

HARTZELL PROPELLER INC.
SERVICE LETTER
TRANSMITTAL SHEET
HC-SL-61-350
Propeller - Piston Unit C-497()

June 01, 2018

This page transmits a revision to Service Letter HC-SL-61-350.

- Original Issue, dated Jun 01/17
- Revision 1, dated Jun 01/18

Changes are shown by a change bar in the left margin of the revised pages.

Revision 1 is issued to change the following in the Service Letter:

- Revised the section, "Assembling the Piston Unit C-497()"

This Service Letter is reissued in its entirety.

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1. Planning Information

A. Effectivity

- (1) Hartzell Propeller Inc. lightweight turbine propeller models HC-D4N-3(Q,T), HC-D4N-5(AL,C,E), HC-D4P-5(L), HC-E4N-3PY, HC-E4N-5(A,B,D,E,L), and HM-D4N-3 that use the piston unit C-497() are affected by this Service Letter.

WARNING: DO NOT USE OBSOLETE OR OUTDATED INFORMATION.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

B. Concurrent Requirements

- (1) Additional service documents may apply to the components/propellers affected by this Service Letter. Compliance with additional service documents may be necessary in conjunction with the completion of the Accomplishment Instructions in this Service Letter. Refer to the Hartzell Propeller Inc. website at www.hartzellprop.com for a cross-reference of service documents.

C. Reason

- (1) Some inspections/procedures specified in the Hartzell Propeller Inc. overhaul/maintenance manuals for the affected propellers require disassembly of the piston unit C-497().
 - (a) Hartzell Propeller Inc. has developed a procedure for separating the piston ring C-493 and the piston C-492 that are bonded together with threadlocking adhesive in the assembly process of the piston unit C-497().
- (2) Regulatory action is not expected.

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D. Description

- (1) This Service Letter provides Additional Maintenance Information (AMI).
- (2) This Service Letter provides instructions for the disassembly and assembly of the piston unit C-497().

E. Approval

- (1) This technical document is approved by Hartzell Propeller Inc.

F. Manpower

Procedure	Man-hours
Piston Unit Disassembly/Assembly	1.0 hour

CAUTION: DO NOT USE OBSOLETE OR OUTDATED INFORMATION. PERFORM ALL INSPECTIONS OR WORK IN ACCORDANCE WITH THE MOST RECENT REVISION OF A DOCUMENT.

G. References

- (1) Hartzell Propeller Inc. Four Blade Lightweight Turbine Propeller Overhaul Manual 141 (61-10-41).
- (2) Hartzell Propeller Inc. Four Blade Lightweight Turbine Propeller Maintenance Manual 143A (61-10-43).
- (3) Hartzell Propeller Inc. Four Blade Lightweight Turbine Propeller and Composite Blades Inspection Repair Overhaul Manual 156A (61-10-56)
- (4) Hartzell Propeller Inc. Illustrated Tool and Equipment Manual 165A (61-00-65) - Available on the Hartzell Propeller Inc. website at www.hartzellprop.com
- (5) Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02) - Volume 7, Consumable Materials and Packaging and Storage is available on the Hartzell Propeller Inc. website at www.hartzellprop.com
- (6) Hartzell Propeller Inc. Wing-in-Ground-Effect Craft Propellers Overhaul and Maintenance Manual 360

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H. Other Publications Affected

- (1) Hartzell Propeller Inc. Four Blade Lightweight Turbine Propeller Overhaul Manual 141 (61-10-41).
- (2) Hartzell Propeller Inc. Four Blade Lightweight Turbine Propeller Maintenance Manual 143A (61-10-43).
- (3) Hartzell Propeller Inc. Four Blade Lightweight Turbine Propeller and Composite Blades Inspection Repair Overhaul Manual 156A (61-10-56)
- (4) Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02) - Volume 7, Consumable Materials and Packaging and Storage is available on the Hartzell Propeller Inc. website at www.hartzellprop.com
- (5) Hartzell Propeller Inc. Wing-in-Ground-Effect Craft Propellers Overhaul and Maintenance Manual 360

2. Material Information

A. Consumables

<u>CM Number</u>	<u>Description</u>
CM116	Loctite, 242

NOTE: All CM numbers or materials in this Service Letter refer to the Consumable Materials chapter of Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02).

B. Special Tooling

<u>TE Number</u>	<u>Description</u>	
TE616	Piston Ring Clamp Kit	Reference Only
TE617	Clamp, Ring, Piston	Locally Fabricated
TE618	Base, Clamp	Locally Fabricated
TE619	Washer, Clamp	Locally Fabricated
n/a	Bolt, 1 inch (25.4 mm) diameter and appropriately sized nut	Locally Procured

NOTE: All TE numbers in this Service Letter refer to Hartzell Propeller Inc. Illustrated Tool and Equipment Manual 165A (61-00-65).

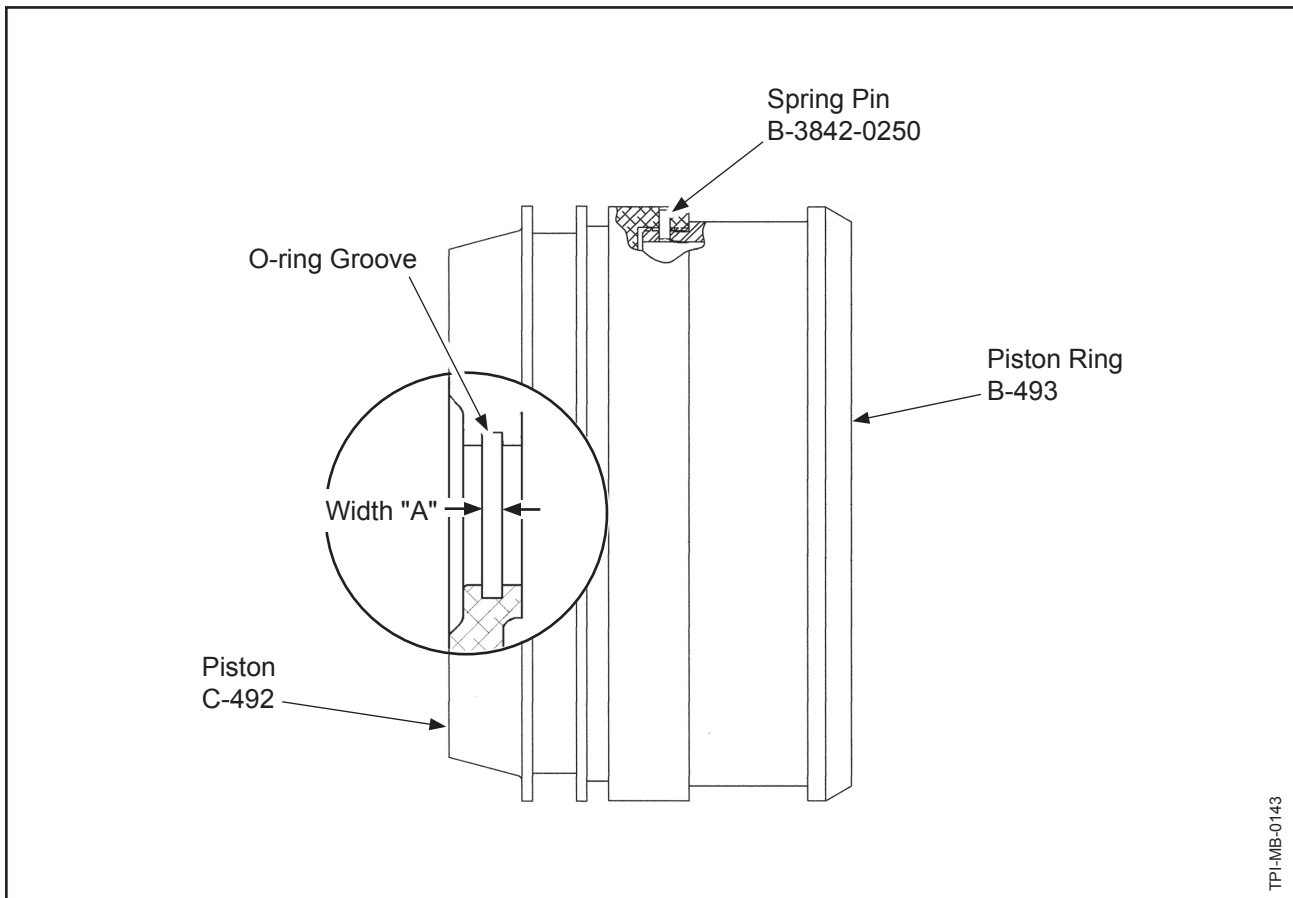
- (1) Contact the Hartzell Propeller Inc. Product Support Department for design prints that may be used to fabricate special tooling.

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3. Accomplishment Instructions

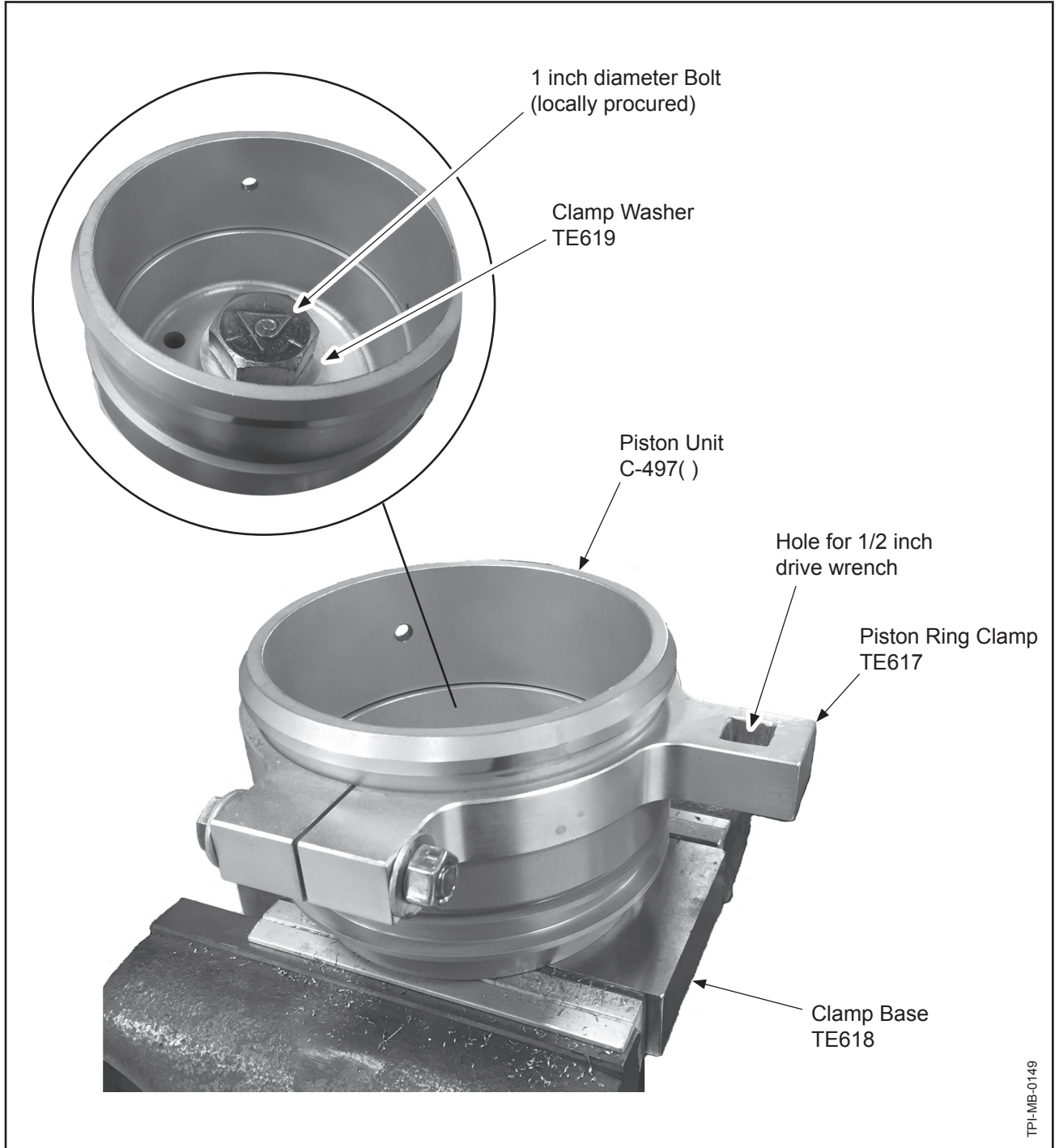
A. Disassembling the Piston Unit C-497()

- (1) This procedure must be performed by a certified propeller repair station with the appropriate rating.
- (2) Measure and make a record of the O-ring groove width "A" on the piston C-492. Refer to Figure 1.
 - (a) This measurement is required to complete step 3.A.(13).
- (3) Remove the spring pin B-3842-0250 from the piston unit C-497(). Refer to Figure 1.



Piston Unit C-497
Figure 1

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Using the Piston Ring Clamp TE571
Figure 2

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- (4) Put the clamp base TE618 in a vise. Refer to Figure 2.
- (5) Attach the piston unit C-497() to the clamp base TE618.
 - (a) Install the clamp washer TE619 onto a locally procured 1 inch (25.4 mm) diameter bolt.
 - (b) Put the bolt with the clamp washer TE619 through the piston unit C-497() and the clamp base TE618, as shown in Figure 2.
 - (c) Install a locally procured nut of the appropriate size onto the 1 inch (25.4 mm) diameter bolt.

CAUTION: DO NOT OVERTIGHTEN THE LOCALLY PROCURED NUT. THE MAXIMUM TORQUE IS 200 FT-LBS (271 N•m). OVERTIGHTENING THE NUT MAY COMPRESS THE O-RING GROOVE AND DAMAGE THE PISTON C-492.

- (d) Tighten the nut to prevent the piston unit C-497() from rotating on the clamp base TE618.
- (6) Install the piston ring clamp TE617 on the piston unit C-497(), as shown in Figure 2.
- (7) Remove the clamp base TE618 and the piston unit C-497() with the piston ring clamp TE617 installed, from the vise.

CAUTION: DO NOT HEAT THE PISTON UNIT C-497() TO MORE THAN 180°F (82°C).

- (8) Heat the piston unit C-497() to 180°F (82°C), then immediately put the clamp base TE618 and the piston unit C-497() with the piston ring clamp TE617 installed, in a vise as shown in Figure 2.
 - (a) While the piston unit C-497() is hot, use a 1/2 inch drive wrench in the hole on the piston ring clamp TE617 to separate the piston ring B-493() from the piston C-492.
 - 1 A breaker bar or adapter may be used when separating the piston ring B-493() from the piston C-492.
 - 2 If the piston unit C-497() cannot be separated, retire the piston unit in accordance with the Part Retirement chapter of Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02).

- (9) Let the parts cool.

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- (10) Remove the piston ring clamp TE617 from the piston ring B-493().
- (11) Remove the clamp base TE618 from the piston C-492.
- (12) Measure and make a record of the O-ring groove width "A" on the piston C-492. Refer to Figure 1.
- (13) Subtract the width "A" measured in step 3.A.(12) from the width "A" measured in step 3.A.(2).
 - (a) If the difference between the two width "A" measurements is more than 0.002 inch (0.05 mm), retire the piston C-492 in accordance with the Part Retirement chapter of Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02).
 - (b) If the difference between the two width "A" measurements is less than or equal to 0.002 inch (0.05 mm), go to step 3.A.(14).

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.

- (14) Using solvent CM106 MEK or CM219 MPK, clean the piston ring B-493() and the piston C-492 to remove any remaining adhesive.

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B. Assembling the Piston Unit C-497()

- (1) This procedure may be performed by a certified propeller repair station with the appropriate rating.
- (2) Make an inspection of the piston ring B-493() and the piston C-492 in accordance with the check criteria in the applicable overhaul/maintenance manual.
- (3) Preassemble the piston ring B-493() and the piston C-492 before application of the adhesive to make sure that they fit together correctly.

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.

- (4) Using solvent CM106 MEK, CM219 MPK, or equivalent, clean the threads on the piston ring B-493() and the piston C-492.
 - (a) Let the piston ring B-493() and the piston C-492 air dry.
- (5) Apply a thin layer of removable threadlocker CM116 to the threads of the piston ring B-493().
 - (a) Make sure that the threadlocker CM116 covers the entire circumference of at least the first three threads on the piston ring B-493().
- (6) Turn the piston ring B-493() into the piston C-492 until the shoulder of the piston ring touches the piston.
- (7) Put the clamp base TE618 in a vise. Refer to Figure 2.
- (8) Measure and make a record of the O-ring groove width "A" on the piston C-492. Refer to Figure 1.
 - (a) This measurement is required to complete step 3.B.(14).
- (9) Attach the piston unit C-497() to the clamp base TE618.
 - (a) Install the clamp washer TE619 onto a locally procured 1 inch (25.4 mm) diameter bolt.
 - (b) Put the bolt with the clamp washer TE619 through the piston unit C-497() and the clamp base TE618, as shown in Figure 2.
 - (c) Install a locally procured nut of the appropriate size onto the 1 inch (25.4 mm) diameter bolt.

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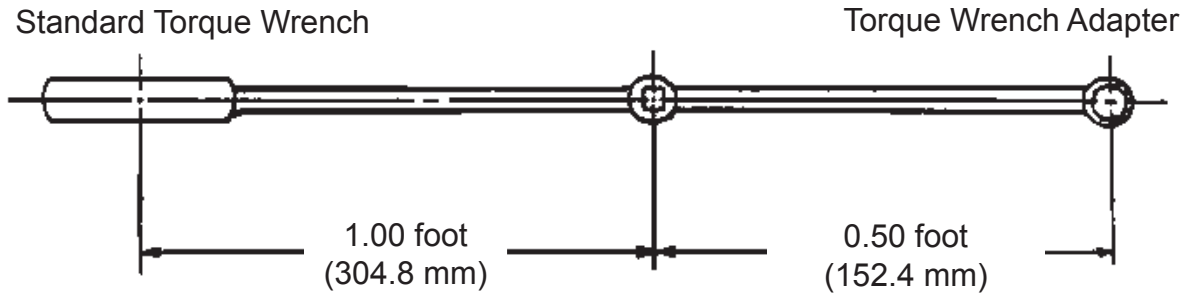
CAUTION: WHEN TIGHTENING THE NUT, THE MAXIMUM ALLOWABLE TORQUE IS 200 FT-LBS (271 N•m) OVERTIGHTENING THE NUT MAY COMPRESS THE O-RING GROOVE AND DAMAGE THE PISTON C-492.

- (d) Tighten the nut securely to prevent the piston unit C-497() from rotating on the clamp base TE618.
- (10) Install the piston ring clamp TE617 on the piston unit C-497(), as shown in Figure 2.
- (11) Using a 1/2 inch drive torque wrench in the hole on the piston ring clamp TE617, apply 140 Ft-Lbs (189 N•m) of torque to the piston ring B-493().
 - (a) If an adapter is used with the torque wrench, use the equation in Figure 3 to calculate the torque value.
- (12) Remove the piston ring clamp TE617 and the clamp base TE618 from the piston unit C-497().
- (13) Measure and make a record of the O-ring groove width "A" on the piston C-492. Refer to Figure 1.
- (14) Subtract the width "A" measured in step 3.B.(13) from the width "A" measured in step 3.B.(8).
 - (a) If the difference between the two width "A" measurements is more than 0.002 inch (0.05 mm), disassemble the piston unit C-497() and retire the piston C-492 in accordance with the Part Retirement chapter of Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02).
 - (b) If the difference between the two width "A" measurements is less than or equal to 0.002 inch (0.05 mm), go to step 3.B.(15).
- (15) Using a cloth dampened with solvent CM106 MEK, CM219 MPK, or equivalent, clean the piston unit C-497() to remove any remaining adhesive.
- (16) Let the adhesive on the piston unit C-497() cure for two hours at 65°-100°F (18°-38°C).
 - (a) Removable threadlocker CM116 cures to handling strength in ten minutes, and full-bond strength or machining strength after two hours at 65°-100°F (18°-38°C).

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

EXAMPLE:

$$\frac{100 \text{ Ft-Lb (136 N}\cdot\text{m)} \times 1 \text{ ft (304.8 mm)}}{1 \text{ ft (304.8 mm)} + 0.50 \text{ ft (152.4 mm)}} = 66.7 \text{ Ft-Lb (9.1 N}\cdot\text{m)} < \text{reading on torque wrench with 6-inch (152.4 mm) adapter for actual torque of 100 Ft-Lb (136 N}\cdot\text{m)}$$

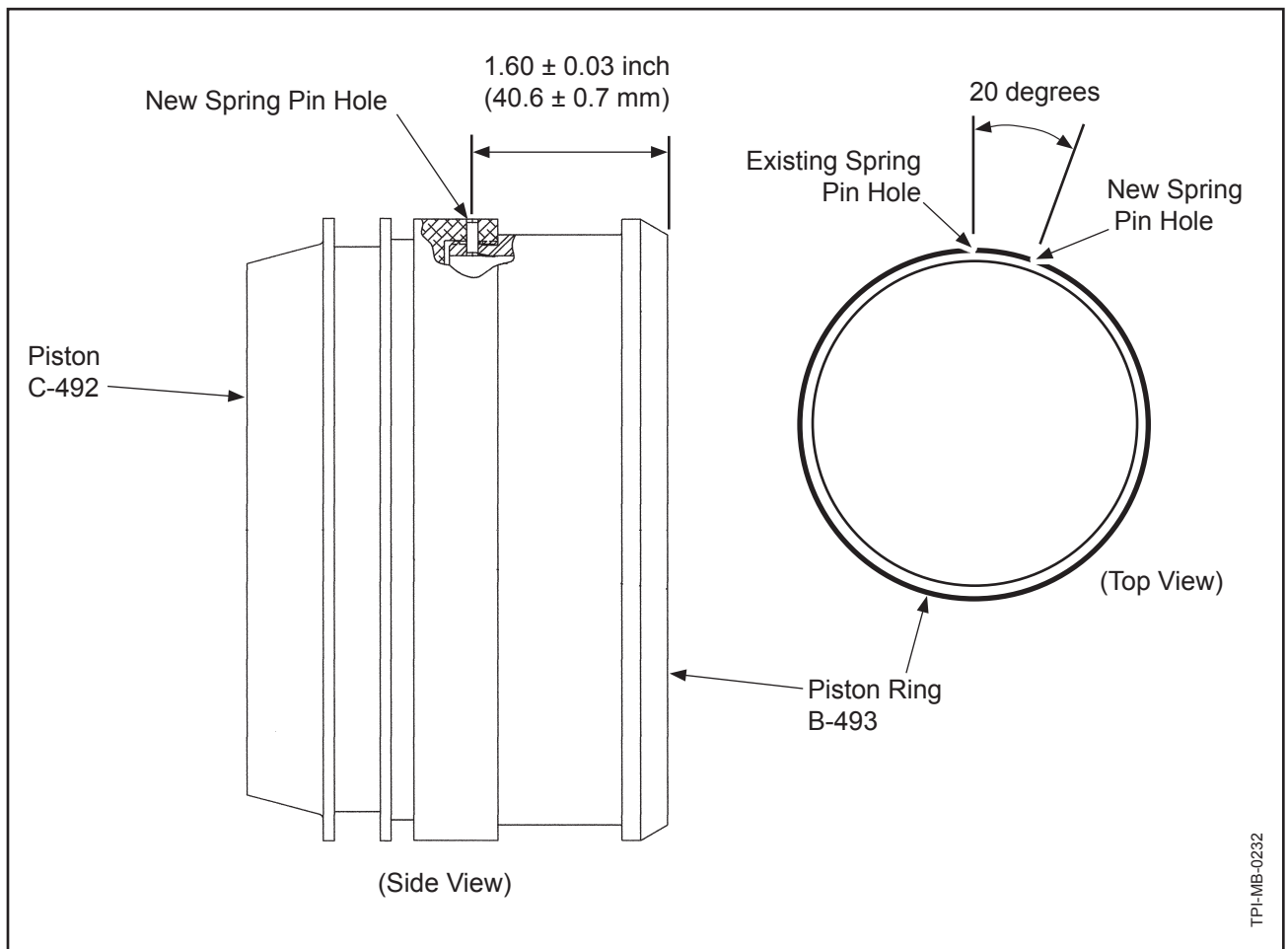
The correction shown is for an adapter that is aligned with the centerline of the torque wrench. If the adapter is angled 90 degrees relative to the torque wrench centerline, the torque wrench reading and actual torque applied will be equal.

APS212

Determining Torque Value of a Standard Torque Wrench With Adapter
Figure 3

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- (17) Drill a new spring pin hole through both the C-492 piston and the B-493() piston ring in accordance with Figure 4.
- (a) Hole size: 0.094 inch (2.38 mm) to 0.097 inch (2.46 mm)
 - (b) Hole location: 1.60 ± 0.03 inch (40.6 ± 0.7 mm) from the end of the piston ring, and at least 20 degrees away from any existing spring pin holes.
- (18) Install the spring pin B-3842-0250 into the hole drilled in step 3.B.(17).
- (a) Using a locally procured peening tool, peen the hole to hold the spring pin B-3842-0250.



Drilling the New Spring Pin Hole
Figure 4

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C. Recommended Service Facilities

- (1) Hartzell Propeller Inc. has a worldwide network of Recommended Service Facilities for overhaul and repair of our products.
- (2) Each service facility must meet standard FAA requirements and additional Hartzell Propeller requirements before being recommended by Hartzell Propeller Inc. Each service facility is audited by Hartzell Propeller Inc. to verify the continuation of the standards.
- (3) Hartzell Propeller Inc. recommends that you use one of these service facilities when having your propeller overhauled or repaired.
- (4) For a current list of Hartzell Propeller Inc. Recommended Service Facilities, contact Hartzell Propeller Inc. Product Support or refer to the Hartzell Propeller Inc. website at www.hartzellprop.com.

D. Contact Information

Hartzell Propeller Inc.
Attn.: Hartzell Propeller Inc. Product Support
One Propeller Place
Piqua, Ohio 45356-2634 USA
Phone: (001) 937.778.4379
Fax: (001) 937.778.4215
E-mail: techsupport@hartzellprop.com