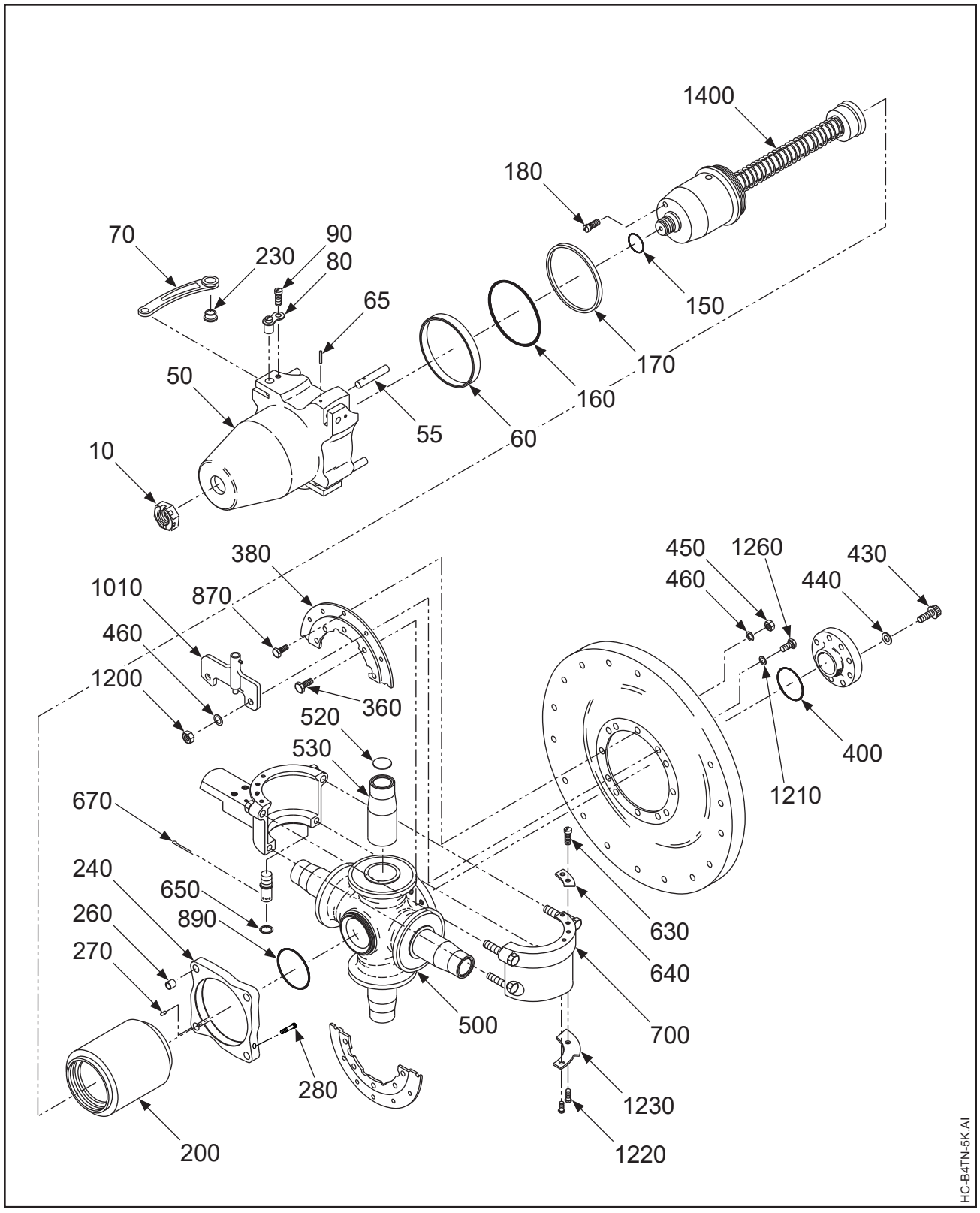
| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| | | | |

- ITEM NOT ILLUSTRATED

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| 10-31 | | **HC-B3TF-7AY PROPELLER ASSEMBLY** | | | | |
| 10A-1 | | **BLADE RETENTION PARTS**<br>**REFER TO THE A-1851-(T) BLADE RETENTION PARTS IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST** | | | | |
| | | **CLAMP ASSEMBLY**<br>**REFER TO THE APPLICABLE CLAMP ASSEMBLY IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST** | | | | |
| 700 | 838-93 | • PCP: CLAMP ASSEMBLY | | 3 | | PCP |
| | | **START LOCK COMPONENTS**<br>**REFER TO THE START LOCK COMPONENTS IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST** | | | | |
| 9060 | | • START LOCK COMPONENTS | | 3 | | |
| | | **SPRING ASSEMBLY**<br>**REFER TO THE APPLICABLE SPRING ASSEMBLY IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST** | | | | |
| 1400 | 831-37 | • PCP: FEATHERING & REVERSING SPRING | | 1 | | PCP |
| | | **BETA VALVE ASSEMBLY**<br>**REFER TO THE APPLICABLE BETA VALVE ASSEMBLY IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST** | | | | |
| 1600 | C-3630-2 | • PCP: BETA VALVE - ASSEMBLY | | 1 | | PCP |
| | | **COUNTERWEIGHT SLUGS/MOUNTING HARDWARE** | | | | |
| -9040<br>-9050 | | • COUNTERWEIGHT SLUG<br>• HEX HEAD BOLT<br>APPLICATION SPECIFIC,<br>REFER TO HARTZELL PROPELLER APPLICATION GUIDE MANUAL 159 (61-02-59) FOR PART NUMBER AND PROPELLER CRITICAL PART (PCP) IDENTIFICATION | | | Y | |
| | | **SPINNER PARTS**<br>• APPLICATION SPECIFIC<br>REFER TO HARTZELL PROPELLER APPLICATION GUIDE MANUAL 159 (61-02-59) AND THE APPLICABLE HARTZELL PROPELLER SPINNER MAINTENANCE MANUAL:<br>MANUAL 127 (61-16-27) - METAL SPINNER ASSEMBLIES<br>MANUAL 148 (61-16-48) - COMPOSITE SPINNER ASSEMBLIES | | | | |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| | | | |

- ITEM NOT ILLUSTRATED




**HC-B4MN-5B(L): Exploded View**
**Figure 10-32**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10-32** | | **HC-B4MN-5B(L) PROPELLER ASSEMBLY** | | | | |
| 10 | A-880-2 | • NUT, HEX, SELF-LOCKING, THIN | | 1 | Y | |
| 50 | C-2303-6 | • PISTON UNIT | -5B | 1 | | |
| 50A | C-2303-6L | • PISTON UNIT | -5BL | 1 | | |
| 55 | A-717 | • ROD, GUIDE, PISTON | | 4 | | |
| 60 | A-862-7 | • • BUSHING, PLASTIC | | 1 | | |
| 65 | A-114-B | • DOWEL PIN | | 4 | | |
| 70 | B-4016 | • LINK ARM | -5B | 4 | | |
| | B-4016L | • LINK ARM | -5BL | 4 | | |
| 70A | B-1901 | • LINK ARM, ALTERNATE FOR ITEM 70 | -5B | 4 | | |
| | B-1901L | • LINK ARM, ALTERNATE FOR ITEM 70 | -5BL | 4 | | |
| 80 | A-1464 | • LINK PIN UNIT | | 4 | Y | |
| 90 | B-3840-6 | • SCREW, 10-32, FILLISTER HEAD | | 4 | Y | |
| 150 | C-3317-121 | • O-RING | | 1 | Y | |
| 160 | C-3317-426-2 | • O-RING | | 1 | Y | |
| 170 | B-1843 | • SEAL, DUST, PISTON | | 1 | Y | |
| 180 | B-3840-6 | • SCREW, 10-32, FILLISTER HEAD | | 4 | Y | |
| 200 | B-3406 | • CYLINDER | | 1 | | |
| 230 | A-944 | • SLEEVE, LINKSCREW | | 3 | Y | |
| 240 | 834-13 | • GUIDE COLLAR UNIT | | 1 | | |
| 260 | A-3023 | • • BUSHING, PLASTIC | | 4 | | |
| 270 | A-114-C | • • DOWEL PIN | | 1 | | |
| 280 | A-2038-14 | • • SCREW, 1/4-28, CAP | | 1 | Y | |
| 360 | A-2051 | • BOLT, 5/16-24, HEX HEAD, REPLACED BY ITEM 360A | | OBS | | |
| 360A | A-2051-1 | • BOLT, 5/16-24, HEX HEAD, REPLACES ITEM 360 | | 10 | Y | |
| 380 | C-3492 | • PLATE, MOUNTING, SPINNER | | 1 | | |
| 400 | C-3317-230 | • O-RING | | 1 | Y | |
| 430 | B-3339 | • BOLT, MOUNTING, 9/16-18, 12 POINT | | 8 | Y | |
| 440 | A-2048-2 | • WASHER, MOUNTING, 9/16" CSK | | 8 | Y | |
| 450 | B-3808-4 | • NUT, HEX, SELF-LOCKING | | 12 | Y | |
| 460 | B-3851-0432 | • WASHER | | AR | Y | |
| 500 | 840-139 | • PCP: HUB UNIT | | 1 | | PCP |
| 520 | B-3897-1 | • • PLUG, EXPANSION | | 4 | Y | |
| 530 | A-1891-A | • • PILOT TUBE | | 4 | | |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| -5B | HC-B4MN-5B | | |
| -5BL | HC-B4MN-5BL | | |

- ITEM NOT ILLUSTRATED

**HC-B4MN-5B(L), page 1 of 3**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10-32** | | **HC-B4MN-5B(L) PROPELLER ASSEMBLY** | | | | |
| 630 | B-3840-6 | • SCREW, 10-32, FILLISTER HEAD | | AR | Y | |
| 640 | A-1305 | • BALANCE WEIGHT | | AR | | |
| 650 | A-6119 | • BUSHING, LINK ARM | | 4 | Y | |
| 670 | B-3838-3-3 | • COTTER PIN | | 4 | Y | |
| 870 | B-3384-12 | • BOLT, 1/4-28, HEX HEAD | | 8 | Y | |
| 890 | C-3317-240 | • O-RING | | 1 | Y | |
| 1200 | B-3808-4 | • NUT, HEX, SELF-LOCKING | | 12 | Y | |
| 1210 | B-3851-0432 | • WASHER | | AR | Y | |
| 1220 | A-2016 | • BOLT, 10-32, HEX HEAD | | 8 | Y | |
| 1220A | A-2016-2 | • BOLT, 10-32, HEX HEAD, ALTERNATE FOR ITEM 1220 | | 8 | Y | |
| -1225 | B-3851-0363 | • WASHER (USE WITH ITEM 1220A ONLY) | | 8 | Y | |
| 1230 | A-3079 | • PLATE, START LOCK | -5B | 3 | | |
| | A-3495 | • PLATE, START LOCK, REPLACED BY ITEM 1230B | -5BL | 3 | | |
| 1230A | A-3495-1 | • PLATE, START LOCK, REPLACES ITEM 1230A | -5BL | 3 | | |
| 1260 | B-3384-3 | • BOLT, 1/4-28, HEX HEAD | | 4 | Y | |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| -5B | HC-B4MN-5B | | |
| -5BL | HC-B4MN-5BL | | |

- ITEM NOT ILLUSTRATED

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| 10-32 | | HC-B4MN-5B(L) PROPELLER ASSEMBLY | | | | |
| 10A-1 | | BLADE RETENTION PARTS | | | | |
| | | REFER TO THE A-1851-(T) BLADE RETENTION PARTS IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST | | | | |
| | | CLAMP ASSEMBLY | | | | |
| | | REFER TO THE APPLICABLE CLAMP ASSEMBLY IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST | | | | |
| 700 | 838-111 | • PCP: CLAMP ASSEMBLY | -5BL | 4 | | PCP |
| | 838-114 | • PCP: CLAMP ASSEMBLY | -5B | 4 | | PCP |
| | | START LOCK ASSEMBLY | | | | |
| | | REFER TO THE APPLICABLE START LOCK ASSEMBLY IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST | | | | |
| 1010 | 830-34 | • START LOCK - ASSEMBLY | -5B | 4 | | |
| | 830-34L | • START LOCK - ASSEMBLY | -5BL | 4 | | |
| | | SPRING ASSEMBLY | | | | |
| | | REFER TO THE APPLICABLE SPRING ASSEMBLY IN THE SUB-ASSEMBLY PARTS LISTS AND FIGURES SECTION FOR EXPLODED VIEW/PARTS LIST | | | | |
| 1400 | 831-72 | • SPRING ASSEMBLY | | 1 | | |
| | | COUNTERWEIGHT SLUGS/MOUNTING HARDWARE | | | | |
| -9040 | | • COUNTERWEIGHT SLUG | | | | |
| -9050 | | • HEX HEAD BOLT<br>APPLICATION SPECIFIC,<br>REFER TO HARTZELL PROPELLER APPLICATION GUIDE MANUAL 159 (61-02-59) FOR PART NUMBER AND PROPELLER CRITICAL PART (PCP) IDENTIFICATION | | | Y | |
| | | SPINNER PARTS | | | | |
| | | • APPLICATION SPECIFIC<br>REFER TO HARTZELL PROPELLER APPLICATION GUIDE MANUAL 159 (61-02-59) AND THE APPLICABLE HARTZELL PROPELLER SPINNER MAINTENANCE MANUAL:<br>MANUAL 127 (61-16-27) - METAL SPINNER ASSEMBLIES<br>MANUAL 148 (61-16-48) - COMPOSITE SPINNER ASSEMBLIES | | | | |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| | | | |

- ITEM NOT ILLUSTRATED

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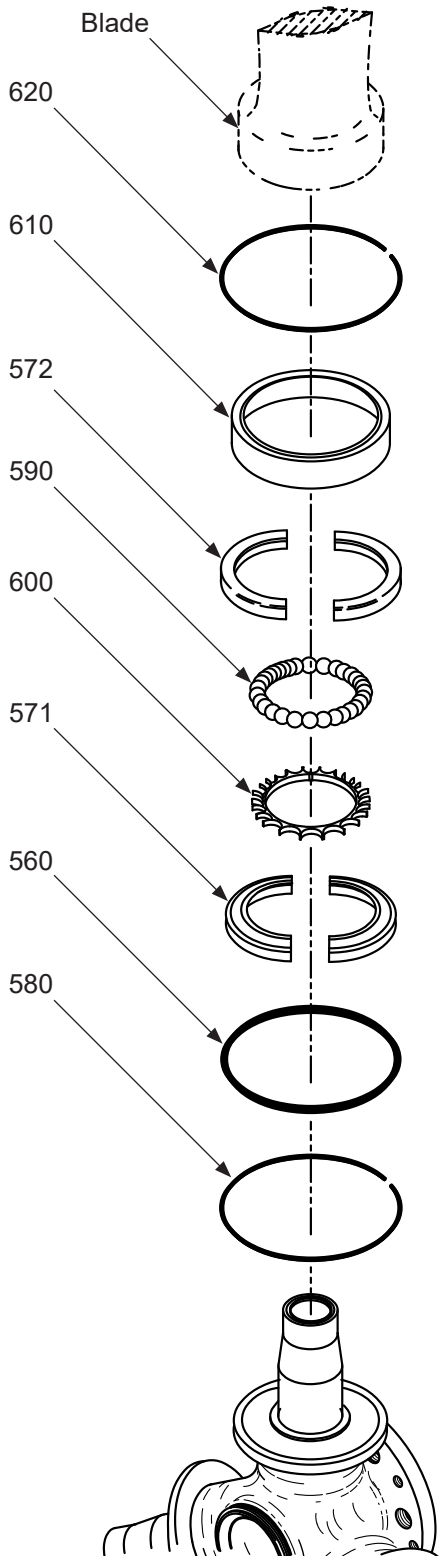
# SUB-ASSEMBLY
# PARTS LISTS and FIGURES




**Blade Retention Parts**
**Figure 10A-1**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10A-1** | | **A-1851-(T) BLADE RETENTION PARTS**<br>**All quantities (UPA) in this parts list are per blade assembly.** | | | | |
| 560 | C-3317-232 | • O-RING | | 1 | Y | |
| 560A | C-3317-230 | • O-RING, ALTERNATE FOR ITEM 560 (IF ITEM 560 CAUSES TOO MUCH FRICTION) | | 1 | Y | |
| 560B | C-3317-231 | • O-RING, ALTERNATE FOR ITEM 560 (IF ITEM 560 CAUSES TOO MUCH FRICTION) | | 1 | Y | |
| -570 | A-1851-T | • BEARING, RETENTION, BLADE | | 1 | | |
| -570A | A-1851 | • BEARING, RETENTION, BLADE, ALTERNATE FOR ITEM 570 | | 1 | | |
| 571 | A-1851-TA | • • RACE, HUB SIDE (USE WITH ITEM 570) | | 1 | | |
| | A-1851-A | • • RACE, HUB SIDE (USE WITH ITEM 570A) | | 1 | | |
| 572 | A-1851-TB | • • RACE, BLADE SIDE (USE WITH ITEM 570) | | 1 | | |
| | A-1851-B | • • RACE, BLADE SIDE (USE WITH ITEM 570A) | | 1 | | |
| 580 | A-1877 | • • RETAINER, BEARING WIRE | | 1 | Y | |
| 590 | B-6144-2 | • • BALL, BEARING, 9/16" DIA | | 19 | Y | |
| | B-6144-2-450 | • • BALL, BEARING, 9/16" DIA, 450 PCS | | RF | | |
| 600 | A-1889 | • BALL SPACER, SUPERSEDED BY ITEM 600A | | 1 | Y | |
| 600A | B-3742 | • BALL SPACER, SUPERSEDES ITEM 600 | | 1 | Y | |
| 610 | A-1852 | • RING, RETAINING, BEARING | | 1 | | |
| 620 | A-1854 | • RETAINER, RING, WIRE | | 1 | Y | |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| Mixing old/new design A-1851-T(A,B) bearing race sets on the same propeller blade is not permitted.<br>Mixing old/new design A-1851-T(A,B) bearing race sets in the same propeller is permitted. | | | |

- ITEM NOT ILLUSTRATED

## A-1851-(T) Blade Retention Parts

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10A-1** | | **A-971 BLADE RETENTION PARTS**<br>**All quantities (UPA) in this parts list are per blade assembly.** | | | | |
| 560 | C-3317-230 | • O-RING | | 1 | Y | |
| -570 | A-971 | • BEARING, RETENTION, BLADE | | 1 | | |
| 571 | A-971-A | • • RACE | | 1 | | |
| 572 | A-971-B | • • RACE | | 1 | | |
| 580 | A-2027 | • • RETAINER, BEARING, WIRE | | 1 | Y | |
| 590 | B-6144-2<br>B-6144-2-450 | • • BALL, BEARING, 9/16" DIA<br>• • BALL, BEARING, 9/16" DIA, 450 PCS | | 17<br>RF | Y | |
| 600 | A-311 | • BALL SPACER | | 1 | Y | |
| 610 | A-972 | • RING, RETAINING, BEARING | | 1 | | |
| 620 | A-974 | • RETAINER, RING, WIRE | | 1 | Y | |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| | | | |

- ITEM NOT ILLUSTRATED

## A-971 Blade Retention Parts

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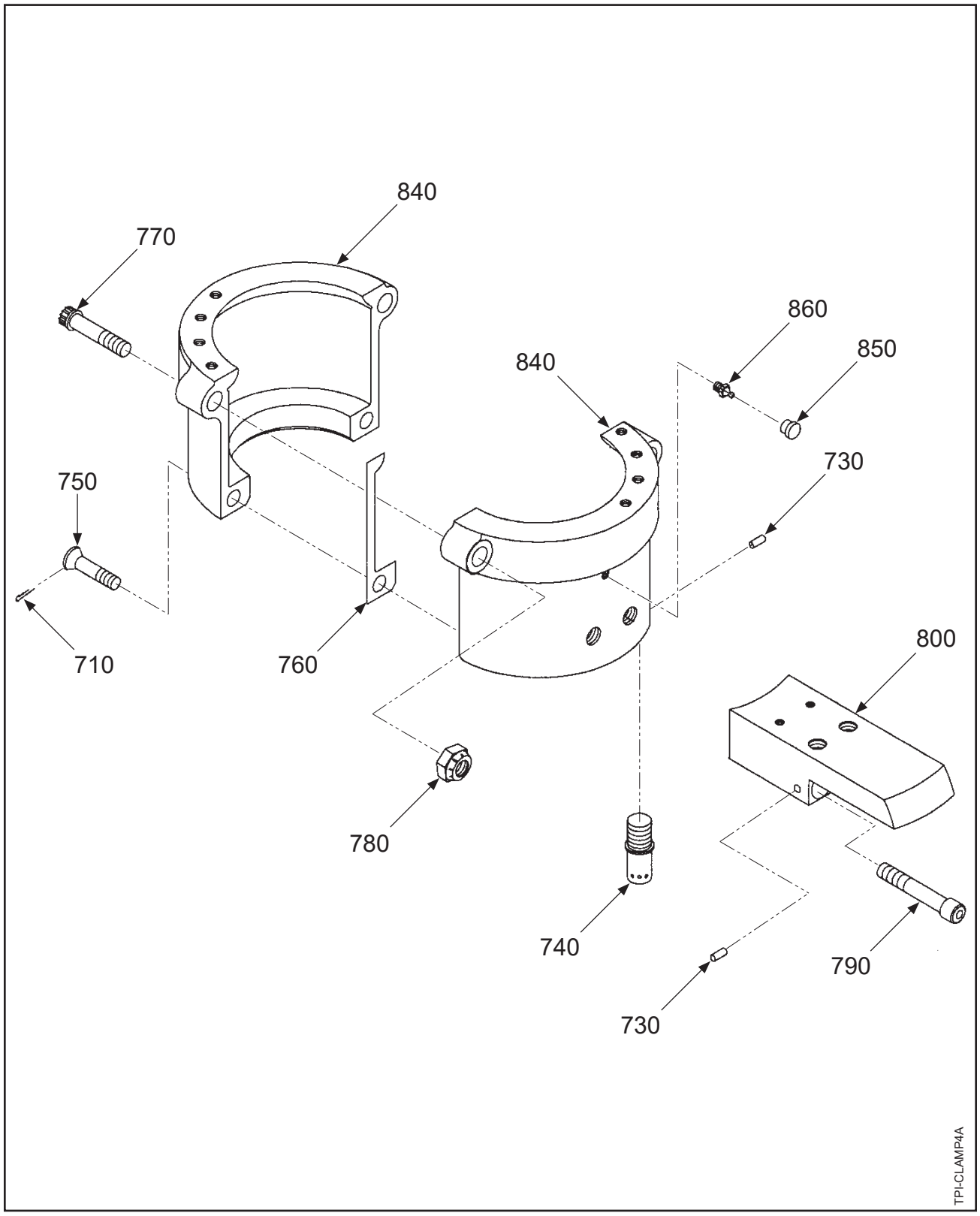


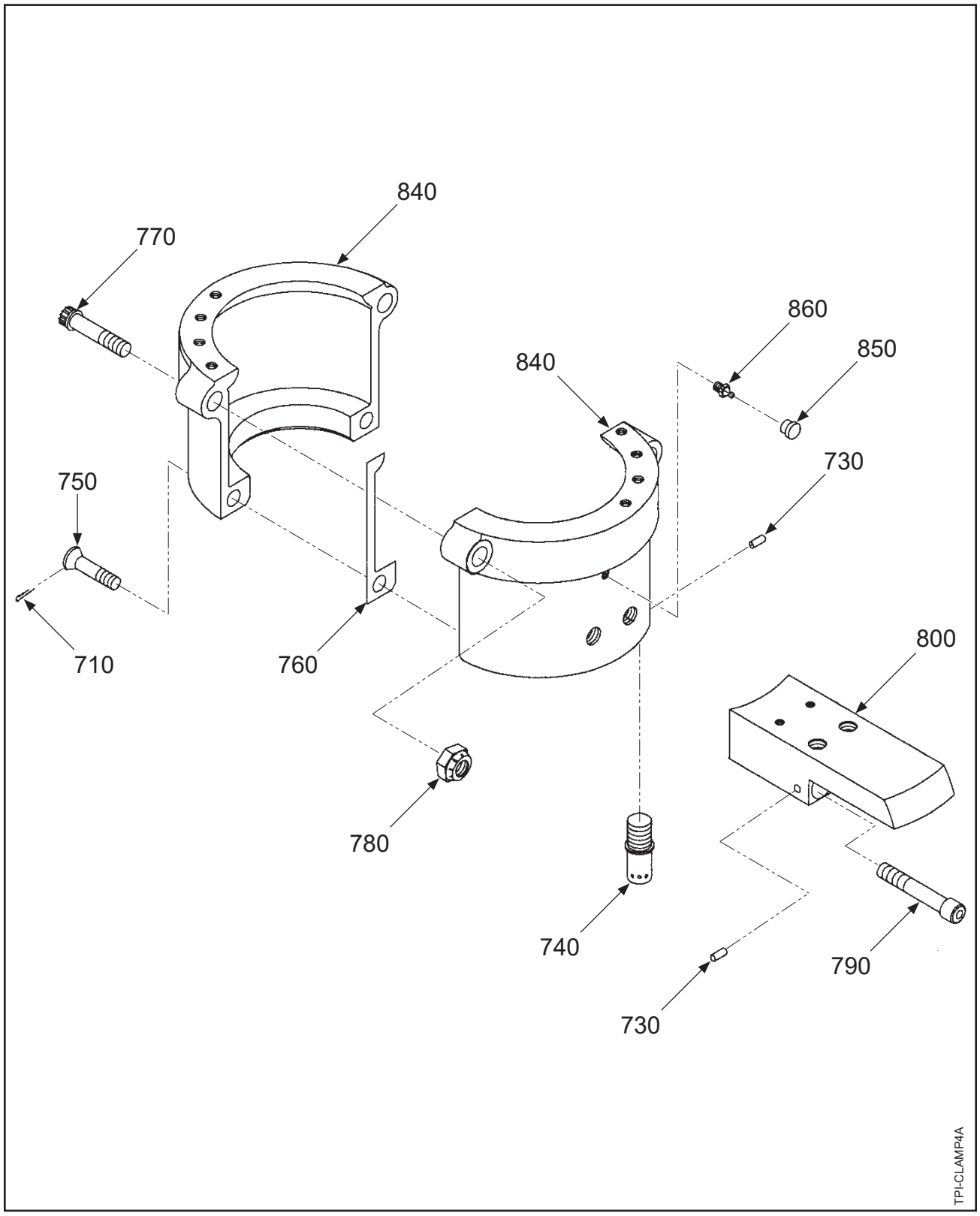

**838-17E Clamp Assembly: Exploded View**
**Figure 10A-2**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10A-2** | | **838-17E CLAMP ASSEMBLY** | | | | |
| 710 | B-3838-3-2 | • COTTER PIN | | 2 | Y | |
| 750 | A-321 | • SCREW, 3/8-24 DOUBLE 60° HEAD | | 2 | Y | |
| 760 | A-1306 | • GASKET, CLAMP | | 2 | Y | |
| 770 | A-1372 | • BOLT, 7/16-20,12 POINT | | 2 | Y | |
| 770A | A-1379 | • BOLT, 7/16-20,12 POINT, ALTERNATE FOR ITEM 770 | | 2 | Y | |
| 780 | A-1373 | • NUT, 7/16-20, HEX, SELF LOCKING | | 2 | Y | |
| 850 | B-6544 | • CAP, FITTING, LUBRICATION | | 2 | Y | |
| -725 | D-7838-17E | • PCP: CLAMP UNIT | | 1 | | PCP |
| 730 | A-285 | • • SPRING PIN, 3/32", CRES | | 3 | Y | |
| 740 | A-304 | • • LINKSCREW, 1/2-20 | | 1 | Y | |
| 790 | 107995-32 | • • BOLT, 7/16-20, 12 POINT | | 2 | Y | |
| 790A | A-2036-32 | • • SCREW, 7/16-20, CAP, MODIFIED, ALTERNATE FOR ITEM 790 | | 2 | Y | |
| 800 | 833-16E | • • PCP: COUNTERWEIGHT | | 1 | | PCP |
| 840 | C-1301S | • • PCP: CLAMP, BLADE (T, W, Z SHANK) | | 1 | | PCP |
| 860 | B-6588-1 | • • FITTING, LUBRICATION | | 2 | Y | |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| | | | |

- ITEM NOT ILLUSTRATED

**838-17E Clamp Assembly**



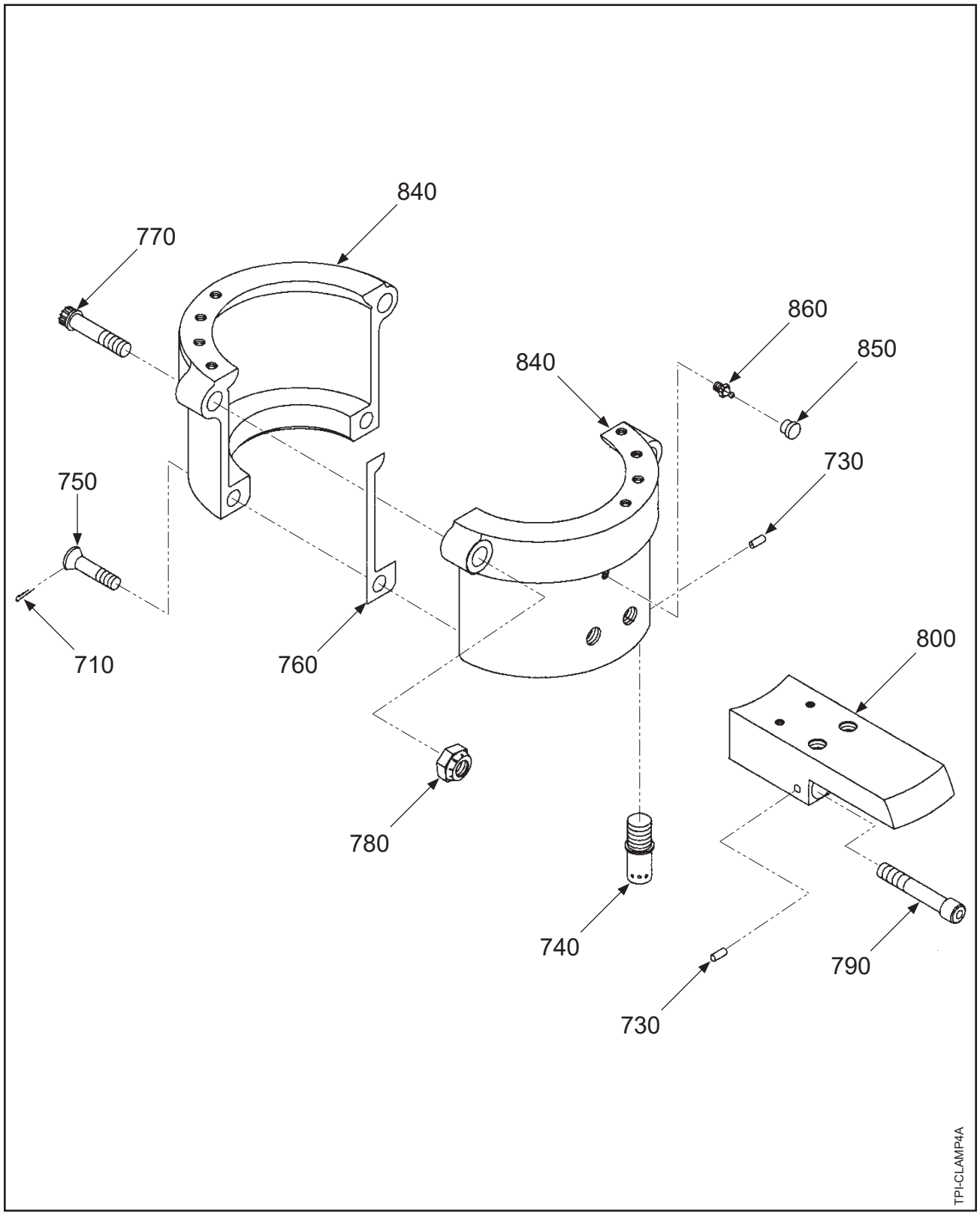

**838-65 Clamp Assembly: Exploded View**
**Figure 10A-3**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10A-3** | | **838-65 CLAMP ASSEMBLY** | | | | |
| 710 | B-3838-3-2 | • COTTER PIN | | 2 | Y | |
| 750 | A-321 | • SCREW, 3/8-24 DOUBLE 60° HEAD | | 2 | Y | |
| 760 | A-1306 | • GASKET, CLAMP | | 2 | Y | |
| 770 | A-1372 | • BOLT, 7/16-20,12 POINT | | 2 | Y | |
| 770A | A-1379 | • BOLT, 7/16-20,12 POINT, ALTERNATE FOR ITEM 770 | | 2 | Y | |
| 780 | A-1373 | • NUT, 7/16-20, HEX, SELF LOCKING | | 2 | Y | |
| 850 | B-6544 | • CAP, FITTING, LUBRICATION | | 2 | Y | |
| -725 | D-7838-65 | • PCP: CLAMP UNIT | | 1 | | |
| 730 | A-285 | • • SPRING PIN, 3/32", CRES | | 3 | Y | |
| 730A | B-3838-3-2 | • • COTTER PIN, ALTERNATE FOR ITEM 730 | | 3 | Y | |
| 740 | A-304 | • • LINKSCREW, 1/2-20 | | 1 | Y | |
| 790 | 107995-22 | • • BOLT, 7/16-20, 12 POINT | | 2 | Y | |
| 790A | A-2036-22 | • • SCREW, 7/16-20, CAP, MODIFIED, ALTERNATE FOR ITEM 790 | | 2 | Y | |
| 800 | B-3007 | • • PCP: COUNTERWEIGHT | | 1 | | PCP |
| 840 | C-1301-9S | • • PCP: CLAMP, BLADE (T, W, Z SHANK) | | 1 | | PCP |
| 860 | B-6588-1 | • • FITTING, LUBRICATION | | 2 | Y | |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| | | | |

- ITEM NOT ILLUSTRATED

**838-65 Clamp Assembly**



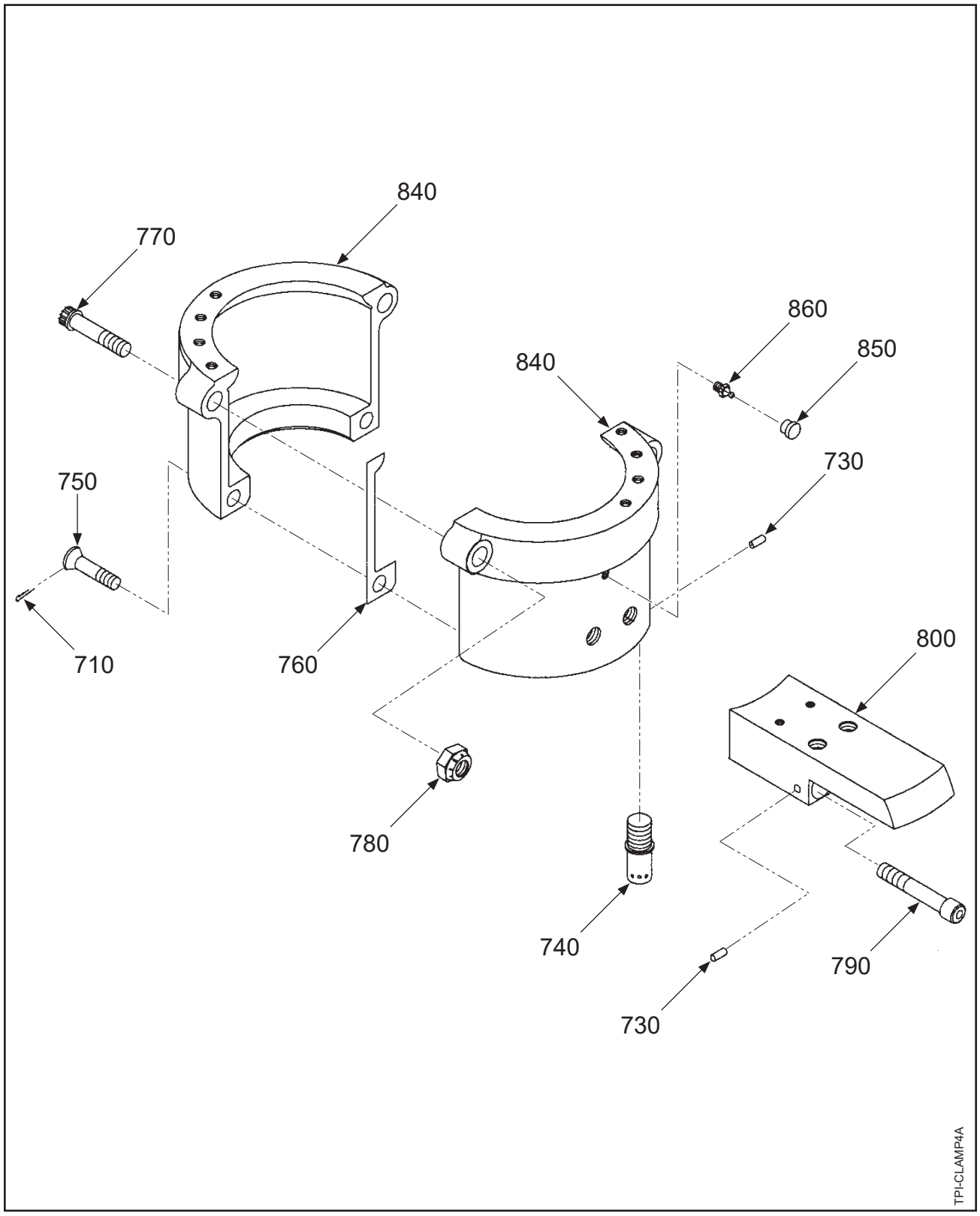

**838-67 Clamp Assembly: Exploded View**
**Figure 10A-4**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10A-4** | | **838-67 CLAMP ASSEMBLY** | | | | |
| 710 | B-3838-3-2 | • COTTER PIN | | 2 | Y | |
| 750 | A-321 | • SCREW, 3/8-24 DOUBLE 60° HEAD | | 2 | Y | |
| 760 | A-1306 | • GASKET, CLAMP | | 2 | Y | |
| 770 | A-1372 | • BOLT, 7/16-20,12 POINT | | 2 | Y | |
| 770A | A-1379 | • BOLT, 7/16-20,12 POINT, ALTERNATE FOR ITEM 770 | | 2 | Y | |
| 780 | A-1373 | • NUT, 7/16-20, HEX, SELF LOCKING | | 2 | Y | |
| 850 | B-6544 | • CAP, FITTING, LUBRICATION | | 2 | Y | |
| -725 | D-7838-67 | • PCP: CLAMP UNIT | | 1 | | |
| 730 | A-285 | • • SPRING PIN, 3/32", CRES | | 3 | Y | |
| 740 | A-304 | • • LINKSCREW, 1/2-20 | | 1 | Y | |
| 790 | 107995-22 | • • BOLT, 7/16-20, 12 POINT | | 2 | Y | |
| 790A | A-2036-22 | • • SCREW, 7/16-20, CAP, MODIFIED, ALTERNATE FOR ITEM 790 | | 2 | Y | |
| 800 | B-3007 | • • PCP: COUNTERWEIGHT | | 1 | | PCP |
| 840 | C-1301-9S | • • PCP: CLAMP, BLADE (T, W, Z SHANK) | | 1 | | PCP |
| 860 | B-6588-1 | • • FITTING, LUBRICATION | | 2 | Y | |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| | | | |

- ITEM NOT ILLUSTRATED

**838-67 Clamp Assembly**



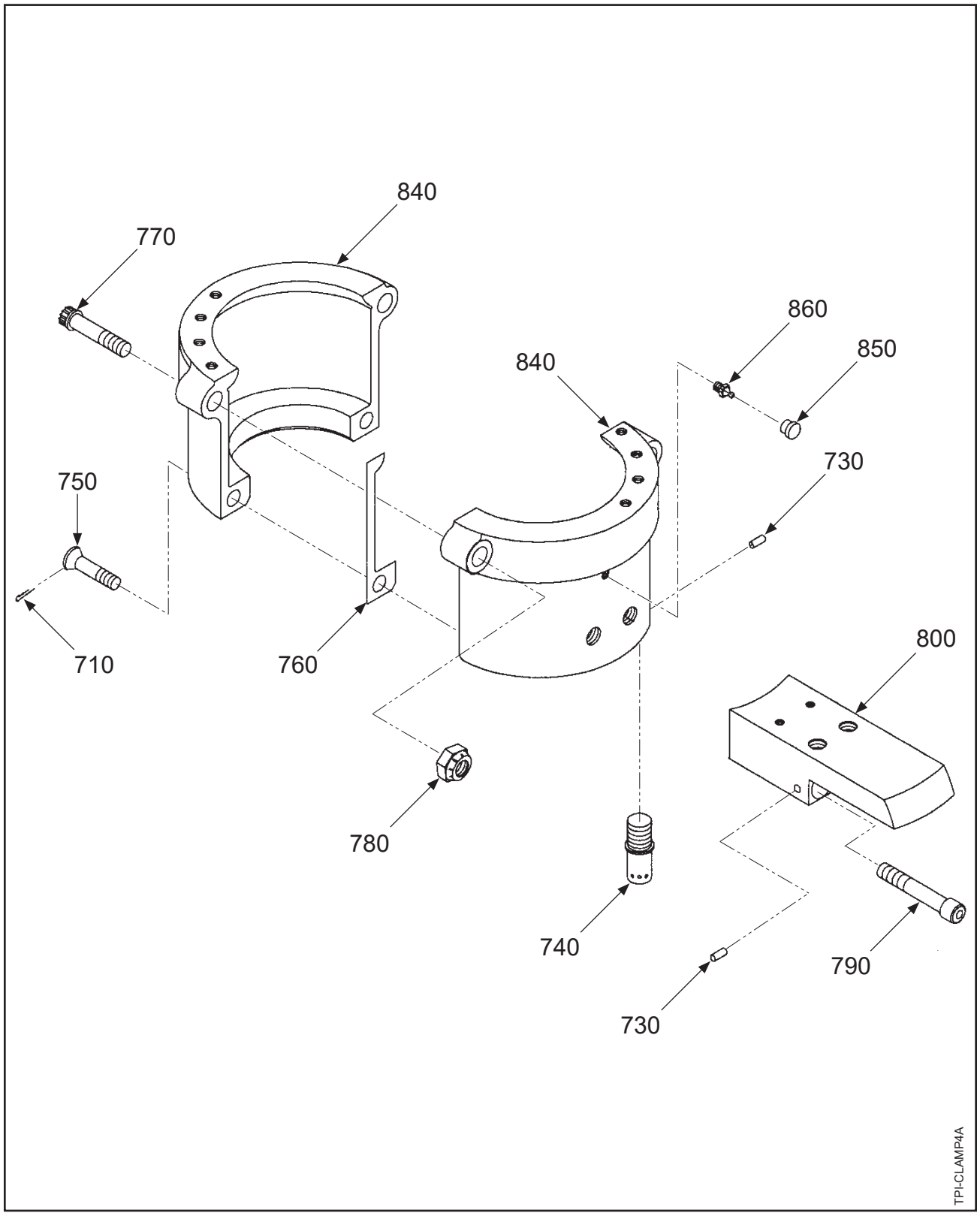

**838-67L Clamp Assembly: Exploded View**
**Figure 10A-5**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10A-5** | | **838-67L CLAMP ASSEMBLY** | | | | |
| 710 | B-3838-3-2 | • COTTER PIN | | 2 | Y | |
| 750 | A-321 | • SCREW, 3/8-24 DOUBLE 60° HEAD | | 2 | Y | |
| 760 | A-1306 | • GASKET, CLAMP | | 2 | Y | |
| 770 | A-1372 | • BOLT, 7/16-20,12 POINT | | 2 | Y | |
| 770A | A-1379 | • BOLT, 7/16-20,12 POINT, ALTERNATE FOR ITEM 770 | | 2 | Y | |
| 780 | A-1373 | • NUT, 7/16-20, HEX, SELF LOCKING | | 2 | Y | |
| 850 | B-6544 | • CAP, FITTING, LUBRICATION | | 2 | Y | |
| -725 | D-7838-67L | • PCP: CLAMP UNIT | | 1 | | |
| 730 | A-285 | • • SPRING PIN, 3/32", CRES | | 3 | Y | |
| 740 | A-304 | • • LINKSCREW, 1/2-20 | | 1 | Y | |
| 790 | 107995-22 | • • BOLT, 7/16-20, 12 POINT | | 2 | Y | |
| 790A | A-2036-22 | • • SCREW, 7/16-20, CAP, MODIFIED, ALTERNATE FOR ITEM 790 | | 2 | Y | |
| 800 | B-3007 | • • PCP: COUNTERWEIGHT | | 1 | | PCP |
| 840 | C-1301-10S | • • PCP: CLAMP, BLADE (T, W, Z SHANK) | | 1 | | PCP |
| 860 | B-6588-1 | • • FITTING, LUBRICATION | | 2 | Y | |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| | | | |

- ITEM NOT ILLUSTRATED

**838-67L Clamp Assembly**



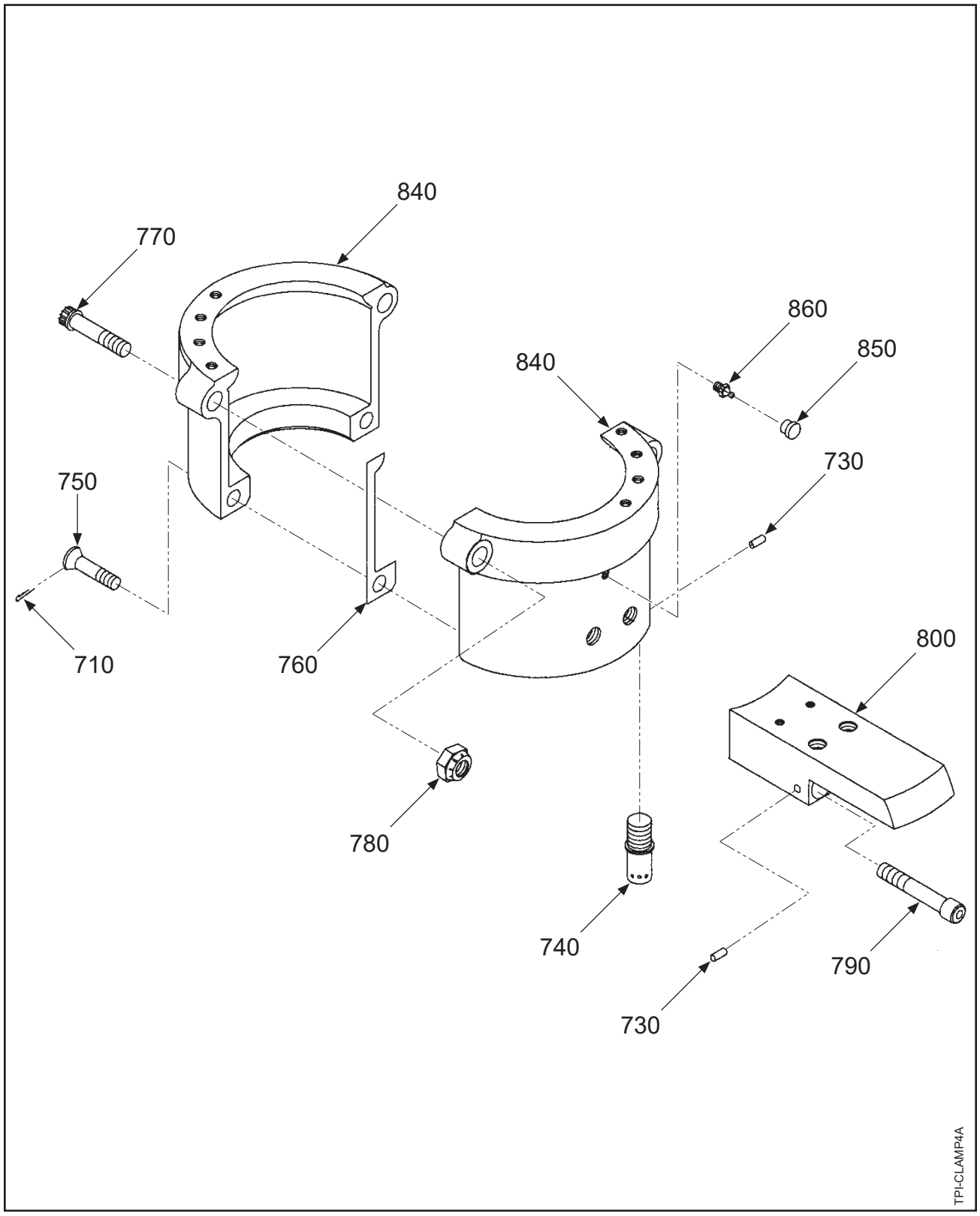

**838-71 Clamp Assembly: Exploded View**
**Figure 10A-6**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10A-6** | | **838-71 CLAMP ASSEMBLY** | | | | |
| 710 | B-3838-3-2 | • COTTER PIN | | 2 | Y | |
| 750 | A-321 | • SCREW, 3/8-24 DOUBLE 60° HEAD | | 2 | Y | |
| 760 | A-1306 | • GASKET, CLAMP | | 2 | Y | |
| 770 | A-1372 | • BOLT, 7/16-20,12 POINT | | 2 | Y | |
| 770A | A-1379 | • BOLT, 7/16-20,12 POINT, ALTERNATE FOR ITEM 770 | | 2 | Y | |
| 780 | A-1373 | • NUT, 7/16-20, HEX, SELF LOCKING | | 2 | Y | |
| 850 | B-6544 | • CAP, FITTING, LUBRICATION | | 2 | Y | |
| -725 | D-7838-71 | • PCP: CLAMP UNIT | | 1 | | |
| 730 | A-285 | • • SPRING PIN, 3/32", CRES | | 3 | Y | |
| 740 | A-304 | • • LINKSCREW, 1/2-20 | | 1 | Y | |
| 790 | 107995-22 | • • BOLT, 7/16-20, 12 POINT | | 2 | Y | |
| 790A | A-2036-22 | • • SCREW, 7/16-20, CAP, MODIFIED, ALTERNATE FOR ITEM 790 | | 2 | Y | |
| 800 | B-3091 | • • PCP: COUNTERWEIGHT | | 1 | | PCP |
| 840 | C-1301-9S | • • PCP: CLAMP, BLADE (T, W, Z SHANK) | | 1 | | PCP |
| 860 | B-6588-1 | • • FITTING, LUBRICATION | | 2 | Y | |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| | | | |

- ITEM NOT ILLUSTRATED

**838-71 Clamp Assembly**



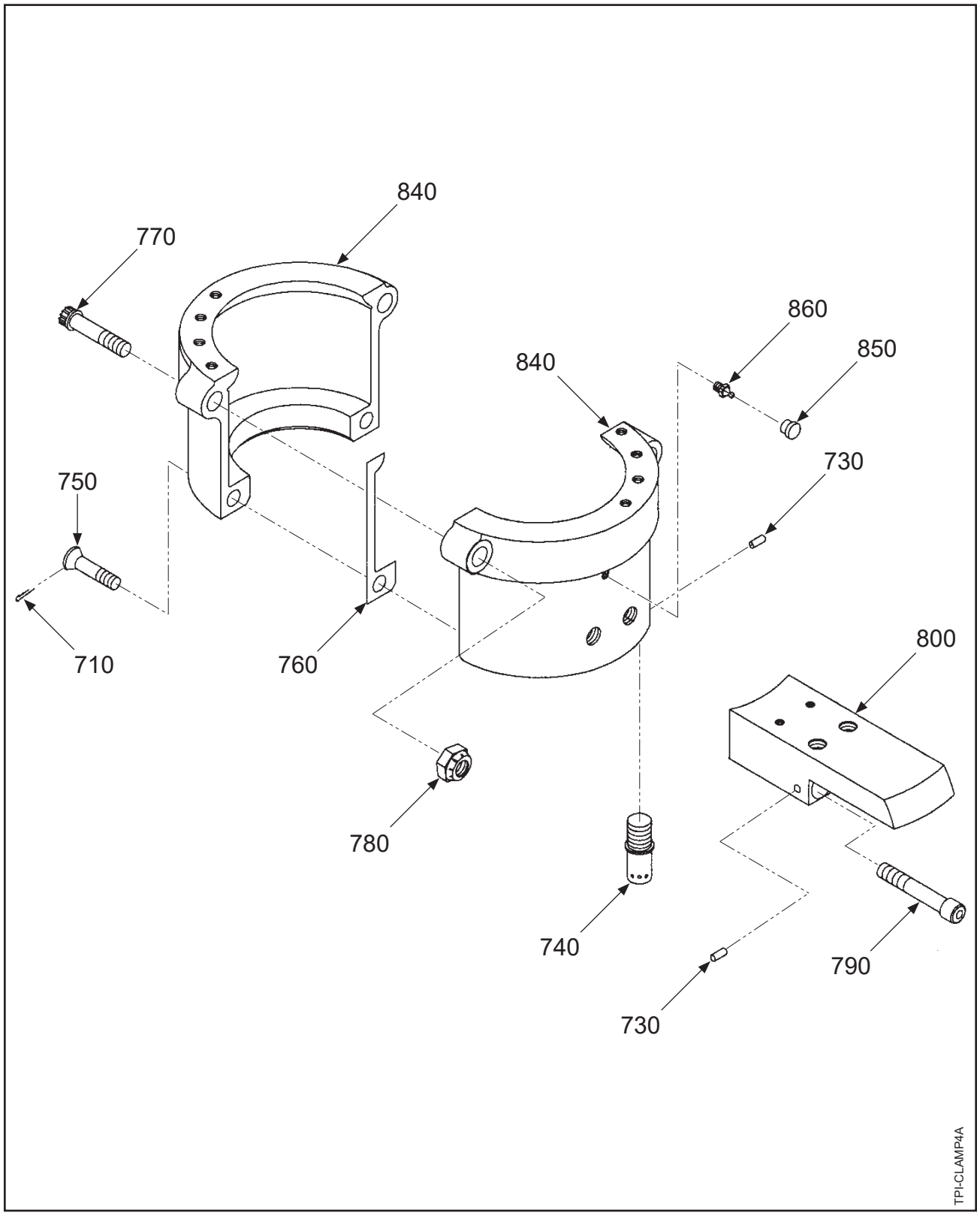

**838-71L Clamp Assembly: Exploded View**
**Figure 10A-7**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10A-7** | | **838-71L CLAMP ASSEMBLY** | | | | |
| 710 | B-3838-3-2 | • COTTER PIN | | 2 | Y | |
| 750 | A-321 | • SCREW, 3/8-24 DOUBLE 60° HEAD | | 2 | Y | |
| 760 | A-1306 | • GASKET, CLAMP | | 2 | Y | |
| 770 | A-1372 | • BOLT, 7/16-20,12 POINT | | 2 | Y | |
| 770A | A-1379 | • BOLT, 7/16-20,12 POINT, ALTERNATE FOR ITEM 770 | | 2 | Y | |
| 780 | A-1373 | • NUT, 7/16-20, HEX, SELF LOCKING | | 2 | Y | |
| 850 | B-6544 | • CAP, FITTING, LUBRICATION | | 2 | Y | |
| -725 | D-7838-71L | • PCP: CLAMP UNIT | | 1 | | |
| 730 | A-285 | • • SPRING PIN, 3/32", CRES | | 3 | Y | |
| 740 | A-304 | • • LINKSCREW, 1/2-20 | | 1 | Y | |
| 790 | 107995-22 | • • BOLT, 7/16-20, 12 POINT | | 2 | Y | |
| 790A | A-2036-22 | • • SCREW, 7/16-20, CAP, MODIFIED, ALTERNATE FOR ITEM 790 | | 2 | Y | |
| 800 | B-3091-2 | • • PCP: COUNTERWEIGHT | | 1 | | PCP |
| 800A | B-3091-1 | • • PCP: COUNTERWEIGHT, ALTERNATE FOR ITEM 800 | | 1 | | PCP |
| 840 | C-1301-10S | • • PCP: CLAMP, BLADE (T, W, Z SHANK) | | 1 | | PCP |
| 860 | B-6588-1 | • • FITTING, LUBRICATION | | 2 | Y | |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| | | | |

- ITEM NOT ILLUSTRATED

**838-71L Clamp Assembly**



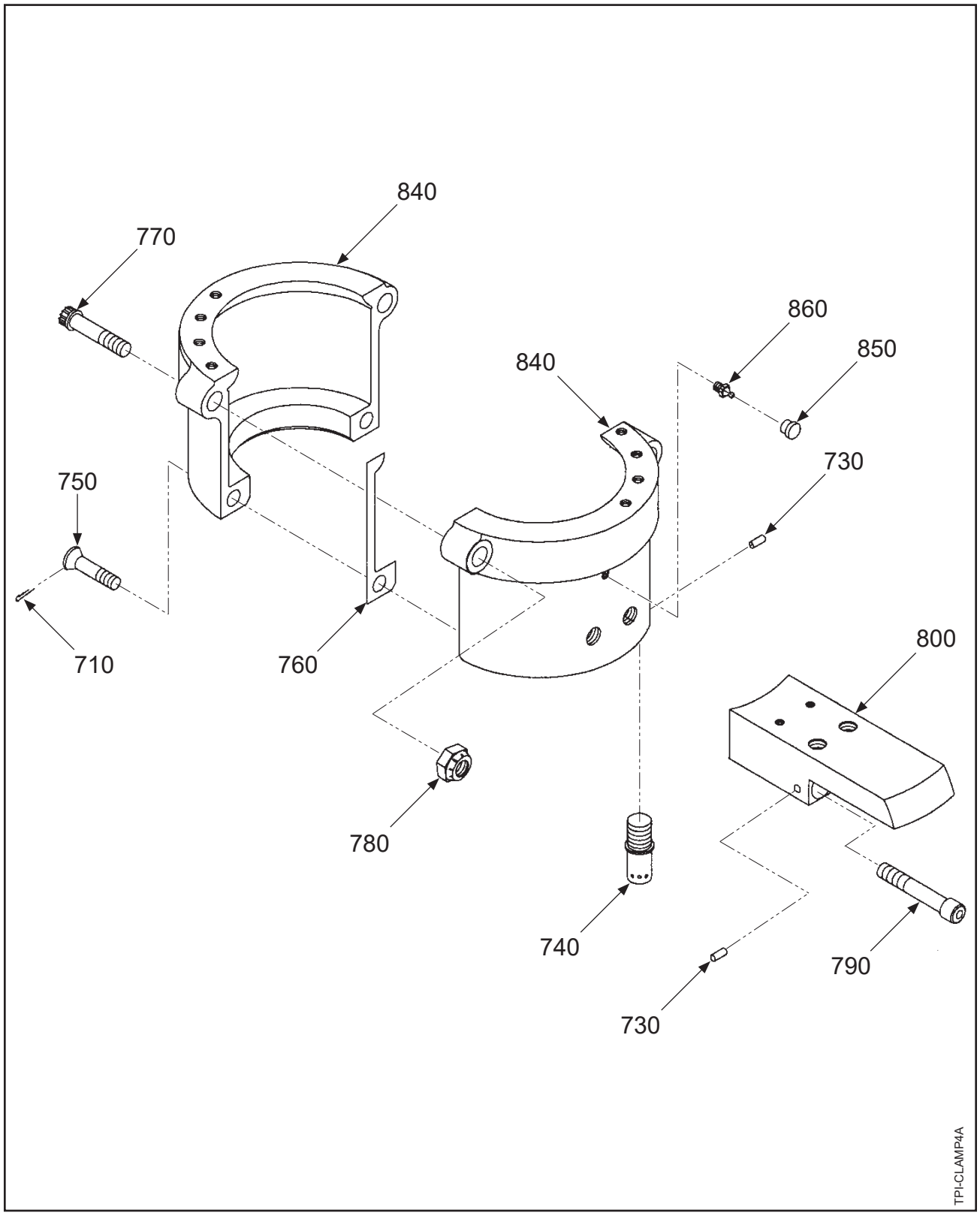

**838-80 Clamp Assembly: Exploded View**
**Figure 10A-8**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10A-8** | | **838-80 CLAMP ASSEMBLY** | | | | |
| 710 | B-3838-3-2 | • COTTER PIN | | 2 | Y | |
| 750 | A-321 | • SCREW, 3/8-24 DOUBLE 60° HEAD | | 2 | Y | |
| 760 | A-47-1 | • GASKET, BLADE CLAMP | | 2 | Y | |
| 770 | A-2017 | • BOLT, 3/8-24, 12 POINT | | 2 | Y | |
| -775 | A-2031 | • WASHER, 3/8" | | 2 | Y | |
| 780 | A-2043-1 | • NUT, 3/8-24, HEX, SELF-LOCKING | | 2 | Y | |
| 850 | B-6544 | • CAP, FITTING, LUBRICATION | | 2 | Y | |
| -725 | D-7838-80 | • PCP: CLAMP UNIT | | 1 | | |
| 730 | A-285 | • • SPRING PIN, 3/32", CRES | | 3 | Y | |
| 740 | A-304 | • • LINKSCREW, 1/2-20 | | 1 | Y | |
| 790 | 107995-22 | • • BOLT, 7/16-20, 12 POINT | | 2 | Y | |
| 790A | A-2036-22 | • • SCREW, 7/16-20, CAP, MODIFIED, ALTERNATE FOR ITEM 790 | | 2 | Y | |
| 800 | 833-29RL | • • PCP: COUNTERWEIGHT | | 1 | | PCP |
| 840 | C-3-1A | • • PCP: BLADE CLAMP | | 1 | | PCP |
| 860 | B-6588-1 | • • FITTING, LUBRICATION | | 2 | Y | |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| | | | |

- ITEM NOT ILLUSTRATED

**838-80 Clamp Assembly**



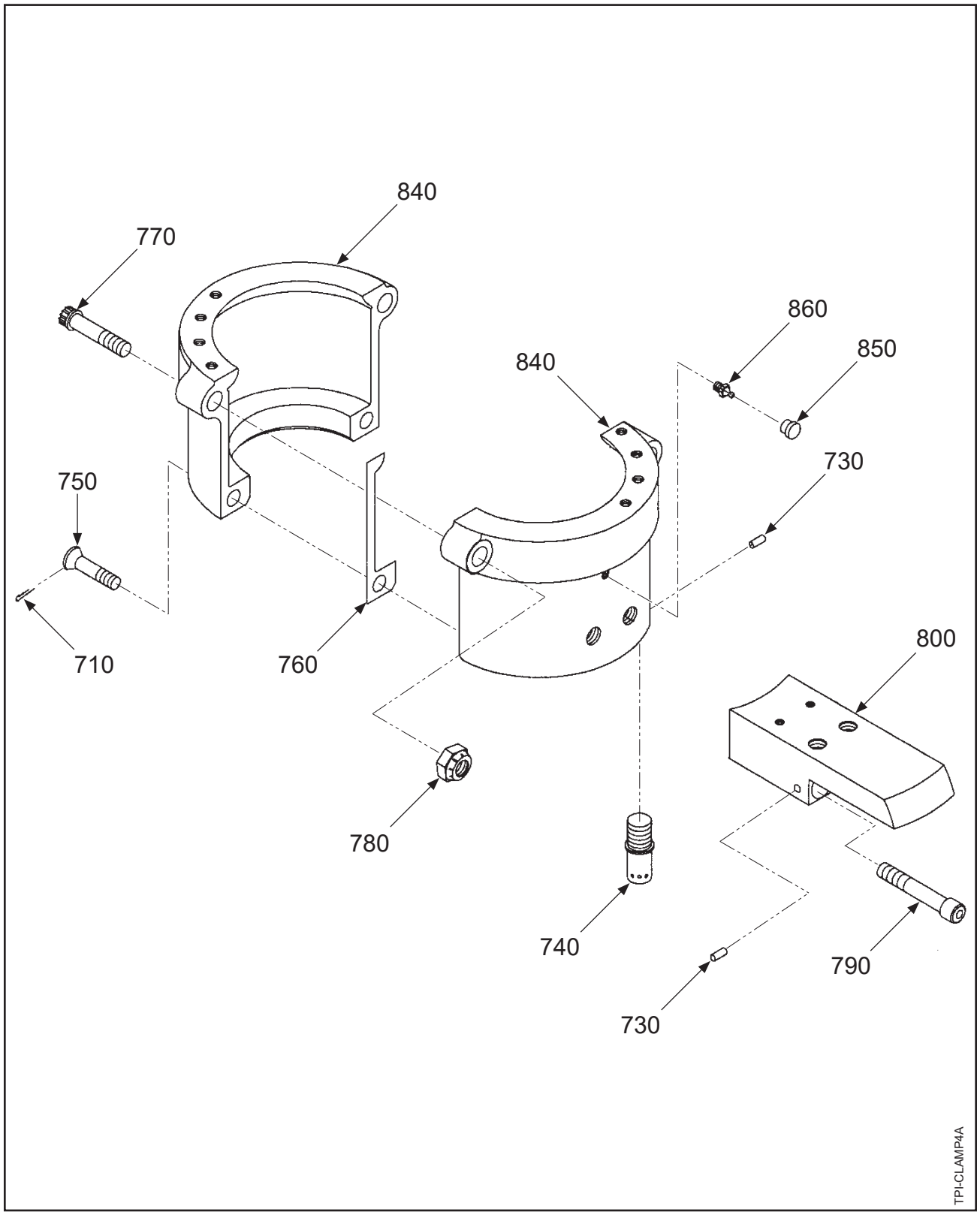

**838-82 Clamp Assembly: Exploded View**
**Figure 10A-9**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10A-9** | | **838-82 CLAMP ASSEMBLY** | | | | |
| 710 | B-3838-3-2 | • COTTER PIN | | 2 | Y | |
| 750 | A-321 | • SCREW, 3/8-24 DOUBLE 60° HEAD | | 2 | Y | |
| 760 | A-1306 | • GASKET, CLAMP | | 2 | Y | |
| 770 | A-1372 | • BOLT, 7/16-20,12 POINT | | 2 | Y | |
| 770A | A-1379 | • BOLT, 7/16-20,12 POINT, ALTERNATE FOR ITEM 770 | | 2 | Y | |
| 780 | A-1373 | • NUT, 7/16-20, HEX, SELF LOCKING | | 2 | Y | |
| 850 | B-6544 | • CAP, FITTING, LUBRICATION | | 2 | Y | |
| -725 | D-7838-82 | • PCP: CLAMP UNIT | | 1 | | |
| 730 | A-285 | • • SPRING PIN, 3/32", CRES | | 3 | Y | |
| 740 | A-304 | • • LINKSCREW, 1/2-20 | | 1 | Y | |
| 790 | 107995-22 | • • BOLT, 7/16-20, 12 POINT | | 2 | Y | |
| 790A | A-2036-22 | • • SCREW, 7/16-20, CAP, MODIFIED, ALTERNATE FOR ITEM 790 | | 2 | Y | |
| 800 | B-3007-1 | • • PCP: COUNTERWEIGHT | | 1 | | PCP |
| 840 | C-1301-9S | • • PCP: CLAMP, BLADE (T, W, Z SHANK) | | 1 | | PCP |
| 840A | C-1301-1S | • • PCP: CLAMP, BLADE (T, W, Z SHANK) ALTERNATE FOR ITEM 840 | | 1 | | PCP |
| 860 | B-6588-1 | • • FITTING, LUBRICATION | | 2 | Y | |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| | | | |

- ITEM NOT ILLUSTRATED

**838-82 Clamp Assembly**



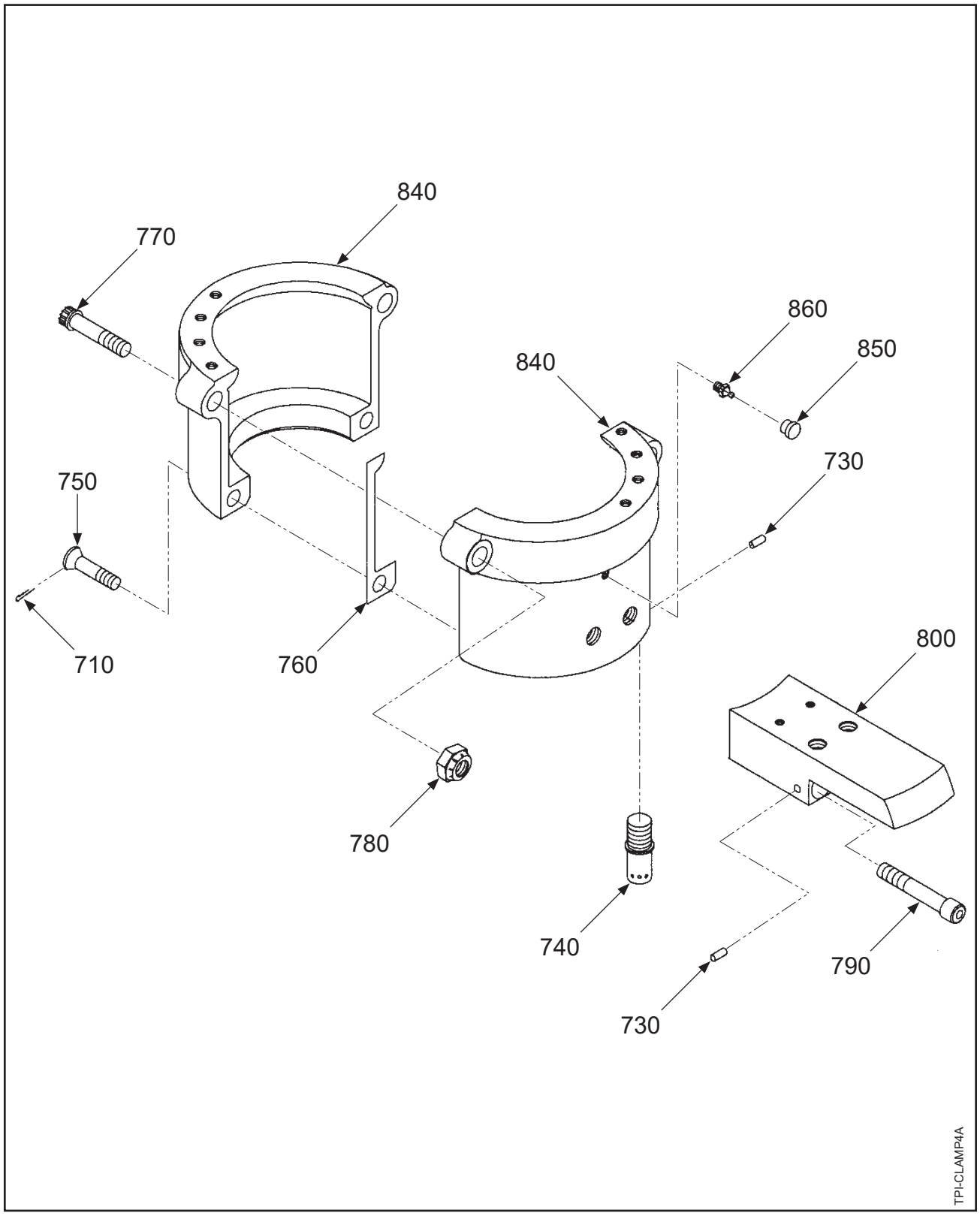

**838-85 Clamp Assembly: Exploded View**
**Figure 10A-10**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10A-10** | | **838-85 CLAMP ASSEMBLY** | | | | |
| 710 | B-3838-3-2 | • COTTER PIN | | 2 | Y | |
| 750 | A-321 | • SCREW, 3/8-24 DOUBLE 60° HEAD | | 2 | Y | |
| 760 | A-1306 | • GASKET, CLAMP | | 2 | Y | |
| 770 | A-1372 | • BOLT, 7/16-20,12 POINT | | 2 | Y | |
| 770A | A-1379 | • BOLT, 7/16-20,12 POINT, ALTERNATE FOR ITEM 770 | | 2 | Y | |
| 780 | A-1373 | • NUT, 7/16-20, HEX, SELF LOCKING | | 2 | Y | |
| 850 | B-6544 | • CAP, FITTING, LUBRICATION | | 2 | Y | |
| -725 | D-7838-85 | • CLAMP UNIT | | 1 | | |
| 730 | A-285 | • • SPRING PIN, 3/32", CRES | | 3 | Y | |
| 740 | A-304 | • • LINKSCREW, 1/2-20 | | 1 | Y | |
| 790 | 107995-22 | • • BOLT, 7/16-20, 12 POINT | | 2 | Y | |
| 790A | A-2036-22 | • • SCREW, 7/16-20, CAP, MODIFIED, ALTERNATE FOR ITEM 790 | | 2 | Y | |
| 800 | B-3661 | • • PCP: COUNTERWEIGHT | | 1 | | PCP |
| 840 | C-1301-9S | • • PCP: CLAMP, BLADE (T, W, Z SHANK) | | 1 | | PCP |
| 860 | B-6588-1 | • • FITTING, LUBRICATION | | 2 | Y | |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| | | | |

- ITEM NOT ILLUSTRATED

**838-85 Clamp Assembly**



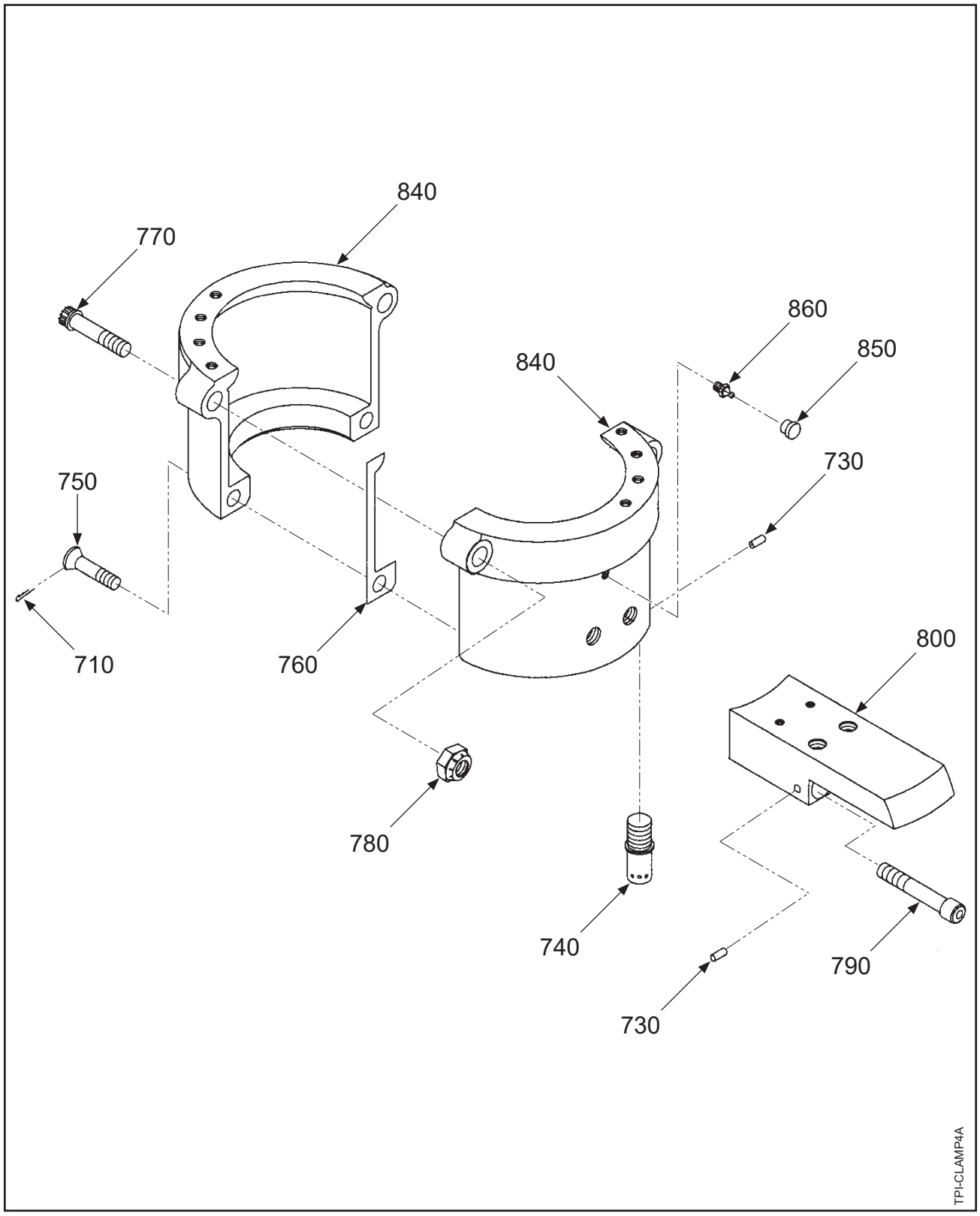

**838-88 Clamp Assembly: Exploded View**
**Figure 10A-11**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10A-11** | | **838-88 CLAMP ASSEMBLY** | | | | |
| 710 | B-3838-3-2 | • COTTER PIN | | 2 | Y | |
| 750 | A-321 | • SCREW, 3/8-24 DOUBLE 60° HEAD | | 2 | Y | |
| 760 | A-1306 | • GASKET, CLAMP | | 2 | Y | |
| 770 | A-1372 | • BOLT, 7/16-20,12 POINT | | 2 | Y | |
| 770A | A-1379 | • BOLT, 7/16-20,12 POINT, ALTERNATE FOR ITEM 770 | | 2 | Y | |
| 780 | A-1373 | • NUT, 7/16-20, HEX, SELF LOCKING | | 2 | Y | |
| 850 | B-6544 | • CAP, FITTING, LUBRICATION | | 2 | Y | |
| -725 | D-7838-88 | • PCP: CLAMP UNIT | | 1 | | |
| 730 | A-285 | • • SPRING PIN, 3/32", CRES | | 3 | Y | |
| 740 | A-304 | • • LINKSCREW, 1/2-20 | | 1 | Y | |
| 790 | 107995-22 | • • BOLT, 7/16-20, 12 POINT | | 2 | Y | |
| 790A | A-2036-22 | • • SCREW, 7/16-20, CAP, MODIFIED, ALTERNATE FOR ITEM 790 | | 2 | Y | |
| 800 | B-3007-2 | • • PCP: COUNTERWEIGHT | | 1 | | PCP |
| 840 | C-1301-9S | • • PCP: CLAMP, BLADE (T, W, Z SHANK) | | 1 | | PCP |
| 840A | C-1301-1S | • • PCP: CLAMP, BLADE (T, W, Z SHANK) ALTERNATE FOR ITEM 840 | | 1 | | PCP |
| 860 | B-6588-1 | • • FITTING, LUBRICATION | | 2 | Y | |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| | | | |

- ITEM NOT ILLUSTRATED

**838-88 Clamp Assembly**



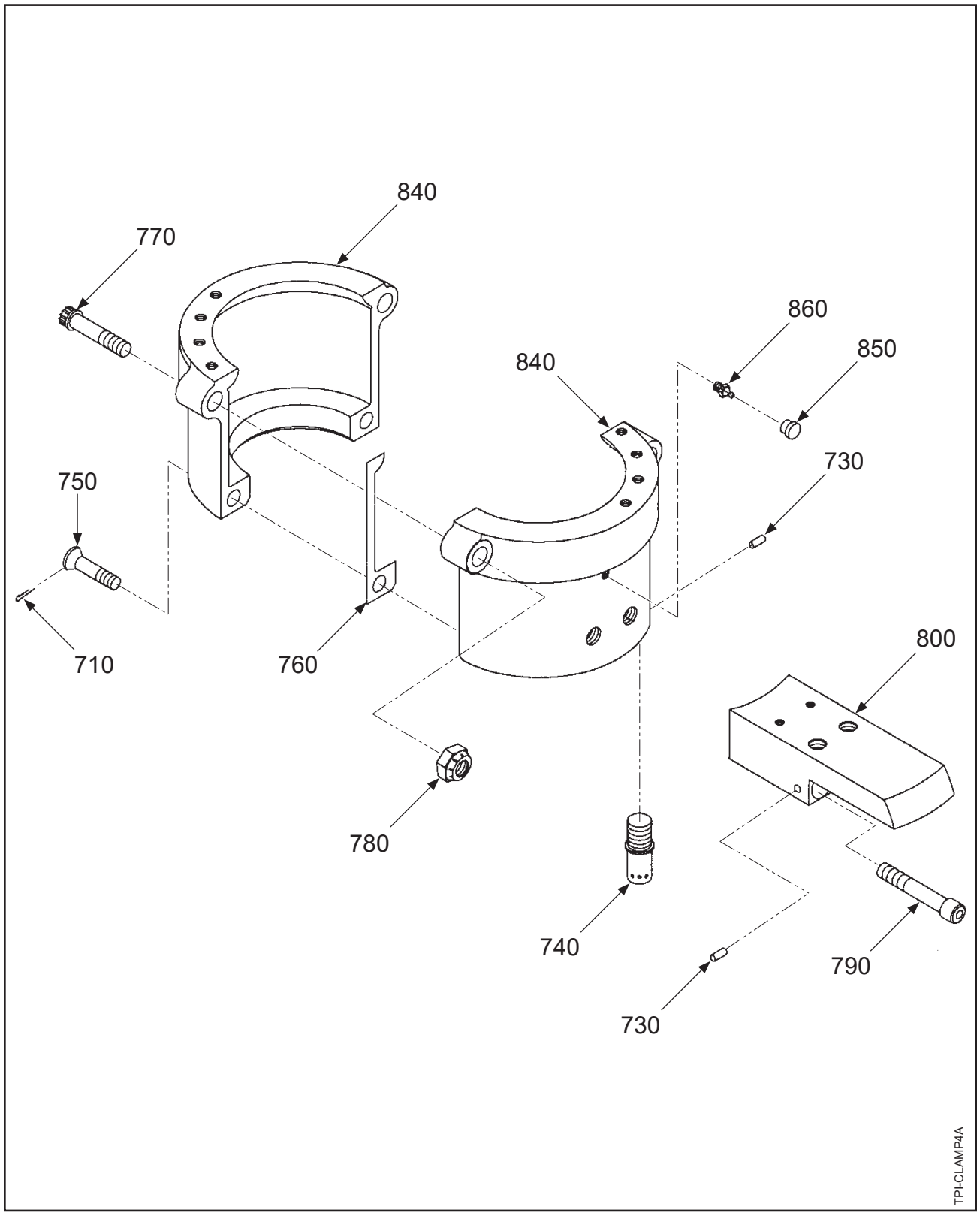

**838-89 Clamp Assembly: Exploded View**
**Figure 10A-12**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10A-12** | | **838-89 CLAMP ASSEMBLY** | | | | |
| 710 | B-3838-3-2 | • COTTER PIN | | 2 | Y | |
| 750 | A-321 | • SCREW, 3/8-24 DOUBLE 60° HEAD | | 2 | Y | |
| 760 | A-1306 | • GASKET, CLAMP | | 2 | Y | |
| 770 | A-1372 | • BOLT, 7/16-20,12 POINT | | 2 | Y | |
| 770A | A-1379 | • BOLT, 7/16-20,12 POINT, ALTERNATE FOR ITEM 770 | | 2 | Y | |
| 780 | A-1373 | • NUT, 7/16-20, HEX, SELF LOCKING | | 2 | Y | |
| 850 | B-6544 | • CAP, FITTING, LUBRICATION | | 2 | Y | |
| -725 | D-7838-89 | • PCP: CLAMP UNIT | | 1 | | |
| 730 | A-285 | • • SPRING PIN, 3/32", CRES | | 3 | Y | |
| 740 | A-304 | • • LINKSCREW, 1/2-20 | | 1 | Y | |
| 790 | 107995-22 | • • BOLT, 7/16-20, 12 POINT | | 2 | Y | |
| 790A | A-2036-22 | • • SCREW, 7/16-20, CAP, MODIFIED, ALTERNATE FOR ITEM 790 | | 2 | Y | |
| 800 | B-3007-1 | • • PCP: COUNTERWEIGHT | | 1 | | PCP |
| 840 | C-1301-9S | • • PCP: CLAMP, BLADE (T, W, Z SHANK) | | 1 | | PCP |
| 860 | B-6588-1 | • • FITTING, LUBRICATION | | 2 | Y | |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| | | | |

- ITEM NOT ILLUSTRATED

**838-89 Clamp Assembly**



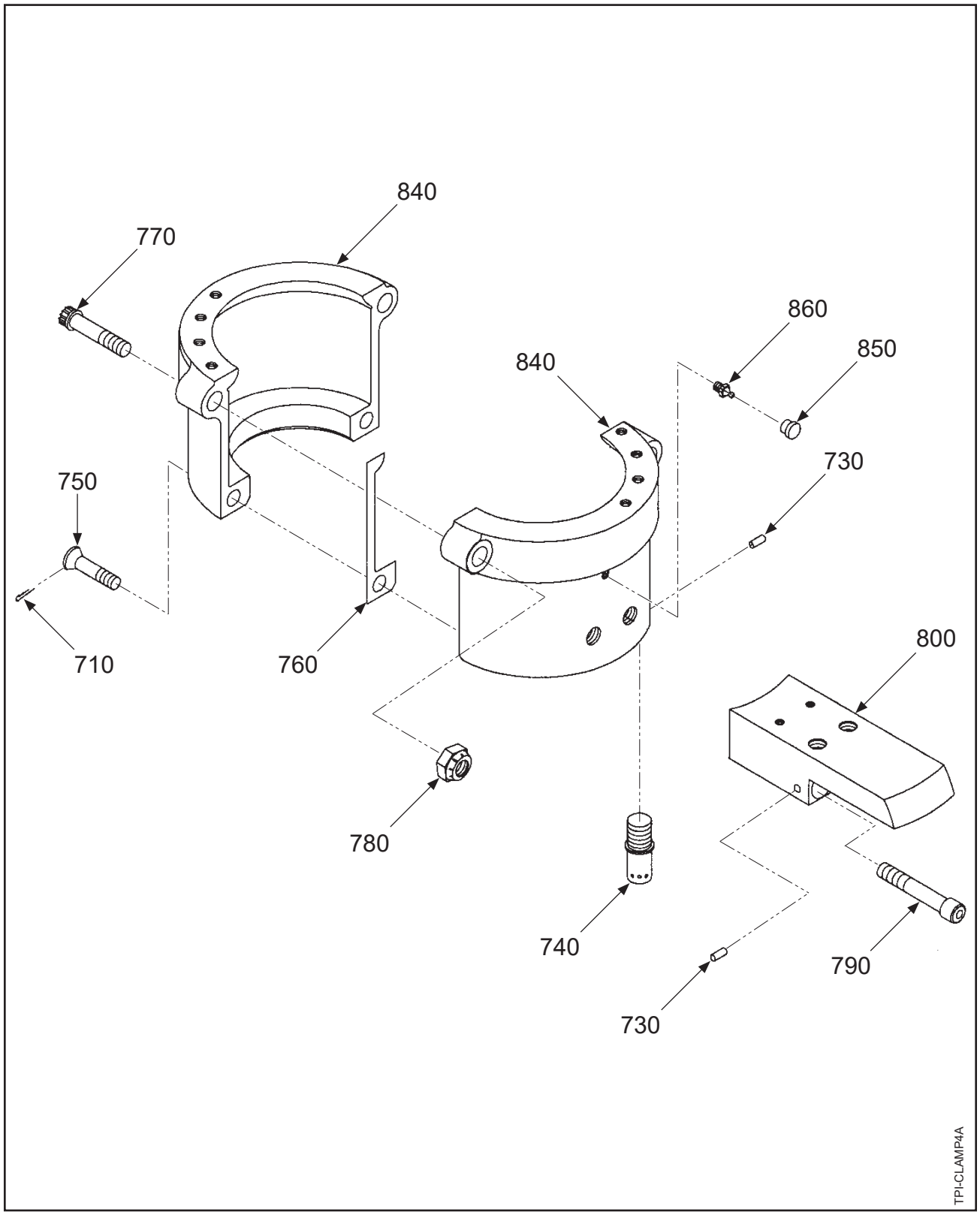

**838-92L Clamp Assembly: Exploded View**
**Figure 10A-13**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10A-13** | | **838-92L CLAMP ASSEMBLY** | | | | |
| 710 | B-3838-3-2 | • COTTER PIN | | 2 | Y | |
| 750 | A-321 | • SCREW, 3/8-24 DOUBLE 60° HEAD | | 2 | Y | |
| 760 | A-1306 | • GASKET, CLAMP | | 2 | Y | |
| 770 | A-1372 | • BOLT, 7/16-20,12 POINT | | 2 | Y | |
| 770A | A-1379 | • BOLT, 7/16-20,12 POINT, ALTERNATE FOR ITEM 770 | | 2 | Y | |
| 780 | A-1373 | • NUT, 7/16-20, HEX, SELF LOCKING | | 2 | Y | |
| 850 | B-6544 | • CAP, FITTING, LUBRICATION | | 2 | Y | |
| -725 | D-7838-92L | • PCP: CLAMP UNIT | | 1 | | |
| 730 | A-285 | • • SPRING PIN, 3/32", CRES | | 3 | Y | |
| 740 | A-304 | • • LINKSCREW, 1/2-20 | | 1 | Y | |
| 790 | 107995-22 | • • BOLT, 7/16-20, 12 POINT | | 2 | Y | |
| 790A | A-2036-22 | • • SCREW, 7/16-20, CAP, MODIFIED, ALTERNATE FOR ITEM 790 | | 2 | Y | |
| 800 | B-3091-3 | • • PCP: COUNTERWEIGHT | | 1 | | PCP |
| 840 | C-1301-10S | • • PCP: CLAMP, BLADE (T, W, Z SHANK) | | 1 | | PCP |
| 860 | B-6588-1 | • • FITTING, LUBRICATION | | 2 | Y | |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| | | | |

- ITEM NOT ILLUSTRATED

**838-92L Clamp Assembly**



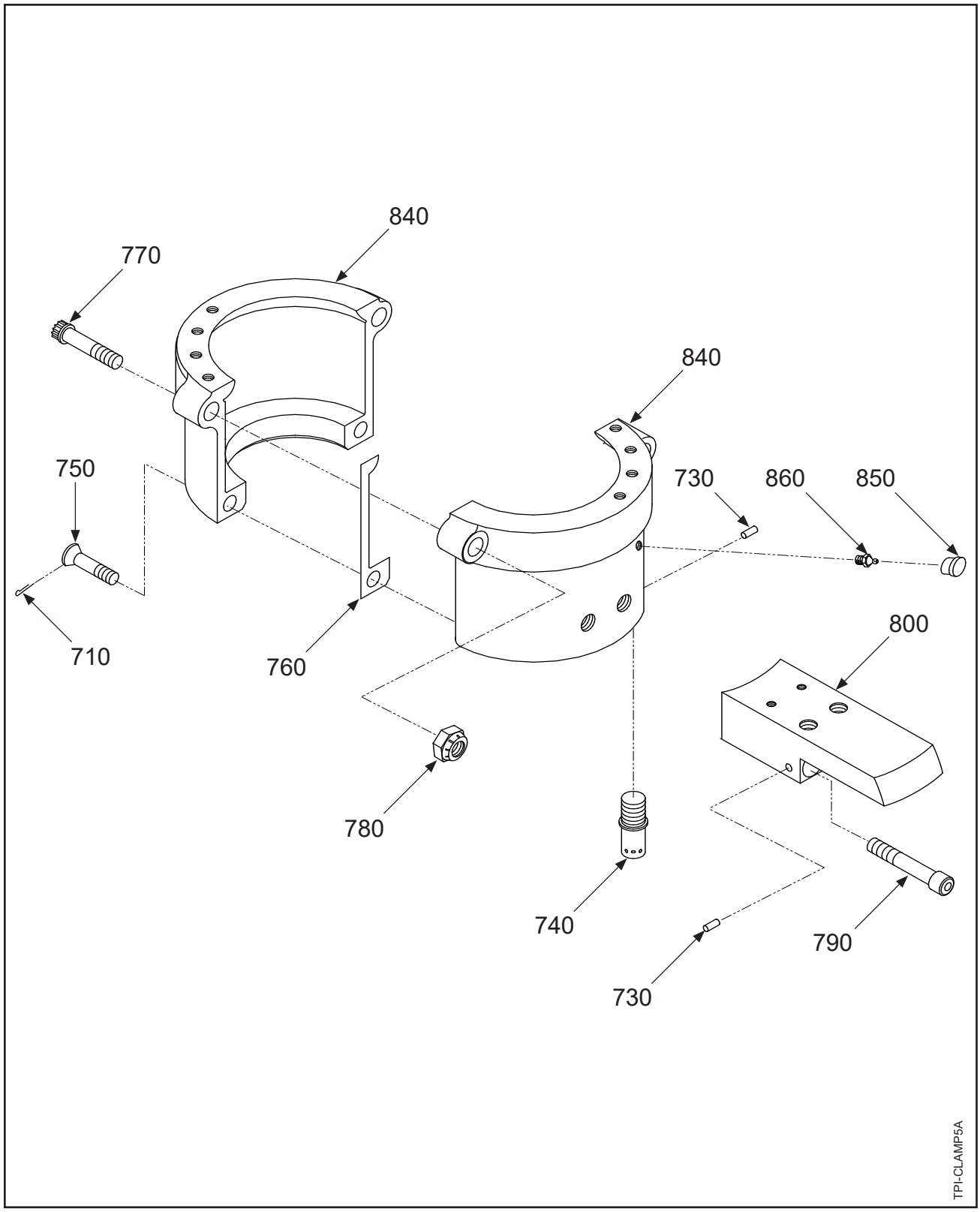

**838-93 Clamp Assembly: Exploded View**
**Figure 10A-14**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10A-14** | | **838-93 CLAMP ASSEMBLY** | | | | |
| 710 | B-3838-3-2 | • COTTER PIN | | 2 | Y | |
| 750 | A-321 | • SCREW, 3/8-24 DOUBLE 60° HEAD | | 2 | Y | |
| 760 | A-1306 | • GASKET, CLAMP | | 2 | Y | |
| 770 | A-1372 | • BOLT, 7/16-20,12 POINT | | 2 | Y | |
| 770A | A-1379 | • BOLT, 7/16-20,12 POINT, ALTERNATE FOR ITEM 770 | | 2 | Y | |
| 780 | A-1373 | • NUT, 7/16-20, HEX, SELF LOCKING | | 2 | Y | |
| 850 | B-6544 | • CAP, FITTING, LUBRICATION | | 2 | Y | |
| -725 | D-7838-93 | • PCP: CLAMP UNIT | | 1 | | |
| 730 | A-285 | • • SPRING PIN, 3/32", CRES | | 3 | Y | |
| 740 | A-304 | • • LINKSCREW, 1/2-20 | | 1 | Y | |
| 790 | 107995-22 | • • BOLT, 7/16-20, 12 POINT | | 2 | Y | |
| 790A | A-2036-22 | • • SCREW, 7/16-20, CAP, MODIFIED, ALTERNATE FOR ITEM 790 | | 2 | Y | |
| 800 | B-3661-1 | • • PCP: COUNTERWEIGHT | | 1 | | PCP |
| 840 | C-1301-9S | • • PCP: CLAMP, BLADE (T, W, Z SHANK) | | 1 | | PCP |
| 840A | C-1301-1S | • • PCP: CLAMP, BLADE (T, W, Z SHANK) ALTERNATE FOR ITEM 840 | | 1 | | PCP |
| 860 | B-6588-1 | • • FITTING, LUBRICATION | | 2 | Y | |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| | | | |

- ITEM NOT ILLUSTRATED

**838-93 Clamp Assembly**



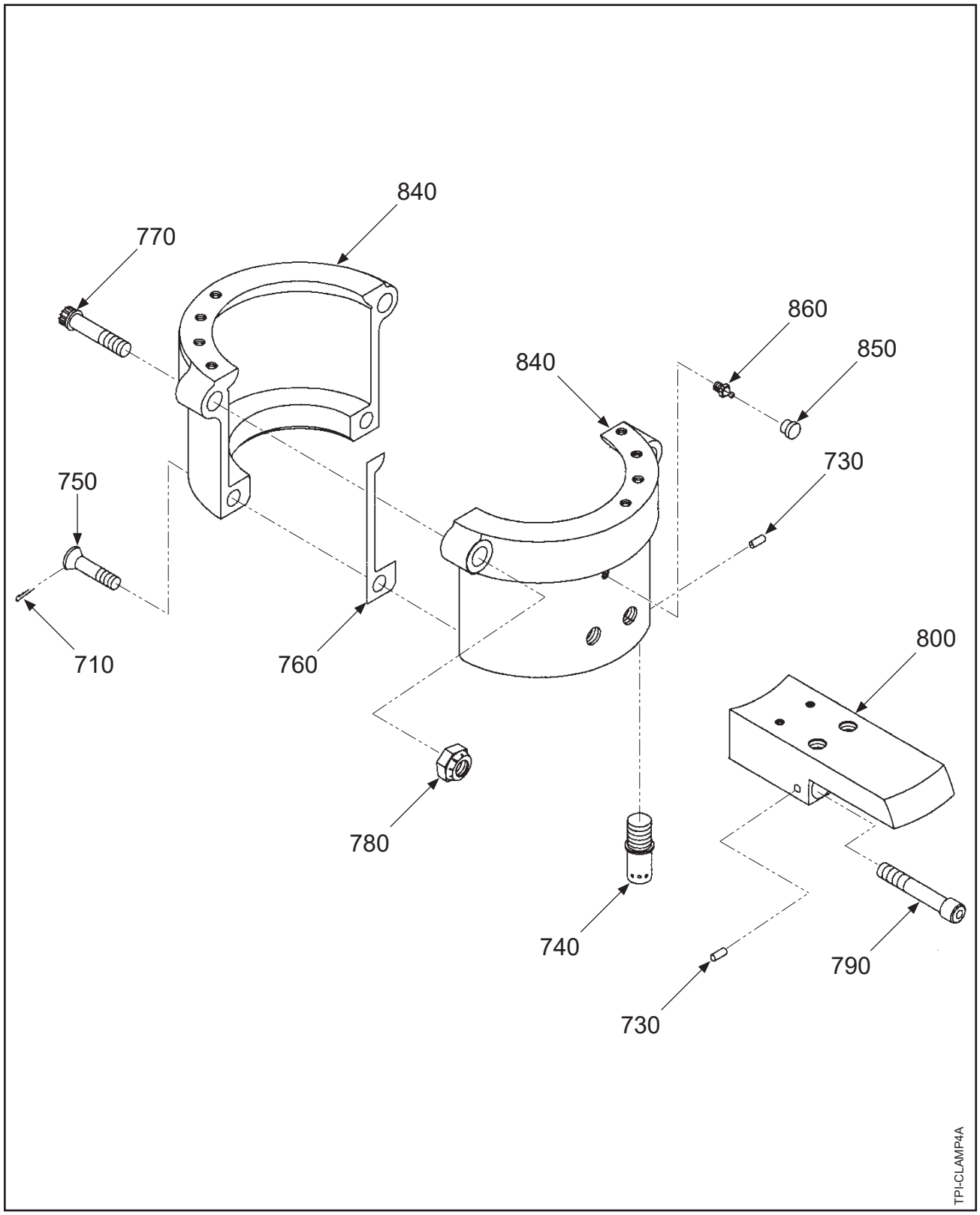

**838-94L Clamp Assembly: Exploded View**
**Figure 10A-15**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10A-15** | | **838-94L CLAMP ASSEMBLY** | | | | |
| 710 | B-3838-3-2 | • COTTER PIN | | 2 | Y | |
| 750 | A-321 | • SCREW, 3/8-24 DOUBLE 60° HEAD | | 2 | Y | |
| 760 | A-1306-1 | • GASKET, CLAMP | | 2 | Y | |
| 770 | A-1372 | • BOLT, 7/16-20,12 POINT | | 2 | Y | |
| 770A | A-1379 | • BOLT, 7/16-20,12 POINT, ALTERNATE FOR ITEM 770 | | 2 | Y | |
| 780 | A-1373 | • NUT, 7/16-20, HEX, SELF LOCKING | | 2 | Y | |
| 850 | B-6544 | • CAP, FITTING, LUBRICATION | | 2 | Y | |
| -725 | D-7838-94L | • PCP: CLAMP UNIT | | 1 | | |
| 730 | A-285 | • • SPRING PIN, 3/32", CRES | | 3 | Y | |
| 740 | A-304 | • • LINKSCREW, 1/2-20 | | 1 | Y | |
| 790 | 107995-22 | • • BOLT, 7/16-20, 12 POINT | | 2 | Y | |
| 790A | A-2036-22 | • • SCREW, 7/16-20, CAP, MODIFIED, ALTERNATE FOR ITEM 790 | | 2 | Y | |
| 800 | B-3319 | • • PCP: COUNTERWEIGHT | | 1 | | PCP |
| 840 | C-1977-3P | • • PCP: CLAMP (M, P, R SHANK) | | 1 | | PCP |
| 860 | B-6588-1 | • • FITTING, LUBRICATION | | 2 | Y | |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| | | | |

- ITEM NOT ILLUSTRATED

**838-94L Clamp Assembly**



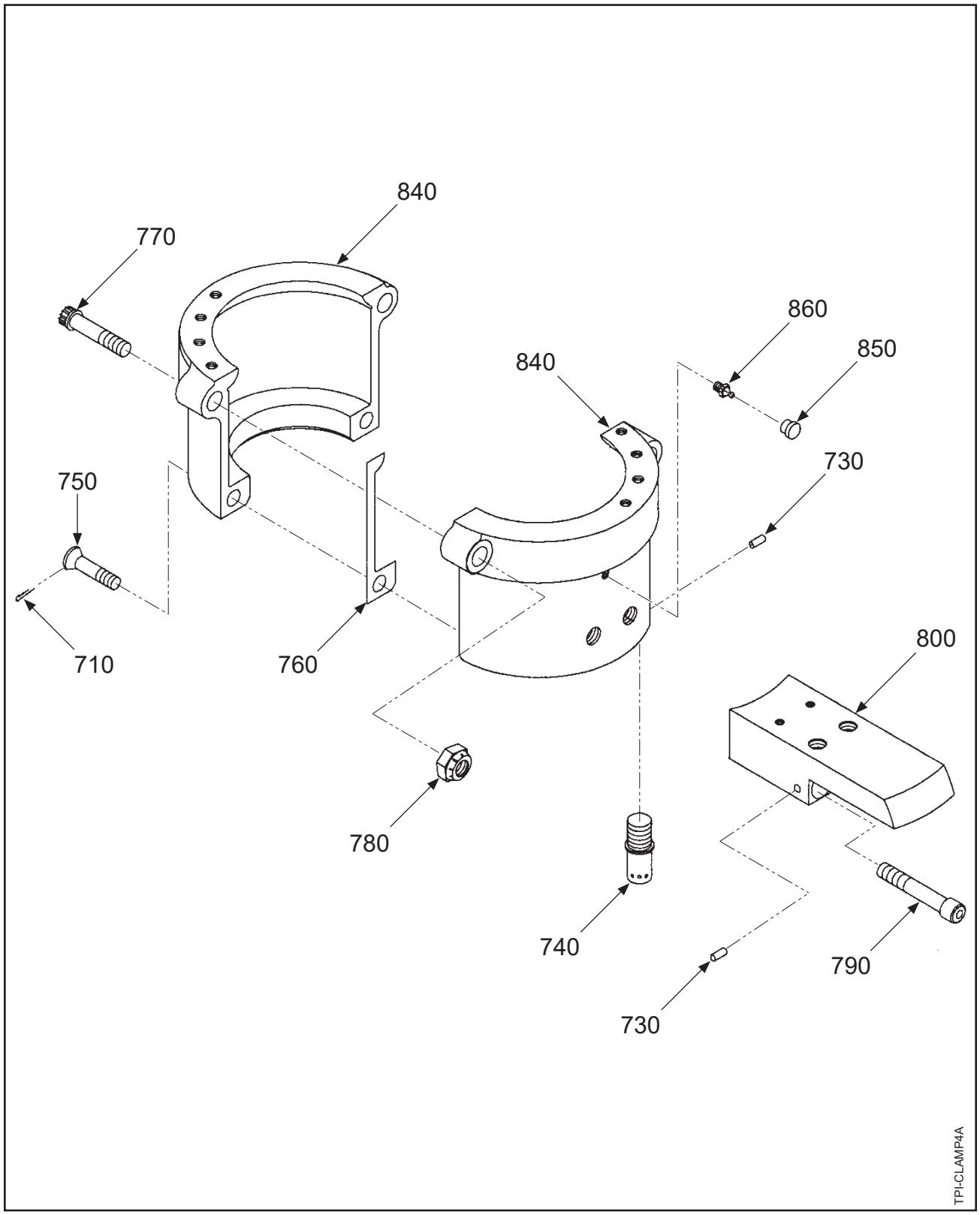

**838-95 Clamp Assembly: Exploded View**
**Figure 10A-16**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10A-16** | | **838-95 CLAMP ASSEMBLY** | | | | |
| 710 | B-3838-3-2 | • COTTER PIN | | 2 | Y | |
| 750 | A-321 | • SCREW, 3/8-24 DOUBLE 60° HEAD | | 2 | Y | |
| 760 | A-1306 | • GASKET, CLAMP | | 2 | Y | |
| 770 | A-1372 | • BOLT, 7/16-20,12 POINT | | 2 | Y | |
| 770A | A-1379 | • BOLT, 7/16-20,12 POINT, ALTERNATE FOR ITEM 770 | | 2 | Y | |
| 780 | A-1373 | • NUT, 7/16-20, HEX, SELF LOCKING | | 2 | Y | |
| 850 | B-6544 | • CAP, FITTING, LUBRICATION | | 2 | Y | |
| -725 | D-7838-95 | • PCP: CLAMP UNIT | | 1 | | |
| 730 | A-285 | • • SPRING PIN, 3/32", CRES | | 3 | Y | |
| 740 | A-304 | • • LINKSCREW, 1/2-20 | | 1 | Y | |
| 790 | 107995-22 | • • BOLT, 7/16-20, 12 POINT | | 2 | Y | |
| 790A | A-2036-22 | • • SCREW, 7/16-20, CAP, MODIFIED, ALTERNATE FOR ITEM 790 | | 2 | Y | |
| 800 | B-3091-2 | • • PCP: COUNTERWEIGHT | | 1 | | PCP |
| 840 | C-1301-9S | • • PCP: CLAMP, BLADE (T, W, Z SHANK) | | 1 | | PCP |
| 860 | B-6588-1 | • • FITTING, LUBRICATION | | 2 | Y | |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| | | | |

- ITEM NOT ILLUSTRATED

**838-95 Clamp Assembly**



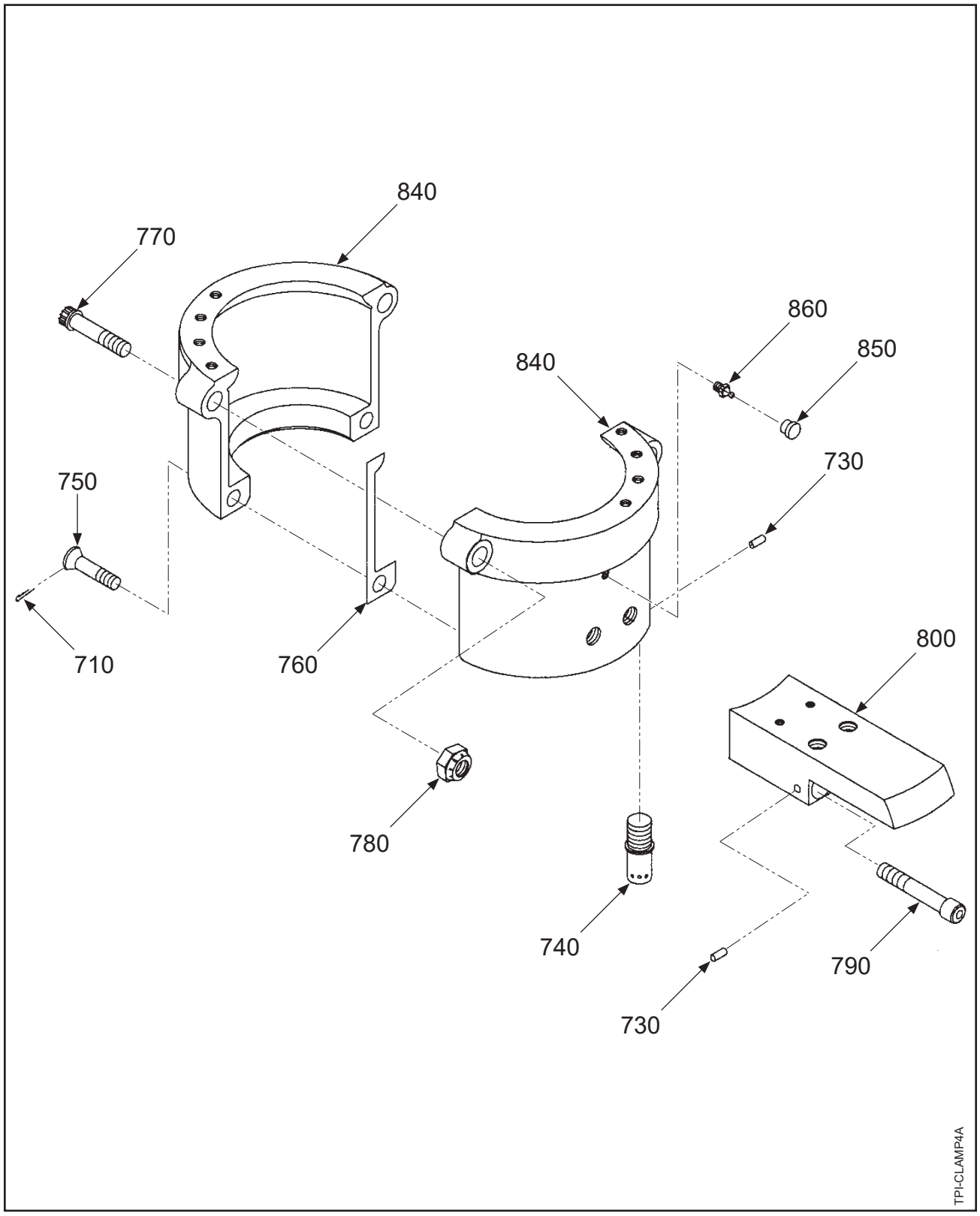

**838-97L Clamp Assembly: Exploded View**
**Figure 10A-17**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10A-17** | | **838-97L CLAMP ASSEMBLY** | | | | |
| 710 | B-3838-3-2 | • COTTER PIN | | 2 | Y | |
| 750 | A-321 | • SCREW, 3/8-24 DOUBLE 60° HEAD | | 2 | Y | |
| 760 | A-1306-1 | • GASKET, CLAMP | | 2 | Y | |
| 770 | A-1372 | • BOLT, 7/16-20,12 POINT | | 2 | Y | |
| 770A | A-1379 | • BOLT, 7/16-20,12 POINT, ALTERNATE FOR ITEM 770 | | 2 | Y | |
| 780 | A-1373 | • NUT, 7/16-20, HEX, SELF LOCKING | | 2 | Y | |
| 850 | B-6544 | • CAP, FITTING, LUBRICATION | | 2 | Y | |
| -725 | D-7838-97L | • PCP: CLAMP UNIT | | 1 | | |
| 730 | A-285 | • • SPRING PIN, 3/32", CRES | | 3 | Y | |
| 740 | A-304 | • • LINKSCREW, 1/2-20 | | 1 | Y | |
| 790 | 107995-22 | • • BOLT, 7/16-20, 12 POINT | | 2 | Y | |
| 790A | A-2036-22 | • • SCREW, 7/16-20, CAP, MODIFIED, ALTERNATE FOR ITEM 790 | | 2 | Y | |
| 800 | B-3324 | • • PCP: COUNTERWEIGHT | | 1 | | PCP |
| 840 | C-1977-3P | • • PCP: CLAMP, BLADE (T, W, Z SHANK) | | 1 | | PCP |
| 860 | B-6588-1 | • • FITTING, LUBRICATION | | 2 | Y | |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| | | | |

- ITEM NOT ILLUSTRATED

**838-97L Clamp Assembly**



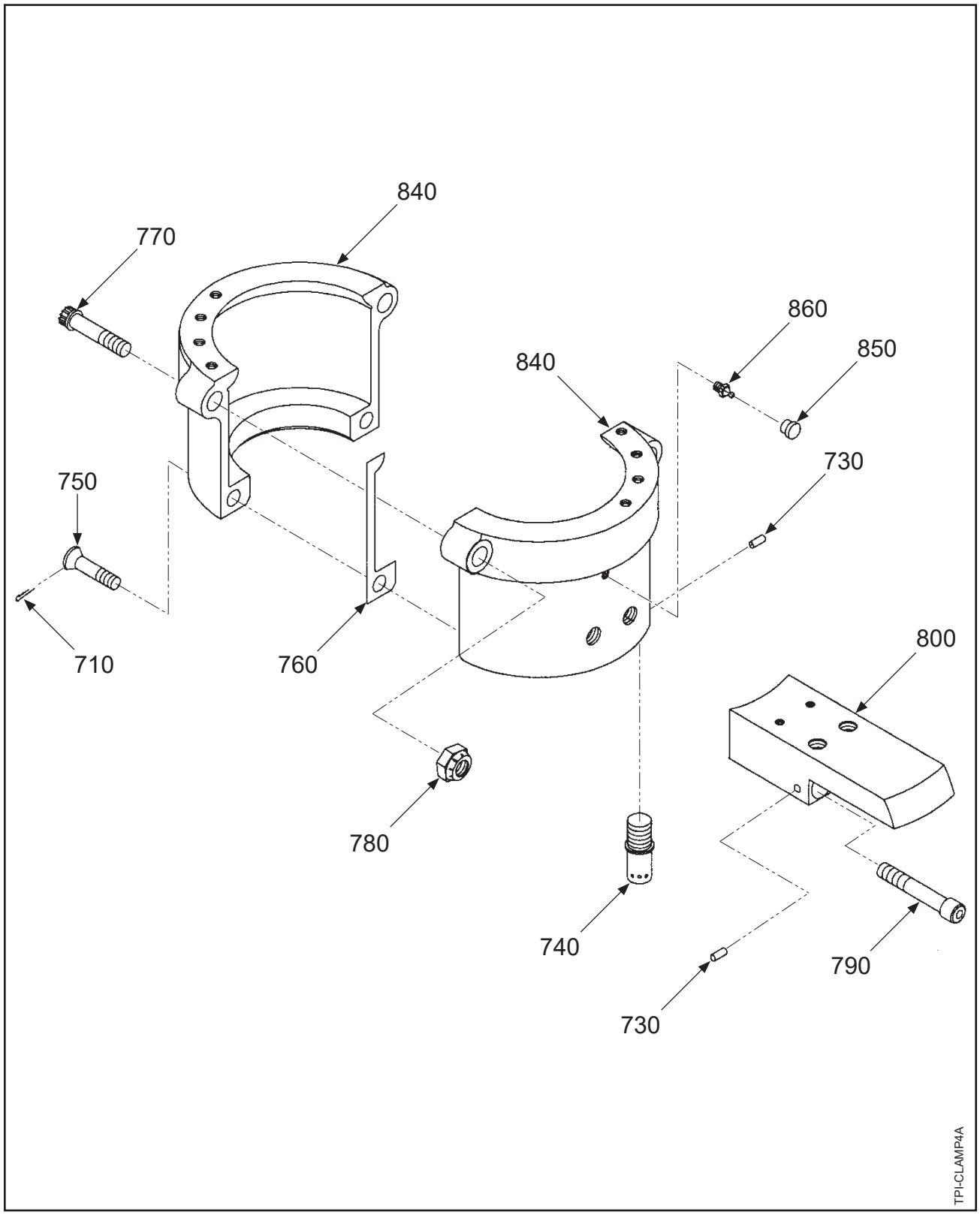

**838-98 Clamp Assembly: Exploded View**
**Figure 10A-18**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10A-18** | | **838-98 CLAMP ASSEMBLY** | | | | |
| 710 | B-3838-3-2 | • COTTER PIN | | 2 | Y | |
| 750 | A-321 | • SCREW, 3/8-24 DOUBLE 60° HEAD | | 2 | Y | |
| 760 | A-1306 | • GASKET, CLAMP | | 2 | Y | |
| 770 | A-1372 | • BOLT, 7/16-20,12 POINT | | 2 | Y | |
| 770A | A-1379 | • BOLT, 7/16-20,12 POINT, ALTERNATE FOR ITEM 770 | | 2 | Y | |
| 780 | A-1373 | • NUT, 7/16-20, HEX, SELF LOCKING | | 2 | Y | |
| 850 | B-6544 | • CAP, FITTING, LUBRICATION | | 2 | Y | |
| -725 | D-7838-98 | • PCP: CLAMP UNIT | | 1 | | |
| 730 | A-285 | • • SPRING PIN, 3/32", CRES | | 3 | Y | |
| 740 | A-304 | • • LINKSCREW, 1/2-20 | | 1 | Y | |
| 790 | 107995-22 | • • BOLT, 7/16-20, 12 POINT | | 2 | Y | |
| 790A | A-2036-22 | • • SCREW, 7/16-20, CAP, MODIFIED, ALTERNATE FOR ITEM 790 | | 2 | Y | |
| 800 | B-3328 | • • PCP: COUNTERWEIGHT | | 1 | | PCP |
| 840 | C-1301-9S | • • PCP: CLAMP, BLADE (T, W, Z SHANK) | | 1 | | PCP |
| 840A | C-1301-1S | • • PCP: CLAMP, BLADE (T, W, Z SHANK) ALTERNATE FOR ITEM 840 | | 1 | | PCP |
| 860 | B-6588-1 | • • FITTING, LUBRICATION | | 2 | Y | |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| | | | |

- ITEM NOT ILLUSTRATED

**838-98 Clamp Assembly**



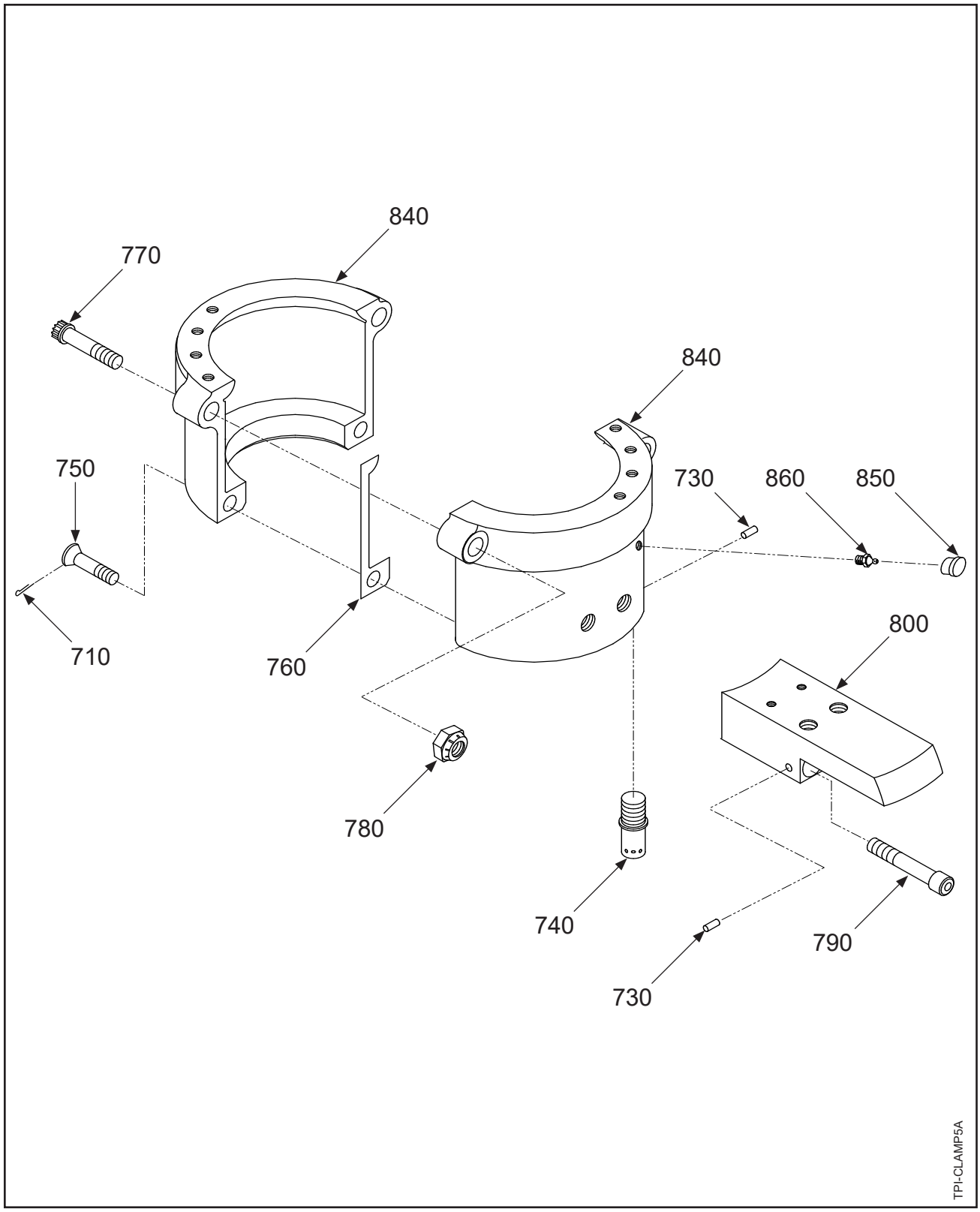

**838-98L Clamp Assembly: Exploded View**
**Figure 10A-19**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10A-19** | | **838-98L CLAMP ASSEMBLY** | | | | |
| 710 | B-3838-3-2 | • COTTER PIN | | 2 | Y | |
| 750 | A-321 | • SCREW, 3/8-24 DOUBLE 60° HEAD | | 2 | Y | |
| 760 | A-1306 | • GASKET, CLAMP | | 2 | Y | |
| 770 | A-1372 | • BOLT, 7/16-20,12 POINT | | 2 | Y | |
| 770A | A-1379 | • BOLT, 7/16-20,12 POINT, ALTERNATE FOR ITEM 770 | | 2 | Y | |
| 780 | A-1373 | • NUT, 7/16-20, HEX, SELF LOCKING | | 2 | Y | |
| 850 | B-6544 | • CAP, FITTING, LUBRICATION | | 2 | Y | |
| -725 | D-7838-98L | • PCP: CLAMP UNIT | | 1 | | |
| 730 | A-285 | • • SPRING PIN, 3/32", CRES | | 3 | Y | |
| 740 | A-304 | • • LINKSCREW, 1/2-20 | | 1 | Y | |
| 790 | 107995-22 | • • BOLT, 7/16-20, 12 POINT | | 2 | Y | |
| 790A | A-2036-22 | • • SCREW, 7/16-20, CAP, MODIFIED, ALTERNATE FOR ITEM 790 | | 2 | Y | |
| 800 | B-3328 | • • PCP: COUNTERWEIGHT | | 1 | | PCP |
| 840 | C-1301-10S | • • PCP: CLAMP, BLADE (T, W, Z SHANK) | | 1 | | PCP |
| 860 | B-6588-1 | • • FITTING, LUBRICATION | | 2 | Y | |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| | | | |

- ITEM NOT ILLUSTRATED

**838-98L Clamp Assembly**



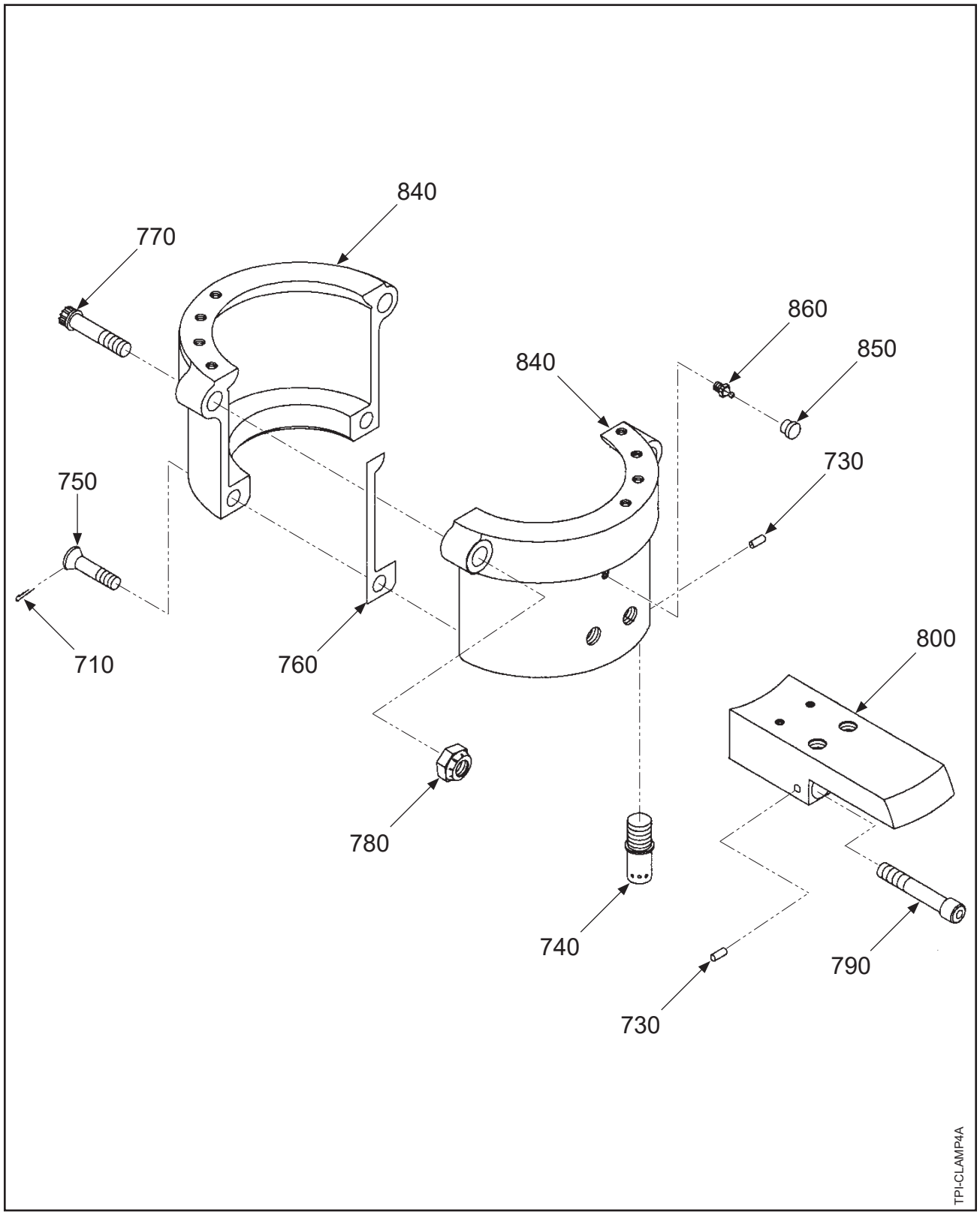

**838-103 Clamp Assembly: Exploded View**
**Figure 10A-20**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10A-20** | | **838-103 CLAMP ASSEMBLY** | | | | |
| 710 | B-3838-3-2 | • COTTER PIN | | 2 | Y | |
| 750 | A-321 | • SCREW, 3/8-24 DOUBLE 60° HEAD | | 2 | Y | |
| 760 | A-1306-1 | • GASKET, CLAMP | | 2 | Y | |
| 770 | A-1372 | • BOLT, 7/16-20,12 POINT | | 2 | Y | |
| 770A | A-1379 | • BOLT, 7/16-20,12 POINT - ALTERNATE | | 2 | Y | |
| 780 | A-1373 | • NUT, 7/16-20, HEX, SELF LOCKING | | 2 | Y | |
| 850 | B-6544 | • CAP, FITTING, LUBRICATION | | 2 | Y | |
| -725 | D7838-103 | • PCP: CLAMP UNIT | | 1 | | |
| 730 | A-285 | • • SPRING PIN, 3/32", CRES | | 3 | Y | |
| 740 | A-304 | • • LINKSCREW, 1/2-20 | | 1 | Y | |
| 790 | 107995-22 | • • BOLT, 7/16-20, 12 POINT | | 2 | Y | |
| 790A | A-2036-22 | • • SCREW, 7/16-20, CAP, MODIFIED, ALTERNATE FOR ITEM 790 | | 2 | Y | |
| 800A | B-3091-3 | • • PCP: COUNTERWEIGHT | | 1 | | PCP |
| 840 | C-1977-1P | • • PCP: CLAMP (M, P, R SHANK) | | 1 | | PCP |
| 840A | C-1977-4P | • • PCP: CLAMP (M, P, R SHANK), ALTERNATE FOR ITEM 840 | | 1 | | PCP |
| 860 | B-6588-1 | • • FITTING, LUBRICATION | | 2 | Y | |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| | | | |

- ITEM NOT ILLUSTRATED

**838-103 Clamp Assembly**



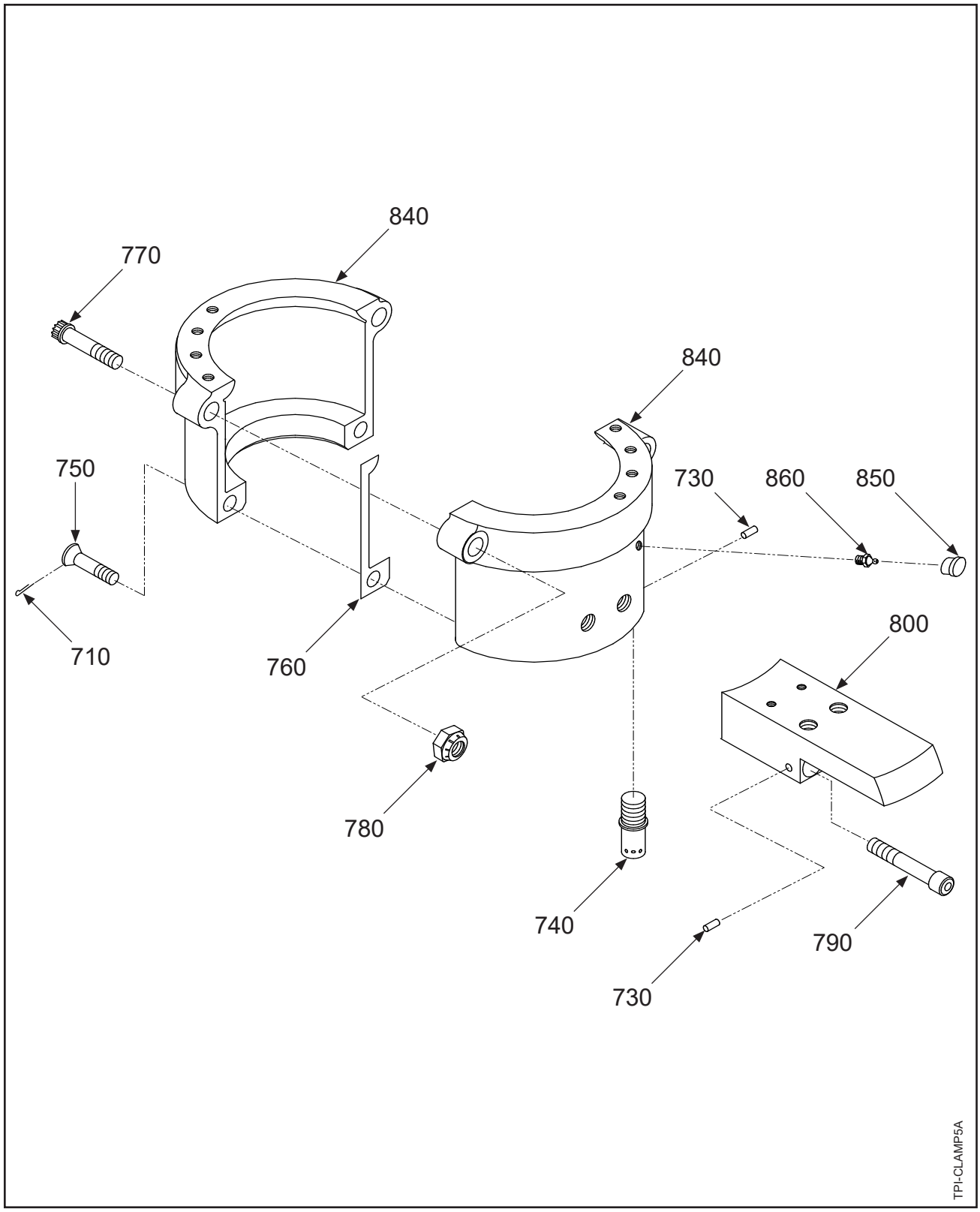

**838-105 Clamp Assembly: Exploded View**
**Figure 10A-21**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10A-21** | | **838-105 CLAMP ASSEMBLY** | | | | |
| 710 | B-3838-3-2 | • COTTER PIN | | 2 | Y | |
| 750 | A-321 | • SCREW, 3/8-24 DOUBLE 60° HEAD | | 2 | Y | |
| 760 | A-1306 | • GASKET, CLAMP | | 2 | Y | |
| 770 | A-1372 | • BOLT, 7/16-20,12 POINT | | 2 | Y | |
| 770A | A-1379 | • BOLT, 7/16-20,12 POINT, ALTERNATE FOR ITEM 770 | | 2 | Y | |
| 780 | A-1373 | • NUT, 7/16-20, HEX, SELF LOCKING | | 2 | Y | |
| 850 | B-6544 | • CAP, FITTING, LUBRICATION | | 2 | Y | |
| -725 | D-7838-105 | • PCP: CLAMP UNIT | | 1 | | |
| 730 | A-285 | • • SPRING PIN, 3/32", CRES | | 3 | Y | |
| 740 | A-304 | • • LINKSCREW, 1/2-20 | | 1 | Y | |
| 790 | 107995-22 | • • BOLT, 7/16-20, 12 POINT | | 2 | Y | |
| 790A | A-2036-22 | • • SCREW, 7/16-20, CAP, MODIFIED, ALTERNATE FOR ITEM 790 | | 2 | Y | |
| 800 | B-3007-3 | • • PCP: COUNTERWEIGHT | | 1 | | PCP |
| 840 | C-1301-9S | • • PCP: CLAMP, BLADE (T, W, Z SHANK) | | 1 | | PCP |
| 840A | C-1301-1S | • • PCP: CLAMP, BLADE (T, W, Z SHANK) ALTERNATE FOR ITEM 840 | | 1 | | PCP |
| 860 | B-6588-1 | • • FITTING, LUBRICATION | | 2 | Y | |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| | | | |

- ITEM NOT ILLUSTRATED

**838-105 Clamp Assembly**



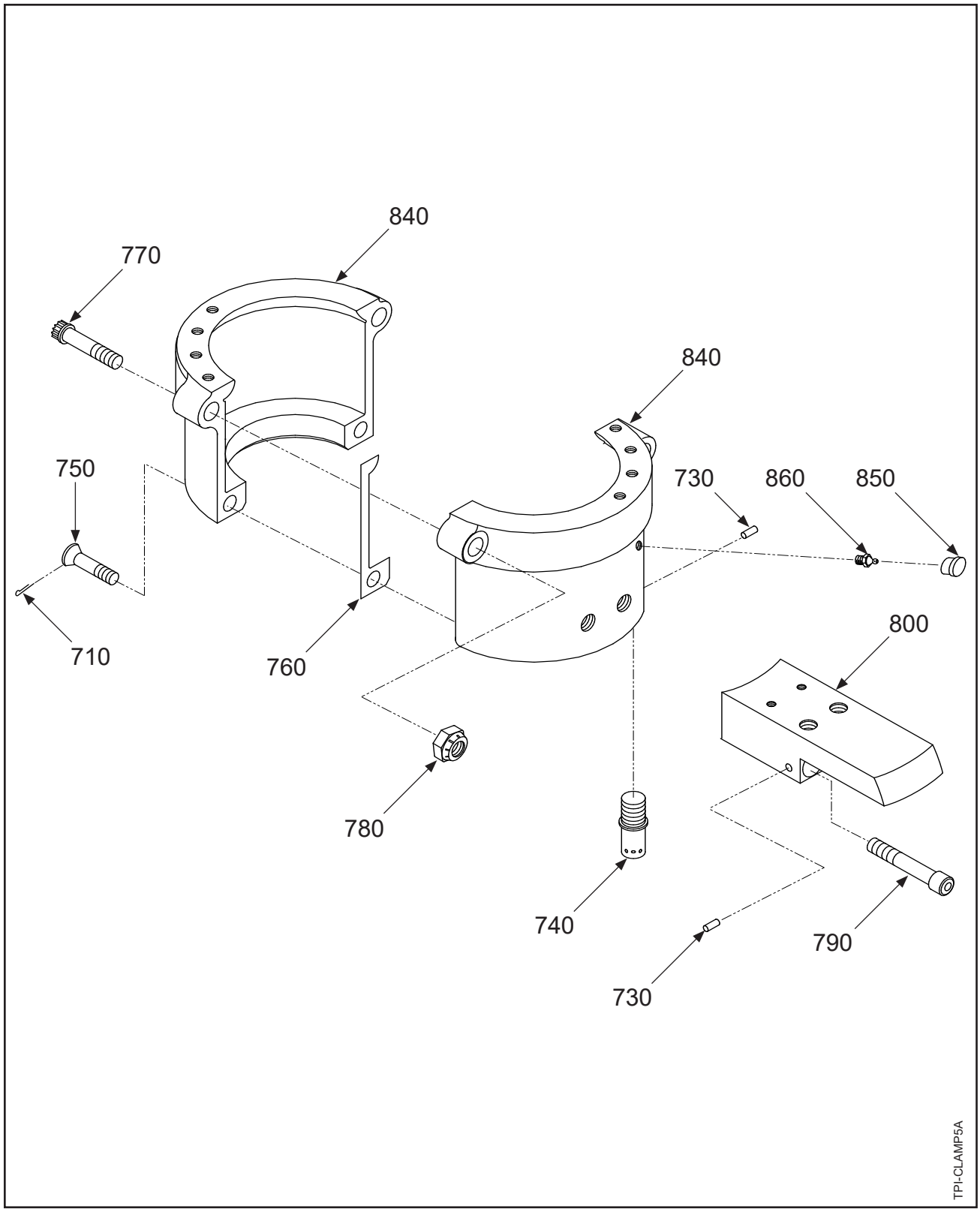

**838-109 Clamp Assembly: Exploded View**
**Figure 10A-22**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10A-22** | | **838-109 CLAMP ASSEMBLY** | | | | |
| 710 | B-3838-3-2 | • COTTER PIN | | 2 | Y | |
| 750 | A-321 | • SCREW, 3/8-24 DOUBLE 60° HEAD | | 2 | Y | |
| 760 | A-1306-1 | • GASKET, CLAMP | | 2 | Y | |
| 770 | A-1372 | • BOLT, 7/16-20,12 POINT | | 2 | Y | |
| 770A | A-1379 | • BOLT, 7/16-20,12 POINT, ALTERNATE FOR ITEM 770 | | 2 | Y | |
| 780 | A-1373 | • NUT, 7/16-20, HEX, SELF LOCKING | | 2 | Y | |
| 850 | B-6544 | • CAP, FITTING, LUBRICATION | | 2 | Y | |
| -725 | D-7838-109 | • PCP: CLAMP UNIT | | 1 | | |
| 730 | A-285 | • • SPRING PIN, 3/32", CRES | | 3 | Y | |
| 740 | A-304 | • • LINKSCREW, 1/2-20 | | 1 | Y | |
| 790 | 107995-22 | • • BOLT, 7/16-20, 12 POINT | | 2 | Y | |
| 790A | A-2036-22 | • • SCREW, 7/16-20, CAP, MODIFIED, ALTERNATE FOR ITEM 790 | | 2 | Y | |
| 800 | B-3328 | • • PCP: COUNTERWEIGHT | | 1 | | PCP |
| 840 | C-1977-1P | • • PCP: CLAMP (M, P, R SHANK) | | 1 | | PCP |
| 840A | C-1977-4P | • • PCP: CLAMP (M, P, R SHANK), ALTERNATE FOR ITEM 840 | | 1 | | PCP |
| 860 | B-6588-1 | • • FITTING, LUBRICATION | | 2 | Y | |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| | | | |

- ITEM NOT ILLUSTRATED

**838-109 Clamp Assembly**



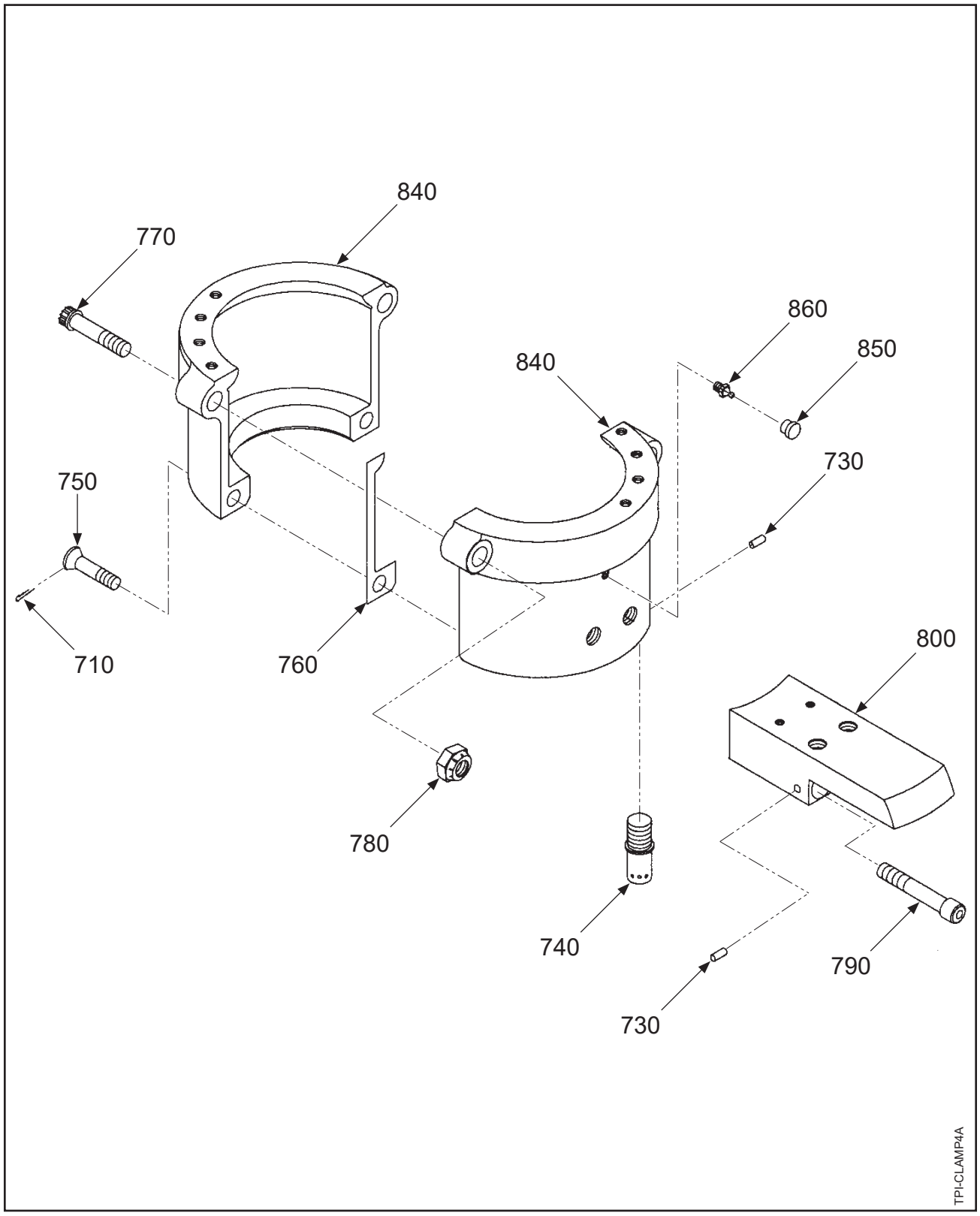

**838-111 Clamp Assembly: Exploded View**
**Figure 10A-23**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10A-23** | | **838-111 CLAMP ASSEMBLY** | | | | |
| 710 | B-3838-3-2 | • COTTER PIN | | 2 | Y | |
| 750 | A-321 | • SCREW, 3/8-24 DOUBLE 60° HEAD | | 2 | Y | |
| 760 | A-1306-1 | • GASKET, CLAMP | | 2 | Y | |
| 770 | A-1372 | • BOLT, 7/16-20,12 POINT | | 2 | Y | |
| 770A | A-1379 | • BOLT, 7/16-20,12 POINT, ALTERNATE FOR ITEM 770 | | 2 | Y | |
| 780 | A-1373 | • NUT, 7/16-20, HEX, SELF LOCKING | | 2 | Y | |
| 850 | B-6544 | • CAP, FITTING, LUBRICATION | | 2 | Y | |
| -725 | D-7838-111 | • PCP: CLAMP ASSEMBLY | | 1 | | |
| 730 | A-285 | • • SPRING PIN, 3/32", CRES | | 3 | Y | |
| 740 | A-304 | • • LINKSCREW, 1/2-20 | | 1 | Y | |
| 790 | 107995-22 | • • BOLT, 7/16-20, 12 POINT | | 2 | Y | |
| 790A | A-2036-22 | • • SCREW, 7/16-20, CAP, MODIFIED, ALTERNATE FOR ITEM 790 | | 2 | Y | |
| 800 | B-3328 | • • PCP: COUNTERWEIGHT | | 1 | | PCP |
| 840A | C-1977-3P | • • PCP: CLAMP (M, P, R SHANK) | | 1 | | PCP |
| 860 | B-6588-1 | • • FITTING, LUBRICATION | | 2 | Y | |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| | | | |

- ITEM NOT ILLUSTRATED

**838-111 Clamp Assembly**



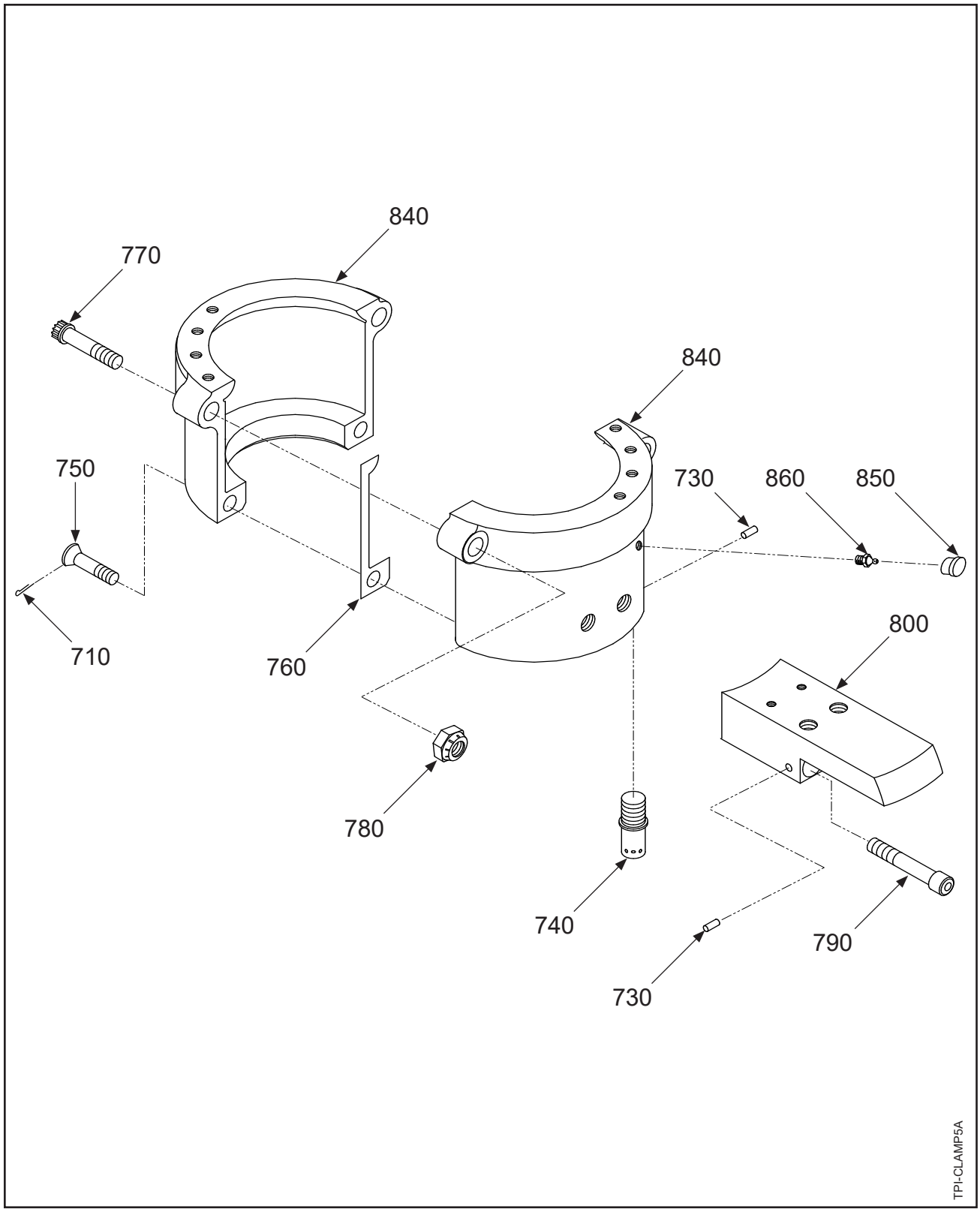

**838-113 Clamp Assembly: Exploded View**
**Figure 10A-24**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10A-24** | | **838-113 CLAMP ASSEMBLY** | | | | |
| 710 | B-3838-3-2 | • COTTER PIN | | 2 | Y | |
| 750 | A-321 | • SCREW, 3/8-24 DOUBLE 60° HEAD | | 2 | Y | |
| 760 | A-47-1 | • GASKET, BLADE CLAMP | | 2 | Y | |
| 770 | A-2017 | • BOLT, 3/8-24, 12 POINT | | 2 | Y | |
| -775 | A-2031 | • WASHER, 3/8" | | 2 | Y | |
| 780 | A-2043-1 | • NUT, 3/8-24, HEX, SELF-LOCKING | | 2 | Y | |
| 850 | B-6544 | • CAP, FITTING, LUBRICATION | | 2 | Y | |
| -725 | D-7838-113 | • PCP: CLAMP UNIT | | 1 | | |
| 730 | A-285 | • • SPRING PIN, 3/32", CRES | | 3 | Y | |
| 740 | A-304 | • • LINKSCREW, 1/2-20 | | 1 | Y | |
| 790 | 107995-22 | • • BOLT, 7/16-20, 12 POINT | | 2 | Y | |
| 790A | A-2036-22 | • • SCREW, 7/16-20, CAP, MODIFIED, ALTERNATE FOR ITEM 790 | | 2 | Y | |
| 800 | C-3669 | • • PCP: COUNTERWEIGHT | | 1 | | PCP |
| 840 | C-3-1A | • • PCP: BLADE CLAMP | | 1 | | PCP |
| 860 | B-6588-1 | • • FITTING, LUBRICATION | | 2 | Y | |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| | | | |

- ITEM NOT ILLUSTRATED

**838-113 Clamp Assembly**



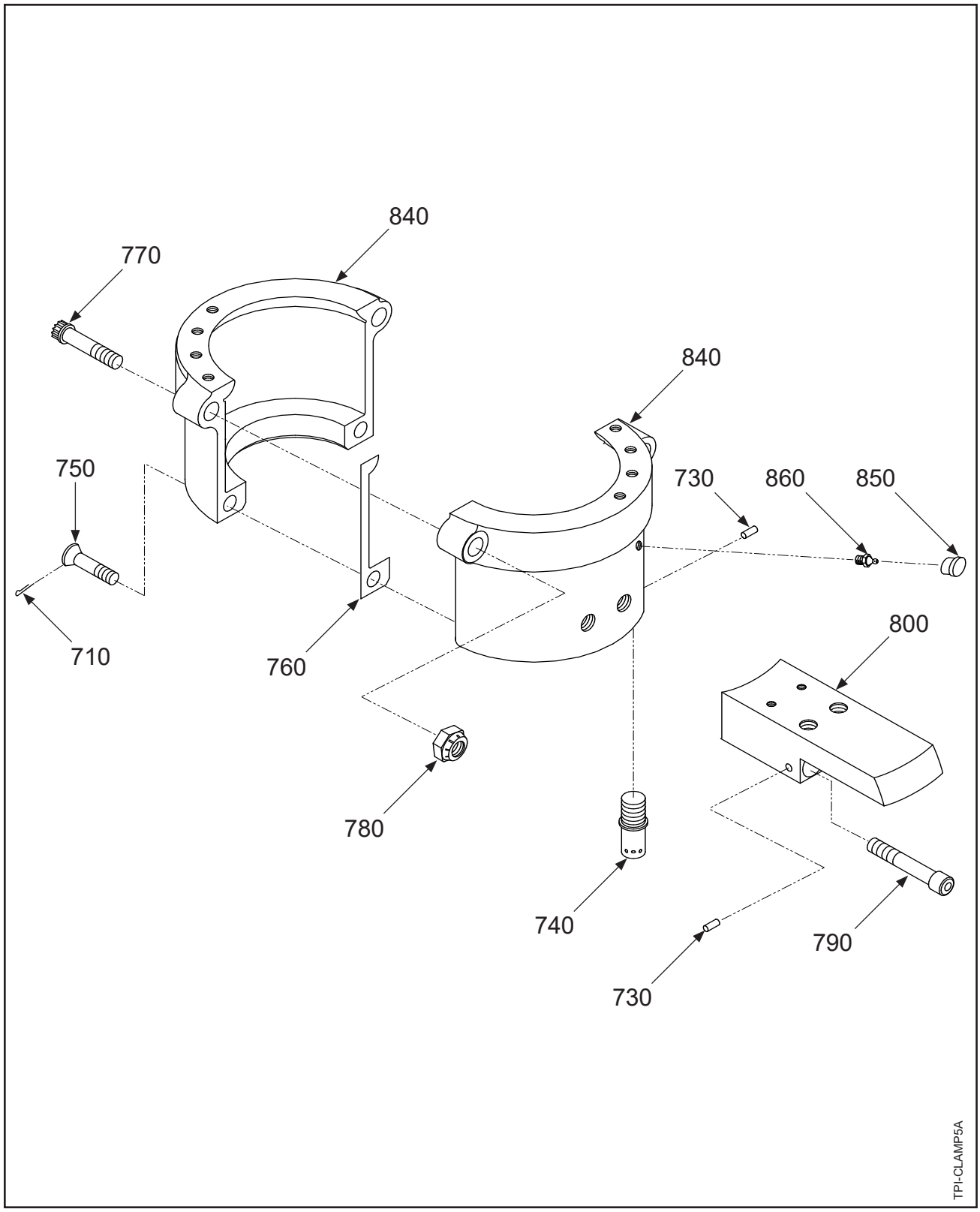

**838-114 Clamp Assembly: Exploded View**
**Figure 10A-25**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10A-25** | | **838-114 CLAMP ASSEMBLY** | | | | |
| 710 | B-3838-3-2 | • COTTER PIN | | 2 | Y | |
| 750 | A-321 | • SCREW, 3/8-24 DOUBLE 60° HEAD | | 2 | Y | |
| 760 | A-1306-1 | • GASKET, CLAMP | | 2 | Y | |
| 770 | A-1372 | • BOLT, 7/16-20,12 POINT | | 2 | Y | |
| 770A | A-1379 | • BOLT, 7/16-20,12 POINT, ALTERNATE FOR ITEM 770 | | 2 | Y | |
| 780 | A-1373 | • NUT, 7/16-20, HEX, SELF LOCKING | | 2 | Y | |
| -725 | D-7838-114 | • PCP: CLAMP ASSEMBLY | | 1 | | |
| 730 | A-285 | • • SPRING PIN, 3/32", CRES | | 3 | Y | |
| 740 | A-304 | • • LINKSCREW, 1/2-20 | | 1 | Y | |
| 790 | 107995-22 | • • BOLT, 7/16-20, 12 POINT | | 2 | Y | |
| 790A | A-2036-22 | • • SCREW, 7/16-20, CAP, MODIFIED, ALTERNATE FOR ITEM 790 | | 2 | Y | |
| 800 | B-3328 | • • PCP: COUNTERWEIGHT | | 1 | | PCP |
| 840 | C-1977-4P | • • PCP: CLAMP (M, P, R SHANK) | | 1 | | PCP |
| 850 | B-6544 | • • CAP, FITTING, LUBRICATION | | 2 | Y | |
| 860 | B-6588-1 | • • FITTING, LUBRICATION | | 2 | Y | |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| | | | |

- ITEM NOT ILLUSTRATED

**838-114 Clamp Assembly**



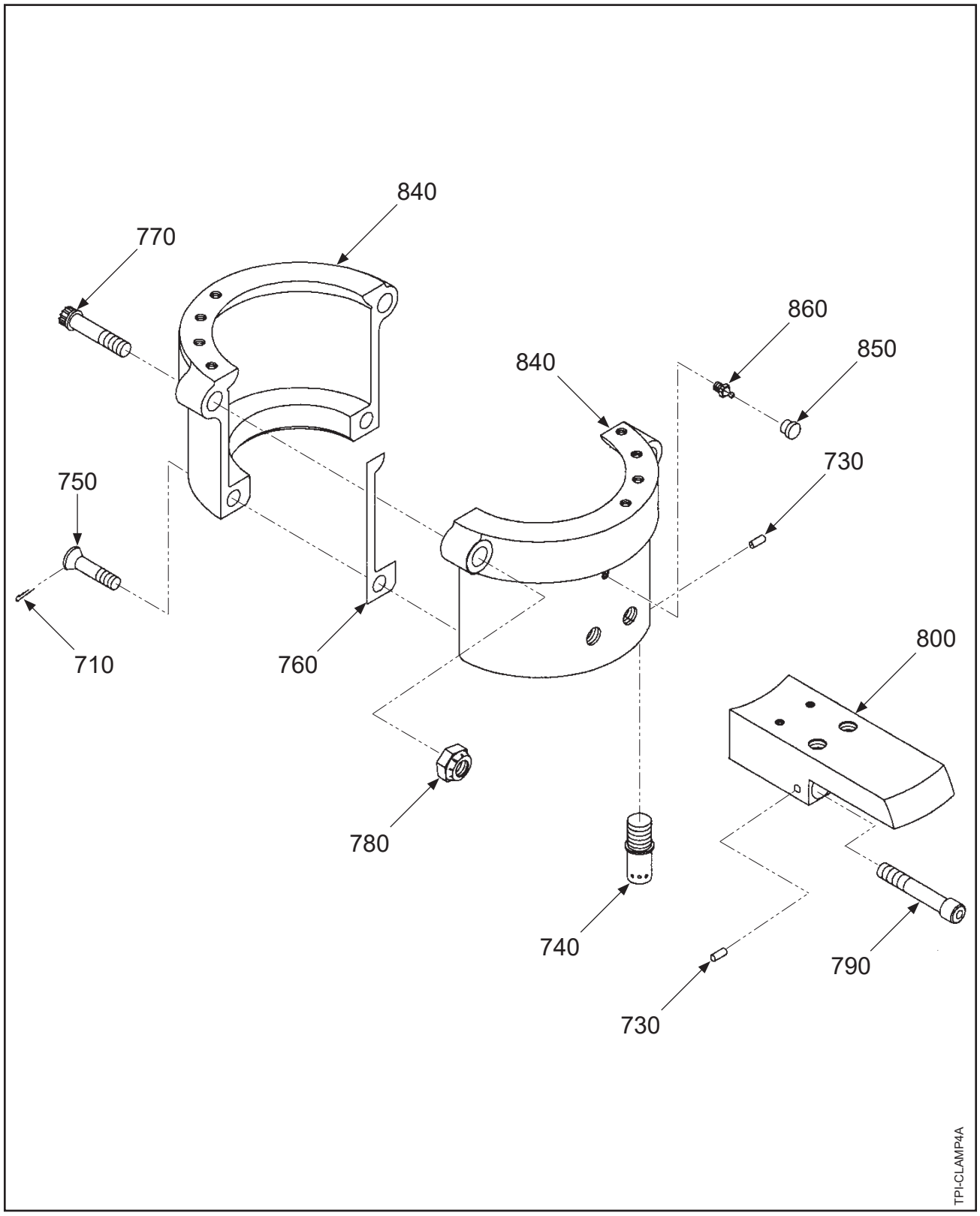

**838-119L Clamp Assembly: Exploded View**
**Figure 10A-26**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10A-26** | | **838-119L CLAMP ASSEMBLY** | | | | |
| 710 | B-3838-3-2 | • COTTER PIN | | 2 | Y | |
| 750 | A-321 | • SCREW, 3/8-24 DOUBLE 60° HEAD | | 2 | Y | |
| 760 | A-1306-1 | • GASKET, CLAMP | | 2 | Y | |
| 770 | A-1372 | • BOLT, 7/16-20,12 POINT | | 2 | Y | |
| 780 | A-1373 | • NUT, 7/16-20, HEX, SELF LOCKING | | 2 | Y | |
| 850 | B-6544 | • CAP, FITTING, LUBRICATION | | 2 | Y | |
| -725 | D-7838-119L | • PCP: CLAMP ASSEMBLY | | 1 | | |
| 730 | A-285 | • • SPRING PIN, 3/32", CRES | | 3 | Y | |
| 740 | A-304 | • • LINKSCREW, 1/2-20 | | 1 | Y | |
| 790 | 107995-12 | • • BOLT, 7/16-20, 12 POINT | | 2 | Y | |
| 790A | A-2036-12 | • • SCREW, 7/16-20, CAP, MODIFIED, ALTERNATE FOR ITEM 790 | | 2 | Y | |
| 800 | C-2681 | • • PCP: COUNTERWEIGHT | | 1 | | PCP |
| 840A | C-1977-2P | • • PCP: CLAMP, BLADE (M, P, R SHANK) | | 1 | | PCP |
| 860 | B-6588-1 | • • FITTING, LUBRICATION | | 2 | Y | |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| | | | |

- ITEM NOT ILLUSTRATED

**838-119L Clamp Assembly**



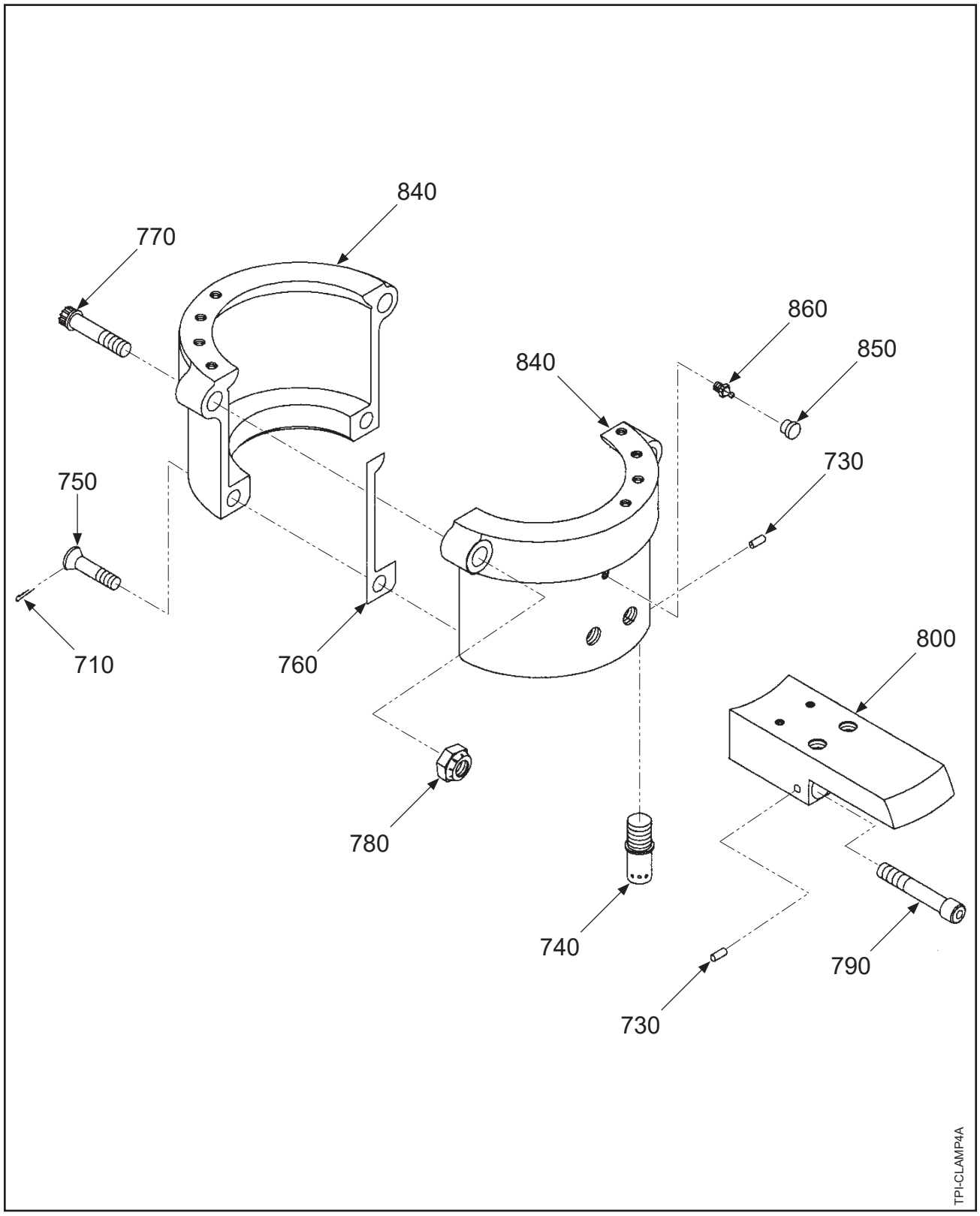

**838-1080 Clamp Assembly: Exploded View**
**Figure 10A-27**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10A-27** | | **838-1080 CLAMP ASSEMBLY** | | | | |
| 710 | B-3838-3-2 | • COTTER PIN | | 2 | Y | |
| 730 | A-285 | • SPRING PIN, 3/32", CRES | | 2 | Y | |
| 740 | A-304 | • LINKSCREW, 1/2-20 | | 1 | Y | |
| 750 | A-321 | • SCREW, 3/8-24 DOUBLE 60° HEAD | | 2 | Y | |
| 760 | A-6871-1 | • GASKET, CLAMP | | 2 | Y | |
| 770 | A-2017 | • BOLT, 3/8-24, 12 POINT | | 2 | Y | |
| -775 | A-2031 | • WASHER, 3/8" | | 2 | Y | |
| 780 | A-2043-1 | • NUT, 3/8-24, HEX, SELF-LOCKING | | 2 | Y | |
| 790 | 107995-24 | • BOLT, 7/16-20, 12 POINT | | 2 | Y | |
| 790A | A-2036-24 | • SCREW, 7/16-20, CAP, MODIFIED, ALTERNATE FOR ITEM 790 | | 2 | Y | |
| 840 | D-6831-1A | • PCP: CLAMP, BLADE (MV SHANK) | | 1 | | PCP |
| 850 | B-6544 | • CAP, FITTING, LUBRICATION | | 2 | Y | |
| 860 | B-6588-1 | • FITTING, LUBRICATION | | 2 | Y | |
| 800 | 833-29RL | • PCP: COUNTERWEIGHT UNIT | | 1 | | PCP |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| | | | |

- ITEM NOT ILLUSTRATED

**838-1080 Clamp Assembly**



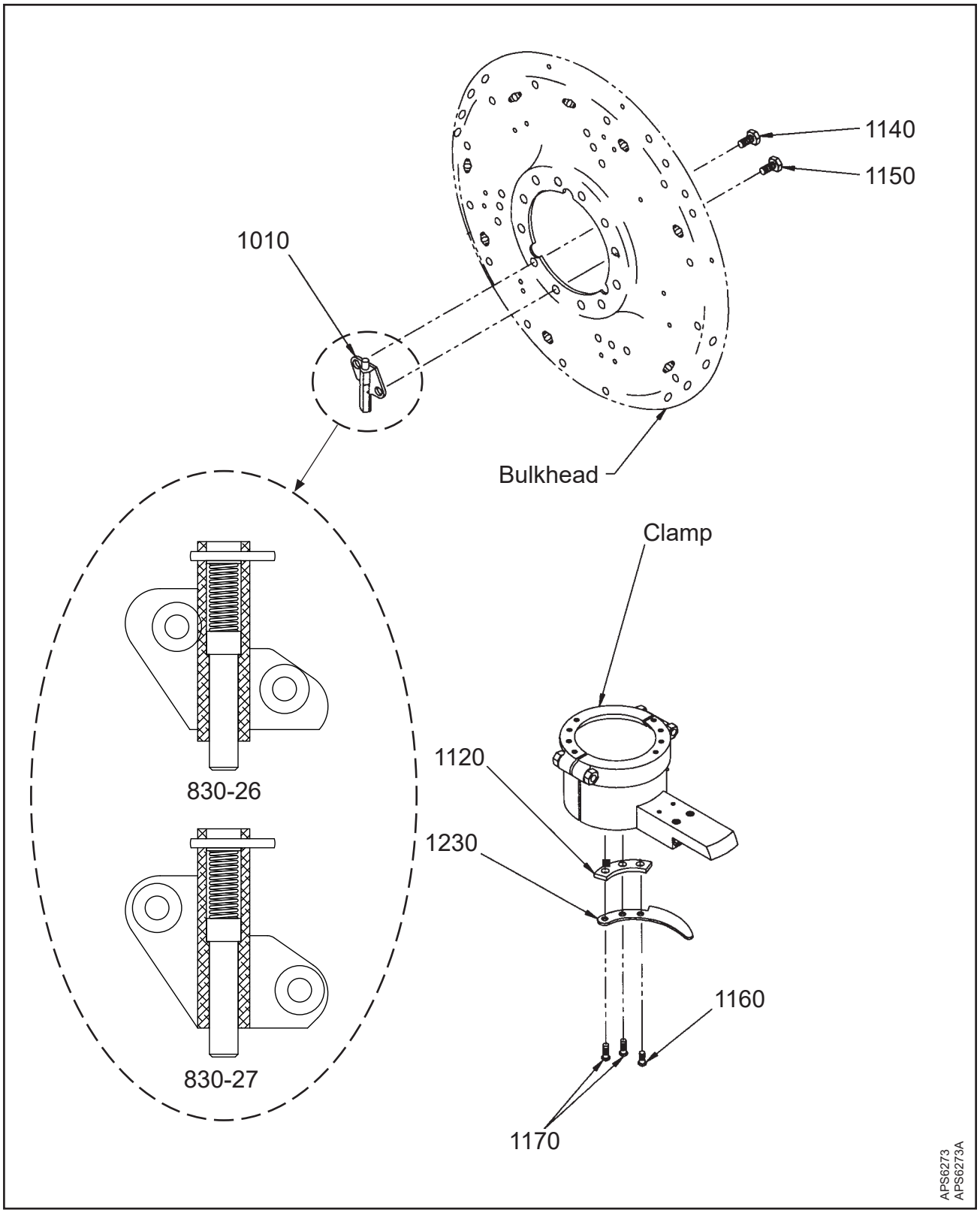

**838-1113 Clamp Assembly: Exploded View**
**Figure 10A-28**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10A-28** | | **838-1113 CLAMP ASSEMBLY** | | | | |
| 710 | B-3838-3-2 | • COTTER PIN | | 2 | Y | |
| 750 | A-321 | • SCREW, 3/8-24 DOUBLE 60° HEAD | | 2 | Y | |
| 760 | A-6871-1 | • GASKET, CLAMP | | 2 | Y | |
| 770 | A-2017 | • BOLT, 3/8-24, 12 POINT | | 2 | Y | |
| -775 | A-2031 | • WASHER, 3/8" | | 2 | Y | |
| 780 | A-2043-1 | • NUT, 3/8-24, HEX, SELF-LOCKING | | 2 | Y | |
| 850 | B-6544 | • CAP, FITTING, LUBRICATION | | 2 | Y | |
| -725 | D-7838-1113 | • PCP: CLAMP UNIT | | 1 | | |
| 730 | A-285 | • • SPRING PIN, 3/32", CRES | | 3 | Y | |
| 730A | B-3838-3-2 | • • COTTER PIN, ALTERNATE FOR ITEM 730 | | 3 | Y | |
| 740 | A-304 | • • LINKSCREW, 1/2-20 | | 1 | Y | |
| 790 | 107995-22 | • • BOLT, 7/16-20, 12 POINT | | 2 | Y | |
| 790A | A-2036-22 | • • SCREW, 7/16-20, CAP, MODIFIED, ALTERNATE FOR ITEM 790 | | 2 | Y | |
| 800 | C-3669 | • • PCP: COUNTERWEIGHT | | 1 | | PCP |
| 840 | D-6831-1A | • • PCP: CLAMP, BLADE (MV SHANK) | | 1 | | PCP |
| 860 | B-6588-1 | • • FITTING, LUBRICATION | | 2 | Y | |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| | | | |

- ITEM NOT ILLUSTRATED

**838-1113 Clamp Assembly**



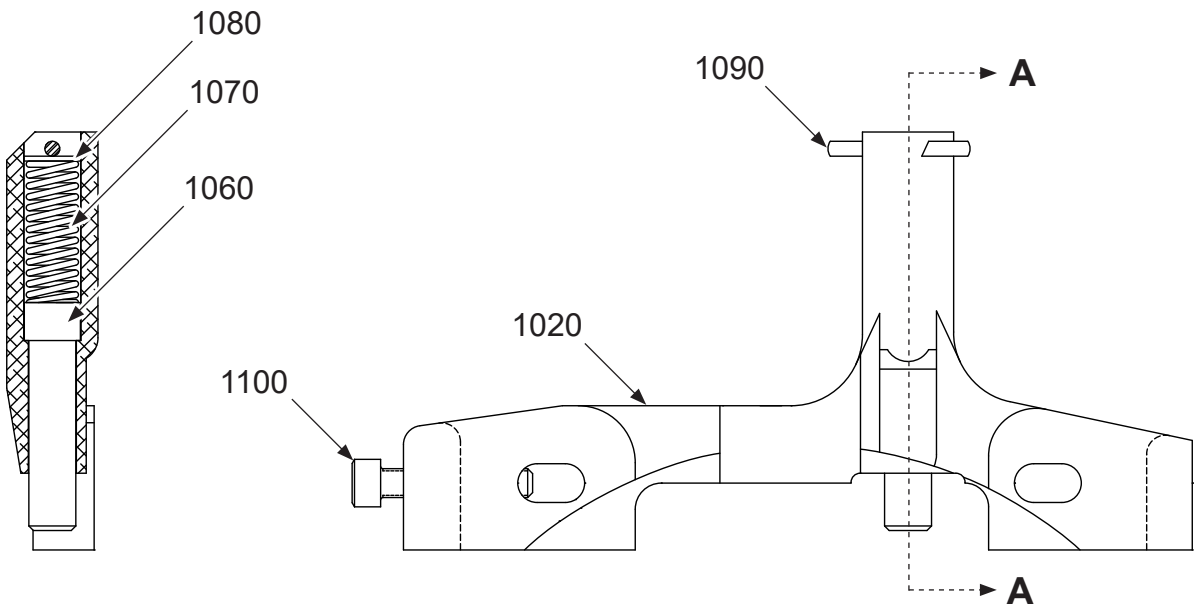

**Start Lock Mounting Kit: Exploded View**
**Figure 10A-29**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| 10A-29 | | | | | | |
| 1000 | | START LOCK - MOUNTING KIT | | | | |
| 1010 | 830-26 | • START LOCK - ASSEMBLY (REFER TO "830-26 START LOCK ASSEMBLY" IN THIS SECTION FOR EXPLODED VIEW/PARTS LIST) | | 1 | | |
| | 830-27 | • START LOCK - ASSEMBLY (REFER TO "830-27 START LOCK ASSEMBLY" IN THIS SECTION FOR EXPLODED VIEW/PARTS LIST) | | 2 | | |
| 1120 | SEE TABLE | • SPACER, PLATE, START LOCK | | 3 | | |
| 1230 | SEE TABLE | • PLATE, START LOCK | | 3 | | |
| 1140 | SEE TABLE | • SCREW, 1/4-28, BUTTON HEAD | | 3 | Y | |
| 1150 | SEE TABLE | • SCREW, 1/4-28, BUTTON HEAD | | 3 | Y | |
| 1160 | B-3720 | • BOLT, 10-32, HEX HEAD | | 3 | Y | |
| 1170 | B-3383-7H | • BOLT, 10-32, HEX HEAD | | 6 | Y | |

| MTG. KIT NUMBER | ITEM NUMBER | | | |
|---|---|---|---|---|
| | 1120 | 1230 | 1140 | 1150 |
| A-7780 | A-3427 | A-3419-2 | A-2070-9 | A-2070-10 |
| A-3432 | A-3427 | A-3419-2 | A-2070-9 | A-2070-10 |
| A-3432-1 | A-3427-1 | A-3419-3 | A-2070-9 | A-2070-10 |
| A-3432-2 | A-3427 | A-3419-4 | A-2070-9 | A-2070-10 |
| A-3432-3 | A-3427 | A-4732 | A-2070-9 | A-2070-10 |
| A-3433 | A-3427 | A-3419-2 | B-3384-5H | B-3384-8H |
| A-3433-1 | A-3427-1 | A-3419-3 | B-3384-5H | B-3384-8H |
| A-3433-2 | A-3427 | A-3419-4 | B-3384-5H | B-3384-8H |
| A-3433-3 | A-3427 | C-7519 | B-3384-5H | B-3384-8H |
| A-3433-4 | A-3427 | A-3419-1 | B-3384-5H | B-3384-8H |

- ITEM NOT ILLUSTRATED

**Start Lock Mounting Kit**



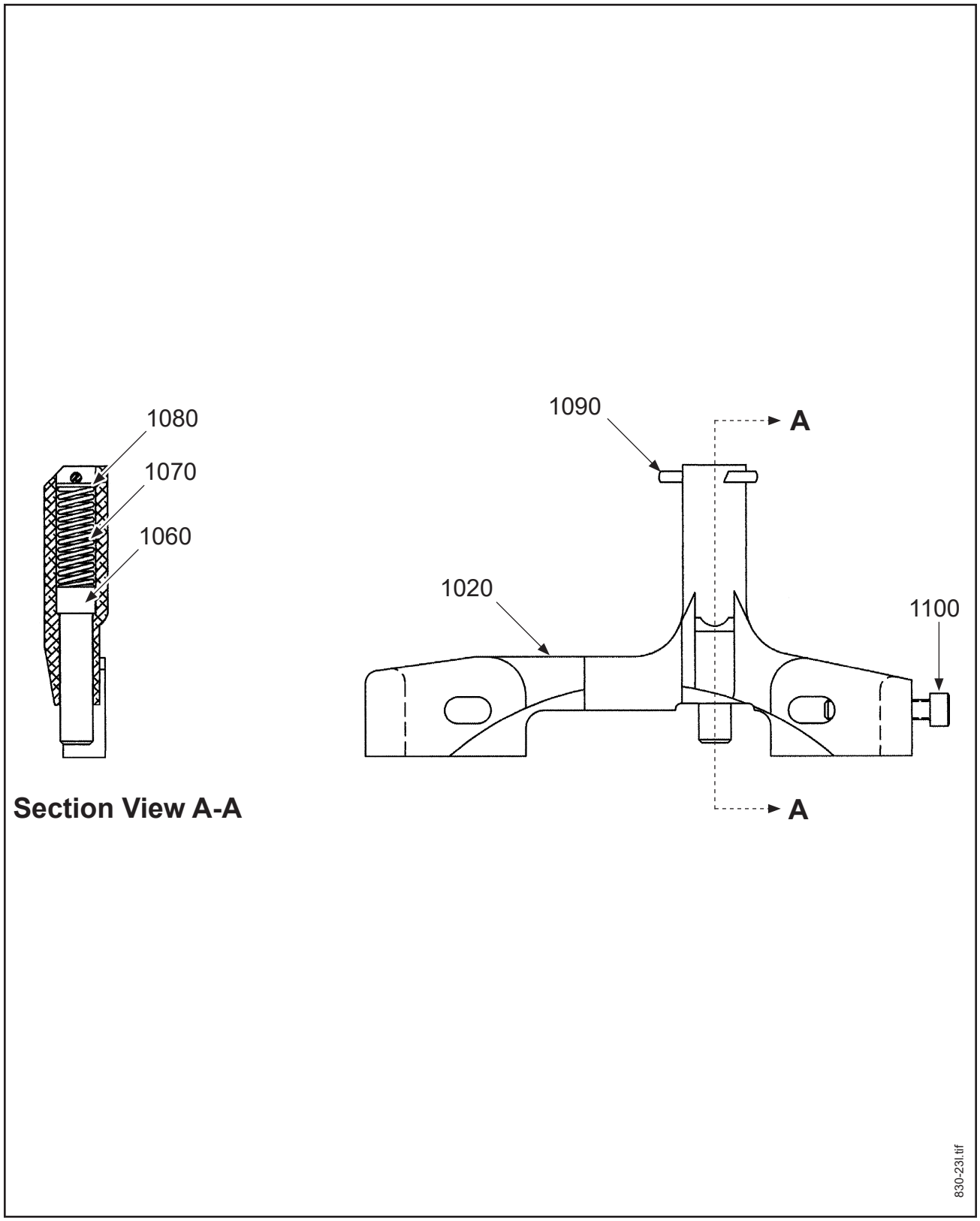

**830-23 Start Lock Assembly: Section View**
**Figure 10A-30**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10A-30** | | **830-23 START LOCK - ASSEMBLY** | | | | |
| 1020 | B-3028-3 | • BRACKET, START LOCK | | 1 | | |
| 1060 | A-883 | • PIN, START LOCK | | 1 | | |
| 1070 | A-3066 | • SPRING, COMPRESSION | | 1 | Y | |
| 1080 | B-3851-N832 | • WASHER | | 1 | Y | |
| 1090 | B-3838-3-3 | • COTTER PIN | | 1 | Y | |
| 1100 | A-3429 | • SCREW, 10-32, CAP | | 1 | Y | |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| | | | |

- ITEM NOT ILLUSTRATED

**830-23 Start Lock Assembly**



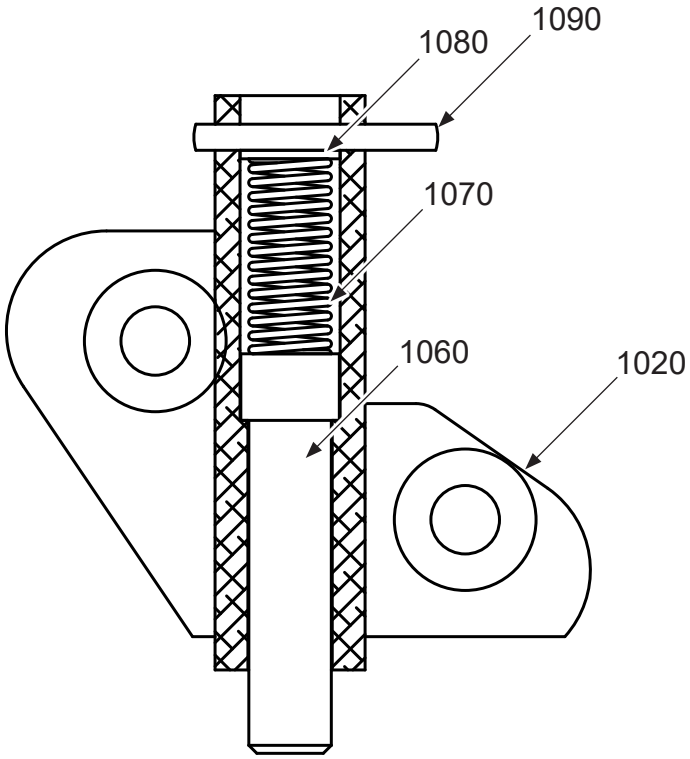

**830-23L Start Lock, LH Assembly: Section View**
**Figure 10A-31**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10A-31** | | **830-23L START LOCK, LH - ASSEMBLY** | | | | |
| 1020 | B-3028-3 | • BRACKET, START LOCK | | 1 | | |
| 1060 | A-883 | • PIN, START LOCK | | 1 | | |
| 1070 | A-3066 | • SPRING, COMPRESSION | | 1 | Y | |
| 1080 | B-3851-N832 | • WASHER | | 1 | Y | |
| 1090 | B-3838-3-3 | • COTTER PIN | | 1 | Y | |
| 1100 | A-3429 | • SCREW, 10-32, CAP | | 1 | Y | |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| | | | |

- ITEM NOT ILLUSTRATED

**830-23L Start Lock, LH Assembly**



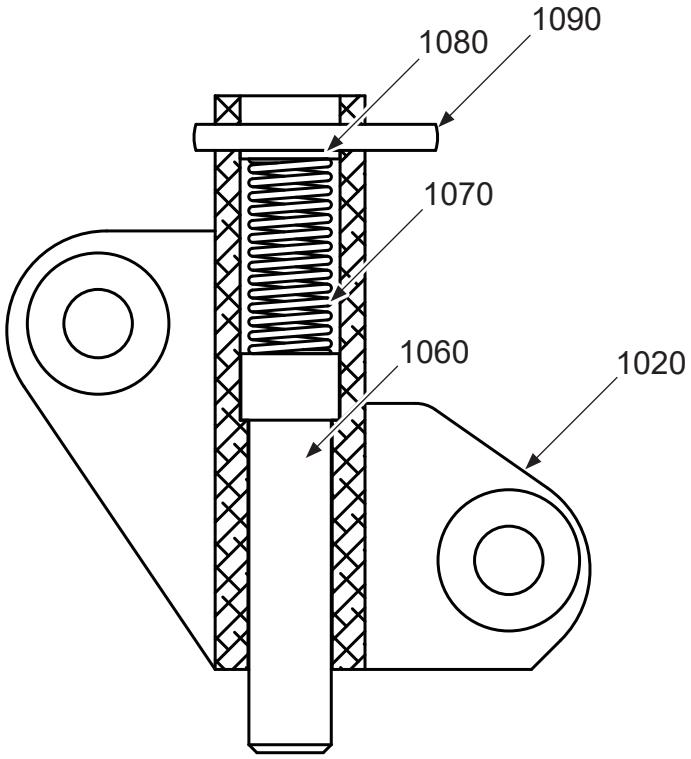

**830-26 Start Lock Assembly: Section View**
**Figure 10A-32**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10A-32** | | **830-26 START LOCK - ASSEMBLY** | | | | |
| 1020 | B-3418-1 | • BRACKET, START LOCK, SUPERSEDED BY ITEM 1020A (NO DE-ICE) | | 1 | | |
| 1020A | 101224 | • BRACKET, START LOCK, SUPERSEDES ITEM 1020 POST HC-SL-61-248 | | 1 | | |
| 1060 | A-883 | • PIN, START LOCK | | 1 | | |
| 1070 | A-884-4 | • SPRING, COMPRESSION | | 1 | Y | |
| 1080 | B-3851-N832 | • WASHER | | 1 | Y | |
| 1090 | B-3838-3-3 | • COTTER PIN | | 1 | Y | |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| | | | |

- ITEM NOT ILLUSTRATED

**830-26 Start Lock Assembly**

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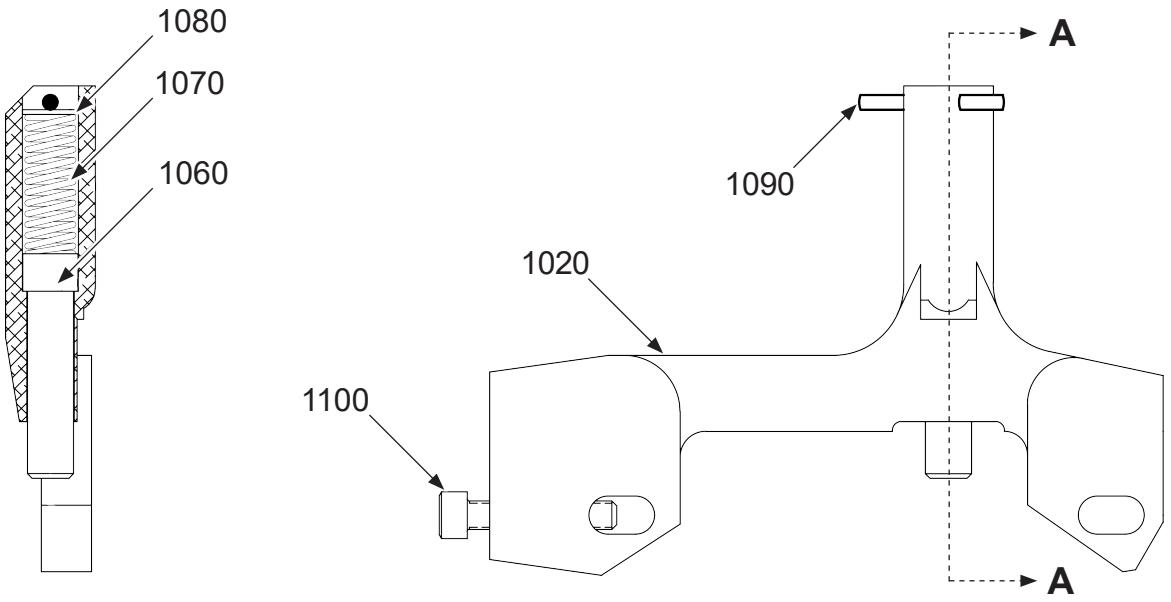
**830-27 Start Lock Assembly: Section View**
**Figure 10A-33**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10A-33** | | **830-27 START LOCK - ASSEMBLY** | | | | |
| 1020 | B-3418-2 | • BRACKET, START LOCK, SUPERSEDED BY ITEM 1020A (NO DE-ICE) | | 1 | | |
| 1020A | 101225 | • BRACKET, START LOCK, SUPERSEDES ITEM 1020 (POST HC-SL-61-248 | | 1 | | |
| 1060 | A-883 | • PIN, START LOCK | | 1 | | |
| 1070 | A-884-4 | • SPRING, COMPRESSION | | 1 | | |
| 1080 | B-3851-N832 | • WASHER | | 1 | Y | |
| 1090 | B-3838-3-3 | • COTTER PIN | | 1 | Y | |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| | | | |

- ITEM NOT ILLUSTRATED

**830-27 Start Lock Assembly**



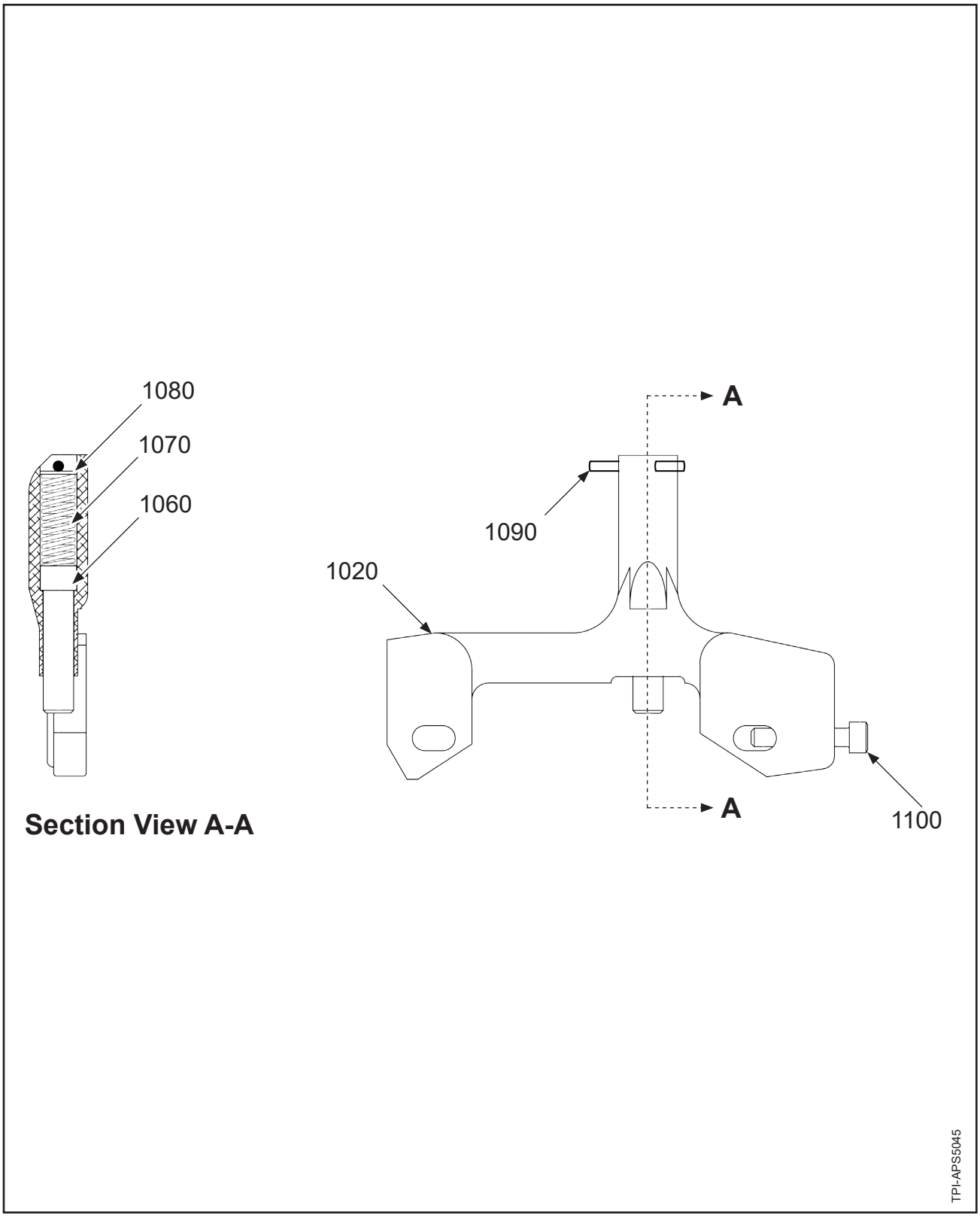

**830-32 Start Lock Assembly: Section View**
**Figure 10A-34**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10A-34** | | **830-32 START LOCK - ASSEMBLY** | | | | |
| 1020 | B-3489 | • BRACKET, START LOCK | | 1 | | |
| 1060 | A-883 | • PIN, START LOCK | | 1 | | |
| 1070 | A-3066 | • SPRING, COMPRESSION | | 1 | Y | |
| 1080 | B-3851-N832 | • WASHER | | 1 | Y | |
| 1090 | B-3838-3-3 | • COTTER PIN | | 1 | Y | |
| 1100 | A-3429 | • SCREW, 10-32, CAP | | 1 | Y | |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| | | | |

- ITEM NOT ILLUSTRATED

**830-32 Start Lock Assembly**



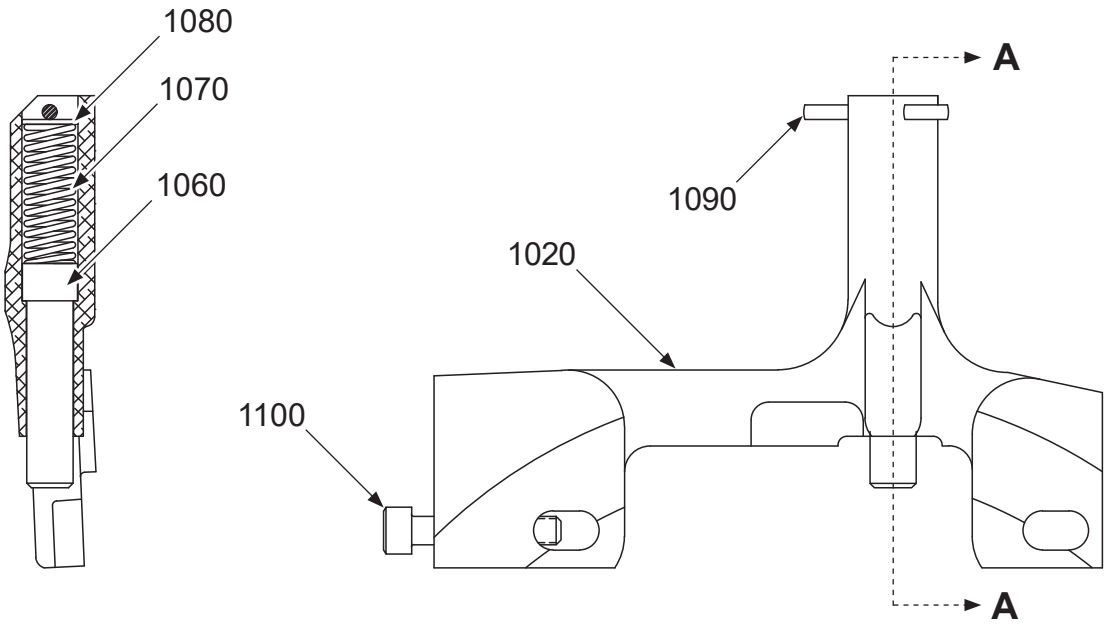

**830-32L Start Lock, LH Assembly: Section View**
**Figure 10A-35**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10A-35** | | **830-32L START LOCK, LH - ASSEMBLY** | | | | |
| 1020A | B-3488 | • BRACKET, START LOCK | | 1 | | |
| 1060 | A-883 | • PIN, START LOCK | | 1 | | |
| 1070 | A-3066 | • SPRING, COMPRESSION | | 1 | Y | |
| 1080 | B-3851-N832 | • WASHER | | 1 | Y | |
| 1090 | B-3838-3-3 | • COTTER PIN | | 1 | Y | |
| 1100 | A-3429 | • SCREW, 10-32, CAP | | 1 | Y | |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| | | | |

- ITEM NOT ILLUSTRATED

**830-32L Start Lock, LH Assembly**



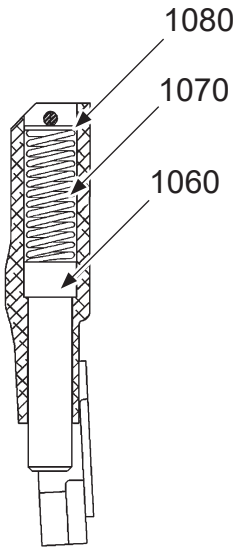

**830-34 Start Lock Assembly: Section View**
**Figure 10A-36**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10A-36** | | **830-34 START LOCK - ASSEMBLY** | | | | |
| 1020 | B-3494 | • BRACKET, START LOCK | | 1 | | |
| 1060 | A-883 | • PIN, START LOCK | | 1 | | |
| 1070 | A-3066 | • SPRING, COMPRESSION | | 1 | Y | |
| 1080 | B-3851-N832 | • WASHER | | 1 | Y | |
| 1090 | B-3838-3-3 | • COTTER PIN | | 1 | Y | |
| 1100 | A-3429 | • SCREW, 10-32, CAP | | 1 | Y | |

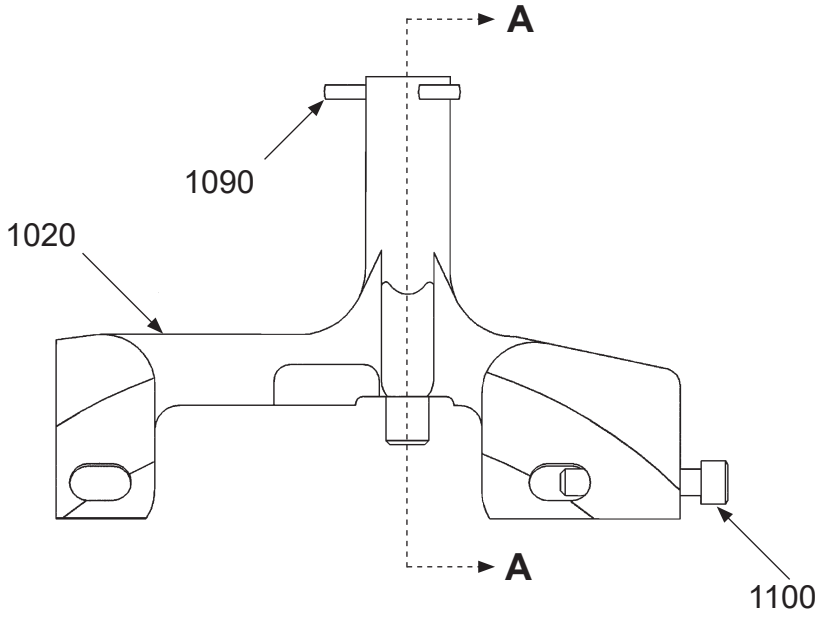
| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| | | | |

- ITEM NOT ILLUSTRATED

**830-34 Start Lock Assembly**




Section View A-A




APS5046

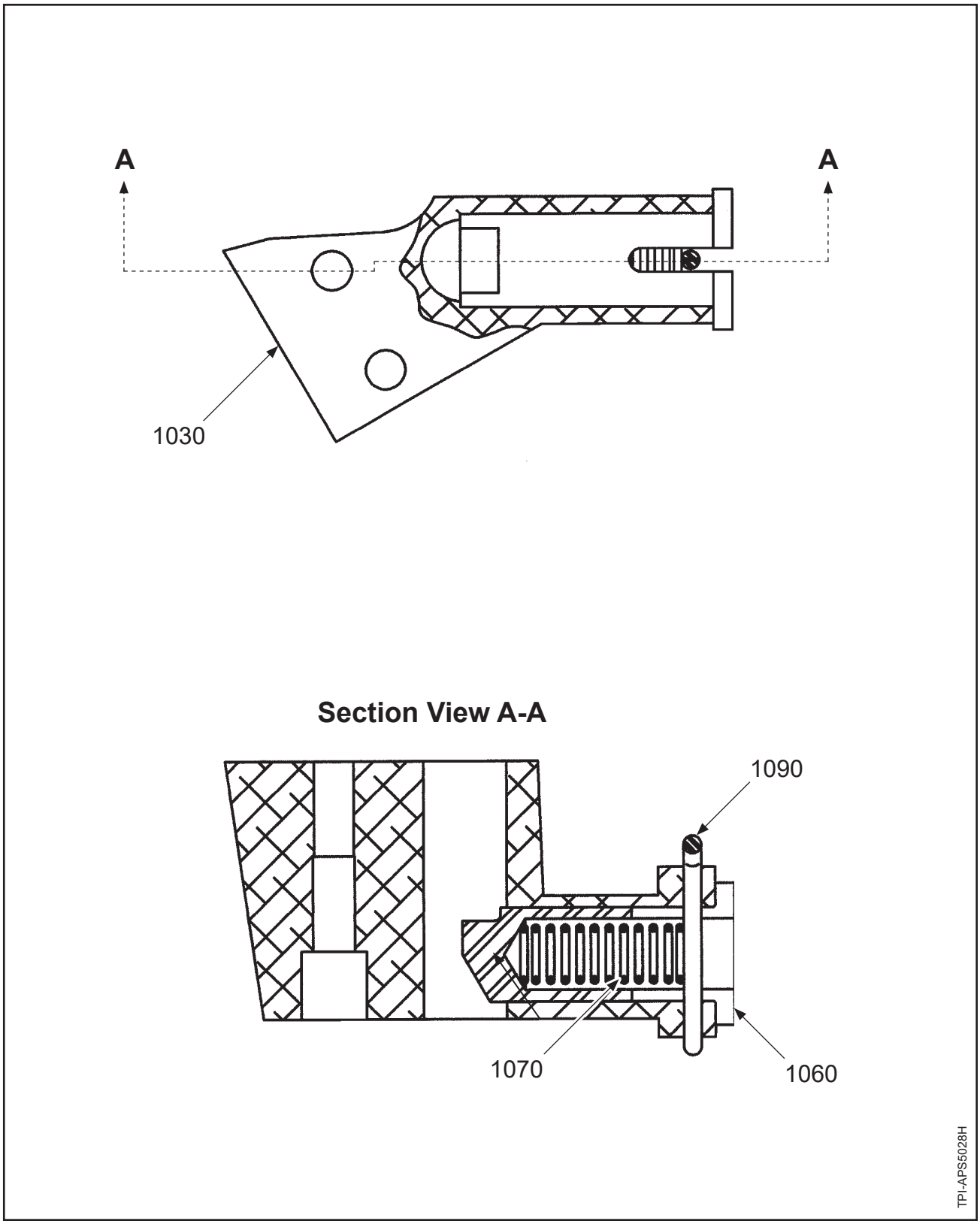
**830-34L Start Lock, LH Assembly: Section View**
**Figure 10A-37**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10A-37** | | **830-34L START LOCK, LH - ASSEMBLY** | | | | |
| 1020 | B-3493 | • BRACKET, START LOCK | | 1 | | |
| 1060 | A-883 | • PIN, START LOCK | | 1 | | |
| 1070 | A-3066 | • SPRING, COMPRESSION | | 1 | Y | |
| 1080 | B-3864-38 | • WASHER, LOCK, INTERNAL TOOTH | | 1 | Y | |
| 1090 | B-3838-3-3 | • COTTER PIN | | 1 | Y | |
| 1100 | A-3429 | • SCREW, 10-32, CAP | | 1 | Y | |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| | | | |

- ITEM NOT ILLUSTRATED

**830-34L Start Lock, LH Assembly**



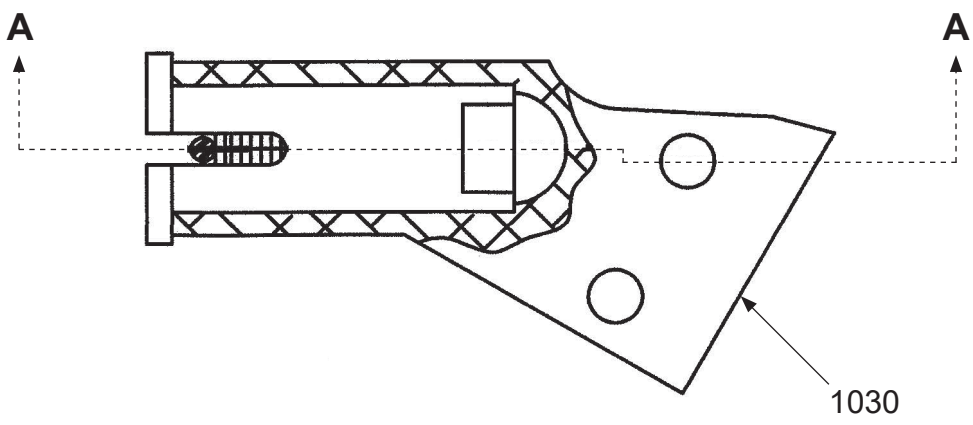

**830-36 Start Lock Assembly: Section View**
**Figure 10A-38**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10A-38** | | **830-36 START LOCK - ASSEMBLY** | | | | |
| 1030 | B-2619 | • HOUSING, START LOCK | | 1 | | |
| 1060 | A-2620-1 | • PIN, START LOCK | | 1 | | |
| 1070 | A-2621-1 | • SPRING, COMPRESSION, REPLACED BY ITEM 1070A | | OBS | | |
| 1070A | A-2628 | • SPRING, COMPRESSION, REPLACES ITEM 1070 | | 1 | Y | |
| 1090 | B-3838-3-5 | • COTTER PIN, REPLACED BY ITEM 1090A | | OBS | Y | |
| 1090A | 102761-3-5 | • COTTER PIN, REPLACES ITEM 1090 | | 1 | Y | |

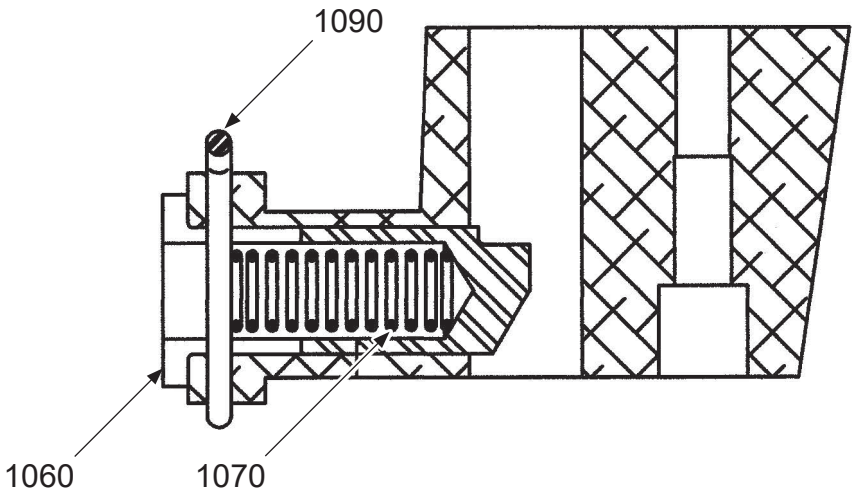
| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| | | | |

- ITEM NOT ILLUSTRATED

**830-36 Start Lock Assembly**




**Section View A-A**




TPI-APS5028B

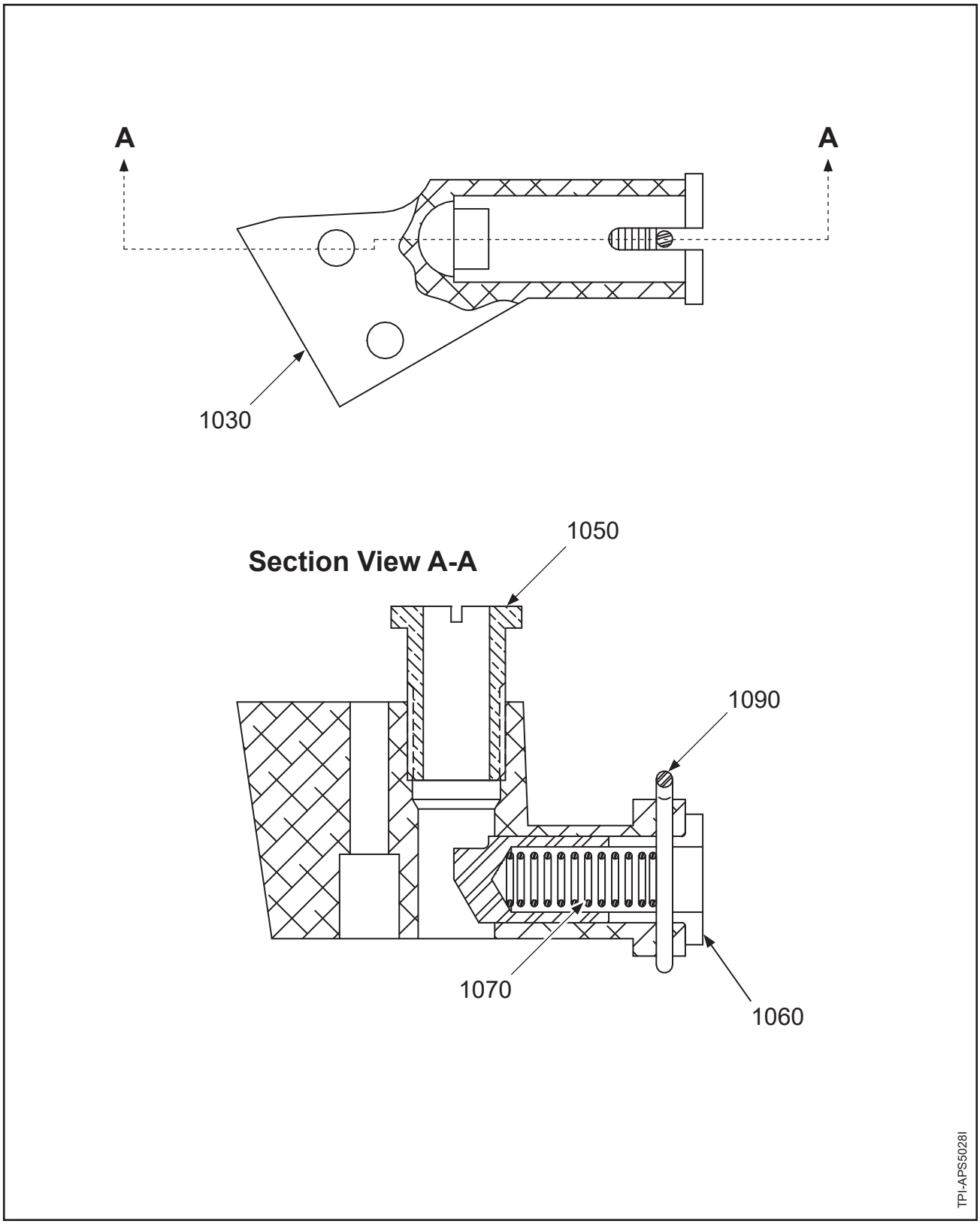
**830-36L Start Lock Assembly: Section View**
**Figure 10A-39**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10A-39** | | **830-36L START LOCK - ASSEMBLY** | | | | |
| 1030 | B-2619L | • HOUSING, START LOCK | | 1 | | |
| 1060 | A-2620-1 | • PIN, START LOCK | | 1 | | |
| 1070 | A-2621-1 | • SPRING, COMPRESSION, REPLACED BY ITEM 1070A | | OBS | | |
| 1070A | A-2628 | • SPRING, COMPRESSION, REPLACES ITEM 1070 | | 1 | Y | |
| 1090 | B-3838-3-5 | • COTTER PIN, REPLACED BY ITEM 1090A | | OBS | Y | |
| 1090A | 102761-3-5 | • COTTER PIN, REPLACES ITEM 1090 | | 1 | Y | |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| | | | |

- ITEM NOT ILLUSTRATED

**830-36L Start Lock Assembly**



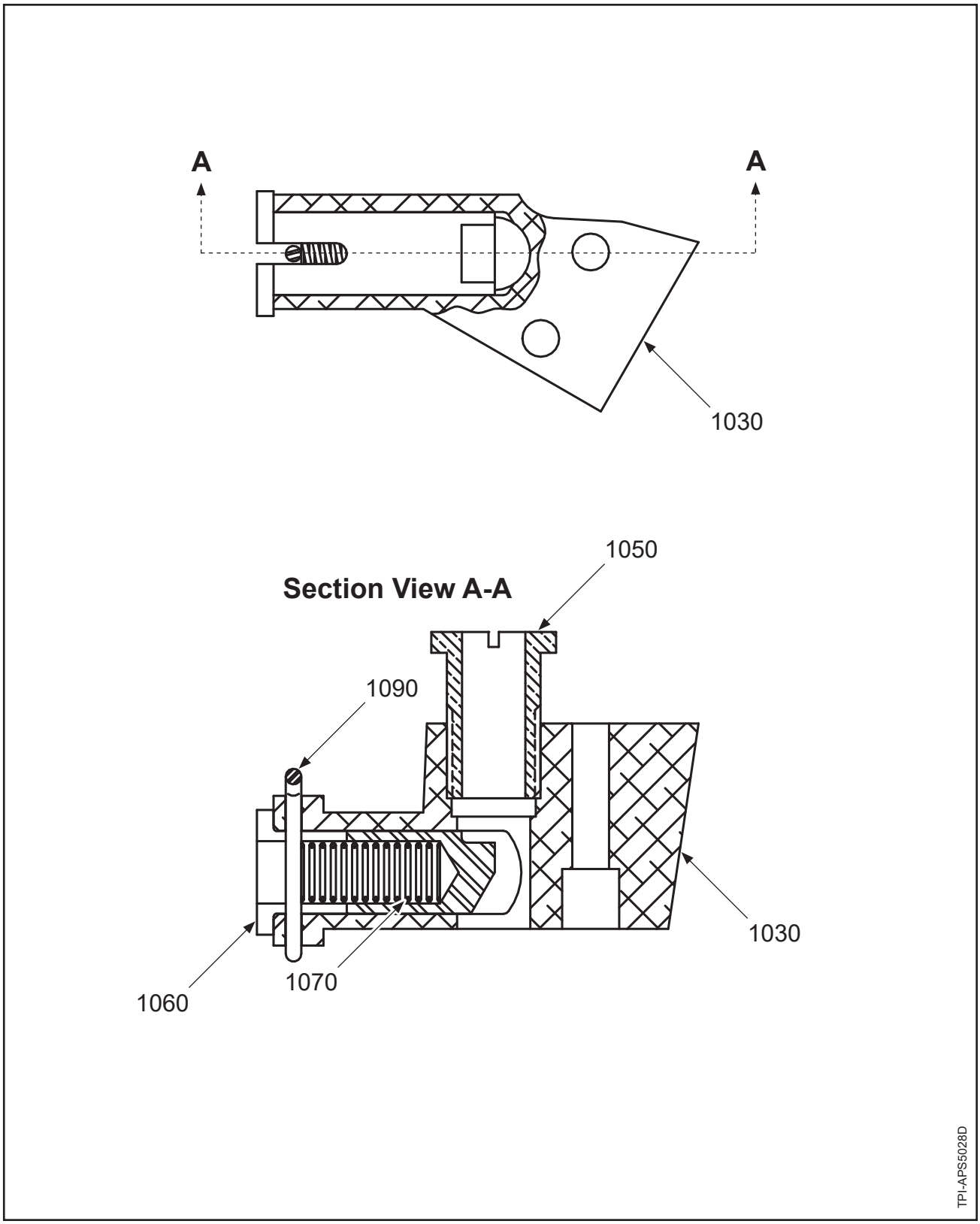

**830-37 Start Lock Assembly: Section View**
**Figure 10A-40**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10A-40** | | **830-37 START LOCK - ASSEMBLY** | | | | |
| 1030 | B-2630 | • HOUSING, START LOCK | | 1 | | |
| 1050 | A-2629 | • BUSHING, START LOCK | | 1 | | |
| 1060 | A-2620-1 | • PIN, START LOCK | | 1 | | |
| 1070 | A-2621-1 | • SPRING, COMPRESSION, REPLACED BY ITEM 1070A | | OBS | | |
| 1070A | A-2628 | • SPRING, COMPRESSION, REPLACES ITEM 1070 | | 1 | Y | |
| 1090 | B-3838-3-5 | • COTTER PIN, REPLACED BY ITEM 1090A | | OBS | Y | |
| 1090A | 102761-3-5 | • COTTER PIN, REPLACES ITEM 1090 | | 1 | Y | |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| | | | |

- ITEM NOT ILLUSTRATED

**830-37 Start Lock Assembly**



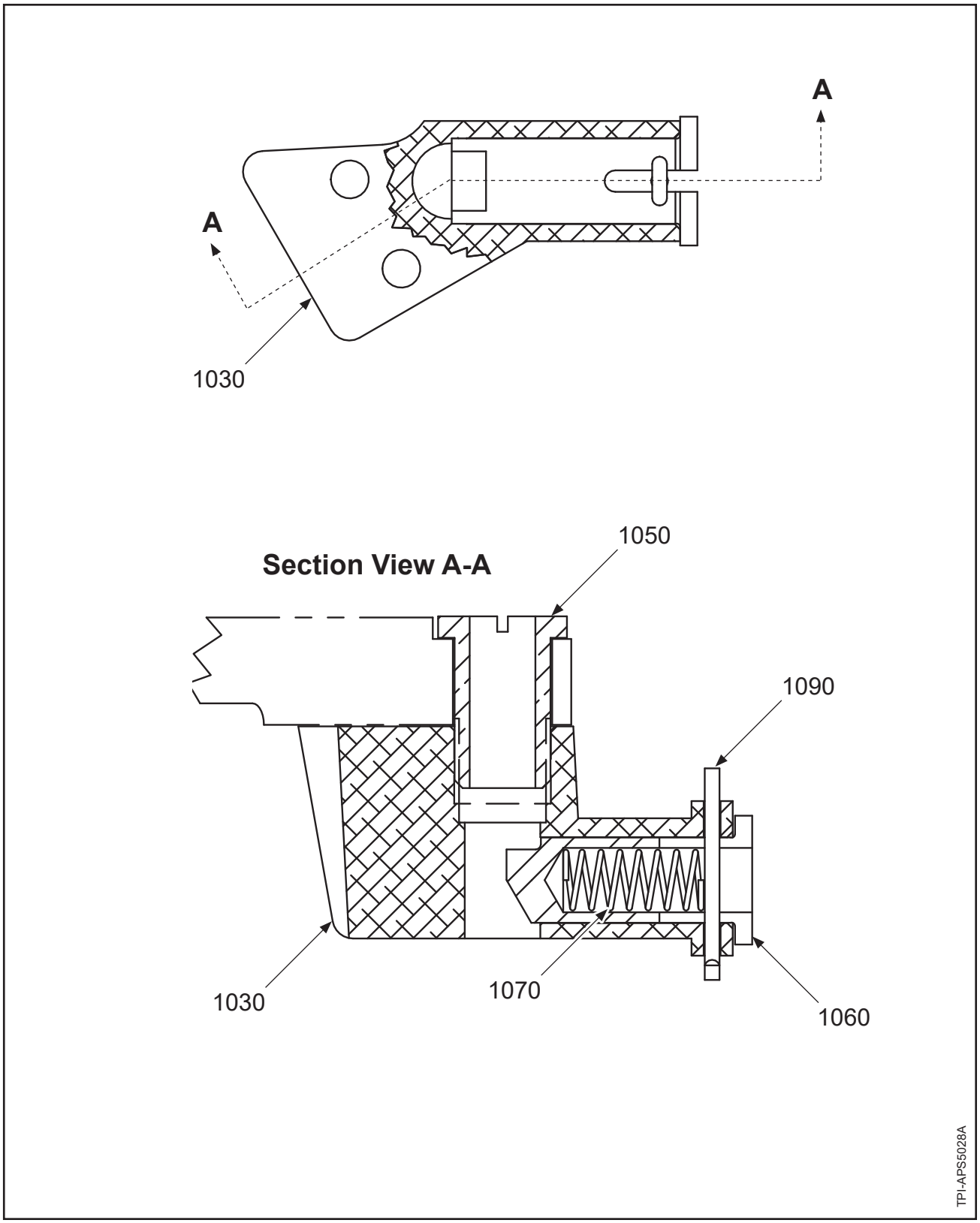

**830-37L Start Lock, LH Assembly: Section View**
**Figure 10A-41**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10A-41** | | **830-37L START LOCK, LH - ASSEMBLY** | | | | |
| 1030 | B-2632 | • HOUSING, START LOCK | | 1 | | |
| 1050 | A-2629 | • BUSHING, START LOCK | | 1 | | |
| 1060 | A-2620-1 | • PIN, START LOCK | | 1 | | |
| 1070 | A-2621-1 | • SPRING, COMPRESSION, REPLACED BY ITEM 1070A | | OBS | | |
| 1070A | A-2628 | • SPRING, COMPRESSION, REPLACES ITEM 1070 | | 1 | Y | |
| 1090 | B-3838-3-5 | • COTTER PIN, REPLACED BY ITEM 1090A | | OBS | Y | |
| 1090A | 102761-3-5 | • COTTER PIN, REPLACES ITEM 1090 | | 1 | Y | |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| | | | |

- ITEM NOT ILLUSTRATED

**830-37L Start Lock, LH Assembly**



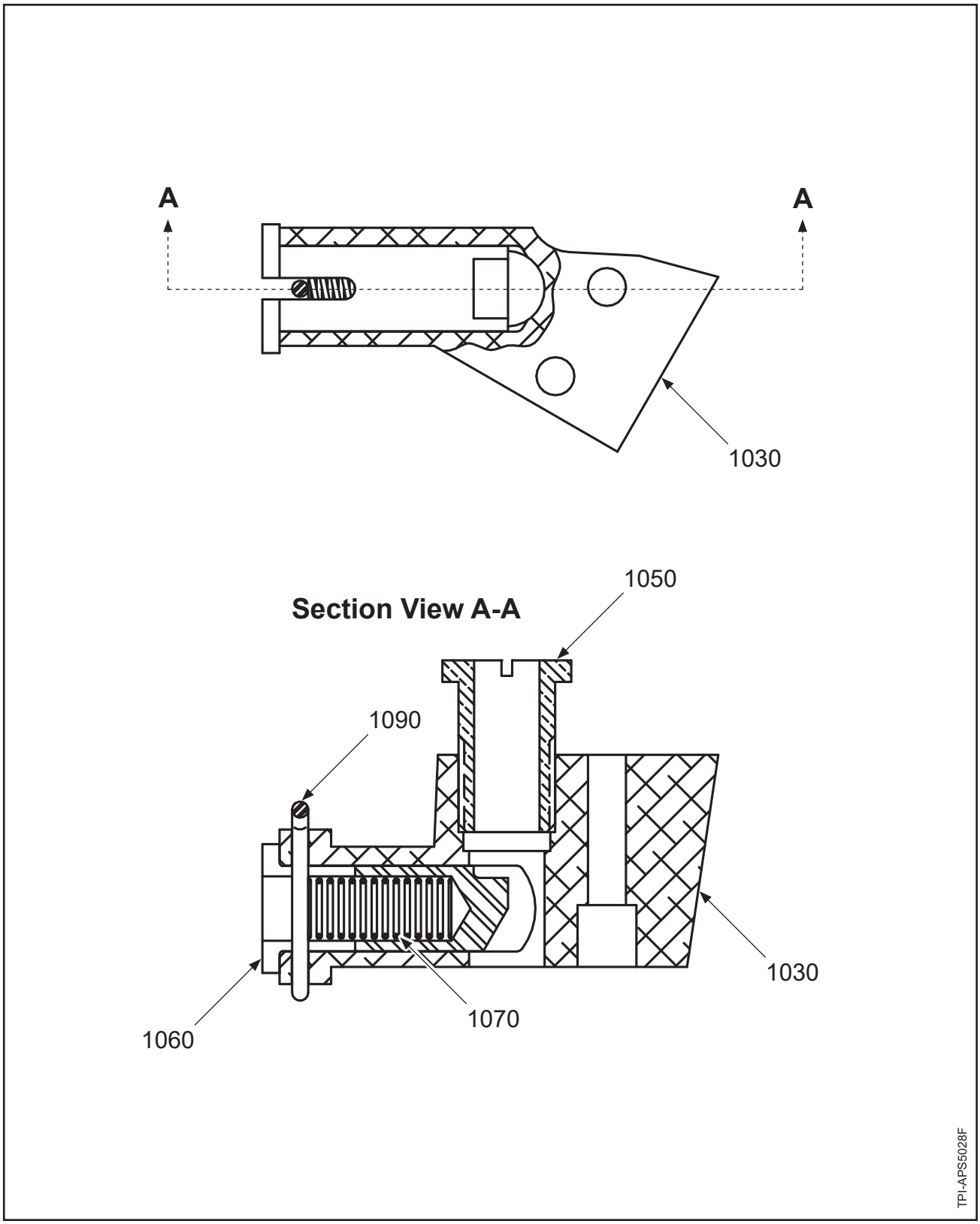

**830-41 Start Lock Assembly: Section View**
**Figure 10A-42**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10A-42** | | **830-41 START LOCK - ASSEMBLY** | | | | |
| 1030 | B-2630 | • HOUSING, START LOCK | | 1 | | |
| 1050 | A-2629 | • BUSHING, START LOCK | | 1 | | |
| 1060 | A-2620-1 | • PIN, START LOCK | | 1 | | |
| 1070 | A-6064 | • SPRING, COMPRESSION | | 1 | Y | |
| 1090 | B-3838-3-5 | • COTTER PIN, REPLACED BY ITEM 1090A | | OBS | Y | |
| 1090A | 102761-3-5 | • COTTER PIN, REPLACES ITEM 1090 | | 1 | Y | |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| | | | |

- ITEM NOT ILLUSTRATED

**830-41 Start Lock Assembly**



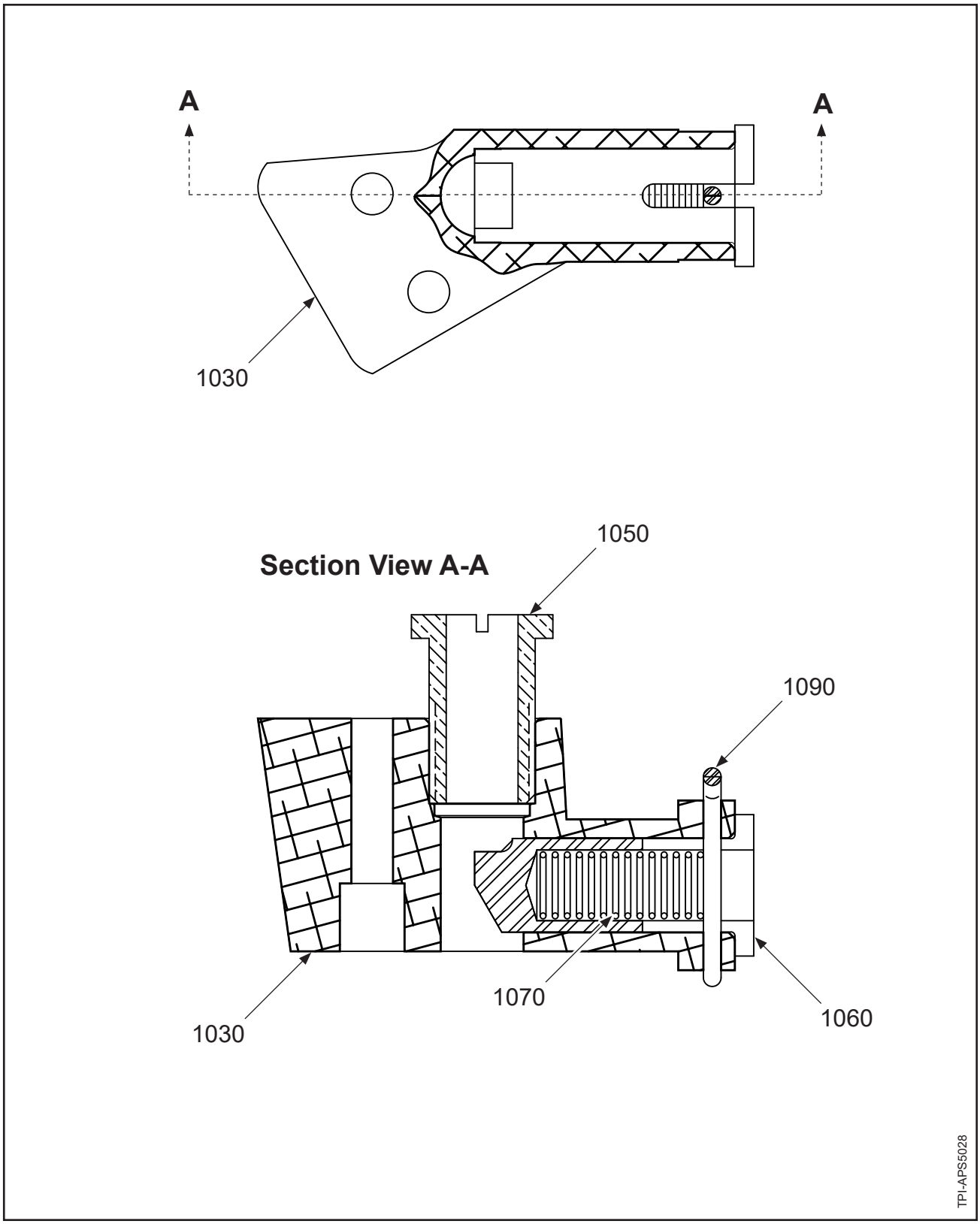

**830-41L Start Lock, LH Assembly: Section View**
**Figure 10A-43**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10A-43** | | **830-41L START LOCK, LH - ASSEMBLY** | | | | |
| 1030 | B-2632 | • HOUSING, START LOCK | | 1 | | |
| 1050 | A-2629 | • BUSHING, START LOCK | | 1 | | |
| 1060 | A-2620-1 | • PIN, START LOCK | | 1 | | |
| 1070 | A-6064 | • SPRING, COMPRESSION | | 1 | Y | |
| 1090 | B-3838-3-5 | • COTTER PIN, REPLACED BY ITEM 1090A | | OBS | Y | |
| 1090A | 102761-3-5 | • COTTER PIN, REPLACES ITEM 1090 | | 1 | Y | |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| | | | |

- ITEM NOT ILLUSTRATED

**830-41L Start Lock, LH Assembly**



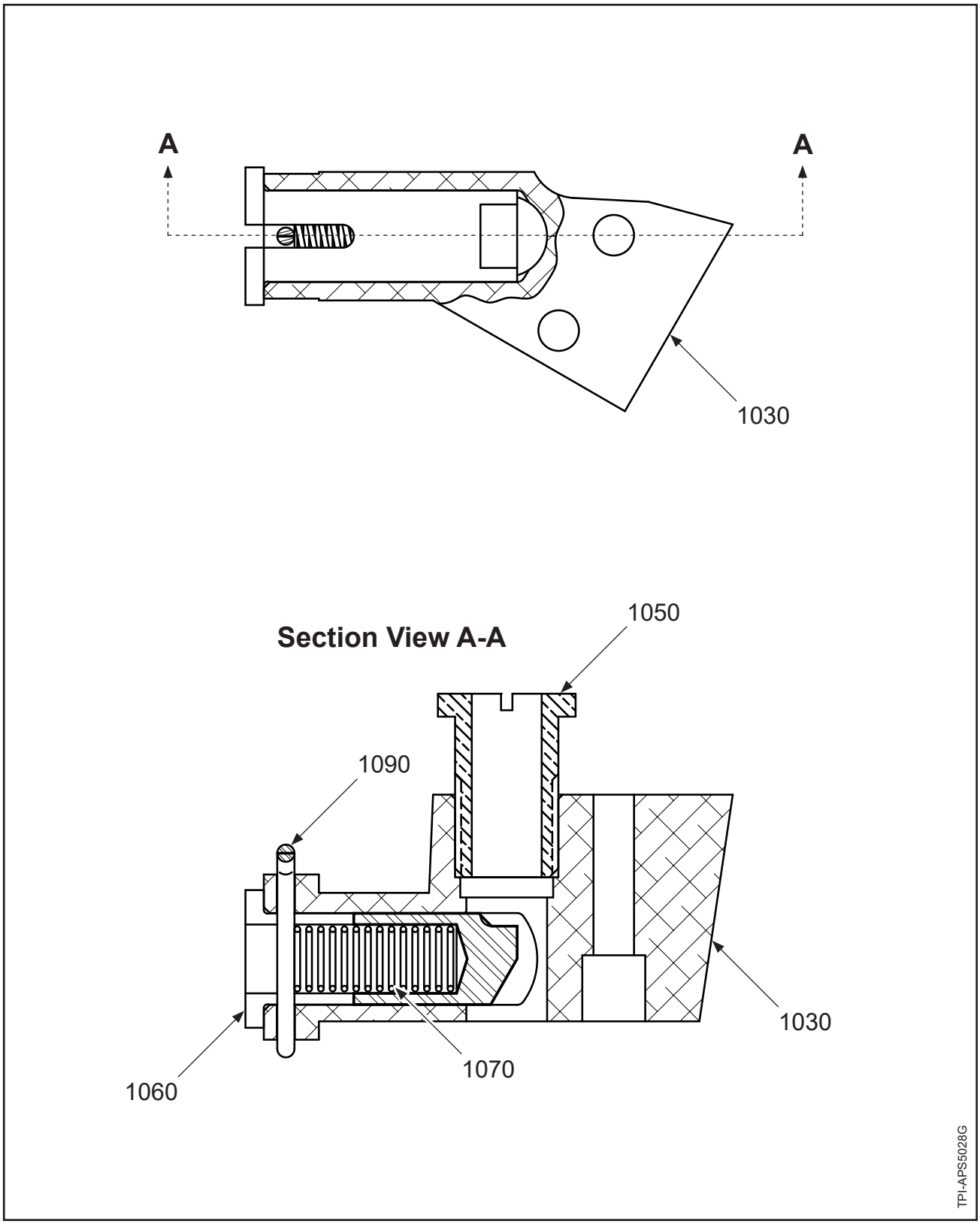

**830-43 Start Lock Assembly: Section View**
**Figure 10A-44**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10A-44** | | **830-43 START LOCK - ASSEMBLY** | | | | |
| 1030 | B-2630-1 | • HOUSING, START LOCK | | 1 | | |
| 1050 | A-2629 | • BUSHING, START LOCK | | 1 | | |
| 1060 | A-2620-3 | • PIN, START LOCK | | 1 | | |
| 1070 | A-2628 | • SPRING, COMPRESSION | | 1 | Y | |
| 1090 | B-7715 | • COTTER PIN | | 1 | Y | |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| | | | |

- ITEM NOT ILLUSTRATED

**830-43 Start Lock Assembly**



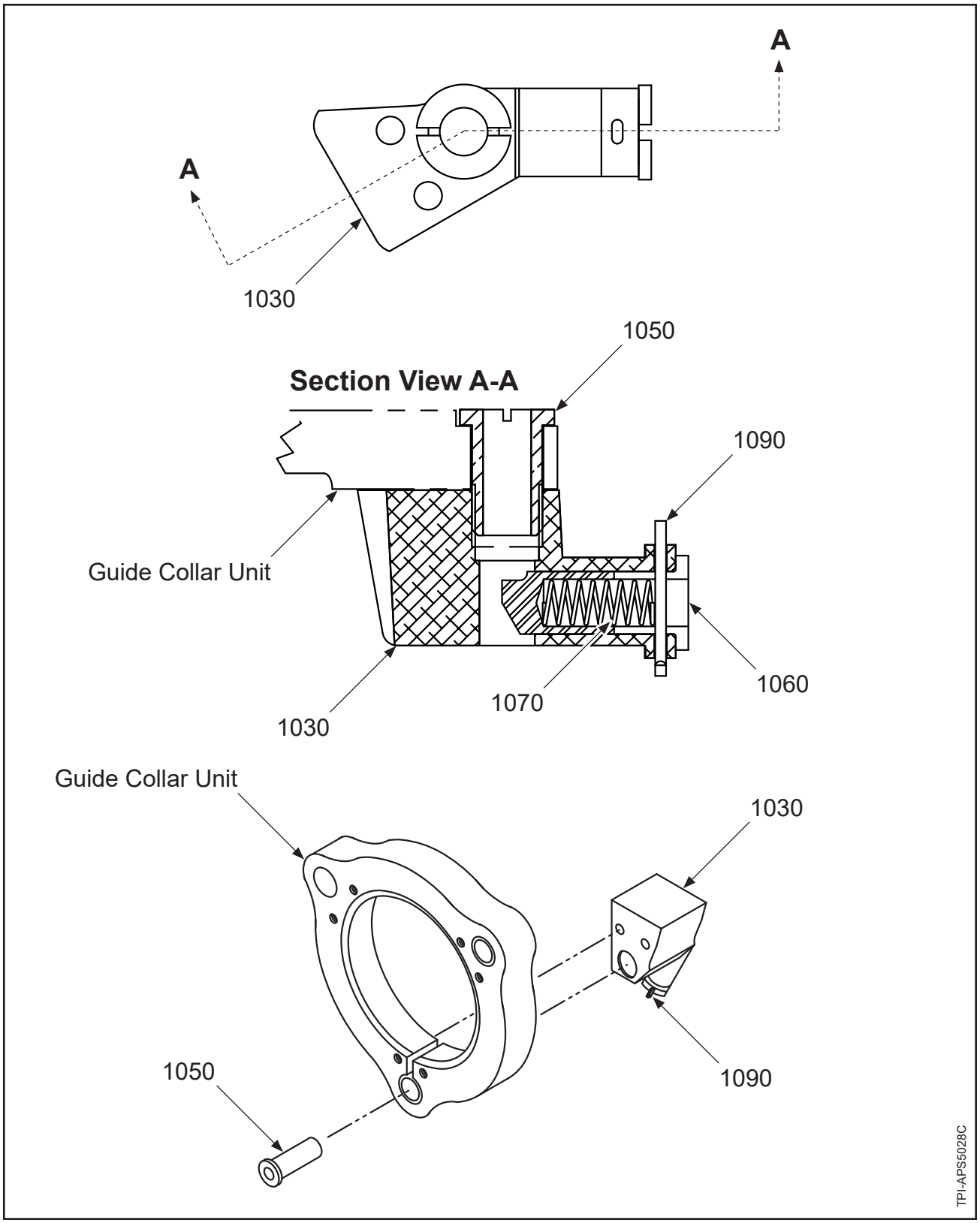

**830-43L Start Lock, LH Assembly: Section View**
**Figure 10A-45**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10A-45** | | **830-43L START LOCK, LH - ASSEMBLY** | | | | |
| 1030 | B-2632-1 | • HOUSING, START LOCK | | 1 | | |
| 1050 | A-2629 | • BUSHING, START LOCK | | 1 | | |
| 1060 | A-2620-3 | • PIN, START LOCK | | 1 | | |
| 1070 | A-2628 | • SPRING, COMPRESSION | | 1 | Y | |
| 1090 | B-7715 | • COTTER PIN | | 1 | Y | |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| | | | |

- ITEM NOT ILLUSTRATED

**830-43L Start Lock, LH Assembly**



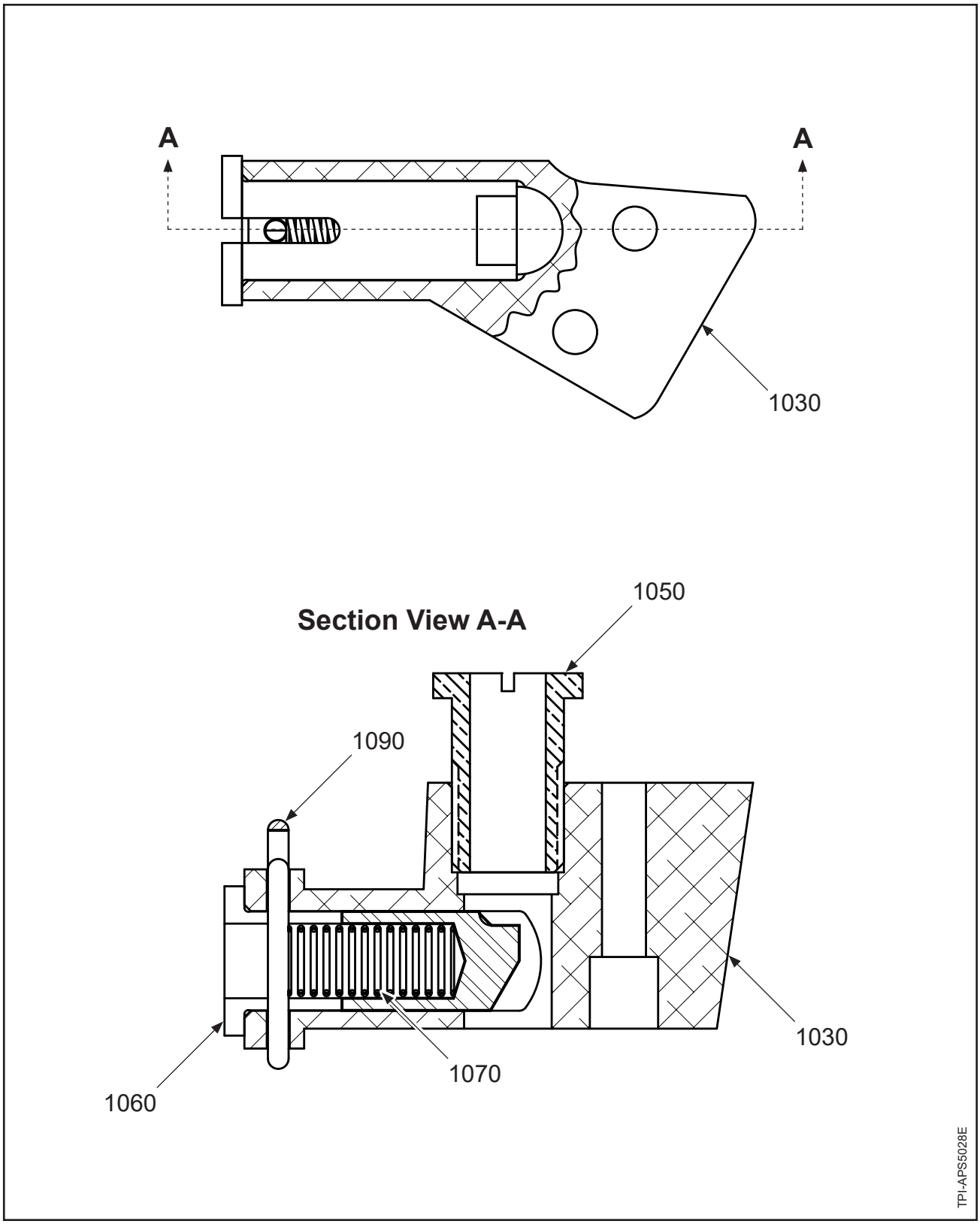

**100026 Start Lock Assembly: Exploded View**
**Figure 10A-46**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10A-46** | | **100026 START LOCK - ASSEMBLY** | | | | |
| 1030 | B-2630-1 | • HOUSING, START LOCK | | 1 | | |
| 1050 | A-2629 | • BUSHING, START LOCK | | 1 | | |
| 1060 | A-2620-3 | • PIN, START LOCK | | 1 | | |
| 1070 | A-6064 | • SPRING, COMPRESSION | | 1 | Y | |
| 1090 | B-7715 | • COTTER PIN | | 1 | Y | |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| | | | |

- ITEM NOT ILLUSTRATED

**100026 Start Lock Assembly**



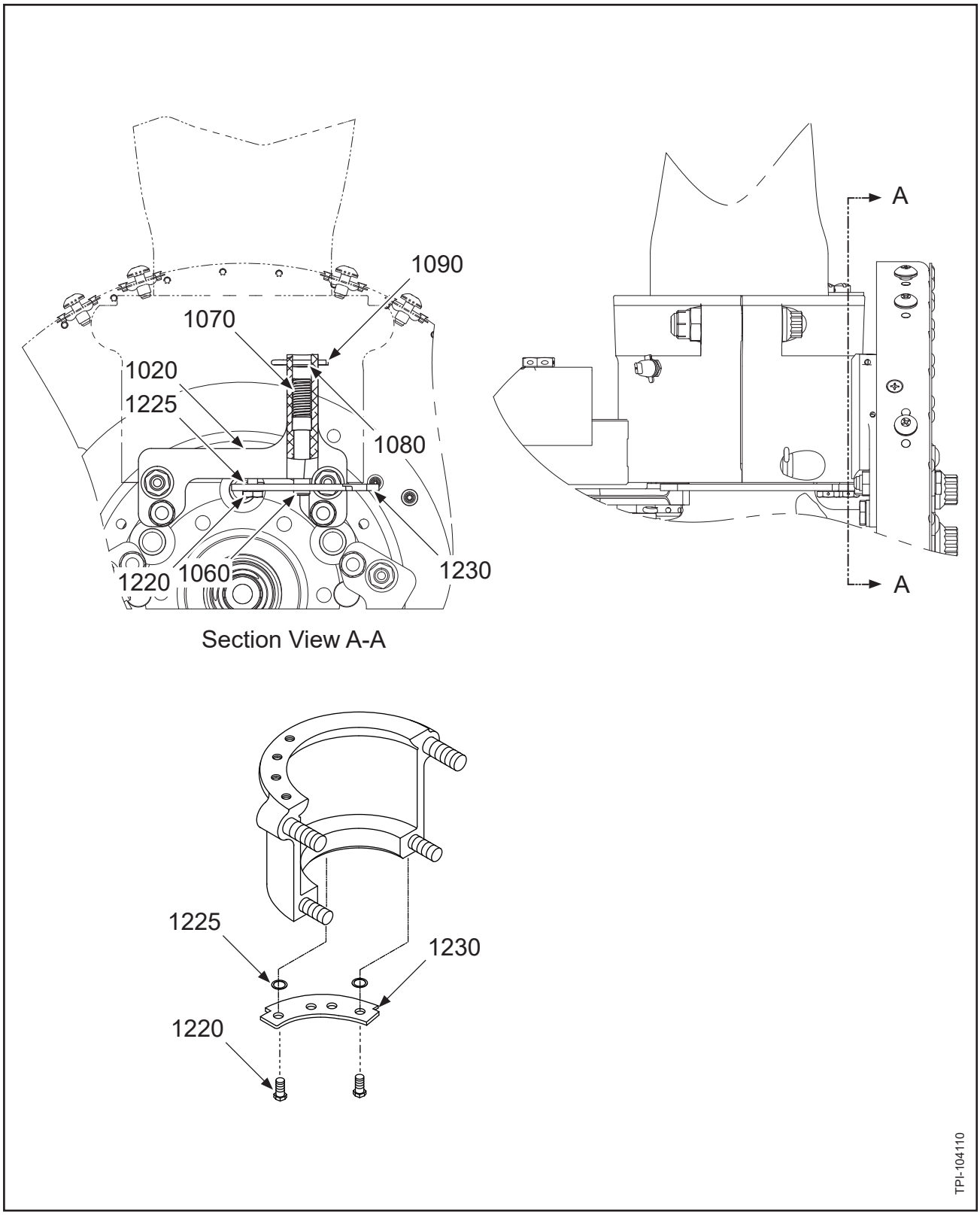

**100026L Start Lock, LH Assembly: Section View**
**Figure 10A-47**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10A-47** | | **100026L START LOCK, LH - ASSEMBLY** | | | | |
| 1030 | B-2632-1 | • HOUSING, START LOCK | | 1 | | |
| 1050 | A-2629 | • BUSHING, START LOCK | | 1 | | |
| 1060 | A-2620-3 | • PIN, START LOCK | | 1 | | |
| 1070 | A-6064 | • SPRING, COMPRESSION | | 1 | Y | |
| 1090 | B-7715 | • COTTER PIN | | 1 | Y | |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| | | | |

- ITEM NOT ILLUSTRATED

**100026L Start Lock, LH Assembly**



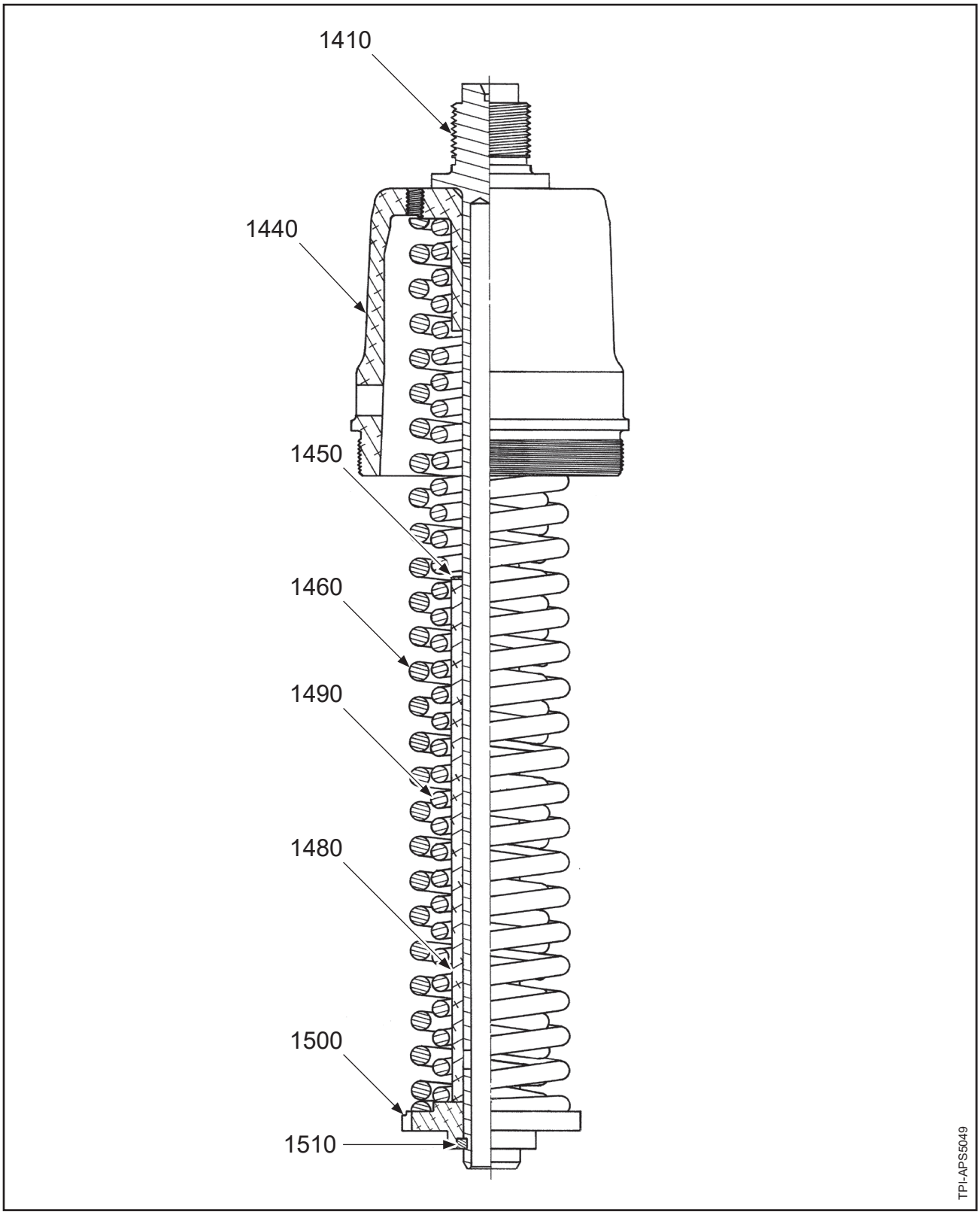

**Start Lock Components: Exploded View**
**Figure 10A-48**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10A-48** | | **START LOCK COMPONENTS** | | | | |
| -1010 | 104110 | • START LOCK - ASSEMBLY | | 3 | | |
| 1020 | 104098 | • • BRACKET, START LOCK | | 1 | | |
| 1060 | A-883 | • • PIN, START LOCK | | 1 | | |
| 1070 | A-3066 | • • SPRING, COMPRESSION | | 1 | Y | |
| 1080 | B-3851-N832 | • • WASHER | | 1 | Y | |
| 1090 | B-3838-3-3 | • • COTTER PIN | | 1 | Y | |
| 1230 | 104099 | • PLATE, START LOCK | | 3 | | |
| 1220 | A-2016-2 | • BOLT, 10-32, HEX HEAD | | 6 | Y | |
| 1225 | B-3851-0332 | • WASHER | | 6 | Y | |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| | | | |

- ITEM NOT ILLUSTRATED

**Start Lock Components**



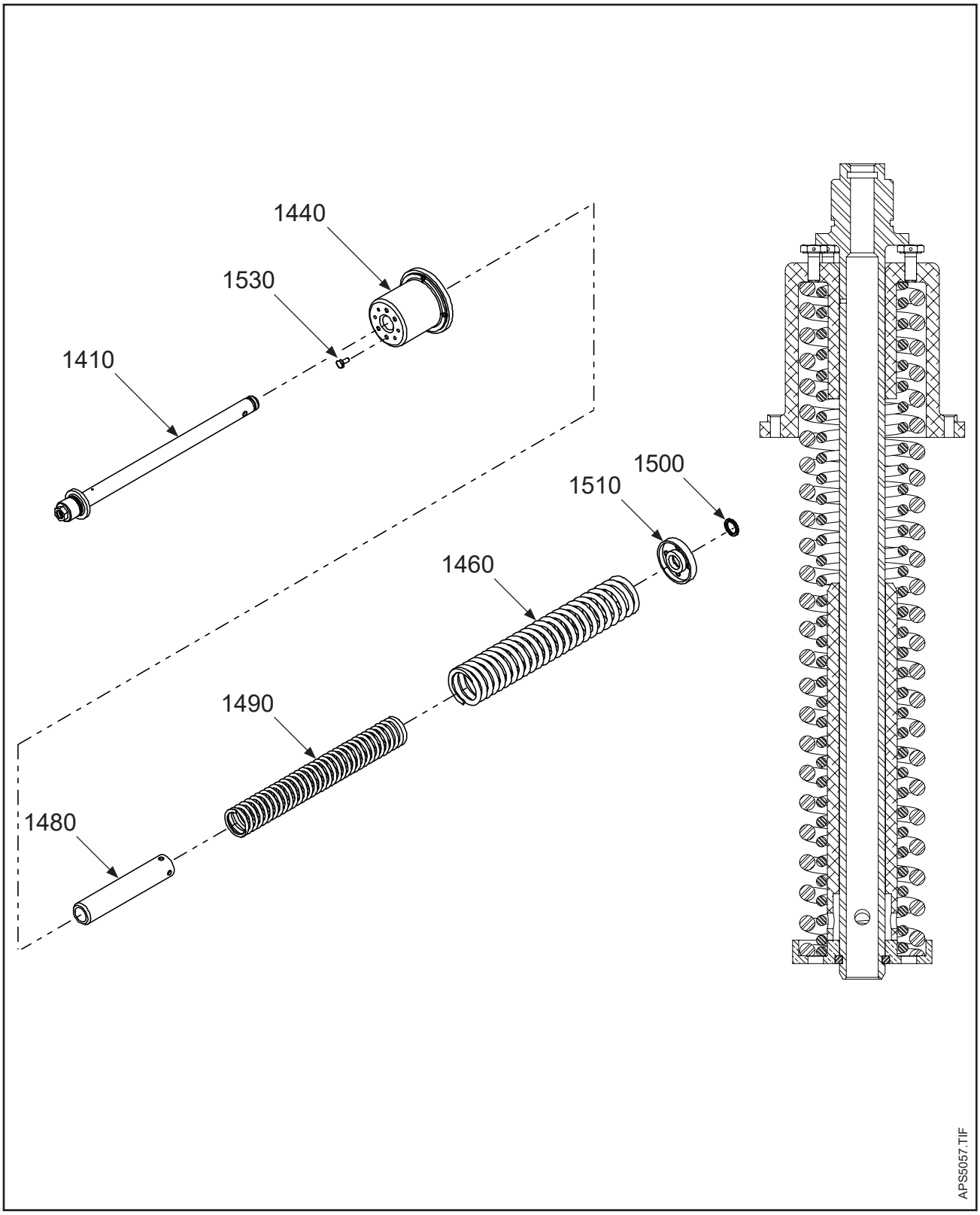

**831-19 Spring Assembly: Section View**
**Figure 10A-49**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10A-49** | | **831-19 SPRING ASSEMBLY** | | | | |
| 1410 | B-868AS | • PCP: ROD, PITCH CHANGE | | 1 | | PCP |
| 1440 | A-1827-1 | • PCP: SPRING RETAINER CUP | | 1 | | PCP |
| 1450 | A-3087 | • PCP: SPACER, SPRING | | AR | Y | PCP |
| 1460 | B-1453 | • PCP: SPRING, COMPRESSION, FEATHERING | | 1 | | PCP |
| 1480 | A-3042A | • TUBE, SPACER, SPRING | | 1 | | |
| 1490 | B-3041 | • PCP: SPRING, COMPRESSION, FEATHERING | | 1 | | PCP |
| 1500 | A-3010 | • SPRING RETAINER, REAR | | 1 | | |
| 1510 | A-867 | • PCP: KEEPER SPLIT | | 1 | Y | PCP |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| | | | |

- ITEM NOT ILLUSTRATED

**831-19 Spring Assembly**



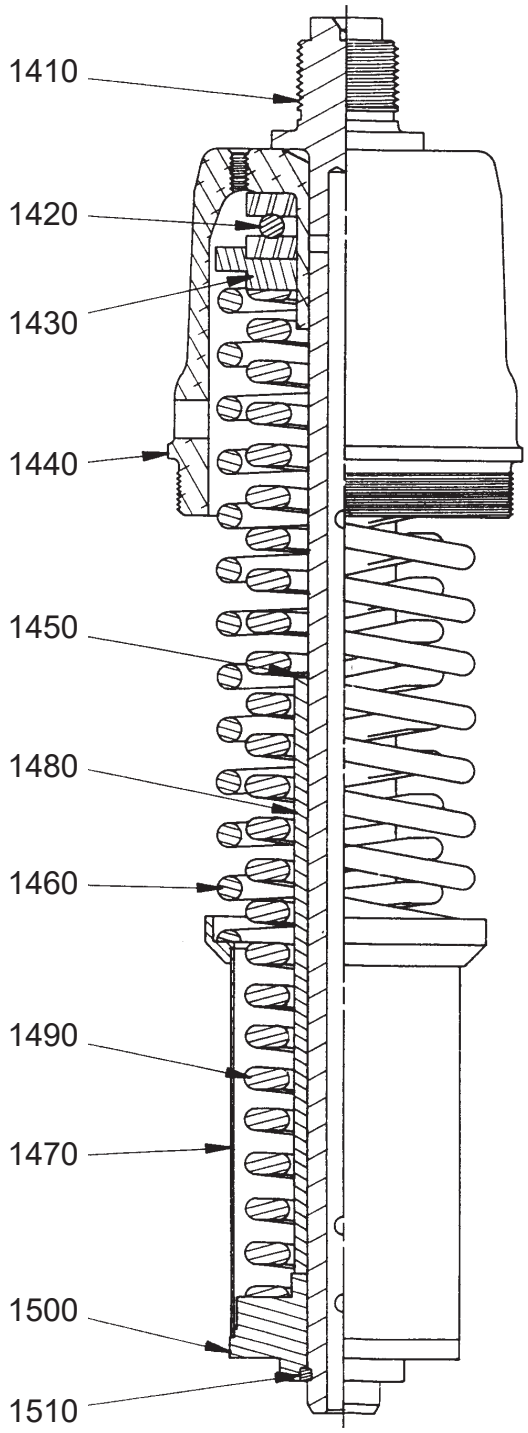

**831-37 Spring Assembly: Exploded View**
**Figure 10A-50**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10A-50** | | **831-37 SPRING ASSEMBLY** | | | | |
| 1410 | B-3421-1 | • ROD, PITCH CHANGE | | 1 | | |
| 1440 | A-3613 | • SPRING RETAINER CUP, SUPERSEDED BY ITEM 1440A | | 1 | | |
| 1440A | 106412 | • SPRING RETAINER CUP, SUPERSEDES ITEM 1440 | | 1 | | |
| 1460 | B-1453 | • PCP: SPRING, COMPRESSION, FEATHERING | | 1 | | PCP |
| 1480 | B-1461 | • TUBE, SPACER, SPRING | | 1 | | |
| 1490 | B-1454 | • PCP: SPRING, COMPRESSION, FEATHERING | | 1 | | PCP |
| 1500 | A-1460 | • REAR RETAINER, REAR | | 1 | | |
| 1510 | A-867 | • PCP: KEEPER SPLIT | | 1 | Y | PCP |
| 1530 | B-3720 | • BOLT, 10-32, HEX HEAD | | 4 | Y | |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| | | | |

- ITEM NOT ILLUSTRATED

**831-37 Spring Assembly**



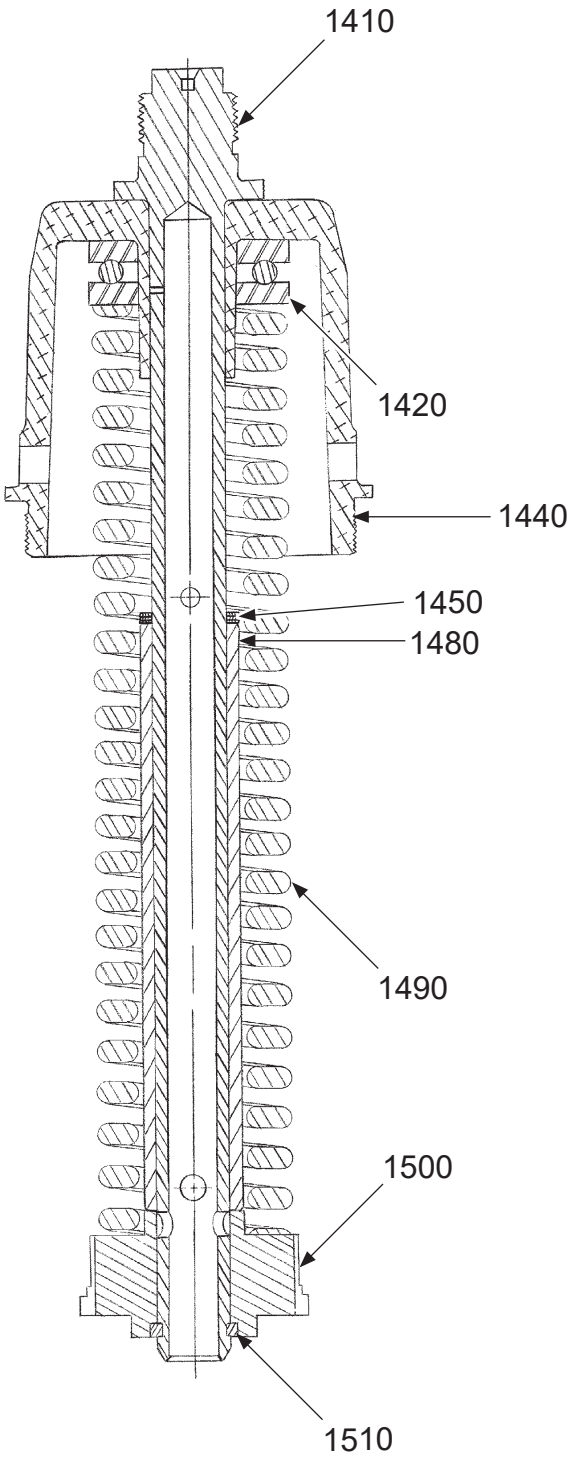

**831-47 Spring Assembly: Section View**
**Figure 10A-51**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| 10A-51 | | **831-47 SPRING ASSEMBLY** | | | | |
| 1410 | B-868AS | • PCP: ROD, PITCH CHANGE | | 1 | | PCP |
| 1420 | A-3497 | • BEARING, THRUST, BALL | | 1 | | |
| 1430 | A-4018 | • GUIDE, SPRING | | 1 | | |
| 1440 | A-1827-1 | • PCP: SPRING RETAINER CUP | | 1 | | PCP |
| 1450 | A-3087 | • PCP: SPACER, SPRING | | AR | Y | PCP |
| 1460 | B-1826 | • PCP: SPRING, COMPRESSION, FEATHERING | | 1 | | PCP |
| 1470 | A-3401 | • EXTENSION, SPRING | | 1 | | |
| 1480 | A-3042A-4 | • TUBE, SPACER, SPRING | | 1 | | |
| 1490 | A-3498 | • PCP: SPRING, COMPRESSION, FEATHERING | | 1 | | PCP |
| 1500 | A-3646 | • SPRING RETAINER, REAR | | 1 | | |
| 1510 | A-867 | • PCP: KEEPER SPLIT | | 1 | Y | PCP |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| | | | |

- ITEM NOT ILLUSTRATED

**831-47 Spring Assembly**



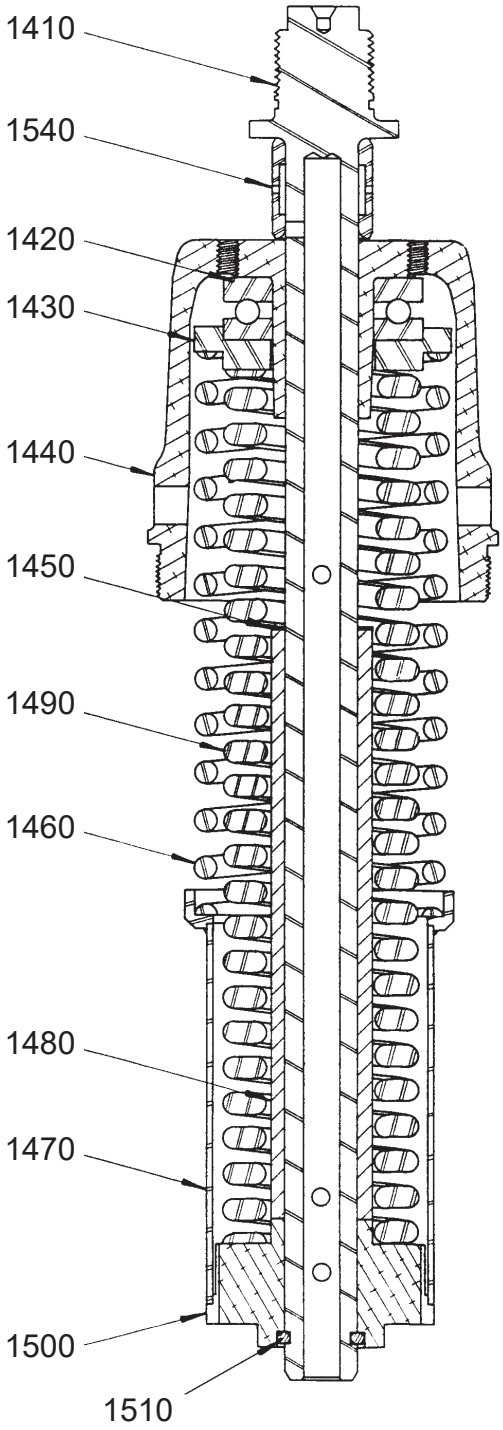

**831-57 Spring Assembly: Section View**
**Figure 10A-52**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| 10A-52 | | **831-57 SPRING ASSEMBLY** | | | | |
| 1410 | B-3332 | • PCP: ROD, PITCH CHANGE | | 1 | | PCP |
| 1420 | A-3497 | • BEARING, THRUST, BALL | | 1 | | |
| 1450 | A-3087 | • PCP: SPACER, SPRING | | AR | Y | PCP |
| 1440 | A-1827-1 | • PCP: SPRING RETAINER CUP | | 1 | | PCP |
| 1480 | A-3042A-4 | • TUBE, SPACER, SPRING | | 1 | | |
| 1490 | A-3498 | • PCP: SPRING, COMPRESSION, FEATHERING | | 1 | | PCP |
| 1500 | A-3646 | • SPRING RETAINER, REAR | | 1 | | |
| 1510 | A-867 | • PCP: KEEPER SPLIT | | 1 | Y | PCP |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| | | | |

- ITEM NOT ILLUSTRATED

**831-57 Spring Assembly**



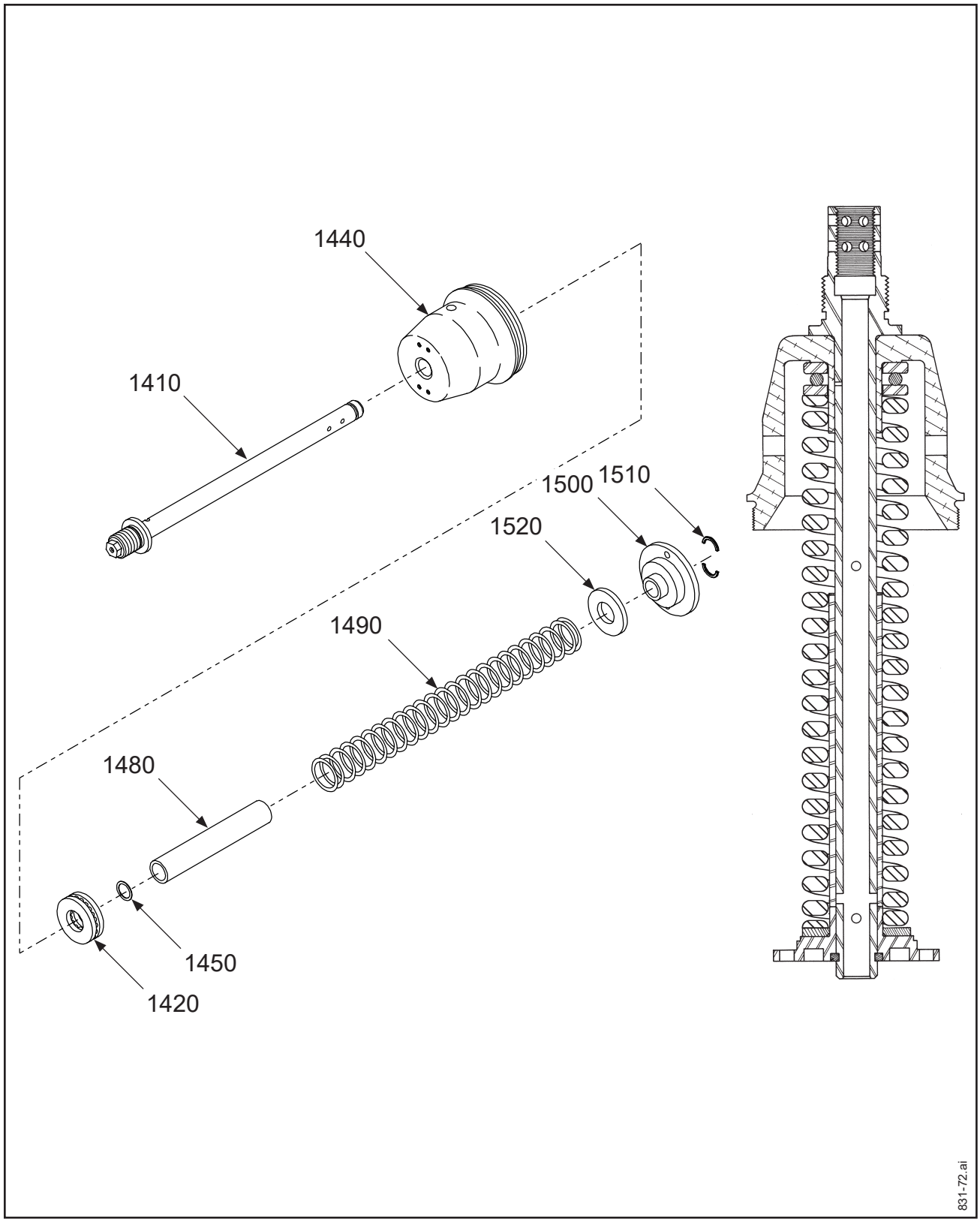

**831-59 Spring Assembly: Section View**
**Figure 10A-53**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10A-53** | | **831-59 SPRING ASSEMBLY** | | | | |
| 1410 | B-868AS | • PCP: ROD, PITCH CHANGE | | 1 | | PCP |
| 1420 | A-3497 | • BEARING, THRUST, BALL | | 1 | | |
| 1430 | A-4018 | • GUIDE, SPRING | | 1 | | |
| 1440 | A-1827-1 | • PCP: SPRING RETAINER CUP | | 1 | | PCP |
| 1450 | A-3087 | • PCP: SPACER, SPRING | | AR | Y | PCP |
| 1460 | B-1826 | • PCP: SPRING, COMPRESSION, FEATHERING | | 1 | | PCP |
| 1470 | A-3401 | • EXTENSION, SPRING | | 1 | | |
| 1480 | A-3042A-4 | • TUBE, SPACER, SPRING | | 1 | | |
| 1490 | A-3498 | • PCP: SPRING, COMPRESSION, FEATHERING | | 1 | | PCP |
| 1500 | A-3646 | • SPRING RETAINER, REAR | | 1 | | |
| 1510 | A-867 | • PCP: KEEPER SPLIT | | 1 | Y | PCP |
| 1540 | A-3342-2 | • SLEEVE, STOP, LOW PITCH | | 1 | | |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| | | | |

- ITEM NOT ILLUSTRATED

**831-59 Spring Assembly**



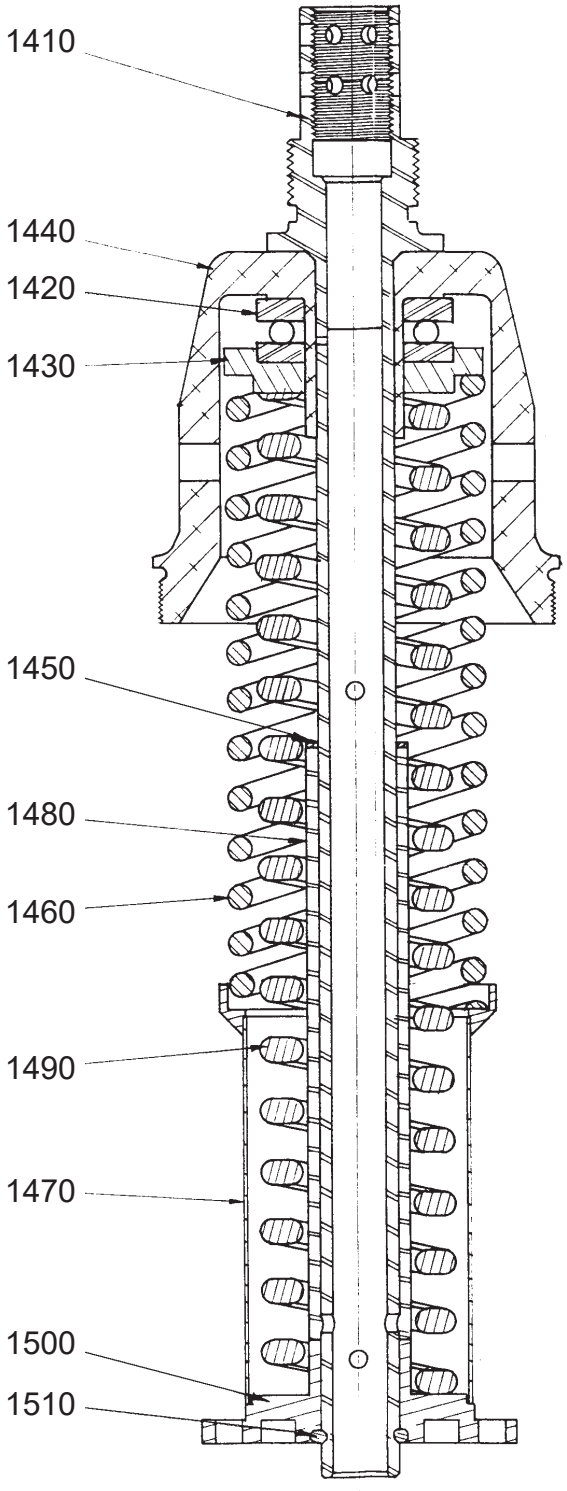

**831-72 Spring Assembly: Exploded View**
**Figure 10A-54**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10A-54** | | **831-72 SPRING ASSEMBLY** | | | | |
| 1410 | C-1948 | • ROD, PITCH CHANGE | | 1 | | |
| 1420 | A-3497 | • BEARING, THRUST, BALL | | 1 | | |
| 1440 | C-2855 | • SPRING RETAINER CUP | | 1 | | |
| 1450 | A-1989 | • SPACER, SPRING | | AR | Y | |
| 1480 | B-1993 | • SPACER, SPRING | | 1 | | |
| 1490 | A-3496 | • PCP: SPRING, COMPRESSION, FEATHERING REPLACED BY ITEM 1490A | | OBS | | PCP |
| 1490A | 102877 | • PCP: SPRING, COMPRESSION, FEATHERING REPLACES ITEM 1490, POST HC-SB-61-324 | | 1 | | PCP |
| 1500 | B-1994 | • SPRING RETAINER, REAR | | 1 | | |
| 1510 | A-1949 | • KEEPER, SPLIT | | 1 | Y | |
| 1520 | A-1997 | • WASHER, 1", COUNTERSUNK | | 1 | | |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| | | | |

- ITEM NOT ILLUSTRATED

**831-72 Spring Assembly**



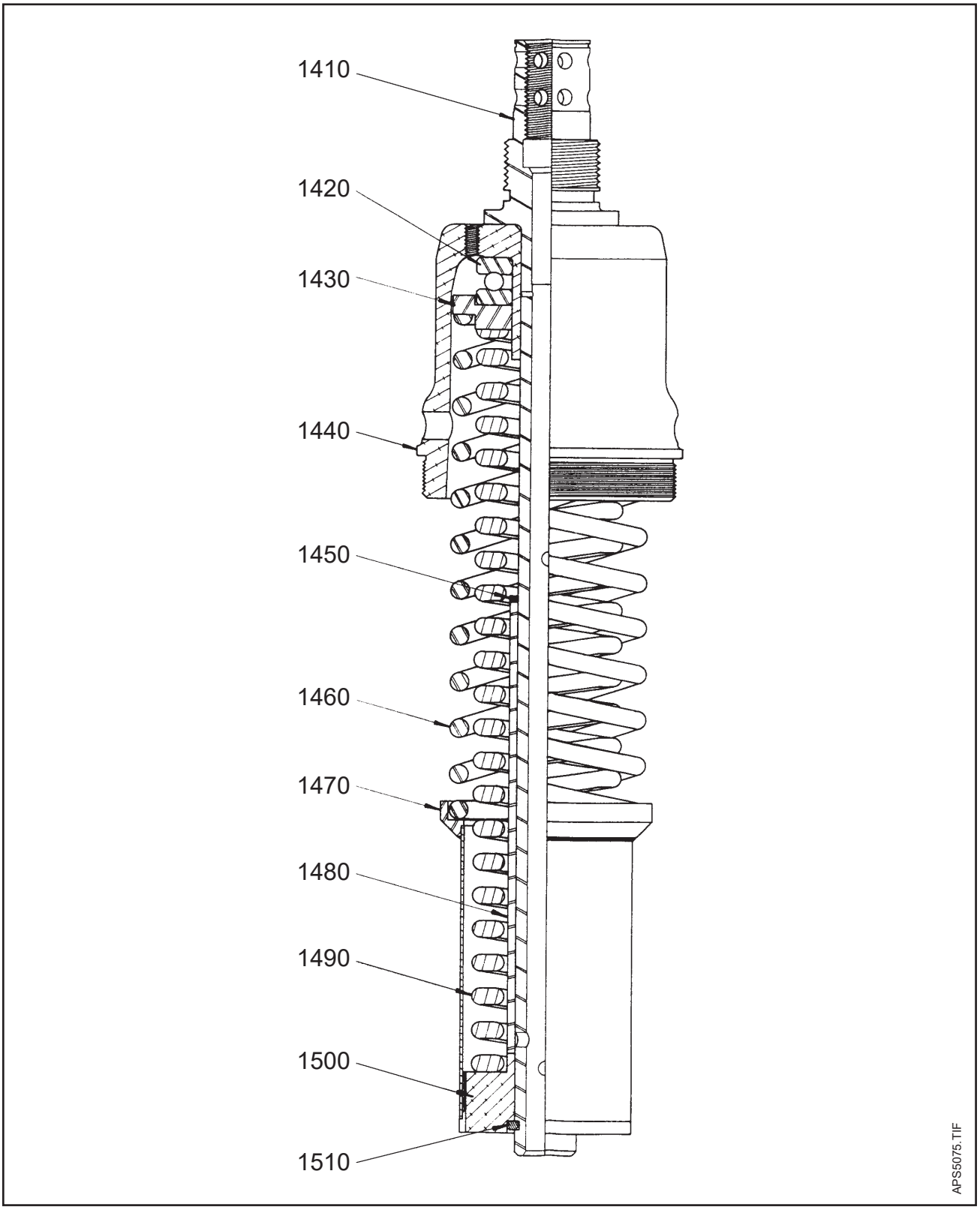

**831-73 Spring Assembly: Section View**
**Figure 10A-55**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10A-55** | | **831-73 SPRING ASSEMBLY** | | | | |
| 1410 | C-1948 | • ROD, PITCH CHANGE | | 1 | | |
| 1420 | A-3497 | • BEARING, THRUST, BALL | | 1 | | |
| 1430 | A-4018 | • GUIDE, SPRING | | 1 | | |
| 1440 | C-2855 | • SPRING RETAINER CUP | | 1 | | |
| 1450 | A-1989 | • SPACER, SPRING | | AR | Y | |
| 1460 | B-1826 | • PCP: SPRING, COMPRESSION, FEATHERING | | 1 | | PCP |
| 1470 | A-3401 | • EXTENSION, SPRING | | 1 | | |
| 1480 | B-1993 | • SPACER, SPRING | | 1 | | |
| 1490 | A-3496 | • PCP: SPRING, COMPRESSION, FEATHERING<br>REPLACED BY ITEM 1490A | | OBS | | PCP |
| 1490A | 102877 | • PCP: SPRING, COMPRESSION, FEATHERING<br>REPLACES ITEM 1490, POST HC-SB-61-324 | | 1 | | PCP |
| 1500 | B-1994 | • SPRING RETAINER, REAR | | 1 | | |
| 1510 | A-1949 | • KEEPER, SPLIT | | 1 | Y | |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| | | | |

- ITEM NOT ILLUSTRATED

**831-73 Spring Assembly**



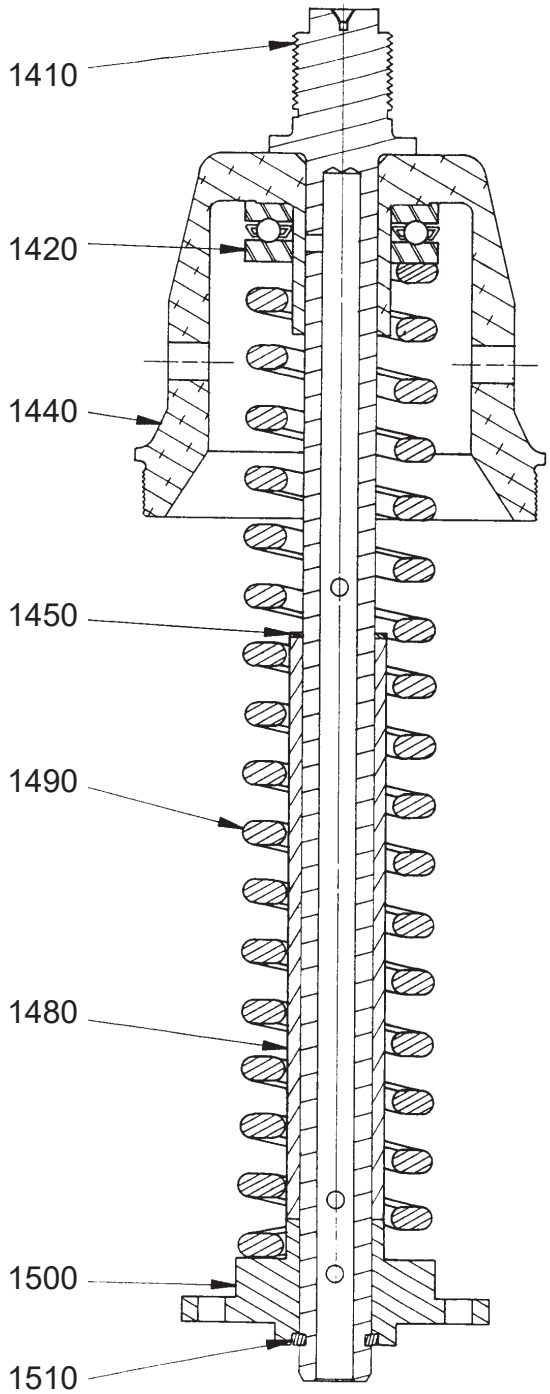

**831-75 Spring Assembly: Section View**
**Figure 10A-56**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10A-56** | | **831-75 SPRING ASSEMBLY** | | | | |
| 1410 | C-1948 | • ROD, PITCH CHANGE | | 1 | | |
| 1420 | A-3497 | • BEARING, THRUST, BALL | | 1 | | |
| 1430 | A-4018 | • GUIDE, SPRING | | 1 | | |
| 1440 | C-5816 | • CUP, SPRING RETAINER | | 1 | | |
| 1450 | A-1989 | • SPACER, SPRING | | AR | Y | |
| 1460 | B-1826 | • PCP: SPRING, COMPRESSION, FEATHERING | | 1 | | PCP |
| 1470 | A-3401 | • EXTENSION, SPRING | | 1 | | |
| 1480 | B-1993 | • SPACER, SPRING | | 1 | | |
| 1490 | A-3498 | • PCP: SPRING, COMPRESSION, FEATHERING | | 1 | | PCP |
| 1500 | B-5808 | • RETAINER, REAR | | 1 | | |
| 1510 | A-1949 | • KEEPER, SPLIT | | 1 | Y | |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| | | | |

- ITEM NOT ILLUSTRATED

**831-75 Spring Assembly**



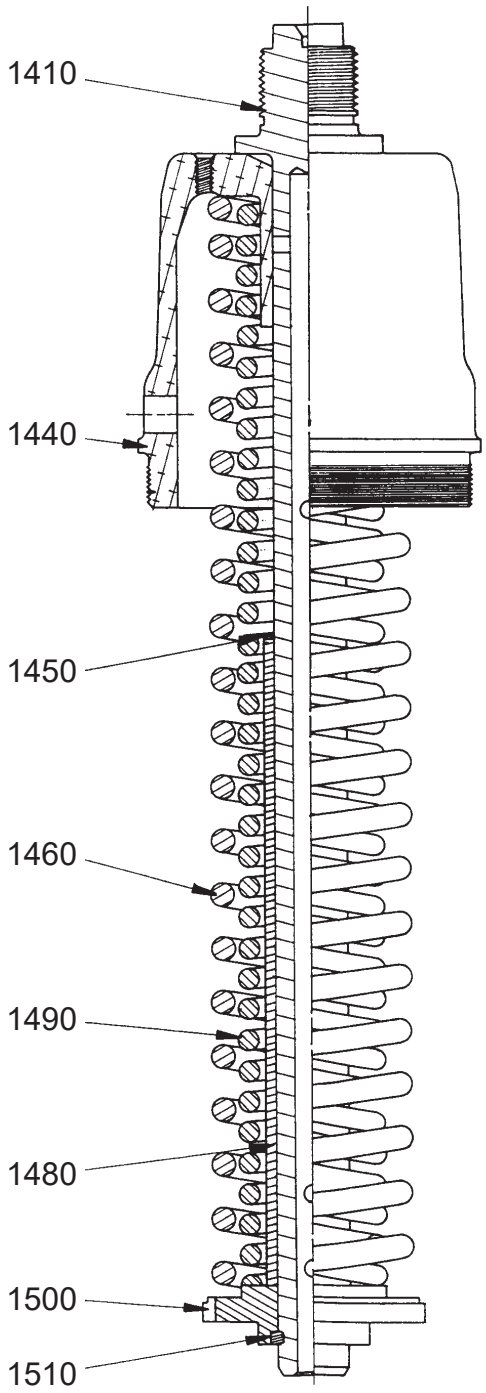

**831-76 Spring Assembly: Section View**
**Figure 10A-57**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10A-57** | | **831-76 SPRING ASSEMBLY** | | | | |
| 1410 | D-5862 | • PCP: ROD, PITCH CHANGE | | 1 | | PCP |
| 1420 | A-3497 | • BEARING, THRUST, BALL | | 1 | | |
| 1440 | C-2858 | • SPRING RETAINER CUP | | 1 | | |
| 1450 | A-3087 | • PCP: SPACER, SPRING | | AR | Y | PCP |
| 1480 | A-3042A-4 | • TUBE, SPACER, SPRING | | 1 | | |
| 1490 | A-3496 | • PCP: SPRING, COMPRESSION, FEATHERING<br>REPLACED BY ITEM 1490A | | OBS | | PCP |
| 1490A | 102877 | • PCP: SPRING, COMPRESSION, FEATHERING<br>REPLACES ITEM 1490, POST HC-SB-61-324 | | 1 | | PCP |
| 1500 | A-4008-1 | • SPRING RETAINER, REAR | | 1 | | |
| 1510 | A-867 | • PCP: KEEPER SPLIT | | 1 | Y | PCP |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| | | | |

- ITEM NOT ILLUSTRATED

**831-76 Spring Assembly**



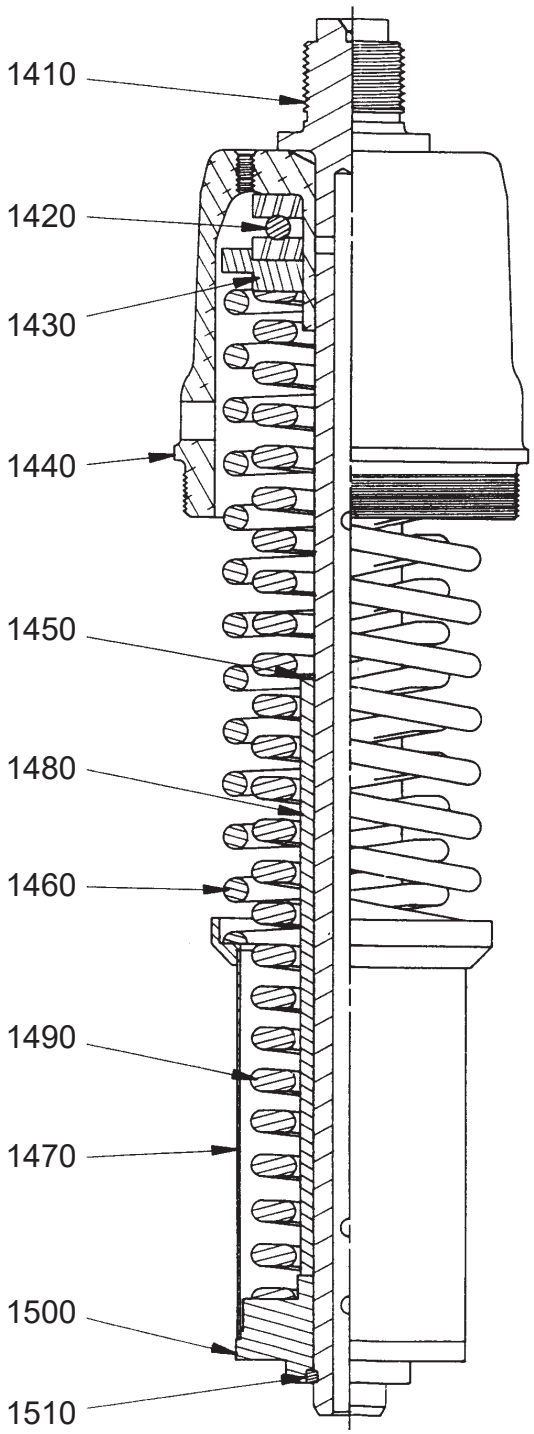

**831-79 Spring Assembly: Section View**
**Figure 10A-58**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| 10A-58 | | **831-79 SPRING ASSEMBLY** | | | | |
| 1410 | D-5862 | • PCP: ROD, PITCH CHANGE | | 1 | | PCP |
| 1440 | C-5976 | • PCP: SPRING RETAINER CUP | | 1 | | PCP |
| 1450 | A-3087 | • PCP: SPACER, SPRING | | AR | Y | PCP |
| 1460 | B-1453 | • PCP: SPRING, COMPRESSION, FEATHERING | | 1 | | PCP |
| 1480 | A-3042A | • TUBE, SPACER, SPRING | | 1 | | |
| 1490 | B-3041 | • PCP: SPRING, COMPRESSION, FEATHERING | | 1 | | PCP |
| 1500 | A-3010 | • SPRING RETAINER, REAR | | 1 | | |
| 1510 | A-867 | • PCP: KEEPER SPLIT | | 1 | Y | PCP |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| | | | |

- ITEM NOT ILLUSTRATED

**831-79 Spring Assembly**



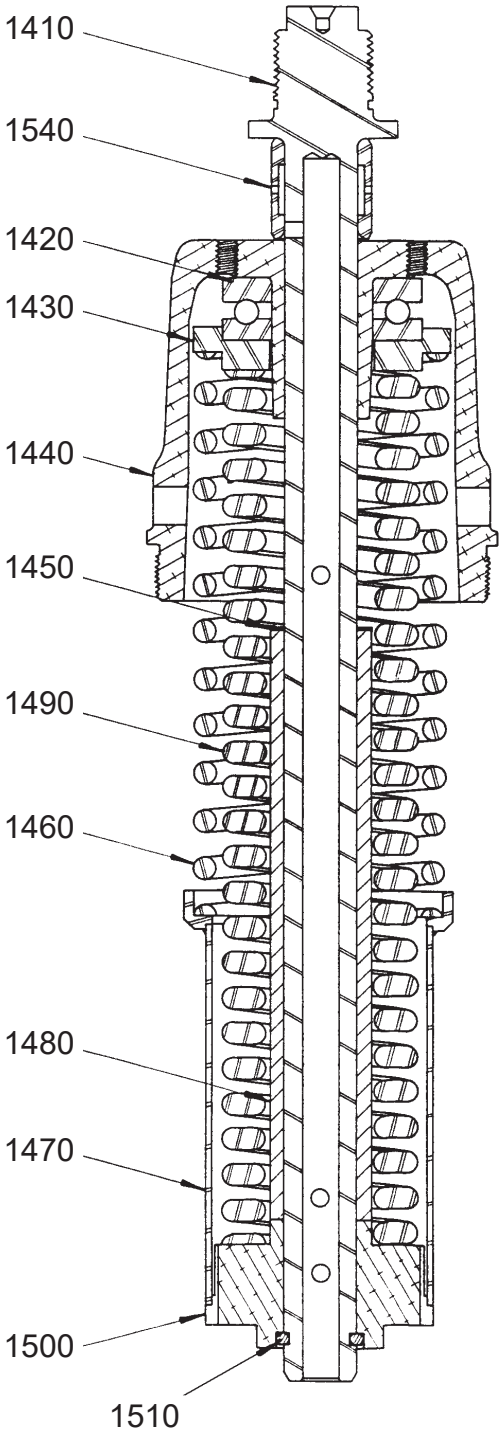

**831-82 Spring Assembly: Section View**
**Figure 10A-59**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10A-59** | | **831-82 SPRING ASSEMBLY** | | | | |
| 1410 | D-5862 | • PCP: ROD, PITCH CHANGE | | 1 | | PCP |
| 1420 | A-3497 | • BEARING, THRUST, BALL | | 1 | | |
| 1430 | A-4018 | • GUIDE, SPRING | | 1 | | |
| 1440 | C-5976 | • PCP: SPRING RETAINER CUP | | 1 | | PCP |
| 1450 | A-3087 | • PCP: SPACER, SPRING | | AR | Y | PCP |
| 1460 | B-1826 | • PCP: SPRING, COMPRESSION, FEATHERING | | 1 | | PCP |
| 1470 | A-3401 | • EXTENSION, SPRING | | 1 | | |
| 1480 | A-3042A-4 | • TUBE, SPACER, SPRING | | 1 | | |
| 1490 | A-3498 | • PCP: SPRING, COMPRESSION, FEATHERING | | 1 | | PCP |
| 1500 | A-3646 | • SPRING RETAINER, REAR | | 1 | | |
| 1510 | A-867 | • PCP: KEEPER SPLIT | | 1 | Y | PCP |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| | | | |

- ITEM NOT ILLUSTRATED

**831-82 Spring Assembly**



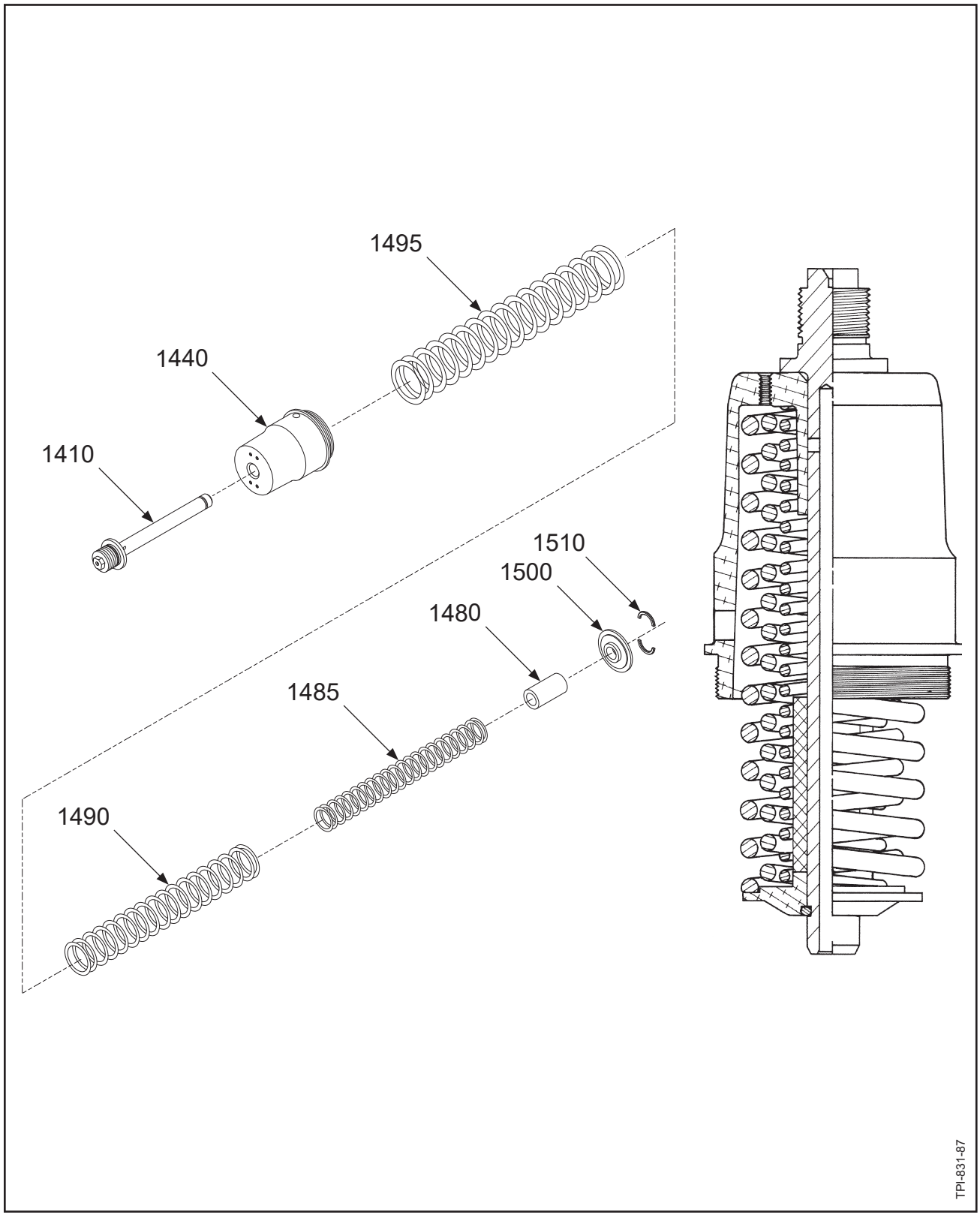

**831-83 Spring Assembly: Section View**
**Figure 10A-60**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| 10A-60 | | 831-83 SPRING ASSEMBLY | | | | |
| 1410 | D-5862 | • PCP: ROD, PITCH CHANGE | | 1 | | PCP |
| 1420 | A-3497 | • BEARING, THRUST, BALL | | 1 | | |
| 1430 | A-4018 | • GUIDE, SPRING | | 1 | | |
| 1440 | C-5976 | • PCP: SPRING RETAINER CUP | | 1 | | PCP |
| 1450 | A-3087 | • PCP: SPACER, SPRING | | AR | Y | PCP |
| 1460 | B-1826 | • PCP: SPRING, COMPRESSION, FEATHERING | | 1 | | PCP |
| 1470 | A-3401 | • EXTENSION, SPRING | | 1 | | |
| 1480 | A-3042A-4 | • TUBE, SPACER, SPRING | | 1 | | |
| 1490 | A-3498 | • PCP: SPRING, COMPRESSION, FEATHERING | | 1 | | PCP |
| 1500 | A-3646 | • SPRING RETAINER, REAR | | 1 | | |
| 1510 | A-867 | • PCP: KEEPER SPLIT | | 1 | Y | PCP |
| 1540 | A-3342-2 | • SLEEVE, STOP, LOW PITCH | | 1 | | |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| | | | |

- ITEM NOT ILLUSTRATED

**831-83 Spring Assembly**



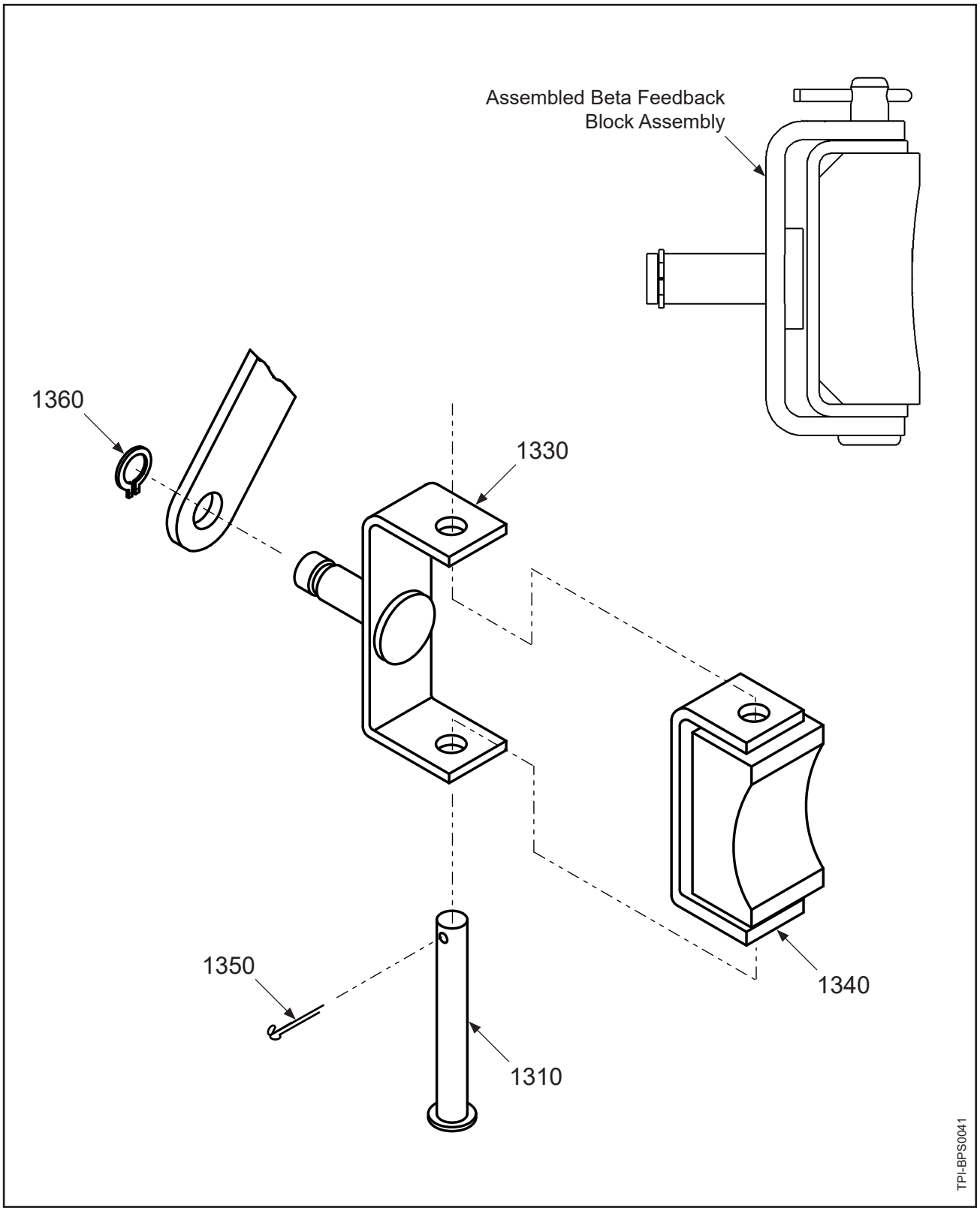

**831-87 Spring Assembly: Exploded View**
**Figure 10A-61**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| 10A-61 | | **831-87 SPRING ASSEMBLY** | | | | |
| 1410 | D-5862-2 | • PCP: ROD, PITCH CHANGE | | 1 | | PCP |
| 1440 | B-666 | • PCP: SPRING RETAINER CUP | | 1 | | PCP |
| 1480 | A-1849 | • PCP: SLEEVE, SPACER | | 1 | | PCP |
| 1485 | B-1824 | • PCP: SPRING, COMPRESSION, FEATHERING | | 1 | | PCP |
| 1490 | B-1825 | • PCP: SPRING, COMPRESSION, FEATHERING | | 1 | | PCP |
| 1495 | B-1826 | • PCP: SPRING, COMPRESSION, FEATHERING | | 1 | | PCP |
| 1500 | A-1829 | • PCP: SPRING, RETAINER, REAR | | 1 | | PCP |
| 1510 | A-867 | • PCP: KEEPER SPLIT | | 1 | Y | PCP |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| | | | |

- ITEM NOT ILLUSTRATED

**831-87 Spring Assembly**



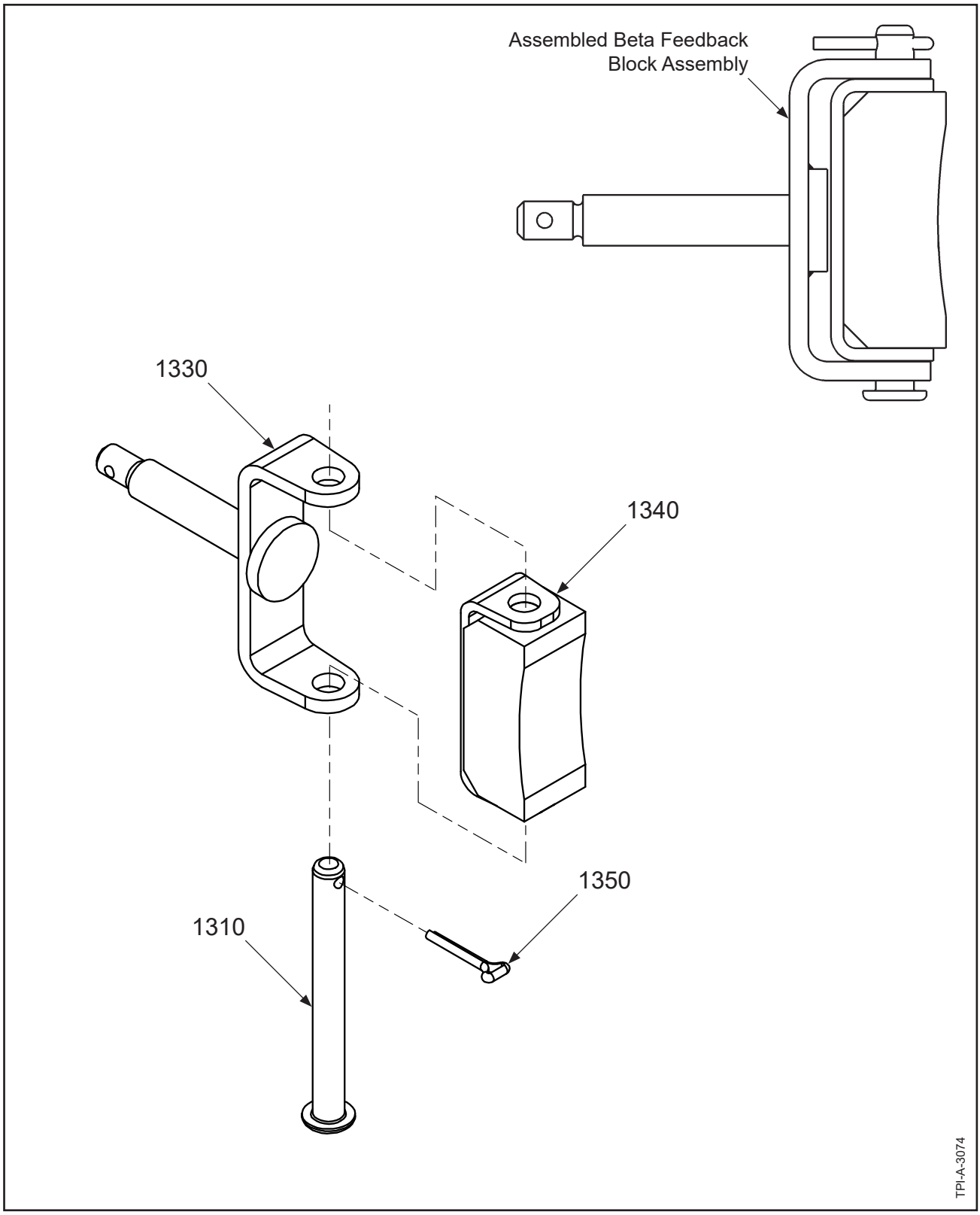

**A-3044 Beta Feedback Block Assembly: Exploded View**
**Figure 10A-62**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10A-62** | | **A-3044 BETA FEEDBACK BLOCK ASSEMBLY** | | | | |
| 1310 | A-3027 | • YOKE GUIDE PIN, SUPERSEDED BY ITEM 1310A | | 1 | Y | |
| 1310A | B-3844-53 | • CLEVIS PIN, SUPERSEDES ITEM 1310 | | 1 | Y | |
| 1330 | A-3025 | • YOKE UNIT | | 1 | | |
| 1340 | A-3026 | • CARBON BLOCK - UNIT | | 1 | Y | |
| 1350 | A-4543 | • COTTER PIN, T-HEAD | | 1 | Y | |
| 1360 | B-3843-25PP | • SNAP RING, EXTERNAL | | 1 | Y | |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| | | | |

- ITEM NOT ILLUSTRATED

**A-3044 Beta Feedback Block Assembly**



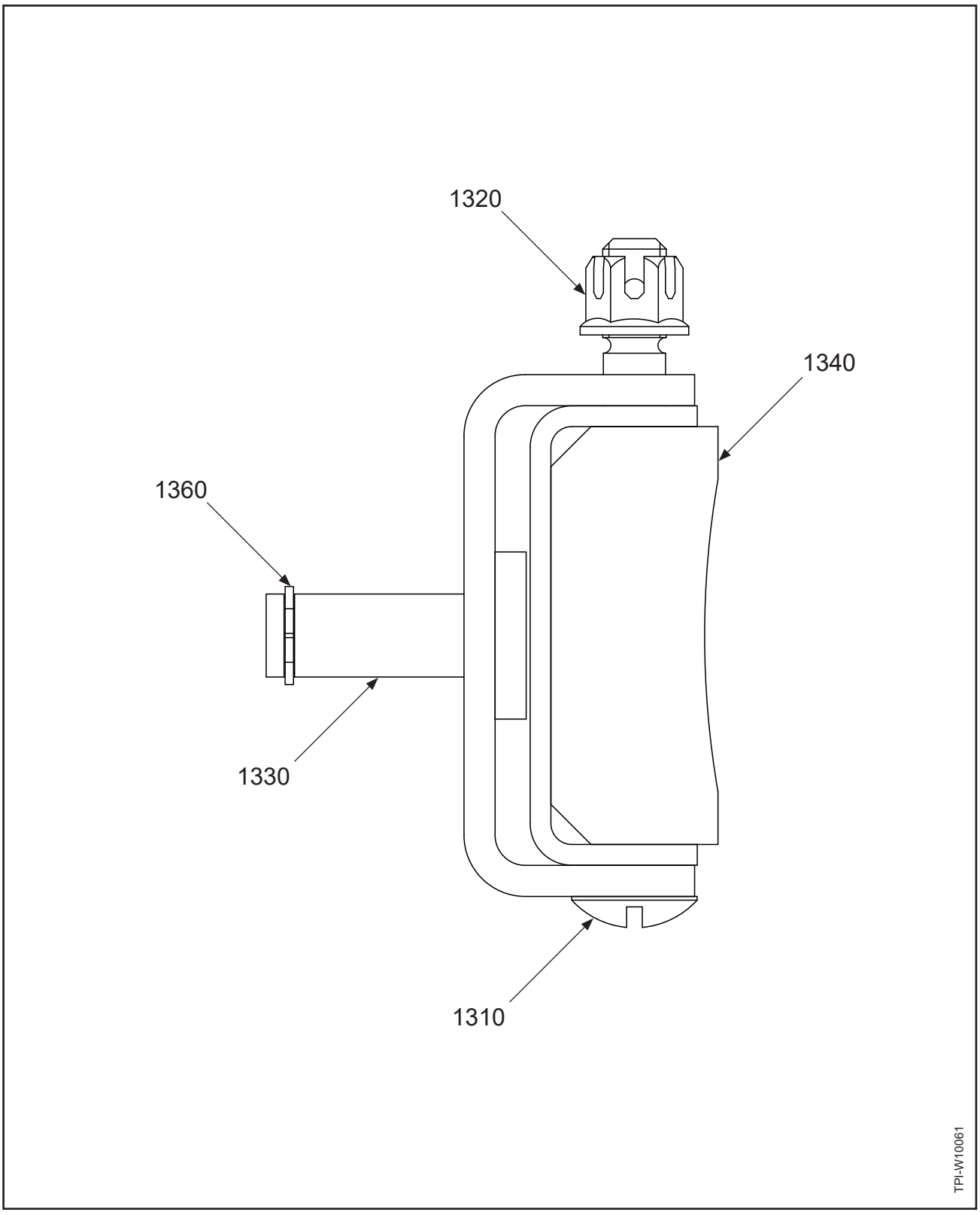

**A-3074 Beta Feedback Block Assembly: Exploded View**
**Figure 10A-63**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10A-63** | | **A-3074 BLOCK, BETA FEEDBACK - ASSEMBLY** | | | | |
| 1310 | A-3027 | • YOKE GUIDE PIN, SUPERSEDED BY ITEM 1310A | | 1 | Y | |
| 1310A | B-3844-53 | • CLEVIS PIN, SUPERSEDES ITEM 1310 | | 1 | Y | |
| 1330 | A-3073 | • YOKE UNIT | | 1 | | |
| 1340 | A-3026 | • CARBON BLOCK - UNIT | | 1 | Y | |
| 1350 | A-4543 | • COTTER PIN, T-HEAD | | 1 | Y | |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| | | | |

- ITEM NOT ILLUSTRATED

**A-3074 Beta Feedback Block Assembly**



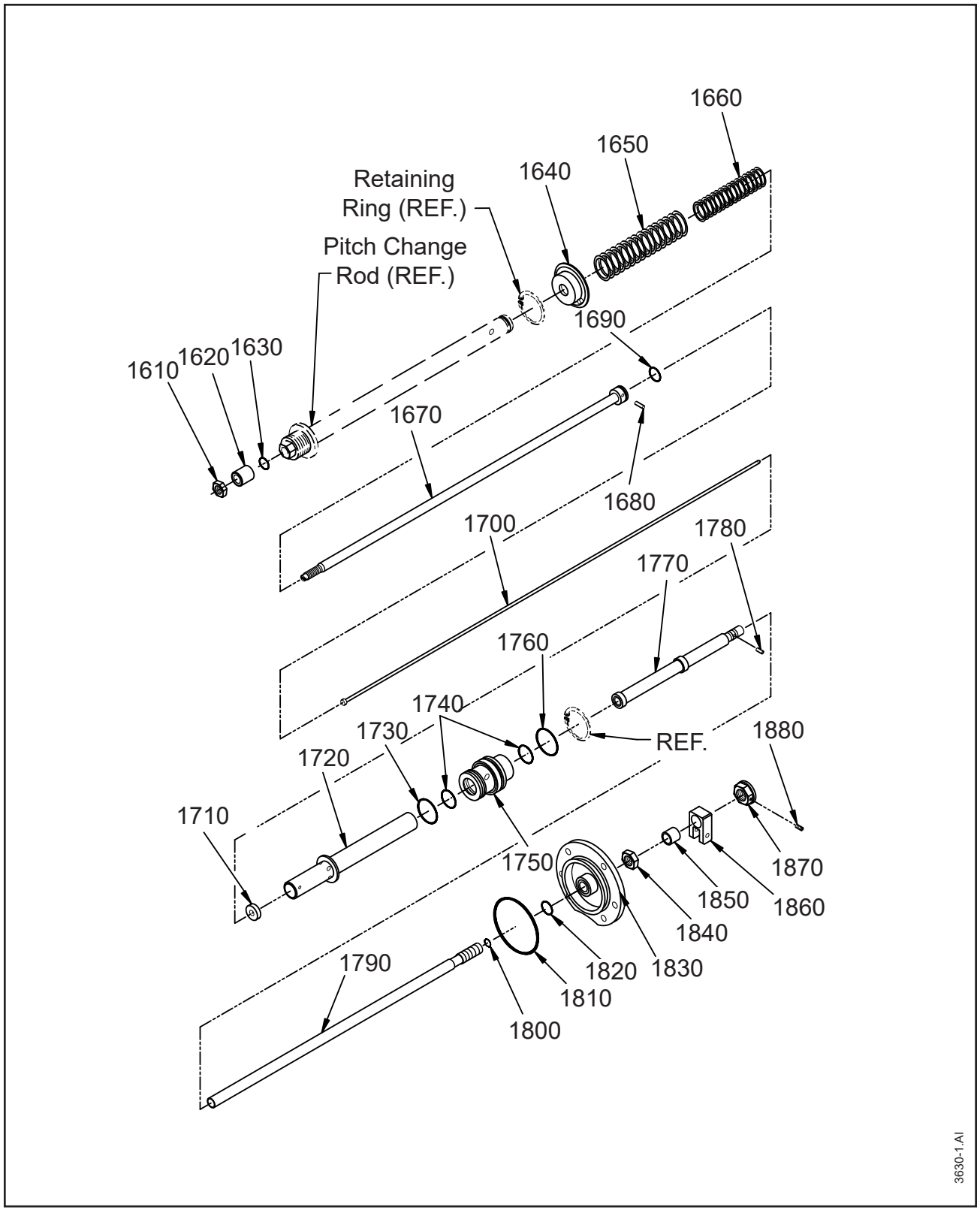

**A-4731 Beta Feedback Block Assembly: Section View**
**Figure 10A-64**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10A-64** | | **A-4731 BLOCK, BETA FEEDBACK - ASSEMBLY** | | | | |
| 1310 | B-6648-31 | • BOLT, 10-32, CLEVIS | | 1 | Y | |
| 1320 | B-3811 | • NUT, 10-32, CASTELLATED, SELF-LOCKING | | 1 | Y | |
| 1330 | A-3025 | • YOKE UNIT | | 1 | | |
| 1340 | A-3026 | • CARBON BLOCK - UNIT | | 1 | Y | |
| 1360 | B-3843-25PP | • SNAP RING, EXTERNAL | | 1 | Y | |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| | | | |

- ITEM NOT ILLUSTRATED

**A-4731 Beta Feedback Block Assembly**



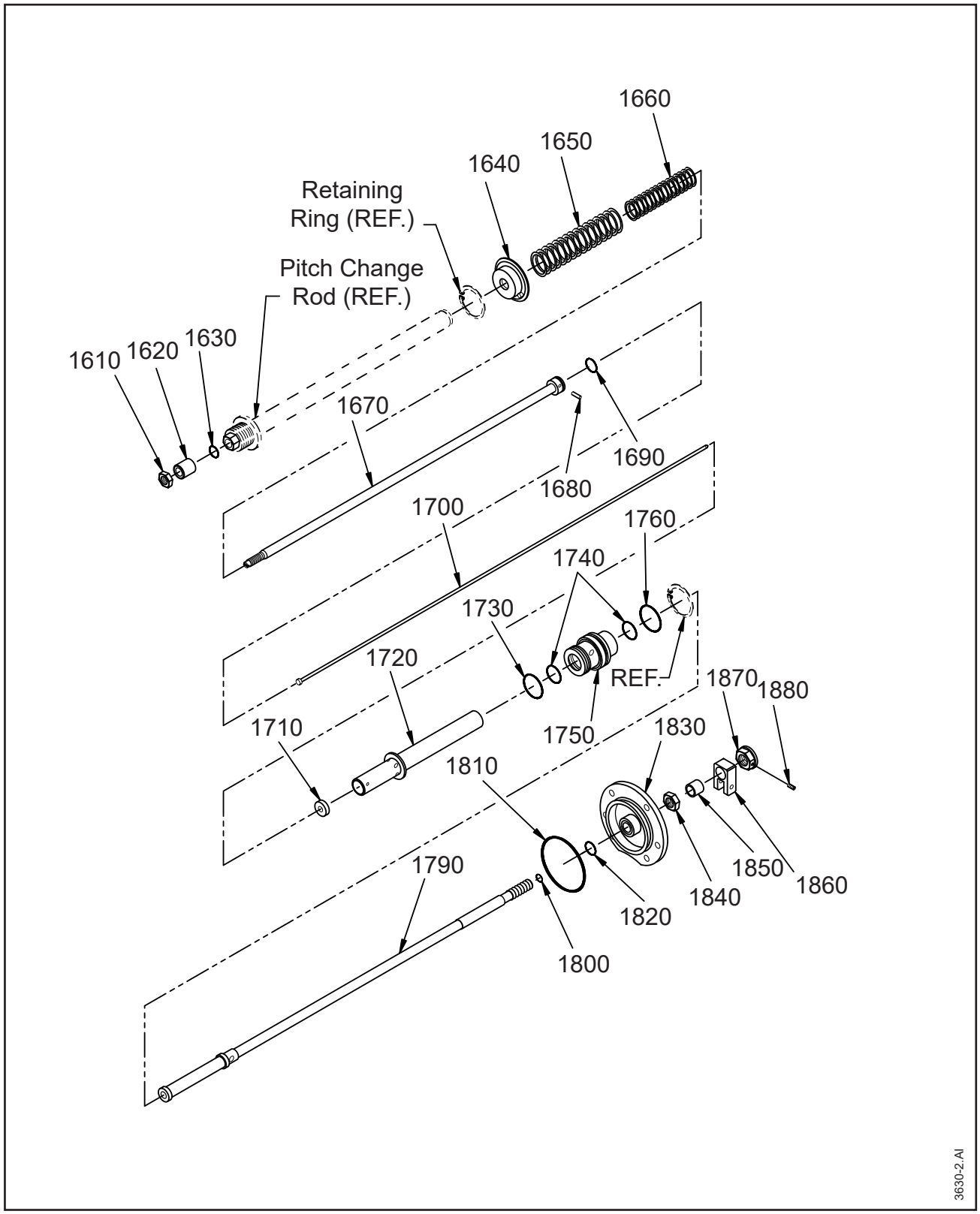

**C-3630-1 Beta Valve Assembly: Exploded View**
**Figure 10A-65**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10A-65** | | **C-3630-1 BETA VALVE - ASSEMBLY** | | | | |
| 1610 | A-2678 | • PCP: NUT, 5/16-24, SELF LOCKING | | 1 | Y | PCP |
| 1610A | B-3368 | • NUT, 5/16-24, HEX, THIN, ALTERNATE FOR ITEM 1610 | | 2 | Y | |
| 1620 | A-2246-1 | • SPACER, ALUMINUM | | 1 | | |
| 1620A | A-2246-8 | • SPACER, ALUMINUM, ALTERNATE FOR ITEM 1620 | | 1 | | |
| 1630 | C-3317-012-2 | • O-RING | | 1 | Y | |
| 1640 | B-3645 | • SPRING RETAINER, BETA | | 1 | | |
| 1650 | A-3607 | • SPRING, COMPRESSION | | 1 | | |
| 1660 | A-3608 | • SPRING, COMPRESSION | | 1 | | |
| -1665 | C-3630-2KIT | • BETA VALVE - KIT | | 1 | | |
| 1670 | B-3606 | • • ROD, BETA | | 1 | | |
| 1680 | B-6378-0750 | • • SPRING PIN, 1/8", CRES | | 1 | Y | |
| 1690 | C-3317-014 | • • O-RING | | 1 | Y | |
| 1700 | A-3619-2 | • • PCP: PIN, INDICATOR, PITCH-UNIT, REPLACED BY ITEM 1700A | | OBS | | PCP |
| 1700A | 101345 | • • PCP: PIN, INDICATOR, PITCH-UNIT, REPLACES ITEM 1700 | | 1 | | PCP |
| 1710 | A-3641 | • • WASHER, COUNTERBORED, BETA VALVE | | 1 | | |
| 1720 | B-3631-1 | • • PCP: SLEEVE, BETA VALVE | B | 1 | | PCP |
| 1730 | C-3317-024 | • O-RING | | 1 | Y | |
| 1740 | C-3317-116 | • O-RING | | 2 | Y | |
| 1750 | B-3602 | • ADAPTOR, SHAFT, BETA VALVE | | 1 | | |
| 1760 | C-3317-028 | • O-RING | | 1 | Y | |
| 1770 | B-3632 | • SPOOL, BETA VALVE NO. 3 | A | 1 | | |
| 1780 | B-6132-0125 | • SPRING PIN, 1/16" | | 1 | Y | |
| 1790 | B-3633 | • SPOOL, BETA VALVE, SECONDARY | A | 1 | | |
| 1800 | C-3317-006 | • O-RING | | 1 | Y | |
| 1810 | C-3317-141 | • O-RING | | 1 | Y | |
| 1820 | C-3317-111 | • O-RING | | 1 | Y | |
| 1830 | B-3611 | • ENGINE COVER, SUPERSEDED BY ITEM 1830A | | 1 | | |
| 1830A | B-2692 | • COVER, ENGINE, SUPERSEDES ITEM 1830 | | 1 | | |
| -1835 | B-6985 | • • BUSHING, BRONZE, OIL IMPREGNATED | | 1 | | |
| 1840 | B-3397 | • NUT, 7/16-20, HEX, THIN | | 1 | Y | |
| 1850 | A-3634 | • BETA VALVE BUSHING | | 1 | | |
| 1860 | A-3621-2 | • PCP: FITTING, ROD END | | 1 | | PCP |
| 1870 | A-3622 | • CAP UNIT, ROD END | | 1 | | |
| 1880 | B-6635-34 | • SCREW, SET, 8-32 | | 1 | Y | |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| A | IF ITEM 1770 OR ITEM 1790 IS REPLACED THEN C-3630-1 MUST BE REPLACED WITH C-3630-2. | | |
| B | MATCHING SERIAL NUMBERS FOR ITEM 1720 ARE NOT NECESSARY. | | |

- ITEM NOT ILLUSTRATED

## C-3630-1 Beta Valve Assembly




**C-3630-2 Beta Valve Assembly: Exploded View**
**Figure 10A-66**

| FIG./ITEM NUMBER | PART NUMBER | DESCRIPTION | EFF CODE | UPA | O/H | PCP |
|---|---|---|---|---|---|---|
| **10A-66** | | **C-3630-2 BETA VALVE - ASSEMBLY** | | | | |
| 1610 | A-2678 | • PCP: NUT, 5/16-24, SELF LOCKING | | 1 | Y | PCP |
| 1620 | A-2246-1 | • SPACER, ALUMINUM | | 1 | | |
| 1620A | A-2246-8 | • SPACER, ALUMINUM, ALTERNATE FOR ITEM 1620 | | 1 | | |
| 1630 | C-3317-012-2 | • O-RING | | 1 | Y | |
| 1640 | B-3645 | • SPRING RETAINER, BETA | | 1 | | |
| 1650 | A-3607 | • SPRING, COMPRESSION | | 1 | | |
| 1660 | A-3608 | • SPRING, COMPRESSION | | 1 | | |
| -1665 | C-3630-2KIT | • BETA VALVE - KIT | | 1 | | |
| 1670 | B-3606 | • • ROD, BETA | | 1 | | |
| 1680 | B-6378-0750 | • • SPRING PIN, 1/8", CRES | | 1 | Y | |
| 1690 | C-3317-014 | • • O-RING | | 1 | Y | |
| 1700 | A-3619-2 | • • PCP: PIN, INDICATOR, PITCH-UNIT, REPLACED BY ITEM 1700A | | OBS | | PCP |
| 1700A | 101345 | • • PCP: PIN, INDICATOR, PITCH-UNIT, REPLACES ITEM 1700 | | 1 | | PCP |
| 1710 | A-3641 | • • WASHER, COUNTERBORED, BETA VALVE | | 1 | | |
| 1720 | B-3631-1 | • • PCP: SLEEVE, BETA VALVE | B | 1 | | PCP |
| 1730 | C-3317-024 | • O-RING, SUPERSEDED BY ITEM 1730A | | 1 | Y | |
| 1730A | N/A | • O-RING, SUPERSEDES ITEM 1730 (SUPPLIED BY ENGINE MANUFACTURER) | | 1 | Y | |
| 1740 | C-3317-116 | • O-RING | | 2 | Y | |
| 1750 | B-3602 | • ADAPTOR, SHAFT, BETA VALVE, SUPERSEDED BY ITEM 1750A | | 1 | | |
| 1750A | N/A | • BETA VALVE SHAFT ADAPTOR, SUPERSEDES ITEM 1750 (SUPPLIED BY ENGINE MANUFACTURER) | | 1 | | |
| 1760 | C-3317-028 | • O-RING, SUPERSEDED BY ITEM 1760A | | 1 | Y | |
| 1760A | N/A | • O-RING, SUPERSEDES ITEM 1760 (SUPPLIED BY ENGINE MANUFACTURER) | | 1 | Y | |
| 1790 | B-3652 | • PCP: SPOOL, BETA VALVE (ALLISON) | | 1 | | PCP |
| 1800 | C-3317-006 | • O-RING | | 1 | Y | |
| 1810 | C-3317-141 | • O-RING | | 1 | Y | |
| 1820 | C-3317-111 | • O-RING | | 1 | Y | |
| 1830 | B-3611 | • ENGINE COVER, SUPERSEDED BY ITEM 1830A | | 1 | | |
| 1830A | B-2692 | • COVER, ENGINE, SUPERSEDES ITEM 1830 | | 1 | | |
| -1835 | B-6985 | • • BUSHING, BRONZE, OIL IMPREGNATED | | 1 | | |
| 1840 | B-3397 | • NUT, 7/16-20, HEX, THIN | | 1 | Y | |
| 1850 | A-3634 | • BETA VALVE BUSHING | | 1 | | |
| 1860 | A-3621-2 | • PCP: FITTING, ROD END | | 1 | | PCP |
| 1870 | A-3622 | • CAP UNIT, ROD END | | 1 | | |
| 1880 | B-6635-34 | • SCREW, SET, 8-32 | | 1 | Y | |

| EFFECTIVITY | MODEL | EFFECTIVITY | MODEL |
|---|---|---|---|
| B | MATCHING SERIAL NUMBERS FOR ITEM 1720 ARE NOT NECESSARY. | | |

- ITEM NOT ILLUSTRATED

## C-3630-2 Beta Valve Assembly

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