



**MAJOR REPAIR AND ALTERATION**  
(Airframe, Powerplant, Propeller, or Appliance)

Form Approved OMB No. 2120-0020 11/30/2007 Electronic Tracking Number  
For FAA Use Only

INSTRUCTIONS: Print or type all entries. See Title 14 CFR §43.9, Part 43 Appendix B, and AC 43.9-1 (or subsequent revision thereof) for instructions and disposition of this form. This report is required by law (49 U.S.C. §44701). Failure to report can result in a civil penalty for each such violation. (49 U.S.C. §46301(a))

1. Aircraft	Nationality and Registration Mark USA N9456P	Serial No. 24-4974
	Make Piper	Model PA-24-260
2. Owner	Name (As shown on registration certificate) N9456P LLC	Address (As shown on registration certificate) Address 5901 N. Grand Canyon Dr. City Las Vegas State NV Zip 89149 Country USA

**3. For FAA Use Only**

The alteration identified herein complies with the applicable airworthiness requirements and is approved for the above described aircraft, subject to conformity inspection by a person authorized in FAR 43, Section 43.7.

11-15-2016 Inspector *Dwight Braunberger* WF-19 NV FS DO

4. Type		5. Unit Identification			
Repair	Alteration	Unit	Make	Model	Serial No.
<input type="checkbox"/>	<input checked="" type="checkbox"/>	AIRFRAME		(As described in Item 1 above)	
<input type="checkbox"/>	<input type="checkbox"/>	POWERPLANT			
<input type="checkbox"/>	<input type="checkbox"/>	PROPELLER			
<input type="checkbox"/>	<input type="checkbox"/>	APPLIANCE	Type Manufacturer		

**6. Conformity Statement**

A. Agency's Name and Address		B. Kind of Agency		C. Certificate No.
Name	Dwight Braunberger	<input checked="" type="checkbox"/> U. S. Certificated Mechanic	<input type="checkbox"/> Manufacturer	3663116
Address	340 N. Phyllis St.	<input type="checkbox"/> Foreign Certificated Mechanic		
City	Las Vegas State NV	<input type="checkbox"/> Certificated Repair Station		
Zip	89110 Country USA	<input type="checkbox"/> Certificated Maintenance Organization		

D. I certify that the repair and/or alteration made to the unit(s) identified in item 5 above and described on the reverse or attachments hereto have been made in accordance with the requirements of Part 43 of the U.S. Federal Aviation Regulations and that the information furnished herein is true and correct to the best of my knowledge.

Extended range fuel per 14 CFR Part 43 App. B <input type="checkbox"/>	Signature/Date of Authorized Individual <i>D Braunberger</i> 12-1-16
--	---

**7. Approval for Return to Service**

Pursuant to the authority given persons specified below, the unit identified in Item 5 was inspected in the manner prescribed by the Administrator of the Federal Aviation Administration and is  Approved  Rejected

BY	FAA Fit. Standards Inspector	Manufacturer	Maintenance Organization	Persons Approved by Canadian Department of Transport
	FAA Designee	Repair Station	<input checked="" type="checkbox"/> Inspection Authorization	Other (Specify)

Certificate or Designation No. 1459849 IA	Signature/Date of Authorized Individual <i>John L. Brown</i>
--	---

NOTICE

Weight and balance or operating limitation changes shall be entered in the appropriate aircraft record. An alteration must be compatible with all previous alterations to assure continued conformity with the applicable airworthiness requirements.

USA N9456P 12-1-16

8. Description of Work Accomplished

Nationality and Registration Mark Date

The purpose of this form 337 is to document installation of a complete new avionics package. Removed two Narco MK 12B VHF NacComs, Two TI2 MP-12A1 Power Audio Units, and one UGR-2 Glideslope Receiver. Removed Glideslope antenna. Removed one Narco VOA-40 Nav Converter Indicator, one VOA-50 Nav Converter Indicator. Removed one VP-22 B1 Narcomaster Audio Panel and one VP-22A2 Narcomaster Audio Panel. Removed Narco AT-50 Transponder. Removed Trans-Cal Industries D120-P2-T altitude Encoder. Removed King KA-25 Isolation Amplifier. Removed Piper PM-1 Marker Beacon Antenna/Receiver. Also removed all associated wire harnesses.

Installed PS Engineering PMA7000B Audio Panel in accordance with PS Engineering Install Manual 200-780-0005. Installed Comant CI-102 Marker Beacon Antenna in accordance with AC 43.13-2B. Installed Garmin GNS 430 GPS-Nav-Com in accordance with Garmin Install Manual 190-00140-02. FAA approved FMS was provided. ICA is on condition. Installed Garmin GA-56 GPS Antenna in accordance with Garmin Install Manual 190-00094-00. Installed Apollo SL-60 GPS-Com in accordance with Apollo Install Manual 560-0957-01. FAA approved FMS was provided. Installed Garmin A-33 GPS antenna in accordance with Garmin Install Manual 560-0949-01. Installed King KN-62 DME in accordance with King Install Manual 006-00144-0006. Installed Apollo MX-20 MFD in accordance with Apollo Install Manual 560-1025-09. This installation is in accordance with STC SA02154AK and this aircraft is listed on the AML. FMS 560-1032-05 and ICA 560-1048-00 were provided. Installed Garmin GTX-327 Transponder in accordance with Garmin Install Manual 190-00187-02. Installed Trans-Cal Industries SSD120-30N Altitude Encoder in accordance with TCI Install Manual 882188. Certification will need to be complied with. Installed JPI Instruments EDM-830 Engine Monitoring System in accordance with JPI Install Manual Report 103. This installation is in compliance with STC SA2586NM and this aircraft is listed on the AML.

Fabricated a new pilots panel from 2024T3x0.090 aluminum. The panel was mounted using the existing factory mounts. The PMA7000B Audio Panel is mounted at the top of the radio stack. Circuit protection is provided by a 5 amp circuit breaker located at the bottom of the copilots panel and labeled "AUDIO". The Intercom is a 6 place system with 2 music input jacks. Music 1 input jack is mounted with the copilots Mic and Phone jacks. Music 2 input jack is mounted with the left forward pax Mic and Phone jacks. A switch above the radio stack in "ALL" position allows all positions to hear music input one or in the "SPLIT" position Pax to hear music input two and crew to hear music input one. The Marker Beacon antenna input is connected to the CI 102 Marker Beacon antenna mounted on the bottom of the fuselage at station 144. The GNS 430 GPS/NavCom is mounted below the PMA7000B. Circuit protection for the Com section is provided by a 10 amp circuit breaker located at the bottom of the copilots panel and labeled "Com 1". Circuit protection for the Nav and GPS sections is provided by a 5 amp circuit breaker located at the bottom of the copilots panel and labeled "GPS/NAV 1". The Com and Nav audio input/outputs are connected to the PMA7000B Com 1 and Nav 1 audio inputs and outputs. Analog Nav output and GPS/Nav annunciation is provided to the # 1 Nav indicator, a Garmin GI-106A mounted at the top right of the pilots panel. This information is also provided to the autopilot "NAV 1 - NAV 2" input selector switch. Serial data Nav information is provided to the MX 20 MFD mounted in the pilots panel. The GPS antenna input is connected to the GA 56 GPS antenna mounted on top of the fuselage at station 85.5. The Com antenna input is connected to an existing Com antenna and the Nav antenna input is connected to the existing Nav Splitter. The Apollo MX 20 MFD is mounted in the center of the pilots panel. Circuit protection is provided by a 5 amp circuit breaker located at the bottom of the copilots panel and labeled "MFD". The MX 20 receives Navigation information from the GNS 430 via serial data bus and altitude information from the GTX 327 transponder also via serial data bus. The Apollo SL60 GPS/Com is mounted below the GNS 430. Circuit protection for the Com section is provided by a 10 amp circuit breaker located at the bottom of the copilots panel and labeled "Com 2". Circuit protection for the GPS section is provided by a 5 amp circuit breaker located at the bottom of the copilots panel and labeled "GPS 2". An annunciator mounted above the radio stack annunciates the SL 60 mode, "PTK or MSG". Com audio input/outputs are connected to the PMA7000B Com 2 audio input/outputs. The GPS Nav output drives a King KI-205 Nav indicator mounted below the GI-106A. This information is also provided to the autopilot "NAV 1 - NAV 2" input selector switch. The GPS antenna input is connected to a A-33 GPS antenna mounted on top of the fuselage at station 103.5. The Com antenna input is connected to an existing Com antenna. The KN 62 DME is mounted below the SL 60. Circuit protection is provided by a 10 amp circuit breaker located at the bottom of the copilots panel and labeled "DME". DME frequency can be controlled by the GNS 430 via serial data bus, the audio output is connected to the DME audio input of the PMA7000B. The antenna input is connected to the existing DME antenna. The GTX 327 transponder is mounted below the KN 62. Circuit

[ X ] Additional Sheets Are Attached

8. Description of Work Accomplished

USA N9456P

Nationality and Registration Mark      Date

protection is provided by a 5 amp circuit breaker located at the bottom of the copilots panel and labeled "Xponder". The altitude input is provided by the TCI SSD120-30N mounted behind the copilots panel at station 59.5. The antenna input is connected to the existing transponder antenna. Installed JPI EDM 830 Engine Monitoring System in the copilots panel. Circuit protection is provided by a 2 amp circuit breaker located at the bottom of the copilots panel and labeled "JPI". The EGT, CHT, OAT, OIL Temp, OIL Pressure, TIT, MAP, FF and RPM sensors were all installed. Serial data navigation information is also received from the GNS 430. The EGT - FF switch is mounted above the radio stack.

An electrical load evaluation was performed and was found to present no additional load beyond the previously installed equipment.

Replaced the pilots coil cord and PTT switch, rewiring the pitch trim and PTT. Installed PTT switch on the copilots yoke.

Installed Nullite light rings on the pilots panel for the Airspeed Indicator, Turn Coordinator, Attitude Gyro, Directional Gyro, Altimeter and Vertical Speed indicator. The light rings are connected to the existing lighting bus. Light rings were also installed in the copilots panel for the RPM indicator, Manifold Pressure indicator and Suction Gage.

All work performed in accordance with AC 43.13-1B.

The aircraft Equipment List was revised. Aircraft will be weighed before airworthiness release. Transponder and pitot-static system need to be certified.

[ ] Additional Sheets Are Attached



U.S. Department of  
Transportation  
Federal Aviation  
Administration

## MAJOR REPAIR AND ALTERATION (Airframe, Powerplant, Propeller, or Appliance)

Form Approved  
OMB No. 2120-0020

For FAA Use Only

Office Identification  
Pii

INSTRUCTIONS: Print or type all entries. See FAR 43.9, FAR 43 Appendix B, and AC 43.9-1 (or subsequent revision thereof) for instructions and disposition of this form. This report is required by law (49 U.S.C. 1421). Failure to report can result in a civil penalty not to exceed \$1,000 for each such violation (Section 901 Federal Aviation Act 1958)

<b>1. Aircraft</b>	Make Piper	Model PA24-250
	Serial No. 24-3136	Nationality and Registration Mark N7905P
<b>2. Owner</b>	Name (As shown on registration certificate) Eagle View, LLC	
	Address (As shown on registration certificate) 3651 Lindell Rd. Box D367 La Vegas	

**3. For FAA Use Only**

4. Unit Identification				5. Type	
Unit	Make	Model	Serial No.	Repair	Alteration
AIRFRAME	(As described in item 1 above)				x
POWERPLANT					
PROPELLER					
APPLIANCE	Type				
	Manufacturer				

**6. Conformity Statement**

<b>A. Agency's Name and Address</b> Lee Streling 2877 Shadowwolf Dr. 83616	<b>B. Kind of Agency</b> <input checked="" type="checkbox"/> U.S. Certificated Mechanic <input type="checkbox"/> Foreign Certificated Mechanic <input type="checkbox"/> Certificated Repair Station <input type="checkbox"/> Manufacturer	<b>C. Certificate No.</b> 563134557
---	---	--

D. I certify that the repair and/or alteration made to the unit(s) identified in item 4 above and described on the reverse or attachments hereto have been made in accordance with the requirements of Part 43 of the U.S. Federal Aviation Regulations and that the information furnished herein is true and correct to the best of my knowledge.

Date 12-4-2012	Signature of Authorized Individual  LEE STRELING
-------------------	--

**7. Approval for Return to Service**

Pursuant to the authority given persons specified below, the unit identified in item 4 was inspected in the manner prescribed by the Administrator of the Federal Aviation Administration and is  APPROVED  REJECTED

<b>BY</b>	FAA Fit Standards Inspector	x	Manufacturer	Inspection Authorization	Other (Specify)
	FAA Designee		Repair Station	Person Approved by Transport Canada Airworthiness Group	
Date of Approval or Rejection		Certificate or Designation No.		Signature of Authorized Individual	

## NOTICE

*Weight and balance or operating limitation changes shall be entered in the appropriate aircraft record. An alteration must be compatible with all previous alterations to assure continued conformity with the applicable airworthiness requirements.*

### 8. Description of Work Accomplished

*(If more space is required, attach additional sheets. Identify with aircraft nationality and registration mark and date work completed.)*

N7905P 12/4/2012 AFTT 6461.80 SN 24-3136

Complete removal of the following items:

Part #	Wt.
Adf IND 1088A	1.5lb
NAV/IND NAV-11	3.5lb
Marker CN40C	1.0lb
Com NARCO COM 11-A	3.0lb
TRANSPONDER AT50A	2.3lb
ADF TUNER 5814	5.0lb
LORAN 800	3.0lb
A.D.F. ANTENNA 108813	1.5lb
AUDIO PANEL A-8101	1.2lb
ENCDDER AR500	1.0 lb

The Following avionic alterations and installations have been accomplished in accordance with the manufacture's installation documents. FAA AC 20-138, appendix 1, procedures for obtaining FAA approval for VFR operation by FAA Form 337 for follow-on GPS equipment installation, specifically section 1, follow-on GPS equipment installation VFR use only, and FAA AC 43:13-1B, chapter 11 all sections, and FAA FAR AC 43:13-2A, chapters 2 and 3 Equipment mounted to airframe in accordance with manufacture's installions manual and/or AC 43:12-1B chapter 4 sections 4, chapter 7 sections 1 and Piper Standard Practice Manual. Note that all circuit breaker used during installation are P/N:7277-2-x, "x" represents the number that corresponds with the amperage of that circuit breaker. RG142 coaxial cable used for installation. All co.,unicatiom wiring are is 22 gauge double or triple twist shielded. Avionics buss feed is 10 gauge wire. Power wires for communications are 18 gauge. Radio power wires are 20 gauge.

The Following avionics have been installed and interface:

Installed	P/N	C/B	Manual Reference
GARMIN GNS 430 GPS-NAV-COM	011-00-490-00	2EA. 5 AMP	190-00356-02REV.F
GARMIN GTX327 TRANSPONDER	01100-280-00	5AMP	190-00187-02REV.F
APOLLO SL 30 NAV/COM	430-6040-300	1EA 2AMP 1EA-5AMP	5172-0007-02REV.B
MA 7000B AUDIO PANEL PMA	7000M-S	2AMP	200-066-003REV.F
MX20DISPLAY	4300270500	5AMP	2170-0002-001
ENCODER	A-30-8	1AMP	ACKA30-8REV.4
GARMIN 9I-106	CDI IND. 0663039-00	1AMP	7010561 REV.O
KING NAV IND KI	206-066-3039-00	1AMP	0664001-001REV.C
AMERKING	14TO 28 VDCINVERT AK 550	15AMP	066-02491-001REV.B

Wiring and antenna co-ax selections, where not specified in the approved data or installation manuals, have been made in accordance with FAA GAR AC 43:13-1B, chapter 11 sections 6-17, and FAA FAR AC 43:13-2A, chapters 2 and 3. Avionic harnesses, electrical harnesses and antennas have been installed in accordance with FAA FAR AC 43:13-1B, chapter 11 sections 6-17, and FAA FAR AC 43:13-2A, chapters 2 and 3. The installation recorded above are to be inspected as per the applicable manufacturer's supplied information and FAA FAR 43, appendix D, as per the requirements of instruction for continued airworthiness at subsequent annual inspections. physical weight and balance performed and equipment list updated. Aircraft electrical load analysis completed. System does not exceed 80% of rated load. All systems operational checks good the installation does not conflict with any previously installed modifications or alterations. E.M.I. Test Performed I.A.W. Ttl Documents N97RE221 REV.A Continuing Airworthiness I.A.W.B.H.T. General Inspection Statement Ok To Return To Service.

END

Additional Sheets Are Attached

U.S.GPO:1989-0-663-171

United States of America  
Department of Transportation - Federal Aviation Administration  
**Supplemental Type Certificate**

Number SA2706L

This certificate issued to Great Lakes Aero Products  
2412 Davison Road  
Flint, Michigan 48906

certifies that the change in the type design for the following product with the limitations and conditions  
thereof as specified herein meets the airworthiness requirements of Part 3 of the Civil Air  
Regulations (See Type Certification Data Sheet No. 1A1B for complete certification basis).

Original Product - Type Certificate Number: 1A1B

Make: Piper

Model: PA-24, PA-24-250, PA-24-260, PA-24-400

**Description of Type Design Change:**

Installation of Great Lakes Aero Products forward windows, P/N's W-, W/T-,  
W/G-2058-187 or -250 and W-, W/G-2059-187 or -250 in accordance with Great Lakes Aero  
Products Installation Instructions A-5, no revisions, dated August, 1978, or later FAA  
approved revisions.

**Limitations and Conditions:**

The approval of this change in type design applies basically to the Piper PA-24,  
PA-24-250, PA-24-260, and PA-24-400 models only. This approval should not be  
extended to other aircraft of these models on which other previously approved  
modifications are incorporated unless it is determined that the interrelationship  
between this change and any of those other previously approved modifications will  
introduce no adverse effect upon the airworthiness of that aircraft.

This certificate and the supporting data which is the basis for approval shall remain in effect until  
superseded, suspended, or a termination date is otherwise established by the Administrator of the  
Federal Aviation Administration.

Date of application: September 2, 1978

Date issued: June 26, 1984

Date of issuance: October 2, 1978

Date received:



By W. F. Horn Administrator

W. F. Horn (Signature)  
Manager, Chicago Aircraft Certification Office,  
ACE-115C, FAA, Central Region  
(Title)

Violation of this certificate is punishable by a fine of not exceeding \$1,000, or imprisonment not exceeding 3 years, or both.  
This certificate may be transferred in accordance with FAR 21.47.

1716-270-01

United States of America  
Department of Transportation - Federal Aviation Administration  
**Supplemental Type Certificate**

Number SA2716L

This certificate issued to Great Lakes Aero Products  
2412 Davison Road  
Flint, Michigan 48906

certifies that the change in the type design for the following product with the limitations and conditions  
thereof as specified herein meets the airworthiness requirements of Part 3 of the Civil Air  
Regulations (See Type Certification Data Sheet No. A1EA for complete certification basis).

Original Product - Type Certificate Number: A1EA

Make: Piper

Model: PA-30, PA-39

**Description of Type Design Change:**

Installation of Great Lakes Aero Products forward windows, P/N's W-, W/T-,  
W/G-2058-187 or -250 and W-, W/G-2059-187 or -250 in accordance with Great Lakes Aero  
Products Installation Instructions A-5, no revisions, dated August, 1978, or later FAA  
approved revisions.

**Limitations and Conditions:**

The approval of this change in type design applies basically to the Piper PA-30 and -39  
models only. This approval should not be extended to other aircraft of these models on  
which other previously approved modifications are incorporated unless it is determined  
that the interrelationship between this change and any of those other previously approved  
modifications will introduce no adverse effect upon the airworthiness of that aircraft.

This certificate and the supporting data which is the basis for approval shall remain in effect until  
superseded, suspended, or a termination date is otherwise established by the Administrator of the  
Federal Aviation Administration.

Date of application: September 2, 1978

Date issued: June 26, 1984

Date of issuance: October 2, 1978

Date received:



By W. F. Horn Administrator

W. F. Horn (Signature)  
Manager, Chicago Aircraft Certification Office,  
ACE-115C, FAA, Central Region  
(Title)

Violation of this certificate is punishable by a fine of not exceeding \$1,000, or imprisonment not exceeding 3 years, or both.  
This certificate may be transferred in accordance with FAR 21.47.

294 Form 61 10-2 (10-80)

United States of America  
Department of Transportation — Federal Aviation Administration  
**Supplemental Type Certificate**

Number SA2550CE

This certificate issued to Webco Aircraft  
Route 4, Box 13A  
Newton, KS 67114

certifies that the change in the type design for the following product with the limitations and conditions therefor as specified hereon meets the airworthiness requirements of Part 3 of the Civil Air Regulations effective May 15, 1958, Amendments 3-1 through 3-6 and Paragraph 3.705(a) of Amendment 3-7

Original Product — Type Certificate Number: A1EA  
Make: Piper  
Model: PA-30, PA-39

Description of Type Design Change: Installation of a Webco door latch kit per Webco Aircraft Drawing List 2430-101, dated August 29, 1989, and Door Latch Kit Installation Instructions WDL INSTR. #001, dated October 5, 1989, or later approved revisions.

Limitations and Conditions: The approval of this change in type design applies only to the basic aircraft models listed and should not be extended to other specific models of these airplanes on which other approved modifications are incorporated, unless it is determined that the interrelationship between this change and any of those other previously incorporated approved modifications will not introduce any adverse effect upon the airworthiness of that aircraft.

This certificate and the supporting data which is the basis for approval shall remain in effect until surrendered, suspended, revoked, or a termination date is otherwise established by the Administrator of the Federal Aviation Administration

Date of application: August 29, 1989

Date issued:

Date of issuance: October 27, 1989

Date amended:

By direction of the Administrator

Lawrence A. Herron  
(Signature)

Lawrence A. Herron, Manager  
Wichita Aircraft Certification Office  
(Title)



Any alteration of this certificate is punishable by a fine of not exceeding \$1,000, or imprisonment not exceeding 3 years, or both.

FAA Form 8110-2 (10-88)

This certificate may be transferred in accordance with FAR 21.67.

# Supplemental Type Certificate

Number SA662SW

This certificate issued to Mitchell Industries, Inc. dba  
EDO-AIRE MITCHELL  
P. O. Box 610  
Mineral Wells, Texas 76067

certifies that the change in the type design for the following product with the limitations and conditions therefor as specified hereon meets the airworthiness requirements of Part 3 of the Civil Air Regulations.

Original Product — Type Certificate Number: 1A15 and A1EA

Make: Piper

Model: PA-24-250, PA-24-260, and PA-30

Description of Type Design Change: Installation of Mitchell Automatic Flight System Model AK220 consisting of Century III Autopilot with optional automatic Pitch Trim, Automatic Aileron stabilizer and radio Coupler in accordance with Bulletin No. 322 Revision 3, dated 12-18-69. Installation of Glide Slope Coupler in accordance with Bulletin No. 366, dated 9-18-67. Installation of Mitchell Radio Coupler Model 1C388-3 per Bulletin No. 611, Revision 1, dated 4-16-74 and Master Drawing List No. 87A708, Revision A, dated 4-16-74.

Limitations and Conditions:

1. Mitchell Industries, Inc. FAA Approved Placard 13A329-220 required with Century III installation.
2. Mitchell Industries, Inc. FAA Approved Placard 13A343-220 required with Stabilizer installation.
3. FAA Approved Autopilot Flight Manual Supplement dated 4-16-74, PN68S168, is required for Mitchell Radio Coupler Model 1C388-3.

This certificate and the supporting data which is the basis for approval shall remain in effect until suspended, revoked, or a termination date is otherwise established by the Administrator of the Federal Aviation Administration.

Date of application: May 27, 1966

Date of issuance: June 24, 1966

Date issued: 9/7/66; 2/7/69; 1/26/70; 4/16/74  
Revision 4

Date amended:



By direction of the Administrator

*Don P. Watson*  
(Signature)

Don P. Watson  
Acting Chief, Engineering and Manufacturing Branch  
(Title)

Any alteration of this certificate is punishable by a fine of not exceeding \$1,000, or imprisonment not exceeding 3 years, or both.



United States of America  
Department of Transportation — Federal Aviation Administration  
**Supplemental Type Certificate**

Number SA3531NM

**BOGERT AVIATION**  
Rt. 1 Box 1676  
Prosser, WA 99350

This certificate, issued to Bogert Aviation

certifies that the change in the type design for the following product with the limitations and conditions therefor as specified hereon meets the airworthiness requirements of Part \* of the \* Regulations.\*

Original Product — Type Certificate Number: \* \*See attached FAA Approved Model List (AML) No. SA3531NM for list of approved airplane models and applicable airworthiness regulations.  
Make: \*  
Model: \*

Description of Type Design Change: Installation of copper electrical cables in accordance with Bogert Aviation Installation Instructions as listed on AML No. SA3531NM, or later FAA approved revision.

Limitations and Conditions: Approval of this change in type design applies to the above model aircraft only. This approval should not be extended to aircraft of this model on which other previously approved modifications are incorporated unless it is determined that the relationship between this change and any of those other previously approved modifications, including changes in type design, will introduce no adverse effect upon the airworthiness of that aircraft. A copy of this Certificate and FAA Approved Model List (AML) No. SA3531NM amended April 10, 1989, or later FAA approved revision, must be maintained as part of the permanent records for the modified aircraft.

This certificate and the supporting data which is the basis for approval shall remain in effect until surrendered, suspended, revoked, or a termination date is otherwise established by the Administrator of the Federal Aviation Administration.

Date of application: May 27, 1986

Date issued:

Date of issuance: July 15, 1986

Date amended: April 10, 1989

By direction of the Administrator

*Steven K. Miller*  
(Signature)

Acting Assistant Manager, Seattle  
Aircraft Certification Office



Any alteration of this certificate is punishable by a fine of not exceeding \$1,000, or imprisonment not exceeding 3 years, or both.

United States of America  
Department of Transportation — Federal Aviation Administration  
**Supplemental Type Certificate**

Number SA2549CE

This certificate, issued to Webco Aircraft  
Route 4, Box 13A  
Newton, KS 67114

certifies that the change in the type design for the following product with the limitations and conditions therefor as specified hereon meets the airworthiness requirements of Part 3 of the Civil Air Regulations effective November 1, 1949, Amendments 3-1 through 3-2

Original Product — Type Certificate Number: 1A15  
Make: Piper  
Model: PA-24, PA-24-250, -260 and -400

Description of Type Design Change: Installation of a Webco door latch kit per Webco Aircraft Drawing List 2430-101, dated August 29, 1989, and Door Latch Kit Installation Instructions WDL INSTR. #001, dated October 5, 1989, or later approved revisions.

Limitations and Conditions: The approval of this change in type design applies only to the basic aircraft models listed and should not be extended to other specific models of these airplanes on which other approved modifications are incorporated, unless it is determined that the interrelationship between this change and any of those other previously incorporated approved modifications will not introduce any adverse effect upon the airworthiness of that aircraft.

This certificate and the supporting data which is the basis for approval shall remain in effect until surrendered, suspended, revoked, or a termination date is otherwise established by the Administrator of the Federal Aviation Administration.

Date of application: August 29, 1989

Date received:

Date of issuance: October 27, 1989

Date amended:



By direction of the Administrator

Lawrence A. Herron  
(Signature)

Lawrence A. Herron, Manager  
Wichita Aircraft Certification Office  
(Title)

Any alteration of this certificate is punishable by a fine of not exceeding \$1,000, or imprisonment not exceeding 3 years, or both.

FAA Form 8110-2 (10-68)

This certificate may be transferred in accordance with FAR 21.47.

United States of America  
Department of Transportation — Federal Aviation Administration  
**Supplemental Type Certificate**

Number SA2549CE

This certificate, issued to Webco Aircraft  
Route 4, Box 13A  
Newton, KS 67114

certifies that the change in the type design for the following product with the limitations and conditions therefor as specified hereon meets the airworthiness requirements of Part 3 of the Civil Air Regulations effective November 1, 1949, Amendments 3-1 through 3-2

Original Product — Type Certificate Number: 1A15  
Make: Piper  
Model: PA-24, PA-24-250, -260 and -400

Description of Type Design Change: Installation of a Webco door latch kit per Webco Aircraft Drawing List 2430-101, dated August 29, 1989, and Door Latch Kit Installation Instructions WDL INSTR. #001, dated October 5, 1989, or later approved revisions.

Limitations and Conditions: The approval of this change in type design applies only to the basic aircraft models listed and should not be extended to other specific models of these airplanes on which other approved modifications are incorporated, unless it is determined that the interrelationship between this change and any of those other previously incorporated approved modifications will not introduce any adverse effect upon the airworthiness of that aircraft.

This certificate and the supporting data which is the basis for approval shall remain in effect until surrendered, suspended, revoked, or a termination date is otherwise established by the Administrator of the Federal Aviation Administration.

Date of application: August 29, 1989

Date issued:

Date of issuance: October 27, 1989

Date amended:



By direction of the Administrator

Lawrence A. Herron  
(Signature)

Lawrence A. Herron, Manager  
Wichita Aircraft Certification Office  
(Title)

Any alteration of this certificate is punishable by a fine of not exceeding \$1,000, or imprisonment not exceeding 3 years, or both.

United States of America  
Department of Transportation — Federal Aviation Administration  
**Supplemental Type Certificate**

Number SA2550CE

This certificate issued to Webco Aircraft  
Route 4, Box 13A  
Newton, KS 67114

certifies that the change in the type design for the following product with the limitations and conditions therefor as specified hereon meets the airworthiness requirements of Part 3 of the Civil Air Regulations effective May 15, 1956, Amendments 3-1 through 3-6 and Paragraph 3.705(a) of Amendment 3-7

Original Product — Type Certificate Number: A1EA  
Make: Piper  
Model: PA-30, PA-39

Description of Type Design Change: Installation of a Webco door latch kit per Webco Aircraft Drawing List 2430-101, dated August 29, 1989, and Door Latch Kit Installation Instructions WDL INSTR. #001, dated October 5, 1989, or later approved revisions.

Limitations and Conditions: The approval of this change in type design applies only to the basic aircraft models listed and should not be extended to other specific models of these airplanes on which other approved modifications are incorporated, unless it is determined that the interrelationship between this change and any of those other previously incorporated approved modifications will not introduce any adverse effect upon the airworthiness of that aircraft.

This certificate and the supporting data which is the basis for approval shall remain in effect until surrendered, suspended, revoked, or a termination date is otherwise established by the Administrator of the Federal Aviation Administration.

Date of application: August 29, 1989 Date issued:

Date of issuance: October 27, 1989 Date amended:



By direction of the Administrator

Lawrence A. Herron  
(Signature)

Lawrence A. Herron, Manager  
Wichita Aircraft Certification Office  
(Title)

Any alteration of this certificate is punishable by a fine of not exceeding \$1,000, or imprisonment not exceeding 3 years, or both.

This certificate may be transferred in accordance with FAR 21.47.



US Department of Transportation  
Federal Aviation Administration

**MAJOR REPAIR AND ALTERATION**  
**(Airframe, Powerplant, Propeller, or Appliance)**

OMB No. 2120-0020  
Exp. 8/31/2014

Electronic Tracking Number

For FAA Use Only

INSTRUCTIONS: Print or type all entries. See Title 14 CFR §43.9, Part 43 Appendix B, and AC 43.9-1 (or subsequent revision thereof) for instructions and disposition of this form. This report is required by law (49 U.S.C. §44701). Failure to report can result in a civil penalty for each such violation. (49 U.S.C. §46301(a))

1. Aircraft	Nationality and Registration Mark <b>N7905P</b>	Serial No. <b>PA24-3136</b>
	Make <b>Piper</b>	Model <b>PA24-250</b> Series <b>250</b>
2. Owner	Name (As shown on registration certificate)	
	Address (As shown on registration certificate)	
	City _____ State _____	
	Zip _____ Country _____	

**3. For FAA Use Only**

4. Type		5. Unit Identification			
Repair	Alteration	Unit	Make	Model	Serial No.
<input type="checkbox"/>	<input type="checkbox"/>	AIRFRAME	_____	(As described in Item 1 above)	_____
<input type="checkbox"/>	<input type="checkbox"/>	POWERPLANT			
<input type="checkbox"/>	<input type="checkbox"/>	PROPELLER			
<input type="checkbox"/>	<input type="checkbox"/>	APPLIANCE	Type		
			Manufacturer		

**6. Conformity Statement**

A. Agency's Name and Address		B. Kind of Agency	
Name _____	Address _____ City _____ State _____ Zip _____ Country _____	<input checked="" type="checkbox"/> U. S. Certificated Mechanic	Manufacturer
		<input type="checkbox"/> Foreign Certificated Mechanic	C. Certificate No. <b>1459849</b>
		<input type="checkbox"/> Certificated Repair Station	
		<input type="checkbox"/> Certificated Maintenance Organization	

D. I certify that the repair and/or alteration made to the unit(s) identified in item 5 above and described on the reverse or attachments hereto have been made in accordance with the requirements of Part 43 of the U.S. Federal Aviation Regulations and that the information furnished herein is true and correct to the best of my knowledge.

Extended range fuel per 14 CFR Part 43 App. B <input type="checkbox"/>	Signature/Date of Authorized Individual <i>John E. Brown</i>
--	---

**7. Approval for Return to Service**

Pursuant to the authority given persons specified below, the unit identified in item 5 was inspected in the manner prescribed by the Administrator of the Federal Aviation Administration and is  Approved  Rejected

BY	FAA Ft. Standards Inspector	Manufacturer _____	Maintenance Organization	Persons Approved by Canadian Department of Transport
	FAA Designee	Repair Station <input checked="" type="checkbox"/>	Inspection Authorization	Other (Specify)

Certificate or Designation No. <b>1459849</b>	Signature/Date of Authorized Individual <i>John E. Brown</i>
--	---

**NOTICE**

Weight and balance or operating limitation changes shall be entered in the appropriate aircraft record. An alteration must be compatible with all previous alterations to assure continued conformity with the applicable airworthiness requirements.

**8. Description of Work Accomplished**

(If more space is required, attach additional sheets. Identify with aircraft nationality and registration mark and date work completed.)

Replaced the original generator and regulator with Inter Av, Inc., (PO Box 16714, San Antonio, Tx 78216) alternator and regulator in accordance with their STC SA 334 SW. There are no special instructions for continued airworthiness, only the annual or 100 hour inspection.

Nothing Follows

Additional Sheets Are Attached



**MAJOR REPAIR AND ALTERATION**  
(Airframe, Powerplant, Propeller, or Appliance)

OMB No. 2120-0020 Exp 8/31/2014 Electronic Tracking Number  
For FAA Use Only

INSTRUCTIONS: Print or type all entries. See Title 14 CFR §43.9, Part 43 Appendix B, and AC 43.9-1 (or subsequent revision thereof) for instructions and disposition of this form. This report is required by law (49 U.S.C. §44701). Failure to report can result in a civil penalty for each such violation. (49 U.S.C. §46301(a))

1. Aircraft	Nationality and Registration Mark <b>N7905P</b>	Serial No. <b>PA24-3136</b>
	Make <b>Piper</b>	Model <b>PA24-250</b> Series <b>250</b>
2. Owner	Name (As shown on registration certificate) <b>TRILLONA J. ...</b>	Address (As shown on registration certificate)
		City _____ State _____ Zip _____ Country _____

**3. For FAA Use Only**

*[Faint handwritten notes and markings]*

4. Type		5. Unit Identification		
Repair	Alteration	Unit	Make	Serial No.
<input type="checkbox"/>	<input type="checkbox"/>	AIRFRAME	_____	(As described in Item 1 above)
<input type="checkbox"/>	<input type="checkbox"/>	POWERPLANT	_____	_____
<input type="checkbox"/>	<input type="checkbox"/>	PROPELLER	_____	_____
<input type="checkbox"/>	<input type="checkbox"/>	APPLIANCE	Type _____ Manufacturer _____	_____

**6. Conformity Statement**

A. Agency's Name and Address	B. Kind of Agency
Name _____ Address _____ City _____ State _____ Zip _____ Country _____	<input checked="" type="checkbox"/> U. S. Certificated Mechanic <input type="checkbox"/> Foreign Certificated Mechanic <input type="checkbox"/> Certificated Repair Station <input type="checkbox"/> Certificated Maintenance Organization
	Manufacturer _____ C. Certificate No. <b>1459849</b>

D. I certify that the repair and/or alteration made to the unit(s) identified in item 5 above and described on the reverse or attachments hereto have been made in accordance with the requirements of Part 43 of the U.S. Federal Aviation Regulations and that the information furnished herein is true and correct to the best of my knowledge.

Extended range fuel per 14 CFR Part 43 App. B <input type="checkbox"/>	Signature/Date of Authorized Individual <i>John D. Brown</i>
--	---

**7. Approval for Return to Service**

Pursuant to the authority given persons specified below, the unit identified in item 5 was inspected in the manner prescribed by the Administrator of the Federal Aviation Administration and is  Approved  Rejected

BY	FAA Ft. Standards Inspector	Manufacturer _____	Maintenance Organization	Persons Approved by Canadian Department of Transport
	FAA Designee	Repair Station	<input checked="" type="checkbox"/> Inspection Authorization	Other (Specify)

Certificate or Designation No. <b>1459849</b>	Signature/Date of Authorized Individual <i>John D. Brown</i>
--	---

NOTICE

Weight and balance or operating limitation changes shall be entered in the appropriate aircraft record. An alteration must be compatible with all previous alterations to assure continued conformity with the applicable airworthiness requirements.

8. Description of Work Accomplished

(If more space is required, attach additional sheets. Identify with aircraft nationality and registration mark and date work completed.)

N7905P

Nationality and Registration Mark

Date

INSTALLED CENTURY III AUTOPILOT  
IACW installation instructions per  
EDO-AIR MITCHELL STC JA662SW.  
ADDED Approved Autopilot Flight Manual  
Supplement to aircraft flight manual.  
A/c was weighed by Lone Mountain  
Aviation After installation. No  
additional special maintenance or  
inspections are required ~~for~~ for continued  
airworthiness. Nothing Follows.

Additional Sheets Are Attached





# MAJOR REPAIR AND ALTERATION (Airframe, Powerplant, Propeller, or Appliance)

OMB No. 2120-0020 Electronic Tracking Number  
Exp. 8/31/2014  
For FAA Use Only

INSTRUCTIONS: Print or type all entries. See Title 14 CFR §43.9, Part 43 Appendix B, and AC 43.9-1 (or subsequent revision thereof) for instructions and disposition of this form. This report is required by law (49 U.S.C. §44701). Failure to report can result in a civil penalty for each such violation. (49 U.S.C. §46301(a))

1. Aircraft	Nationality and Registration Mark <b>N7905P</b>	Serial No. <b>PA24-3136</b>	
	Make <b>Piper</b>	Model <b>PA24-250</b> Series <b>250</b>	
2. Owner	Name (As shown on registration certificate)	Address (As shown on registration certificate)	
		Address	State
		City	Country
3. For FAA Use Only			

4. Type		5. Unit Identification			
Repair	Alteration	Unit	Make	Model	Serial No.
<input type="checkbox"/>	<input type="checkbox"/>	AIRFRAME	_____	(As described in Item 1 above)	_____
<input type="checkbox"/>	<input type="checkbox"/>	POWERPLANT			
<input type="checkbox"/>	<input type="checkbox"/>	PROPELLER			
<input type="checkbox"/>	<input type="checkbox"/>	APPLIANCE	Type		
			Manufacturer		

6. Conformity Statement		
A. Agency's Name and Address		B. Kind of Agency
Name _____	City _____ State _____ Zip _____ Country _____	<input checked="" type="checkbox"/> U. S. Certificated Mechanic
Address _____		Foreign Certificated Mechanic
City _____ State _____		Certificated Repair Station
Zip _____ Country _____		Certificated Maintenance Organization
		C. Certificate No. <b>1459849</b>

D. I certify that the repair and/or alteration made to the unit(s) identified in item 5 above and described on the reverse or attachments hereto have been made in accordance with the requirements of Part 43 of the U.S. Federal Aviation Regulations and that the information furnished herein is true and correct to the best of my knowledge.

Extended range fuel per 14 CFR Part 43 App. B <input type="checkbox"/>	Signature/Date of Authorized Individual <i>John E. Brown</i>
--	---

7. Approval for Return to Service  
Pursuant to the authority given persons specified below, the unit identified in item 5 was inspected in the manner prescribed by the Administrator of the Federal Aviation Administration and is  Approved  Rejected

BY	FAA Fit. Standards Inspector	Manufacturer <input type="checkbox"/>	Maintenance Organization	Persons Approved by Canadian Department of Transport
	FAA Designee	Repair Station <input checked="" type="checkbox"/>	Inspection Authorization	Other (Specify)

Certificate or Designation No. <b>1459849</b>	Signature/Date of Authorized Individual <i>John E. Brown</i>
--	---

**NOTICE**

Weight and balance or operating limitation changes shall be entered in the appropriate aircraft record. An alteration must be compatible with all previous alterations to assure continued conformity with the applicable airworthiness requirements.

8. Description of Work Accomplished  
(If more space is required, attach additional sheets. Identify with aircraft nationality and registration mark and date work completed.)

A Weeco door latch Kit was installed under STC SA 2549 CE in accordance with the Furnished Door Latch Kit Installation Instructions (WDL INSTR #001). This door latch requires no special maintenance or inspections other than the normal 100hr. or annual inspections.

Nothing Follows

Additional Sheets Are Attached

•U.S.G.P.O. 1990-761-753



US Department of Transportation  
Federal Aviation Administration

## MAJOR REPAIR AND ALTERATION (Airframe, Powerplant, Propeller, or Appliance)

OMB No. 2120-0020  
Exp. 8/31/2014

Electronic Tracking Number

For FAA Use Only

**INSTRUCTIONS:** Print or type all entries. See Title 14 CFR §43.9, Part 43 Appendix B, and AC 43.9-1 (or subsequent revision thereof) for instructions and disposition of this form. This report is required by law (49 U.S.C. §44701). Failure to report can result in a civil penalty for each such violation. (49 U.S.C. §46301(a))

<b>1. Aircraft</b>	Nationality and Registration Mark <b>N 7905P</b>	Serial No. <b>PA 24-3136</b>	Series <b>250</b>
	Make <b>Piper</b>	Model <b>PA 24-250</b>	<b>25024-3136</b>
<b>2. Owner</b>	Name (As shown on registration certificate)		
	Address (As shown on registration certificate) Address _____ State _____ City _____ Country _____ Zip _____		

**3. For FAA Use Only**

**4. Type**

**5. Unit Identification**

Repair	Alteration	Unit	Make	Model	Serial No.
<input type="checkbox"/>	<input type="checkbox"/>	AIRFRAME	_____	(As described in Item 1 above)	_____
<input type="checkbox"/>	<input type="checkbox"/>	POWERPLANT	_____	_____	_____
<input type="checkbox"/>	<input type="checkbox"/>	PROPELLER	_____	_____	_____
<input type="checkbox"/>	<input type="checkbox"/>	APPLIANCE	Type _____	_____	_____
			Manufacturer _____	_____	_____

**6. Conformity Statement**

<b>A. Agency's Name and Address</b> Name _____ Address _____ City _____ State _____ Zip _____ Country _____	<b>B. Kind of Agency</b> <input checked="" type="checkbox"/> U. S. Certificated Mechanic <input type="checkbox"/> Foreign Certificated Mechanic <input type="checkbox"/> Certificated Repair Station <input type="checkbox"/> Certificated Maintenance Organization Manufacturer _____ <b>C. Certificate No.</b> <b>1459849</b>
---	---

**D.** I certify that the repair and/or alteration made to the unit(s) identified in Item 5 above and described on the reverse or attachments hereto have been made in accordance with the requirements of Part 43 of the U.S. Federal Aviation Regulations and that the information furnished herein is true and correct to the best of my knowledge.

Extended range fuel per 14 CFR Part 43 App. B <input type="checkbox"/>	Signature/Date of Authorized Individual <i>John D. Brown</i>
--	---

**7. Approval for Return to Service**

Pursuant to the authority given persons specified below, the unit identified in item 5 was inspected in the manner prescribed by the Administrator of the Federal Aviation Administration and is  Approved  Rejected

<b>BY</b>	FAA Fit. Standards Inspector	Manufacturer	Maintenance Organization	Persons Approved by Canadian Department of Transport
	FAA Designee	Repair Station	<input checked="" type="checkbox"/> Inspection Authorization	Other (Specify) _____

Certificate or Designation No. <b>1459849</b>	Signature/Date of Authorized Individual <i>John D. Brown</i>
--	---

NOTICE

Weight and balance or operating limitation changes shall be entered in the appropriate aircraft record. An alteration must be compatible with all previous alterations to assure continued conformity with the applicable airworthiness requirements.

8. Description of Work Accomplished  
(If more space is required, attach additional sheets. Identify with aircraft nationality and registration mark and date work completed.)

Nationality and Registration Mark,

Date

Install a stabilator modification kit IAW  
STC # SA00618AT issued to "Logresti speed merchant"  
3426 25th Ave. Vero Beach Florida 32960, all  
work done IAW Logresti speed Merchants master drawings  
list, report # 32 dated August 15, 1994 "The Piper  
Comanche" service manual and the 43-13-2A Weight &  
Balance equipment list amended, and Report.

Additional Sheets Are Attached



## MAJOR REPAIR AND ALTERATION (Airframe, Powerplant, Propeller, or Appliance)

OMB No. 2120-0020 Exp. 8/31/2014 Electronic Tracking Number  
For FAA Use Only

**INSTRUCTIONS:** Print or type all entries. See Title 14 CFR §43.9, Part 43 Appendix B, and AC 43.9-1 (or subsequent revision thereof) for instructions and disposition of this form. This report is required by law (49 U.S.C. §44701). Failure to report can result in a civil penalty for each such violation. (49 U.S.C. §46301(e))

<b>1. Aircraft</b>	Nationality and Registration Mark <b>N7905P</b>	Serial No. <b>PA24-3136</b>	Series <b>250</b>
	Make <b>Piper</b>	Model <b>PA24-250</b>	
<b>2. Owner</b>	Name (As shown on registration certificate)	Address (As shown on registration certificate)	
		Address _____ City _____ State _____ Zip _____ Country _____	

### 3. For FAA Use Only

4. Type		5. Unit Identification			
Repair	Alteration	Unit	Make	Model	Serial No.
<input type="checkbox"/>	<input type="checkbox"/>	AIRFRAME	_____	(As described in Item 1 above)	_____
<input type="checkbox"/>	<input type="checkbox"/>	POWERPLANT			
<input type="checkbox"/>	<input type="checkbox"/>	PROPELLER			
<input type="checkbox"/>	<input type="checkbox"/>	APPLIANCE	Type _____		
			Manufacturer _____		

### 6. Conformity Statement

<b>A. Agency's Name and Address</b>	<b>B. Kind of Agency</b>	
Name _____	<input checked="" type="checkbox"/> U. S. Certificated Mechanic	Manufacturer
Address _____	<input type="checkbox"/> Foreign Certificated Mechanic	<b>C. Certificate No. 1459849</b>
City _____ State _____	<input type="checkbox"/> Certificated Repair Station	
Zip _____ Country _____	<input type="checkbox"/> Certificated Maintenance Organization	

**D.** I certify that the repair and/or alteration made to the unit(s) identified in item 5 above and described on the reverse or attachments hereto have been made in accordance with the requirements of Part 43 of the U.S. Federal Aviation Regulations and that the information furnished herein is true and correct to the best of my knowledge.

Extended range fuel per 14 CFR Part 43 App. B <input type="checkbox"/>	Signature/Date of Authorized Individual <i>John D. Brown</i>
--	---

### 7. Approval for Return to Service

Pursuant to the authority given persons specified below, the unit identified in item 5 was inspected in the manner prescribed by the Administrator of the Federal Aviation Administration and is  Approved  Rejected

BY	FAA Ft. Standards Inspector	Manufacturer _____	Maintenance Organization	Persons Approved by Canadian Department of Transport
	FAA Designee	Repair Station	<input checked="" type="checkbox"/> Inspection Authorization	Other (Specify)

Certificate or Designation No. <b>1459849</b>	Signature/Date of Authorized Individual <i>John D. Brown</i>
--	---

NOTICE

Weight and balance or operating limitation changes shall be entered in the appropriate aircraft record. An alteration must be compatible with all previous alterations to assure continued conformity with the applicable airworthiness requirements.

8. Description of Work Accomplished  
(If more space is required, attach additional sheets. Identify with aircraft nationality and registration mark and date work completed.)

N7905P

Nationality and Registration Mark

Date

Replaced the original side windows  
with Great LAKES AERO PRODUCTS WINDOWS  
IN ACCORDANCE WITH STC SA 270GL

There are no special instructions for  
continued air worthiness, only the annual or  
100 hr inspection

NOTHING FOLLOWS

Additional Sheets Are Attached



## MAJOR REPAIR AND ALTERATION (Airframe, Powerplant, Propeller, or Appliance)

OMB No. 2120-0020  
Exp 8/31/2014

Electronic Tracking Number

For FAA Use Only

**INSTRUCTIONS:** Print or type all entries. See Title 14 CFR §43.9, Part 43 Appendix B, and AC 43.9-1 (or subsequent revision thereof) for instructions and disposition of this form. This report is required by law (49 U.S.C. §44701). Failure to report can result in a civil penalty for each such violation. (49 U.S.C. §46301(e))

<b>1. Aircraft</b>	Nationality and Registration Mark <b>N 7905 P</b>	Serial No. <b>PA 24-3136</b>	
	Make <b>Piper</b>	Model <b>PA 24-250</b>	Series <b>250</b>
<b>2. Owner</b>	Name (As shown on registration certificate)		
	Address (As shown on registration certificate)		
	Address _____		State _____
	City _____	Zip _____	Country _____

**3. For FAA Use Only**

4. Type		5. Unit Identification			
Repair	Alteration	Unit	Make	Model	Serial No.
<input type="checkbox"/>	<input type="checkbox"/>	AIRFRAME	_____	(As described in Item 1 above)	_____
<input type="checkbox"/>	<input type="checkbox"/>	POWERPLANT			
<input type="checkbox"/>	<input type="checkbox"/>	PROPELLER			
<input type="checkbox"/>	<input type="checkbox"/>	APPLIANCE	Type _____ Manufacturer _____		

**6. Conformity Statement**

A. Agency's Name and Address		B. Kind of Agency	
Name _____	Address _____ City _____ State _____ Zip _____ Country _____	<input checked="" type="checkbox"/> U. S. Certificated Mechanic	Manufacturer
		<input type="checkbox"/> Foreign Certificated Mechanic	C. Certificate No. <b>1459849</b>
		<input type="checkbox"/> Certificated Repair Station	
		<input type="checkbox"/> Certificated Maintenance Organization	

**D. I certify that the repair and/or alteration made to the unit(s) identified in item 5 above and described on the reverse or attachments hereto have been made in accordance with the requirements of Part 43 of the U.S. Federal Aviation Regulations and that the information furnished herein is true and correct to the best of my knowledge.**

Extended range fuel per 14 CFR Part 43 App. B <input type="checkbox"/>	Signature/Date of Authorized Individual <i>John D. Brown</i>
--	---

**7. Approval for Return to Service**

Pursuant to the authority given persons specified below, the unit identified in item 5 was inspected in the manner prescribed by the Administrator of the Federal Aviation Administration and is  Approved  Rejected

<b>BY</b>	FAA Fit. Standards Inspector	Manufacturer <i>[initials]</i>	Maintenance Organization	Persons Approved by Canadian Department of Transport
	FAA Designee	Repair Station	<input checked="" type="checkbox"/> Inspection Authorization	Other (Specify)

Certificate or Designation No. <b>1459849</b>	Signature/Date of Authorized Individual <i>John D. Brown</i>
--	---

### NOTICE

Weight and balance or operating limitation changes shall be entered in the appropriate aircraft record. An alteration must be compatible with all previous alterations to assure continued conformity with the applicable airworthiness requirements.

#### B. Description of Work Accomplished

(If more space is required, attach additional sheets. Identify with aircraft nationality and registration mark and date work completed.)

Removed aluminum battery to starter cables and installed copper electrical cables in accordance with Bogert Aviation Installations Instructions with STC SA3531 NM. There are no special instructions for continued airworthiness, only the annual or 100 hour inspection.  
Nothing Follows

Additional Sheets Are Attached

★U.S. GOVERNMENT PRINTING OFFICE: 1992-769-012/60157





US Department of Transportation  
Federal Aviation Administration

## MAJOR REPAIR AND ALTERATION (Airframe, Powerplant, Propeller, or Appliance)

OMB No. 2120-0020  
Exp 8/31/2014

Electronic Tracking Number

For FAA Use Only

**INSTRUCTIONS:** Print or type all entries. See Title 14 CFR §43.9, Part 43 Appendix B, and AC 43.9-1 (or subsequent revision thereof) for instructions and disposition of this form. This report is required by law (49 U.S.C. §44701). Failure to report can result in a civil penalty for each such violation. (49 U.S.C. §46301(e))

<b>1. Aircraft</b>	Nationality and Registration Mark <b>N 7905 P</b>	Serial No. <b>PA 24-3136</b>		
	Make <b>Piper</b>	Model <b>PA 24-250</b>	Series <b>250</b>	
<b>2. Owner</b>	Name (As shown on registration certificate)		Address (As shown on registration certificate)	
	Address		City	
	State		Country	
	Zip		Country	

**3. For FAA Use Only**

4. Type		5. Unit Identification			
Repair	Alteration	Unit	Make	Model	Serial No.
<input type="checkbox"/>	<input type="checkbox"/>	AIRFRAME	_____	(As described in Item 1 above)	_____
<input type="checkbox"/>	<input type="checkbox"/>	POWERPLANT	_____	_____	_____
<input type="checkbox"/>	<input type="checkbox"/>	PROPELLER	_____	_____	_____
<input type="checkbox"/>	<input type="checkbox"/>	APPLIANCE	Type	_____	_____
			Manufacturer	_____	_____

**6. Conformity Statement**

<b>A. Agency's Name and Address</b>		<b>B. Kind of Agency</b>	
Name	_____	<input checked="" type="checkbox"/> U. S. Certificated Mechanic	Manufacturer
Address	_____	<input type="checkbox"/> Foreign Certificated Mechanic	C. Certificate No. <b>1459849</b>
City	State _____	<input type="checkbox"/> Certificated Repair Station	
Zip	Country _____	<input type="checkbox"/> Certificated Maintenance Organization	

**D.** I certify that the repair and/or alteration made to the unit(s) identified in Item 5 above and described on the reverse or attachments hereto have been made in accordance with the requirements of Part 43 of the U.S. Federal Aviation Regulations and that the information furnished herein is true and correct to the best of my knowledge.

Extended range fuel per 14 CFR Part 43 App. B <input type="checkbox"/>	Signature/Date of Authorized Individual <i>John D. Brown</i>
--	---

**7. Approval for Return to Service**

Pursuant to the authority given persons specified below, the unit identified in item 5 was inspected in the manner prescribed by the Administrator of the Federal Aviation Administration and is  Approved  Rejected

<b>BY</b>	FAA Fit. Standards Inspector	Manufacturer <input type="checkbox"/>	Maintenance Organization	Persons Approved by Canadian Department of Transport
	FAA Designee	Repair Station <input checked="" type="checkbox"/>	Inspection Authorization	Other (Specify)

Certificate or Designation No. <b>1459849</b>	Signature/Date of Authorized Individual <i>John D. Brown</i>
--	---

NOTICE

Weight and balance or operating limitation changes shall be entered in the appropriate aircraft record. An alteration must be compatible with all previous alterations to assure continued conformity with the applicable airworthiness requirements.

8. Description of Work Accomplished

(If more space is required, attach additional sheets. Identify with aircraft nationality and registration mark and date work completed.)

N7905P \_\_\_\_\_  
Nationality and Registration Mark Date

Installed Landing gear Main Fork, Piper  
Part# P/N 25026 on Both Right & Left.  
Main Gear. Installed according to  
Piper Service manual. Nothing Follows

Additional Sheets Are Attached

United States of America  
Department of Transportation—Federal Aviation Administration  
**Supplemental Type Certificate**

Number SE3552NM

This certificate, issued to Johnston Aircraft Service, Inc.

certifies that the change in the type design for the following product with the limitations and conditions therefor as specified hereon meets the airworthiness requirements of Part 13 of the Civil Air Regulations, effective June 15, 1956, as amended by 13-1 and 13-2.

Original Product—Type Certificate Number: E-295  
Make: Lycoming  
Model: O-540-A1A, -A1A5, -A1B5, -A1C5, -A1D5

Description of Type Design Change: Modification of crankshaft damper configuration in accordance with FAA sealed Johnston Aircraft Service, Inc. Report CPR-2 "NC" dated December 10, 1986, or later FAA approved revision.

Limitations and Conditions: The approval of this change in type design applies to the basic engine of the specified models that are otherwise unmodified. This approval should not be extended to other specific engines of these models on which other previously approved modifications are incorporated, unless it is determined that the interrelationship between this change and any of those other previously approved modifications will introduce no adverse effect upon the airworthiness of that engine.

This certificate and the supporting data which is the basis for approval shall remain in effect until surrendered, suspended, revoked, or a terminating date is otherwise established by the Administrator of the Federal Aviation Administration.

Date of application: November 25, 1986

Date issued:

Date of issuance: December 10, 1986

Date amended:



By direction of the Administrator

*Marvin F. Kummelsberg*

Manager, Western Aircraft  
Certification Office

(Title)

Any alteration of this certificate is punishable by a fine of not exceeding \$1,000, or imprisonment not exceeding 3 years, or both.

This certificate may be transferred in accordance with FAR 21.47.

JOHNSTON AIRCRAFT SERVICE, INC.

P.O. BOX 1457

TULARE, CALIFORNIA 93275

JOHNSTON AIRCRAFT SERVICE, INC. REPORT CPR-2

ENTITLED

Technical Details for Changing the Lycoming O-540 A1A, A1A5, A1B5, A1C5, A1D5 and Lycoming IO-540 C1B5 to be eligible for the Hartzel Compact Propeller, HC-C2YK-1BF/F8477D-5R.

F.A.A. APPROVED PER S.T.C. NO. SE3552NM  
SE3553NM

Date: DEC 10 1986

CYLINDER REMOVAL

1. Remove Left Rear (# 6) Cylinder and Piston Assembly from Engine using Instructions contained in Lycoming Overhaul Manual for Direct Drive Engines, P.N 60294-7. Leave the Piston and Rings inside the Cylinder with only enough Piston showing for access to the Piston Pin.
2. You now have access to the Counterweights through the # 6 Cylinder hole in the Crankcase.

COUNTERWEIGHT REMOVAL

Use Figure 1 (Typical Crankshaft and Related Parts) as shown below to aid in Counterweight Removal and Installation.

1. Remove the two (2) Lycoming Counterweights, P/N 71904, and (2) Rollers, P/N 70416 and (2) P/N 72022, merely by removing the retaining rings, CPR-2 Figure 1, Ref. 11, after which the Washers, Ref. 10, Rollers, Ref. 9, and Counterweights, Ref. 8, may be detached from the Crankshaft Lug.
2. After removing 71904 Counterweights and prior to installing 72801 Counterweights, dimensionally check bushings in Crankshaft Counterweight Cheeks. Any bushings not meeting New Lycoming specifications must be replaced per latest version of Lycoming Service Instruction 1142.

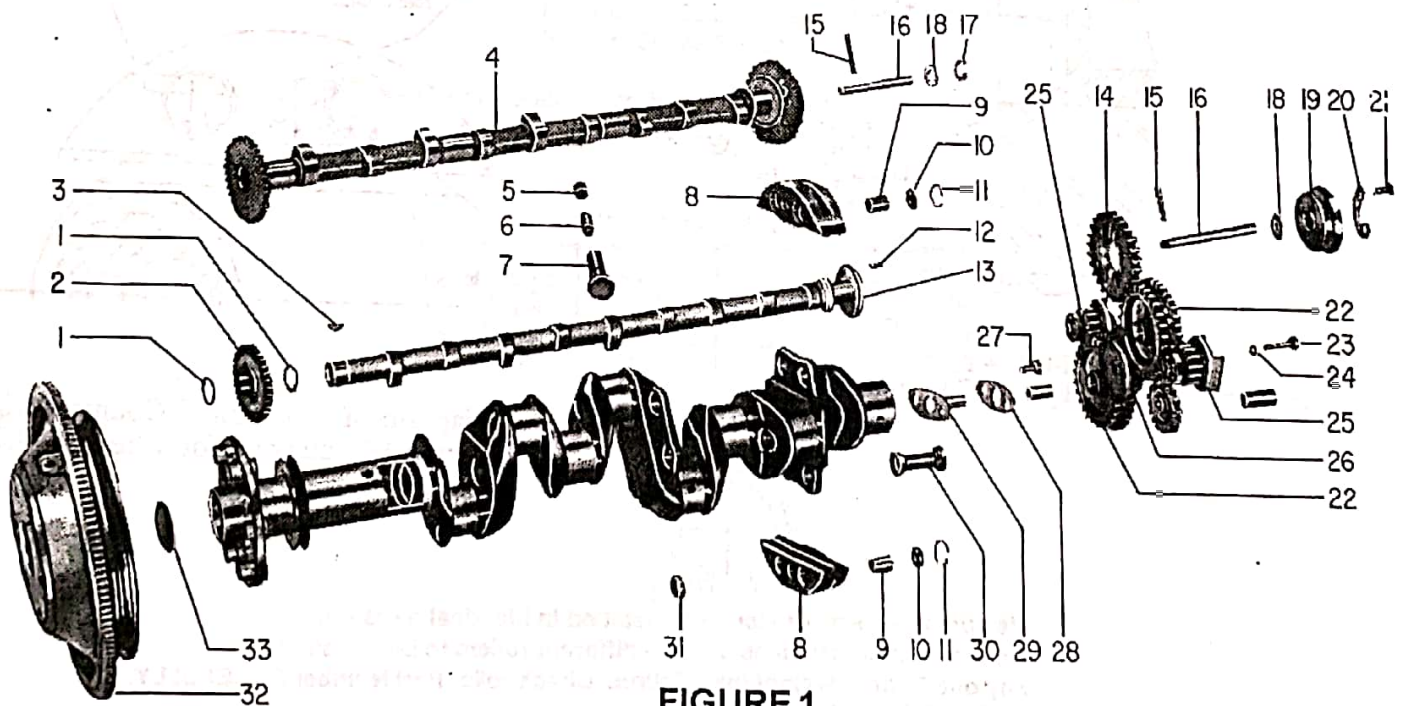


FIGURE 1

- |                             |                            |  |
|-----------------------------|----------------------------|--|
| 1. Retaining Rings          | 12. Stepped Dowel          | 23. Screw                                    |
| 2. Camshaft Gov. Drive Gear | 13. Camshaft               | 24. Washer                                   |
| 3. Woodruff Key             | 14. Camshaft Gear          | 25. Magneto Drive Gear                       |
| 4. Camshaft (Integral Gear) | 15. Pin                    | 26. Crankshaft Gear                          |
| 5. Tappet Socket            | 16. Tachometer Shaft       | 27. Hex Head Screw                           |
| 6. Tappet Plunger Assy.     | 17. Retaining Ring         | 28. Lockplate                                |
| 7. Tappet Body              | 18. Spacer                 | 29. Idler Gear Shaft                         |
| 8. Counterweight            | 19. Breather Slinger       | 30. Sludge Tube (not used on current models) |
| 9. Roller                   | 20. Lockplate              | 31. Crankshaft Counterweight Bushing         |
| 10. Washer                  | 21. Hex Head Screw         | 32. Ring Gear Support Assy.                  |
| 11. Retaining Ring          | 22. Crankshaft Idler Gears | 33. Expansion Plug                           |

**COUNTERWEIGHT INSTALLATION**

- Per Lycoming Service Instruction 1012 Rev.F, Install New P/N 71907 Washers, Ref.10, and New P/N LW11750 (71906) Retaining Rings, Ref. 11, on one side of New Style Rebuilt or New Counterweight Assembly, P/N 72801, Ref.8, and place the Counterweight on its proper lug on the Crankshaft per Figure 2, Service Instruction 1012 Rev. F. Insert (2) New Rollers, P/N 72797, Ref.9, and secure assembly by installing New P/N 71907 Washers and P/N LW11750 (71906) Circlips on the other side of the Counterweight. All the Bushings, P/N 71903, in the Counterweights must be New and Finished per Lycoming Service Instruction 1143. Circlips are inserted with sharp edge outward ( see CPR-2 Figure 2). Two gages will check all circlips in any Avco Lycoming Counterweight. See Table on Figure 3, of CPR-2.

NOTE: All reference numbers refer to Figure 1, P.2 of CPR-2.

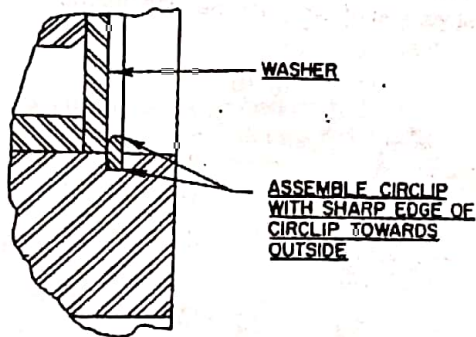


Figure 2  
Assembly of Circlips in Counterweight

CIRCLIP P/N	"A" DIM	"B" DIM	GAGE	APPLICATION
71906	.892	.198	64892-2	ALL C/W'S
LW-14820	.892	.198	64892-2	ALL C/W'S
77005	1.132	.245	64892-3	LARGE C/W ON 1800-541 ONLY

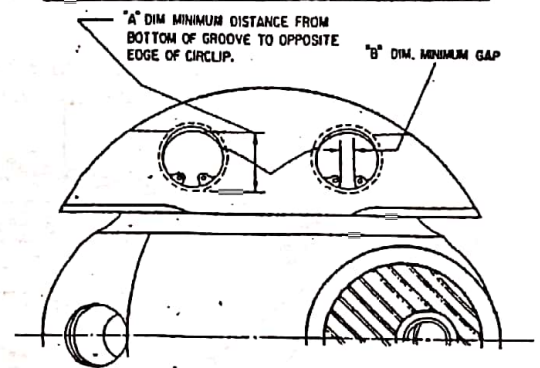


Figure 3  
Diagram of Assembled Counterweight Showing Dimensions for Checking Circlip

**CAUTION**

Be sure the correct rollers are installed in identical pairs only. Under no circumstances are two different rollers to be installed on any one Counterweight installation. Check roller Part Number CAREFULLY.

Insert one end of the Counterweight Retaining Gap Gage, Avco Lycoming P/N 64892-2 or -3 between the ends of the Counterweight Retaining Ring; see Figure 3 for gap dimensions and gage selection. Be sure the gage is resting on the bottom of the groove. The gage must pass between the ends of the Retaining Ring and when rocked back and forth, must clear the inside edge of the top of the Retaining Rings. If the gage does not pass freely between the ends and under the top of the ring, the ring is not properly seated. Be sure all rings are properly seated.

COUNTERWEIGHT INSTALLATION CONTINUED.NOTE:

A recent revision to Lycoming Part No. 64892 Gage Set eliminated the Part No. 64892-1 Gage from the set. The Part No. 64892-2 that is to be used for checking both the Part Nos. 71906 and LW14820 Circlips, must be modified to the specifications listed in the Table Section of Figure 3 or a new gage set can be purchased through Avco Lycoming Williamsport Division.

SPECIAL TOOLS REQUIRED.

Avco Lycoming Part No. 64892 Gage Set, now consist of:

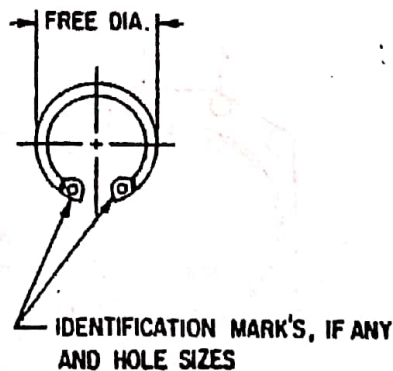
Part No. 64892-2 Gage

Part No. 64892-3 Gage

Repeat the same procedures with the second New Style Counterweight, Part No. 72801, but use two (2) New Rollers, Part No. 72965, in the second assembly.

CIRCLIP IDENTIFICATION

FREE DIA.	HOLE SIZE	STAMPED MARK	P/N
1.056	.072/.060	93	71906
1.056	.093/.076	N/A	LW-14820
1.344	.090/.076	N/A	77005



**Figure 4**  
**Circlip Identification**

CYLINDER INSTALLATION

1. Re-install No. 6 Cylinder and Piston Assembly on its pad using a New Cylinder Base Seal. Initially tighten 1/2 inch cylinder hold-down nuts, to a torque of 300 in. lb (25ft. lb) in the sequence shown in Figure 5. On engines with cylinder hold-down plates, follow instructions in Figure 6
2. Install 3/8 inch nuts on the remaining cylinder base studs and torque to 300 in. lbs (25ft. lb). The sequence for tightening these nuts is optional.
3. Using the same sequence as described in Paragraphs 1 and 2, and shown in Figure 5, check all 1/2 inch nuts for tightness by bringing torque to 600 in.lb (50ft. lb). Be sure shims are removed before final torquing engines using cylinder hold-down plates.
4. Check 3/8 inch nuts for tightness on the remaining cylinder base studs by bringing torque up to 300 in. lb (25ft.lb). Sequence is optional.
5. After all cylinder base nuts have been tightened, remove any nicks in cylinder fins by de-burring or filing.
6. After tightening cylinder base nuts, install the remaining cylinder parts in the opposite sequence you removed them. Use all new gaskets and seals during assembly. Be sure to collapse Lifter Plungers and check for proper dry clearance of .028 to .080 between Rocker Arms and Valves with Piston at Top Dead Center on compression stroke. If your engine WAS performing normally and you cannot obtain proper Valve clearance then re-check your cylinder installation for problems ( refer to Lycoming Direct Drive Overhaul Manual, Part No. 60294-7).

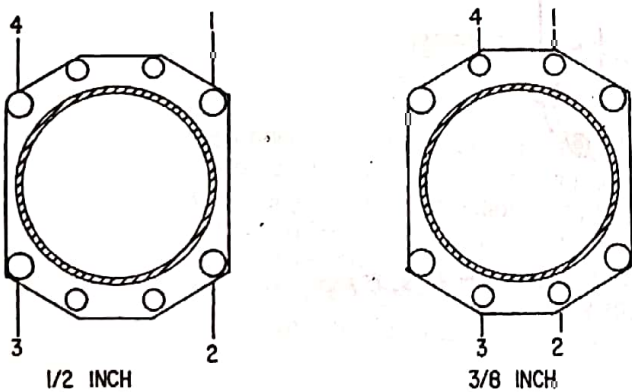
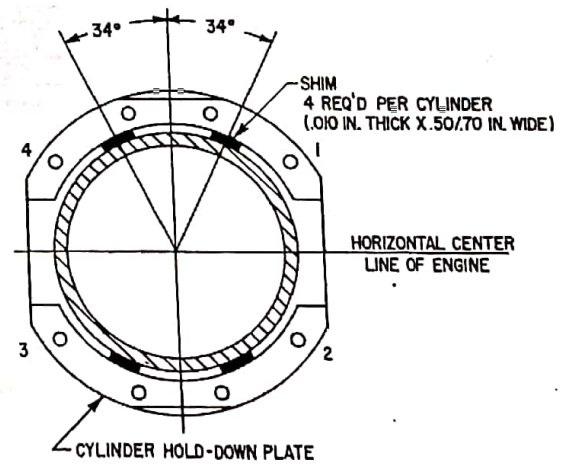


Figure 5 Sequence of Tightening  
Cylinder Base Nuts



INSTRUCTIONS—ON ENGINES USING CYLINDER HOLD-DOWN PLATES, DURING INITIAL TIGHTENING, USE TWO SHIMS BETWEEN EACH PLATE AND THE BARREL, LOCATED AS SHOWN. REMOVE SHIMS BEFORE FINAL TIGHTENING.

Figure 6 Location of Shims Between  
Cylinder Barrel and Hold-Down Plates



1. All the Engines listed for this Modification now have the same rotational dampening system as the Lycoming O-540 E4A5 and IO-540 D4A5, both rated at 260 H.P. at 2700 R.P.M., per current Lycoming Parts Manual, PC-115 and 215, and current Lycoming Certified Aircraft Engine Manual SSP 283.
2. One other determining factor is the Camshaft. Any Engine equipped with early Camshaft, Part No. 71642, is not eligible for the H.P. or R.P.M. increase.
3. All Engines changed by this Modification shall have (M) followed by the S.T.C. Number marked on the Engine Data Plate following the Engine Model designation.

REFERENCE MATERIAL

Lycoming Service Instruction 1012F  
Lycoming Service Instruction 1142 ( Latest Version)  
Lycoming Service Instruction 1143 ( Latest Version)  
Lycoming Direct Drive Overhaul Manual  
Part No. 60294-7 ( Latest Version)  
Lycoming Parts Catalog, Part No. PC-115, for O-540 Series  
Aircraft Engines ( Latest Version)

# TEXTRON Lycoming

Williamsport Plant  
Textron Lycoming/Subsidiary of Textron Inc.  
652 Oliver Street  
Williamsport, PA 17701 U.S.A.

# SERVICE INSTRUCTION

DATE: October 31, 1988

Service Instruction No. 1012F  
(Supersedes Service Instruction No. 1012E)  
Engineering Aspects are  
FAA Approved

SUBJECT: PART I: Correct Location for Counterweights and Rollers on a Crankshaft  
PART II: Proper Assembly Procedure for Counterweights and Rollers on a Crankshaft

MODELS AFFECTED: All Textron Lycoming engines employing counterweights.

TIME OF COMPLIANCE: As Required.

The purpose of this service instruction is to provide correct assembly procedures and identify the correct location on the crankshaft for the various counterweights and rollers utilized on Textron Lycoming reciprocating aircraft engines. Since the original edition of this publication; counterweight design changes,

material improvements and improvements in manufacturing methods have resulted in a number of counterweight supersedures. The following table lists applicable counterweight part number supersedures in the sequence of occurrence. The referenced notes following the table describe the supersedure.

## COUNTERWEIGHT AND ROLLER SUPERSEDURE HISTORY

Original Counterweight Part Number	Superseding Counterweight Part Number	Original Roller Part Number	Superseding Roller Part Number
* 69393	71904	† 76787	73648
* 69394	71905		
** 69349	71905		
** 65602	71904		
** 65640	71904		
+ 71904	LW-19225		
+ 71905	LW-19226		
+ 72801	LW-19227		
+ 72534	LW-19213		
+ 73643	LW-19211		
+ 73644	LW-19210		
+ 73812	LW-19212		

- \* P/N 69393 and 69394 counterweights are cast iron and did not incorporate bushings in the roller bores. These counterweights must be replaced at overhaul. (Not interchangeable.)
- \*\* P/N's 69349, 65602 and 65640 counterweights incorporate screw in plugs and circlips to secure the rollers in the counterweight. When it becomes necessary to replace one of these counterweights, all counterweights on that certain crankshaft must be replaced. (Not interchangeable.)
- + P/N's 71904, 71905, 72801, 72534, 73643, 73644 and 73812 counterweights have been superseded as a result of manufacturing process changes. Each one is completely interchangeable with its respective replacement counterweight. Existing stock of these counterweights is usable until depleted.
- † P/N 76787 roller was replaced by P/N 73648 as a product improvement and to eliminate a dispensible part.

PART I

NOTE

Any O-540-A1A model engine installed in a Piper aircraft must be converted to the O-540-A1A5 configuration at overhaul. This is accomplished by installing two (2) fifth order counterweight rollers P/N 72022, in place of two (2) of the four (4) sixth order P/N 70416 rollers, on one of the two (2) rear crankshaft lugs. When this modification has been completed, stamp the number "5" after the model number on the engine nameplate.

Part I separates applicable engines into groups that utilize the same basic crankshaft design with the same counterweight and roller configuration. The location column in the table that accompanies each group references the group to a numbered figure which is an illustration that is typical of the crankshaft installed in the engines listed with the group. Each counterweight lobe position is numbered on the illustration and the location column in the table assigns each counterweight and roller combination to one or more of these numbered positions.

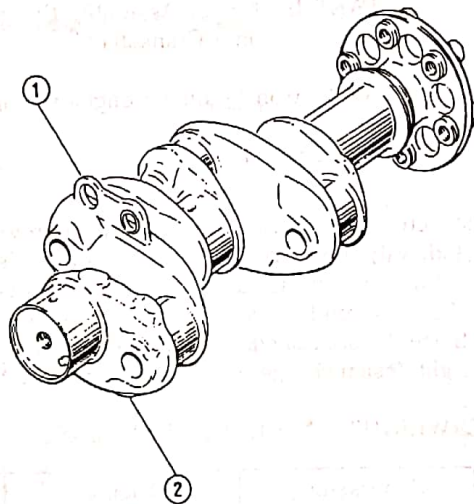


Figure 1.  
Counterweights and Rollers - Group 1

Group	Counterweights P/N	Qty. No.	Roller P/N	Qty. No.	Location
<b>Group 1 (4 Cyl. Direct Drive Engines)</b>					<b>Figure 1</b>
0-360-A1F6, -A1F6D, -A1G6, -A1G6D, -E1A6D, -F1A6, -G1A6; LO-360-A1G6D, -E1A6D; IO-360- A1B6, -A1B6D, -A1D6, -A1D6D, -A3B6D, -A3D6D, -B2F6, -C1C6, -C1D6, -C1E6, -J1A5D; AEIO-360-A1B6, -B1G6; LIO-360-C1E6; TO-360- C1A6D, -E1A6D, -F1A6D; LTO-360-E1A6D; TIO- 360-A3B6, -C1A6D.	LW-19227 LW-19227	1 1	LW-10977 LW-10945	2 2	Either Position Either Position

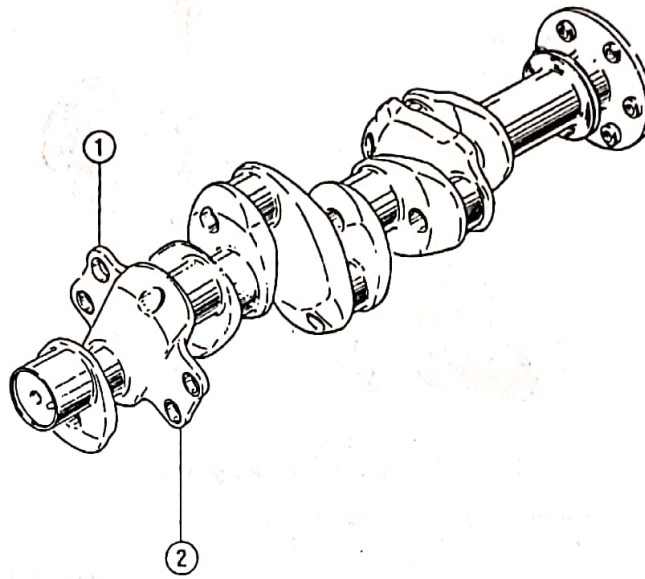


Figure 2.  
Counterweights and Rollers - Group 2, 3, 4, 5, 6, 7

Group	Counterweights P/N	Qty. No.	Roller P/N	Qty. No.	Location
<b>Group 2 (6 Cyl. Direct Drive Engines)</b> 0-540-A1D, -A2B.	LW-19225	2	70416	4	Figure 2 Position 1, 2
<b>Group 3 (6 Cyl. Direct Drive Engines)</b> 0-540-A1A, -A1A5, -A1B5, -A1C5, -A1D5, -A3D5, -B1A5, -B1B5, -B2B5, -B2C5, -F1A5, -F1B5, -G1A5, -G2A5, -H1B5D, -H2A5, -H2B5D; IO-540-C1B5, -C1C5.	LW-19225 LW-19225	1 1	70416 72022	2 2	Figure 2 Either Position Either Position
<b>Group 4 (6 Cyl. Direct Drive Engines)</b> 0-540-A4D5, -B4B5, -E4A5, -E4B5, -E4C5, -J1A5D; IO-540-A1A5, -B1A5, -B1B5, -B1C5, -C1B5, -C4B5, -C4C5, -C4D5D, -D4A5, -E1A5, -E1B5, -G1A5, -G1B5, -G1C5, -G1D5, -G1E5, -G1F5, -J4A5, -P1A5, -T4A5D, -T4B5D, -T4C5D, -W1A5D; AEIO-540-D4A5, -D4B5, -L1B5D; TIO- 540-C1A, -E1A, -G1A, -H1A, -AA1A5, -AB1AD.	LW-19227 LW-19227	1 1	72965 72797	2 2	Figure 2 Either Position Either Position
<b>Group 5 (6 Cyl. Direct Drive Engines)</b> IO-540-K1A5, -K1A5D, -K1B5, -K1C5, -K1D5, -K1E5, K1E5D, -K1F5, -K1F5D, -K1G5, -K1G5D, -K1H5, -K1J5, -K1J5D, -K1K5, -L1A5, -L1A5D, -L1B5D, -L1C5, -M1A5, -M1A5D, -M1B5D, -M2A5D, -N1A5, -R1A5, -R1A5D, -S1A5, -U1B5D, -AA1A5; AEIO-540-L1B5D; HIO-540-A1A; TIO-540-A1A, -A1B, -A2A, -A2B, -A2C, -F2BD, -J2B, -J2BD, -N2BD, -R2AD, -S1AD, -T2AD, -U2A, -V2AD, -W2A; LTIO-540- F2BD, -J2B, -J2BD, -N2BD, -U2A, -V2AD, -W2A.	LW-19210 LW-19210	1 1	73648 76788	2 2	Figure 2 Either Position Either Position
<b>Group 6 (6 Cyl. Direct Drive Engines)</b> 0-540-J3A5, -J3A5D, -J3C5D, -L3C5D; IO-540- W3A5D.	LW-19210 LW-19210	1 1	LW-15558 76788	2 2	Figure 2 Either Position Either Position
<b>Group 7 (6 Cyl. Direct Drive Integral Accessory Housing Engines)</b> TIO-541-A1A	76044 76044	1 1	76042 76043	2 2	Figure 2 Either Position Either Position

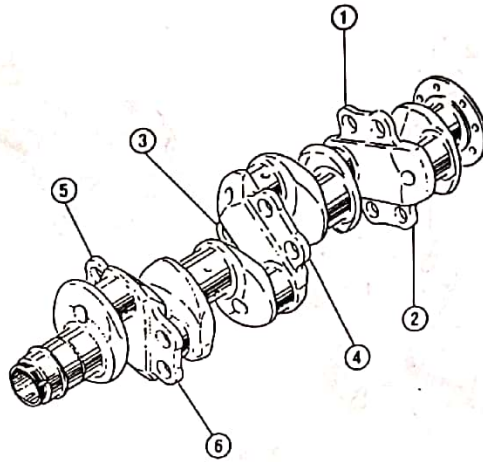


Figure 3.  
Counterweights and Rollers - Group 8, 9, 10, 11, 12, 13, 14

Group	Counterweights P/N	Qty. No.	Roller P/N	Qty. No.	Location Figure 3
Group 8 (6 Cyl. Geared Engines) GO-435-C2, -C2A, -C2A2, -C2B, -C2B1, -C2B2, -C2C, -C2E; GO-480-B series (except -B1A6, -B1E6) -C2C6, -C2D6, -D series; IGO-480-A1B6	LW-19225	6	69433	12	All Positions
Group 9 (6 Cyl. Geared Engines) GO-435-C2B2-6; GO-480-B1A6*, -B1E6, -C series; -F series, -G series; GSO-480 series (except -B1B3); IGSO-480 series (except -A1F3)	LW-19225 LW-19225 LW-19226	4 1 1	69433 70416 69433	8 2 2	Figure 3 Positions 1, 2, 3, 4 Position 6 Position 5
Group 10 (6 Cyl. Geared Engines) (Special) GO-480-B1A6 with the following S/N's: L-567-28, L-569-28, L-573-28, L-574-28, L-575-28, L-576-28.	LW-19225	6	70416	12	Figure 3 All Positions
Group 11 (6 Cyl. Geared Engines) GSO-480-B1B3; IGSO-480-A1F3.	LW-19210 LW-19213	2 4	76788 69433	4 8	Figure 3 Positions 1, 2 Positions 3, 4, 5, 6
Group 12 (6 Cyl. Geared Engines) IGO-540-A, -B series	LW-19213 LW-19225 LW-19226	4 1 1	73287 70416 73287	8 2 2	Figure 3 Positions 1, 2, 3, 4 Position 6 Position 5
Group 13 (6 Cyl. Geared Engines) IGSO-540-A, -B series	LW-19213 LW-19225 LW-19226	4 1 1	69433 70416 69433	8 2 2	Figure 3 Positions 1, 2, 3, 4 Position 6 Position 5
Group 14 (6 Cyl. Vertical Engines) VO-540-B1B3, -C1C3	LW-19213	6	73338	12	Figure 3 All Positions

\* See Group 10 also.

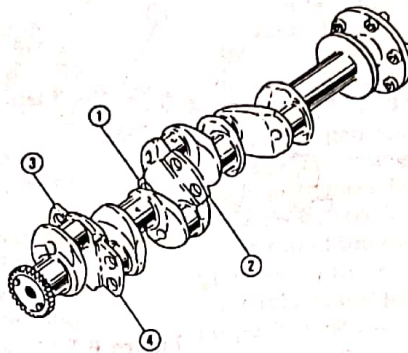


Figure 4.  
Counterweights and Rollers - Group 15

Group	Counterweights P/N	Qty. No.	Roller P/N	Qty. No.	Location Figure 4
Group 15* (6 Cyl. Direct Drive Integral Accessory Housing Engines) TIO-541-E1A4, -E1B4, S/N's 101-59 thru S/N's 297-59	75637	1	77386	2	Position 1
	76044	1	76042	2	Position 3
	76044	1	76043	2	Position 4
	75636	1	77385	2	Position 2
TIO-541-E1A4, -E1B4, S/N's 298-59 and up, -E1C4, -E1D4	75637	1	77386	2	Position 1
	76044	1	76042	2	Position 3
	76044	1	76043	2	Position 4
	78988 *	1	77385	2	Position 2

\* - Change 77887 crankshaft and counterweight assembly to 78989 at engine overhaul by using 78988 counterweight instead of 75636.

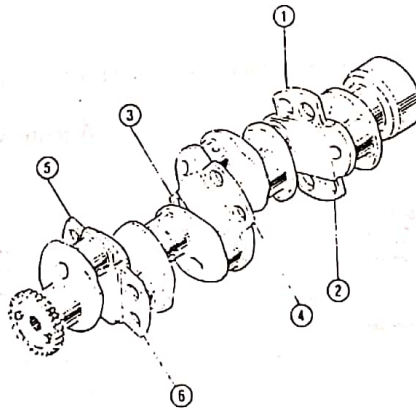


Figure 5.  
Counterweights and Rollers - Group 16

Group	Counterweights P/N	Qty. No.	Roller P/N	Qty. No.	Location Figure 5
Group 16 (6 Cyl. Geared Integral Accessory Housing Engines) TIGO-541-B1A, -D1A, -D1B, -E1A	75637	5	75631	10	Positions 2, 3, 4, 5, 6
	77002	1	77007	2	Position 1

When assembling TIGO-541 counterweight P/N 77002 to No. 1 position on the crankshaft, do not use 71906 or LW-14820 circlips and 71907 washers. Use washer P/N 77004 and circlip P/N 77005.

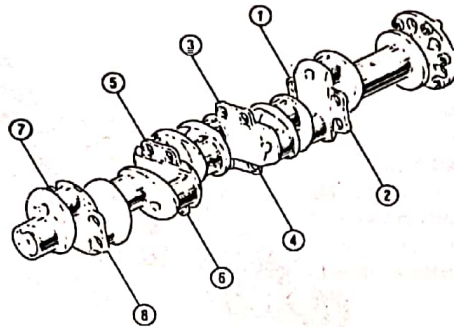


Figure 6.  
Counterweights and Rollers - Group 6

Group	Counterweights P/N	Qty. No.	Roller P/N	Qty. No.	Location
<b>Group 17 (8 Cyl. Direct Drive Engines)</b>					
IO-720-A, -B, -C, -D series	(73643) LW-19211	6	73649	12	Positions 1, 2, 4, 5, 7, 8
	(73812) LW-19212	1	73814	2	Position 3
	(73644) LW-19210	1	73648	2	Position 6

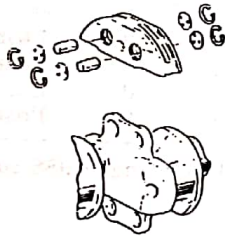


Figure 7.  
Typical Counterweight Installation

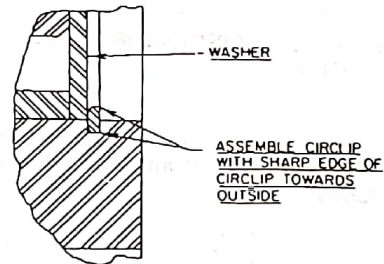


Figure 8.  
Assembly of Circlips in Counterweight

CIRCLIP P/N	"E" DIM	"F" DIM	GAGE	APPLICATION
71906	.892	.98	64892-2	ALL C/W'S
LW-14820	.892	.98	64892-2	ALL C/W'S
71005	1.132	2.45	64892-3	LARGE C/W ON 1500-541 OHLS

"E" DIM MINIMUM DISTANCE FROM BOTTOM OF GROOVE TO OPPOSITE EDGE OF CIRCLIP.  
"F" DIM MINIMUM GAP

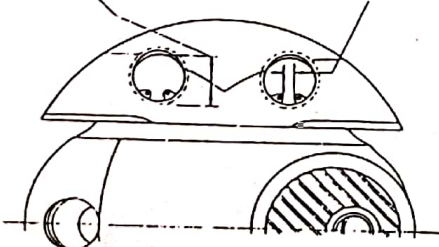


Figure 9.  
Diagram of Assembled Counterweight Showing Dimensions for Checking Circlip

CIRCLIP IDENTIFICATION			
FREE DIA	HOLE SIZE	STAMPED MARK	P/N
1.056	.072/.060	93	71906
1.056	.093/.076	N/A	LW-14820
1.344	.090/.076	N/A	71005

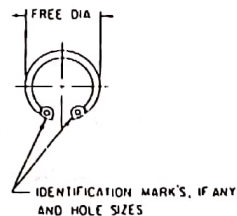


Figure 10.  
Circlip Identification

PART II

CAUTION

The practice of marking crankshafts, counterweights and rollers, to insure proper location at reassembly, should not be accomplished with permanent markings of any kind. Refer to the latest Revision of Service Instruction No. 1152. Scoring, scratching, etching or other type of permanent marking could result in counterweight failure. See figure 7.

Install washers, P/N 71907 and circlips, P/N 71906 or LW-14820 on one side of the counterweight and place the counterweight on the proper crankshaft lobe. Insert the proper rollers and secure the assembly by installing washers and circlips on the other side of the counterweight (refer to figure 7). Circlips are inserted with the sharp edge outward (see figure 8). Two gages will check all circlips installed in any Textron Lycoming counterweight. See table with figure 9.

CAUTION

Install the correct rollers in identical pairs only. Under no circumstance are two different rollers to be installed on any one counterweight installation. Check roller part

number and size by using the table at the end of this instruction.

Insert one end of the counterweight circlip gap gage, P/N 64892-2 or -3 between the ends of the circlip; see figure 9 for gap dimension and gage selection. Be sure the gage is resting on the bottom of the groove. The gage must pass between the ends of the circlip and when rocked back and forth, must clear the inside edge of the top of the circlip. If the gage does not pass freely between the ends and under the top of the circlip, the circlip is not properly seated. Insure all circlips are properly seated.

NOTE

A recent revision to P/N 64892 gage set eliminated the 64892-1 gage from the set. The 64892-2 gage that is to be used for checking both the 71906 and LW-14820 circlips, must be modified to the specifications listed in the table section of figure 9 or a new gage set P/N 64892 can be purchased through any Textron Lycoming authorized Distributor.

SPECIAL TOOLS REQUIRED:

Textron Lycoming P/N 64892 gage set, now consists of:

- 64892-2 Gage
- 64892-3 Gage

ROLLER OUTSIDE DIAMETERS

P/N	OD	P/N	OD	P/N	OD
69433	.5050/.5045	73648	.6572/.6567	76788	.6895/.6890
70416	.6950/.6945	73649	.6098/.6093	77007	.5167/.5162
72022	.6655/.6650	73814	.5652/.5647	77385	.5845/.5840
72797	.6915/.6910	75631	.4741/.4736	77386	.5333/.5328
72965	.6602/.6597	76042	.6420/.6415	LW-10945	.6915/.6910
73287	.5194/.5189	76043	.6795/.6790	LW-10977	.7141/.7136
73338	.5260/.5255			LW-15558	.6451/.6446

NOTE: Revision F" adds new models, changes text, updates part numbers as applicable.

18297, 19215, 19563, 19215A, 20196, 22254, 22636, 22734A, 22734B — These numbers for Textron Lycoming reference only.



## **TEXTRON** Lycoming

Reciprocating Engine Division/  
Subsidiary of Textron Inc.  
652 Oliver Street  
Williamsport, PA 17701 U.S.A.

# SERVICE INSTRUCTION

May 28, 1992

Supplement No. 1

for

Service Instruction No. 1012F

A recent revision to P/N's LW-19225, LW-19226 and LW-19227 counterweight assemblies changes the distance from the centerline of the counterweight bushing bore to the flat edge of the counterweight on applicable counterweights that are identified with the letter "E", as a suffix to the counterweight part number. (Refer to Dimension "A", in the revised Figure 6, from Supplement No. 2 to Service Instruction No. 1143B which is also included with this supplement for reference purposes.) Applicable counterweights that were placed in service, prior to distribution of this Supplement, that are not identified with a letter suffix in the part number will have to be measured to determine the "A" dimension. After the "A" dimension has been determined, vibropeen the correct identification letter on the counterweight as a suffix to the part number.

Although applicable counterweights that are identified with the letter "E" suffix in the part number, fit and perform perfectly on the lobes of crankshafts installed in direct drive engines it is impossible to assemble them on crankshafts that are installed in reduction gear equipped engines. For this reason production of counterweights with the relocated bushing bores has

been discontinued and all applicable counterweights will be manufactured to the original "A" dimension which is listed with the part number that contains the "D" suffix in the revised Figure 6. New counterweights that are manufactured to the original "A" dimension will be identified with the letter "F" or a subsequent letter (G, H, etc.) as a suffix to the part number.

### CAUTION

TO INSURE PROPER COUNTERWEIGHT OPERATION DO NOT ASSEMBLE A P/N LW-19225E, LW-19226E OR LW-19227E AT ANY DESIGNATED LOCATION ON THE CRANKSHAFT OF A REDUCTION GEAR EQUIPPED ENGINE. USE THESE COUNTERWEIGHTS ON DIRECT DRIVE CRANKSHAFTS ONLY. APPLICABLE COUNTERWEIGHTS THAT ARE IDENTIFIED WITH REVISION LETTERS D, F OR SUBSEQUENT LETTERS CAN BE USED AT ANY DESIGNATED LOCATION.

Counterweight Part No.	Spacer Detail Part No.	Dimensions		Weight (Lbs.) Minimum
		A	B ± .002	
71904	12	.825	.425	1.796
LW-19225D	27	.855	.395	1.796
LW-19225E	17	.875	.375	1.796
71905	12	.825	.425	1.752
LW-19226D	27	.855	.395	1.756
LW-19226E	17	.875	.375	1.756
72801	10	.715	.535	1.846
LW-19227D	28	.740	.510	1.846
LW-19227E*	30	.760	.490	1.846
72534	13	.950	.300	2.246
LW-19213	29	.965	.285	2.246
73643	15	.805	.445	2.212
LW-19211	12	.825	.425	2.212
73644	11	.741	.509	2.166
LW-19210	30	.761	.489	2.166
73812	15	.908	.342	2.266
LW-19212	31	.923	.327	2.266
74901	20	.720	.530	1.470
75636	20	.720	.530	1.600
75637	17	.875	.375	1.678
76044	18	.730	.520	1.810
78988	18	.730	.520	1.600

\* Use spacer No. 30 and .001 inch thick shim stock to achieve .490 spacer thickness when grinding the bushings in a P/N LW-19227E counterweight.

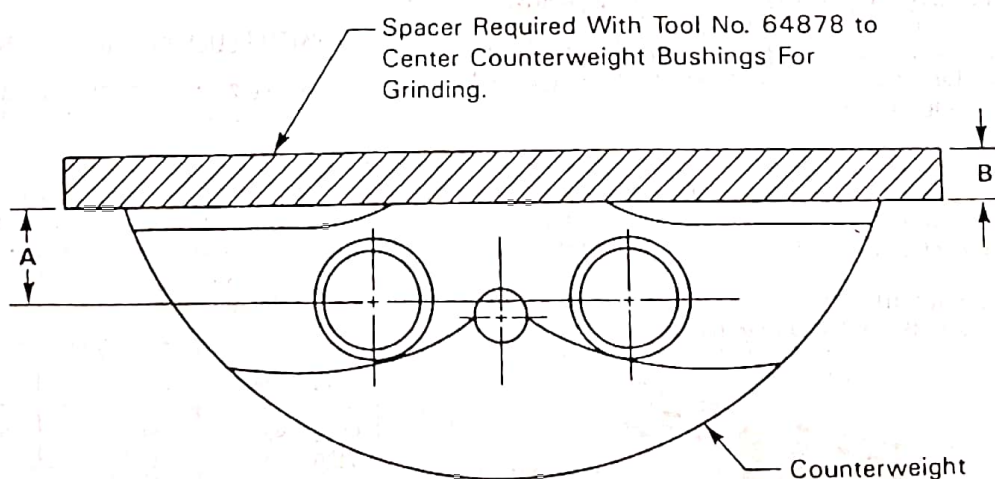


Figure 6. (Revised) Identification of Dimension "A" and "B"  
 (From Supplement No. 2 to Service Instruction No. 1143B, included for reference purposes)

5. Assemble the new bushing on the puller and pro-



# Service Instruction

LYCOMING DIVISION  
WILLIAMSPORT, PA. 17701



DATE: May 7, 1971

Service Instruction No. 1142B  
(Supersedes Service Instruction No. 1142A)  
Engineering Aspects are  
FAA (DEER) Approved

SUBJECT: Replacement of Crankshaft Counterweight Bushings

MODELS AFFECTED: O-360-A1E6, -A1F6, -A1G6, IO-360-A1B6, -A1C6, -A1D6, -C1D6, -C1E6, LIO-360-C1E6, GO-435, GO-480, GSO-480, IGSO-480, O-540, IO-540, IGO-540, IGSO-540, VO-540, TIO-541, TIGO-541 and IO-720 series engines.

TIME OF COMPLIANCE: At overhaul.

All of the above engines incorporate dynamic counterweight and roller combinations as an effective means of dampening vibrations. Each roller used to attach the counterweight is supported by three hardened steel bushings, two of which are located in the counterweight and the other in the crankshaft lug.

Wear on the steel bushings in the crankshaft counterweight lugs is confined to a localized area opposite the longitudinal centerline of the crankshaft. This wear will appear as an out-of-round condition, which can readily be measured.

**CAUTION**

If an engine is disassembled prior to its normal overhaul time, check the inside diameter of the counterweight bushings in the crankshaft. If any bushing is more than .0007 inch out-of-round, it must be replaced.

Also, the bushings are occasionally found to be cracked on the outside surface, a condition not visible until the bushing has been removed. Consequently, all bushings in the crankshaft lugs should be replaced during overhaul. The crankshaft may be returned to the factory for rebushing, or it may be accomplished in the following manner:

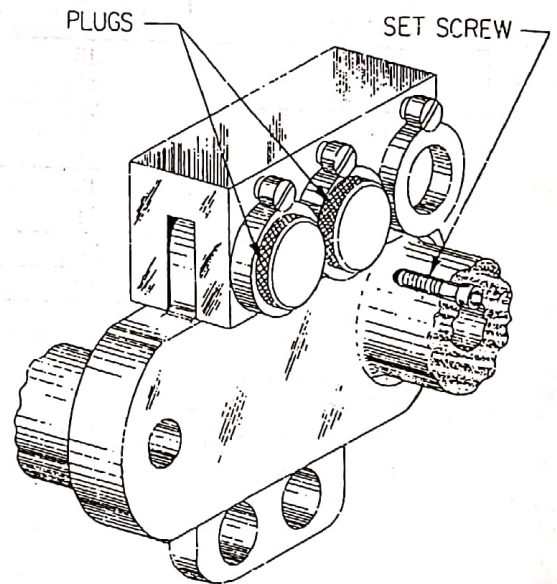
**NOTE**

For replacement of the bushings in the counterweights at overhaul, see the latest edition of Service Instruction No. 1143.

1. Assemble puller (Avco Lyc. P/N 64872, figure 1) and remove the old bushing from crankshaft lug.



Figure 1. No. 64872 Puller to Remove and Install Bushings



WITH PLUGS IN PLACE TIGHTEN SET SCREW

Figure 2. No. ST-280 Reaming Fixture Assembled to Crankshaft

2. Measure the hole and determine what size bushing is required by the following chart. If the hole is within standard limits, reaming the hole is not necessary. If, however, it is determined that a larger oversize bushing is required, steps 3 and 4 must be completed before installing the new bushing.

Hole Size	Nominal Size	Reamer Size
.9369/.9377	Std.	None
.9420/.9425	P05	64874 (.005 o/s)
.9445/.9450	P075	ST 210 (.0075 o/s)
.9470/.9475	P010	64875 (.0010 o/s)
.9495/.9500	P0125	ST 211 (.0125 o/s)
.9520/.9525	P15	64876 (.015 o/s)

3. Determine reamer needed (.005 o/s, .0075 o/s, .010 o/s, .0125 o/s or .015 o/s) and assemble the reaming fixture (Avco Lyc. P/N ST-280) over the crankshaft lug. Use the two plugs provided to line up the holes and secure the fixture by tightening the Allen head set screws. See figure 2.

**NOTE**

On fixture ST-280 select proper set of holes for crankshaft being reamed. Wide set of holes are spaced 2.125 apart. The narrow set are spaced 1.800 apart.

4. Assemble the reamer to be used with a universal joint drive. Remove one plug from the fixture and proceed to hand ream the hole to proper size. Following the above procedure ream the remaining hole.

**NOTE**

One location plug must be in fixture when reaming to assure proper spacing.

5. Assemble the new bushing on the puller and proceed to pull the bushing into the hole. (Reference 578, Table of Limits, Service Bulletin No. 266.)

**CAUTION**

The inside diameter of this bushing is finished at the factory and no further finishing of the bushing is necessary. Caution must be exercised when installing the bushing so that the finished ID is not damaged. Because of possible damage to the crankshaft lug, never under any circumstances remove or install these bushings by use of a drill.

6. After the bushing is installed, check its alignment with the main bearings by placing the crankshaft in vee blocks on a surface plate. Install the wedge blocks, Tool No. ST-212, in the bushing and compare parallelism of the wedge blocks with that of main journals within .002 per inch. Support the crankshaft in the vee blocks at journals adjacent to the bushing location.

**SPECIAL TOOLS REQUIRED:**

Part No.	Nomenclature
64872 . . . . .	Puller - Remove and install counterweight bushings
ST-280 . . . . .	Fixture - Ream crankshaft counterweight holes
64874 . . . . .	Reamer - .005 o/s counterweight bushing holes
ST-210 . . . . .	Reamer - .0075 o/s counterweight bushing holes
64875 . . . . .	Reamer - .010 o/s counterweight bushing holes
ST-211 . . . . .	Reamer - .0125 o/s counterweight bushing holes
64876 . . . . .	Reamer - .015 o/s counterweight bushing holes
ST-212 . . . . .	Wedge blocks, parallel - counterweight bushing

**PARTS REQUIRED:**

Part No.	Nomenclature
70256 . . . . .	Bushing - Crankshaft counterweight Std.
70256-P05 . . . . .	Bushing - Crankshaft counterweight .005 o/s
70256-P075 . . . . .	Bushing - Crankshaft counterweight .0075 o/s
70256-P10 . . . . .	Bushing - Crankshaft counterweight .010 o/s
70256-P125 . . . . .	Bushing - Crankshaft counterweight .0125 o/s
70256-P15 . . . . .	Bushing - Crankshaft counterweight .015 o/s
73810 . . . . .	Bushing - Crankshaft counterweight Std.
73810-P05 . . . . .	Bushing - Crankshaft counterweight .005 o/s
73810-P075 . . . . .	Bushing - Crankshaft counterweight .0075 o/s
73810-P10 . . . . .	Bushing - Crankshaft counterweight .010 o/s
73810-P125 . . . . .	Bushing - Crankshaft counterweight .0125 o/s
73810-P15 . . . . .	Bushing - Crankshaft counterweight .015 o/s
74876 . . . . .	Bushing - Crankshaft counterweight Std.
74876-P05 . . . . .	Bushing - Crankshaft counterweight .005 o/s
74876-P075 . . . . .	Bushing - Crankshaft counterweight .0075 o/s
74876-P10 . . . . .	Bushing - Crankshaft counterweight .010 o/s
74876-P125 . . . . .	Bushing - Crankshaft counterweight .0125 o/s
74876-P15 . . . . .	Bushing - Crankshaft counterweight .015 o/s

**NOTE**

See applicable parts catalog for correct bushing part number for installation in particular crankshafts.

NOTE: Revision "B" adds model TIGO-541; additional fixture plug and removes 64873 fixture.

12179, 13623, OS-5084 - These numbers for Avco Lycoming reference only.

# **TEXTRON** Lycoming

Williamsport Plant  
Textron Lycoming/Subsidiary of Textron Inc.  
652 Oliver Street  
Williamsport, PA 17701 U.S.A.

# SERVICE INSTRUCTION

DATE:

April 11, 1988

Service Instruction No. 1143B  
(Supersedes Service Instruction No. 1143A)  
Engineering Aspects are  
FAA Approved

SUBJECT:

PART I - Counterweight Bushing Tooling Update.

PART II - Counterweight Bushing Replacement.

MODELS AFFECTED:

All Textron Lycoming piston aircraft engines with dynamic counterweights employing 3/4 inch I.D. bushings.

TIME OF COMPLIANCE:

During engine overhaul.

Dynamic counterweights are installed on piston engine crankshafts to eliminate vibrations that are caused by torsional frequency changes that occur at different engine speeds and operating conditions. The counterweight is mounted on the crankshaft with two steel rollers that allow the counterweight to move as required to maintain crankshaft balance. Both the counterweight supporting lug of the crankshaft and the counterweight contain hardened steel bushings that are ground to a very smooth and annular finish. If any of these bushings become damaged or worn out of round, the counterweight will become ineffective and cause vibrations that will lead to severe engine damage or failure.

The procedure for inspecting and replacing the hardened steel bushings in a crankshaft is described in the latest revision of Service Instruction No. 1142. This publication describes the procedures and tooling required to inspect and replace the steel bushings installed in a counterweight assembly.

A recent change in counterweight manufacturing

procedures has affected the finished dimensions of some of the counterweights that were included in previous editions of this publication. This change in the finished dimensions of the counterweight requires changes in some of the special counterweight bushing tooling listed in the special tools section of this publication. Textron Lycoming Service Letter No. L217 briefly describes these tooling changes and offers update kits on a limited time special price basis. This publication will completely describe the tooling changes and include the necessary illustrations and dimensions of the detail parts required to update each tool.

To control the inventory of new and superseded counterweights, all counterweights that are machined to the new specifications have been issued new part numbers. The table with Figure 6 of this publication matches new counterweight part numbers with the respective superseded counterweight part number. All new counterweights are completely interchangeable with the respective superseded counterweight.

### PART I. COUNTERWEIGHT BUSHING TOOLING UPDATE

Spacers are used with the P/N 64878 fixture to align the bushing bore of the counterweight with the center of the fixture. The "A" dimension from Figure 6 which is the distance from the center line of the counterweight bushing bore to the flat edge of the spacer. As can be seen in the table with Figure 6, the counterweights that are machined to the new specifications do not have the same "A" dimension as the counterweights that they replace. Owners of P/N 64878 fixtures who do not wish to purchase the P/N 64878-50 update kit can make the spacers required to align these new counterweights from hardened and ground steel using the dimensions

shown in Figure 1. Stamp or vibra-peen each spacer with the correct part number on a surface that will not interfere with counterweight alignment.

A new set-master is required for the P/N ST-94 gaging fixture. Figure 2 illustrates the new set master and finish grinding dimension. Stamp or vibra-peen the step height dimension, on each step, as shown in Figure 2. This dimension is the distance from the center line of the set master to the surface of the step which can be matched with an "A" dimension in the table with Figure 6. This tool is made from oil hardened tool steel and ground to the finish dimensions.

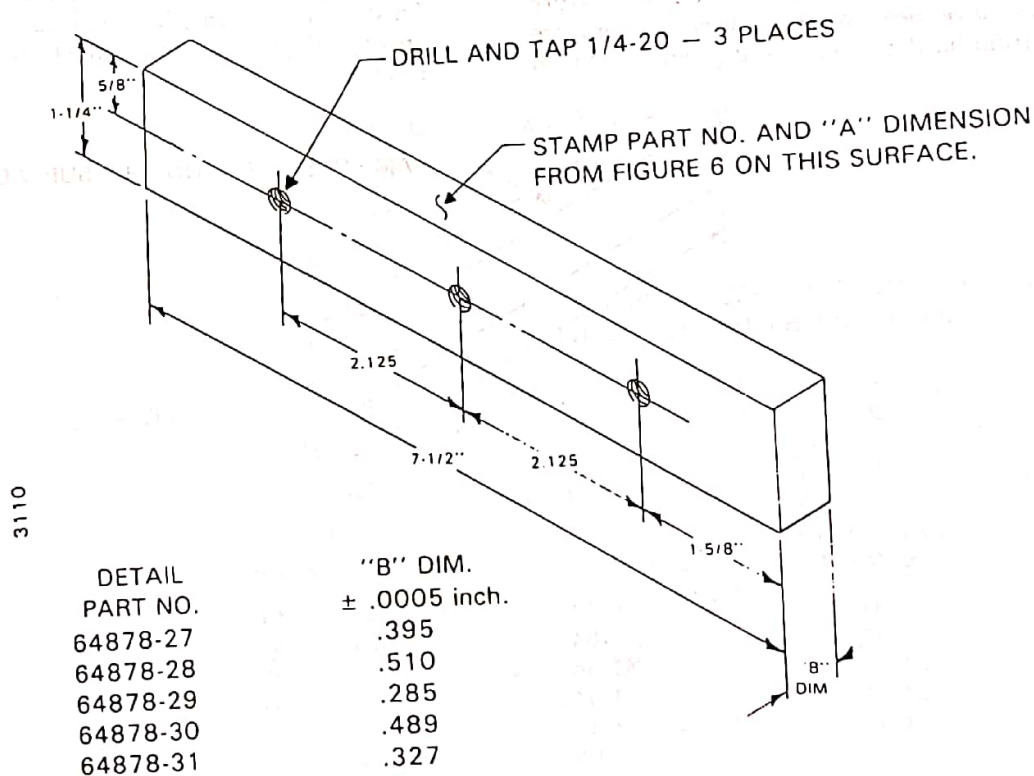


Figure 1. Dimensions of New Spacers for P/N 64878 Fixture

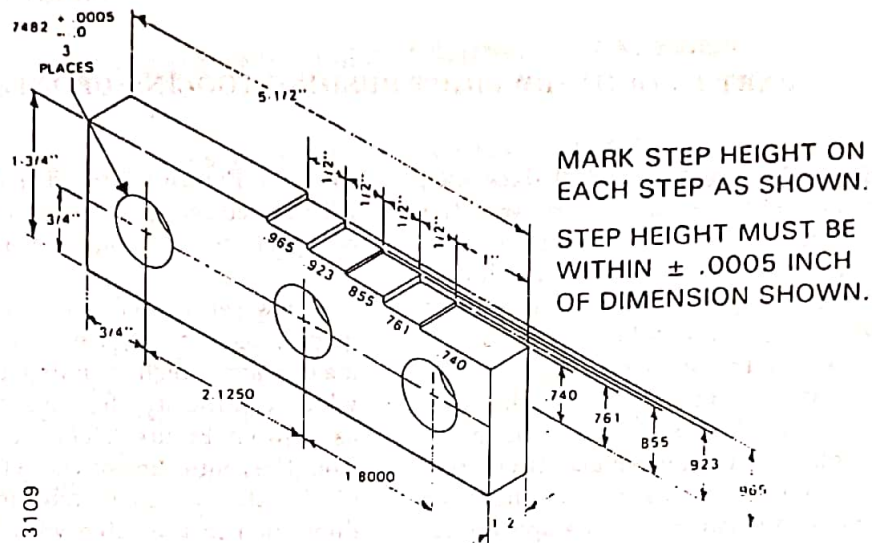
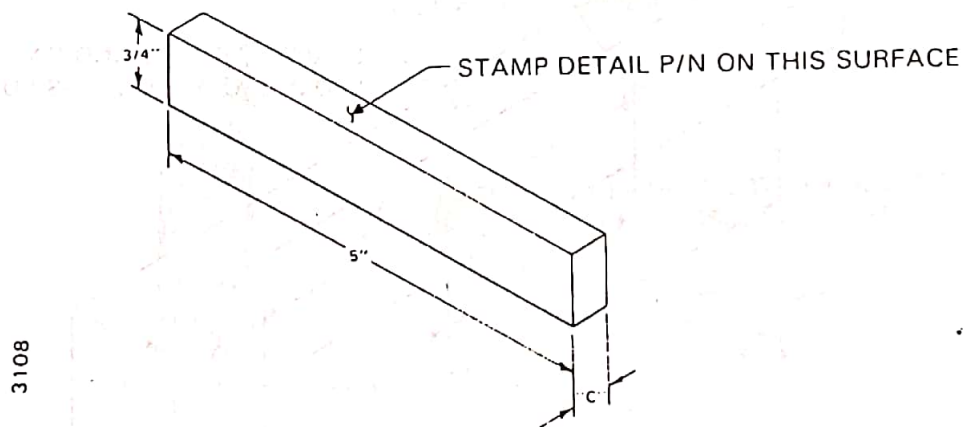


Figure 2. Dimensions of New Set Master P/N ST-94-10

To insure the counterweight is properly and squarely mounted to the P/N ST-91, fixture spacers have been added. These spacers are made from hardened steel and ground to finish

dimensions. Refer to Figure 3 for part numbers, finished dimensions, and application of these spacers. Figures 9 and 10 illustrate use of the spacers.



DETAIL PART NUMBER	DIMENSION "C"	USE WITH COUNTERWEIGHT P/N
ST-91-7	5/64	73643, 73644, 72534, 73812
ST-91-8	11/64	72801
ST-91-9	13/64	71904, 71905, LW-19210
ST-91-10	7/64	LW-19225, LW-19226, 75637
ST-91-11	7/32	LW-19227
ST-91-12	9/64	LW-19211
ST-91-13	1/32	LW-19212
ST-91-14	1/4	75636, 76044, 78988

Figure 3. Dimensions of New Spacers for ST-91 Gage

**PART II. COUNTERWEIGHT BUSHING REPLACEMENT**

The procedure for replacing counterweight bushings is as follows:

1. Counterweight Bushing Inspection - Wear in the counterweight bushings is usually evident as out-of-round on the inside diameter. Check each bushing with the P/N ST-73 bore gage. The diameter should be between 0.7485 and 0.7505 inch and the out-of-round should not exceed 0.0005 inch. The P/N ST-73 gage can be set with a micrometer. If the diameter of any bushing is oversize or out-of-round all of the bushings in the counterweight must be replaced.

2. Counterweight Bushing Removal - The bushings can be pressed from the counterweight with an arbor press and special driver P/N ST-92. Refer to Figure 4. Insure the counterweight lays flat

and square with the arbor press spindle. Press both bushings from one side of the counterweight, turn the counterweight over and press out the remaining two bushings.

3. Counterweight Bushing Bore Inspection -Visually examine the bushing bore. The bore must be smooth and free of scratches, tool marks, galling or other surface damage. Any evidence of damage is reason to scrap the counterweight. Measure the bushing bore diameter; bushing bores will be found to be either .9369/.9377 or .9384/.9392. Counterweights having the larger diameter bore are marked with the letter "B" near each bore. Refer to the "Parts Required" section of this publication. Using the magnetic particle method check the counterweight for cracks. Any indication of cracks is reason to reject the counterweight.

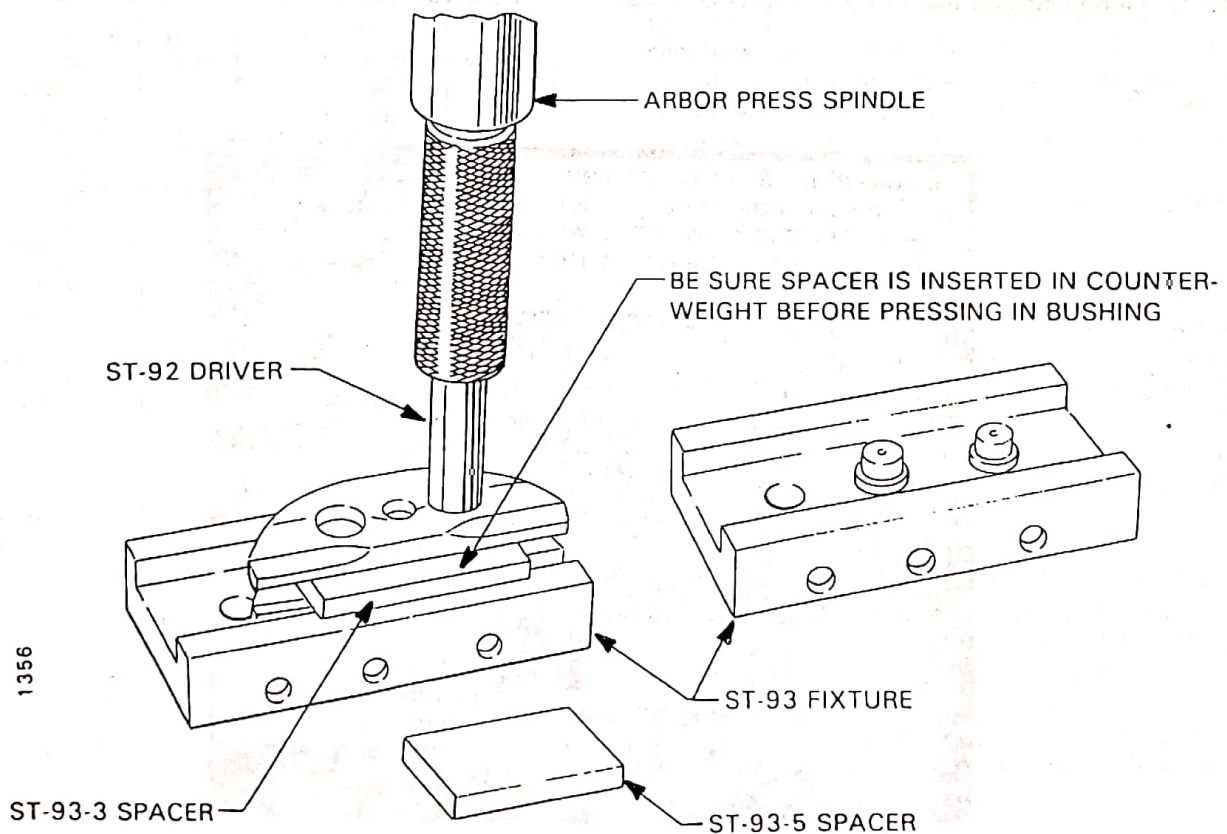


Figure 4. Installing Counterweight Bushing Using Fixture ST-93 and Driver ST-92



**CAUTION**

It is not permissible under any circumstance to attempt to enlarge the bushing bore in a counterweight. Eventual engine damage will result from any operation that will reduce the snap ring groove depth in the counterweight bushing bores.

**4. Counterweight Bushing Installation -**

**CAUTION**

The spacers provided with fixture P/N ST-93 are used to control the depth that the bushings are driven into the counterweight. The bushing must be flush to .002 inch from protruding into the slot of the counterweight.

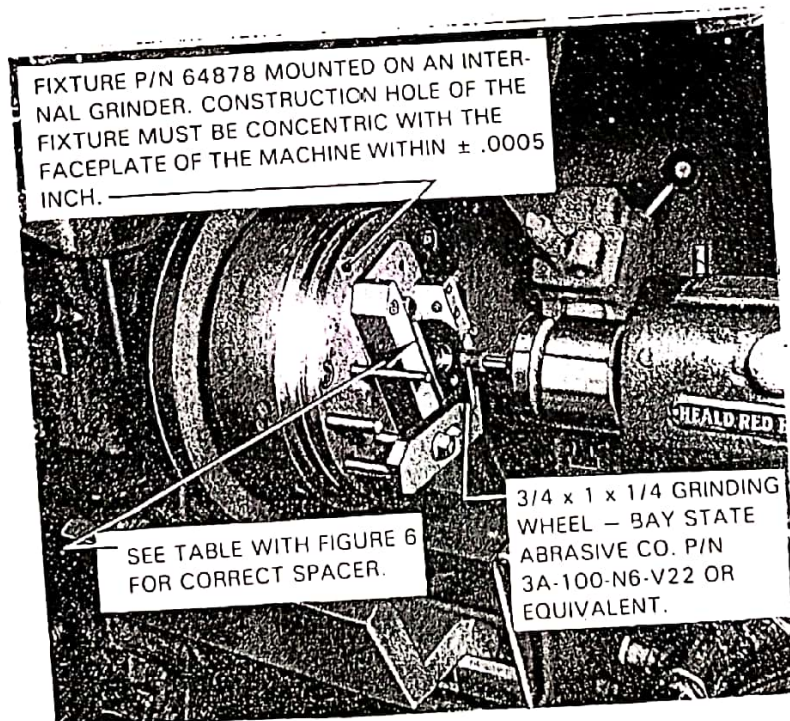
Measure the center to center distance of the bushing bore in the counterweight. Select the two holes in the P/N ST-93 fixture that correspond with this measurement and install the two P/N ST-93-2

locating pins in these holes. Refer to Figure 4. Install the correct spacer either ST-93-3 or ST-93-5 in the counterweight and position it on the P/N ST-93 fixture with the P/N ST-93-2 pins located in the bushing bores. Using an arbor press and the P/N ST-92 driver press the new bushings in place. Turn the counterweight over and install new bushings in the opposite side of the counterweight in the same manner.

5. Finish grinding of the counterweight bushing I.D. — grinding the inside diameter of the new bushing to the correct size and surface finish is the most important step in the rebushing procedure. Do not attempt to substitute any other process for the one herein described.

**NOTE**

The fixture P/N 64878 is sold without any mounting or locating holes drilled in its base. This allows the fixture to be mounted on any suitable machine without interference from pre-drilled holes.



1355

Figure 5. Counterweight and 64878 Fixture Assembled on an Internal Grinding Machine

A. Secure the P/N 64878 fixture on the faceplate of an internal grinding machine. Insure the 1-1/8 inch diameter construction hole in the center of the fixture is concentric with the center of the faceplate. Concentricity must be held to within  $\pm .0005$  inch total indicated reading. Refer to Figure 5.

NOTE

In the following table the new superseding counterweight part number is listed in the same block with the part number of the counterweight that it replaces. The new number is the lower number in each block.

B. Select and install the correct spacer on the fixture and secure it to the alignment bar of the fixture with the three 1/4-20 socket head screws. The detail part number is stamped on the spacer. Refer to the table with Figure 6 for the correct spacer to use with each counterweight.

Counterweight Part No.	Spacer Detail Part No.	Dimensions		Weight (Lbs.) Minimum
		A	B $\pm .002$	
71904	12	.825	.425	1.796
LW-19225	27	.855	.395	1.796
71905	12	.825	.425	1.752
LW-19226	27	.855	.395	1.756
72801	10	.715	.535	1.846
LW-19227	28	.740	.510	1.846
72534	13	.950	.300	2.246
LW-19213	29	.965	.285	2.246
73643	15	.805	.445	2.212
LW-19211	12	.825	.425	2.212
73644	11	.741	.509	2.166
LW-19210	30	.761	.489	2.166
73812	16	.908	.342	2.266
LW-19212	31	.923	.327	2.266
74901	20	.720	.530	1.470
75636	20	.720	.530	1.600
75637	17	.875	.375	1.678
76044	18	.730	.520	1.810
78988	18	.730	.520	1.600

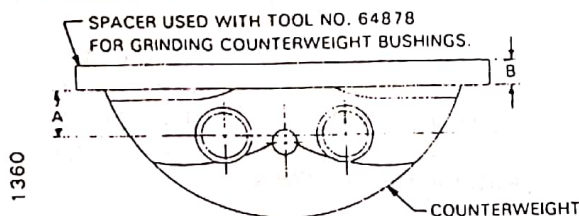


Figure 6. Identification of Dimension "A" and "B"

NOTE

Locating pin P/N 64878-2 is used to align the counterweight through an unfinished bushing. P/N 64878-6 locating pin is larger and is used to align the fixture through bushings that have been ground to size. These locating pins are off-set to accommodate the two different center to center bushing bore distances that will be found on counterweights.

C. Install and rotate the smaller pin P/N 64878-2 to the position required to place one set of bushings on the center line of the fixture. Lock the locating pin in this position by tightening the 10-32 socket head screw that secures the P/N 64878-23 locating clamp.

D. Install the counterweight on the fixture as shown in Figure 5. Insure the counterweight and fixture mating surfaces are clean. Tighten the applicable knurled head screw to secure the counterweight against the spacer. If the threaded end of the screw attempts to enter the slot in the counterweight, install the metal block P/N 64878-21 on the end of the screw. Adjust the fibre block of the hold down clamp over the center of the counterweight and tighten the socket head screw to secure the counterweight to the fixture.

E. Grind the inside diameter of both bushings to 0.7485/0.7505 inch diameter. Surface finish of the finished bushing must be 15 micro inches. The 3/4 x 1 x 1/4 grinding wheel shown in Figure 5 is satisfactory for this purpose. It can be purchased from Bay State Division, Dresser Industries Inc., 12 Union Street, Westboro, Mass. 01581. Order P/N 3A-100-N6-V22.

F. Remove the counterweight from the fixture and remove the small locating pin P/N 64878-2. Install the larger locating pin P/N 64878-6 in the opposite hole. Rotate the pin to align the unground bushings with the center line of the fixture. Secure the pin and counterweight as described in steps C and D. Proceed to grind the remaining bushing as described in step E.

6. Inspection of Finished Counterweight Bushings -

A. Inspect the newly ground counterweight bushings using the magnetic particle method to determine if grinding cracks are present in the finished bushing. Replace any bushings that are found to be cracked.

B. Fixture P/N ST-94 is used to check the finished bushing bores for correct location. To set up the fixture, install the P/N ST-94-2 relieved locating pin in the center hole with the locating diameters in the vertical position as shown in Figure 7. Install the P/N ST-94-3 solid locating pin in the outside hole that has the same center to center distance as the counterweight bushing bores. The P/N ST-94-2 pin can remain permanently installed in the center hole with the P/N ST-94-3 being moved as required to adapt to the counterweight being inspected. If the pins do not fit into the newly ground bushing, it may be concluded that the bores are mislocated and the bushings must be replaced and reground again. If the counterweight fits, proceed to step C.

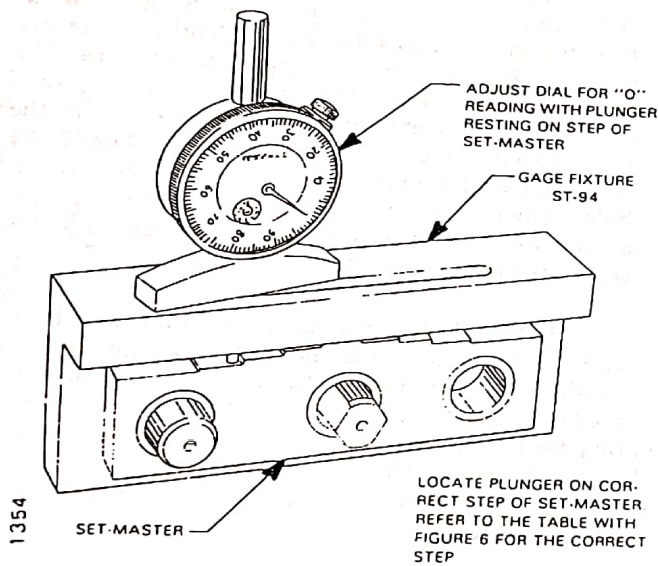


Figure 7. Depth Gage Adjusted with Set-Master Preparatory to Checking Line Position of Counterweight Bushings

C. Also check the distance from the center of the bushing bore to the flat edge of the counterweight with the fixture P/N ST-94 and

either P/N ST-94-5 or ST-94-10 set-master in the following manner. Place the set-master over the locating pins of the fixture (refer to Figure 7), preload the depth gage approximately .010 inch, set the dial gage to "0" with the plunger resting on the appropriate step of the set-master. The steps are identified by the "A" dimensions from the table with Figure 6. Remove the set-master and install the counterweight over the pins. Set the depth indicator thru the fixture and onto the counterweight. Refer to Figure 8. No more than  $\pm .004$  inch difference between this measurement and the measurement obtained with the set-master is allowed.

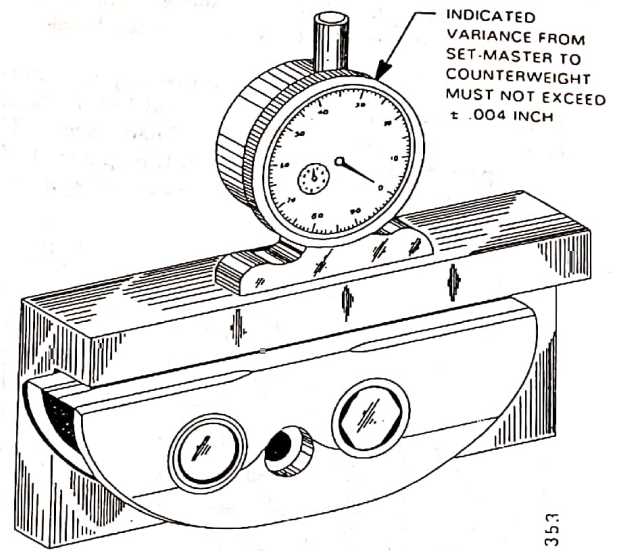


Figure 8. Checking Center Line Position of Counterweight Using Gage Fixture ST-94

NOTE

During the following step (D) if erratic or excessively "out of limits" measurements are observed, remove the counterweight and insert it on the P/N ST-91 fixture so that the opposite inner face of the counterweight is located against the fixture. Then repeat the measurements. Only one of the inner faces of the counterweight is square with the bushing bores.

D. Select the proper spacer either P/N ST-91-7, ST-91-8, ST-91-9, ST-91-10, ST-91-11, ST-91-12, ST-91-13, or ST-91-14 and install it and the counterweight on the fixture. Refer to Figure 3 for spacer application. Press the counterweight squarely against the spacer and tighten the knurled screw to secure the counterweight firmly against the locating surface of the fixture. Install the gaging arbors P/N ST-91-3 through each of the finished bushings as illustrated in Figure 6. Place the fixture on a surface plate and indicate both ends of each arbor as illustrated in Figure 9. Turn the fixture over to rest on its adjacent side and again indicate both ends of the gaging arbors. See Figure 10. The difference in measurements from one end of the gaging arbor to the other must not exceed .003 inch per inch in any instance.

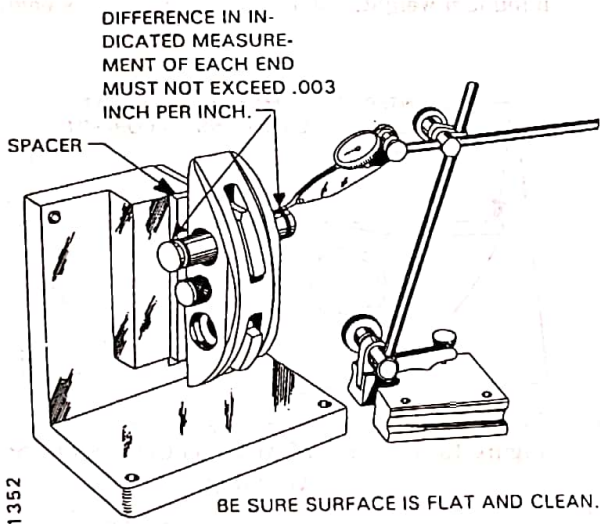


Figure 9. Checking Parallel and Squareness of Counterweight Bushings with Gage Fixture ST-91 - Vertical Position

7. Counterweight Balance Procedure - The center of gravity of the counterweight is located at the center of the 1/4 inch or 3/8 inch diameter drilled hole that is located between the bushing bores. The balance of the counterweight in relation to its center of gravity is quite important and may have been changed when the new bushings were installed. Check the balance of the counterweight in the following manner.

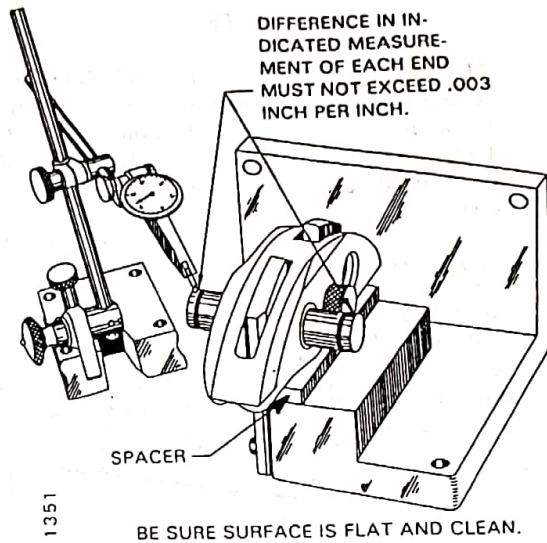


Figure 10. Checking Parallel and Squareness of Counterweight Bushings with Gage Fixture ST-91 - Horizontal Position

A. Install the counterweight on the correct P/N ST-96 balancing arbor, either the P/N ST-96-1 for the 3/8 inch hole or P/N ST-96-2 for the 1/4 inch hole, and place the arbor on a pair of balancing ways. Insure each blade of the ways engages the arbor at a point not more than 1-1/2" from each end.

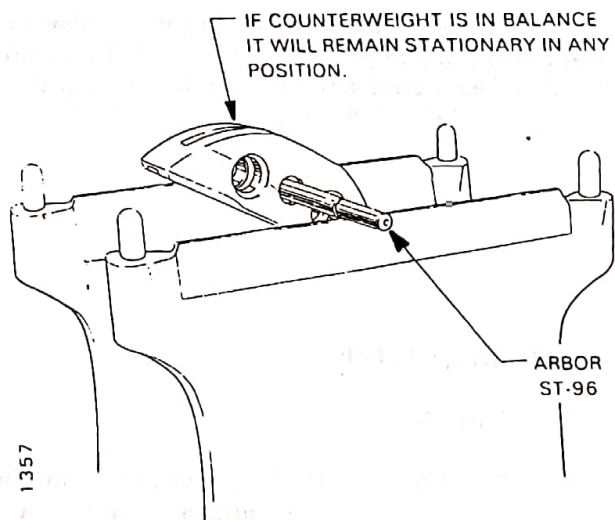


Figure 11. Counterweight Mounted on ST-96 Arbor for Balancing

**NOTE**

The center of both of the P/N ST-96 arbors is tapered to compensate for slight variations in the diameter of the hole. The first 1-1/2 inches of each end of the arbor is carefully ground to insure concentric diameters.

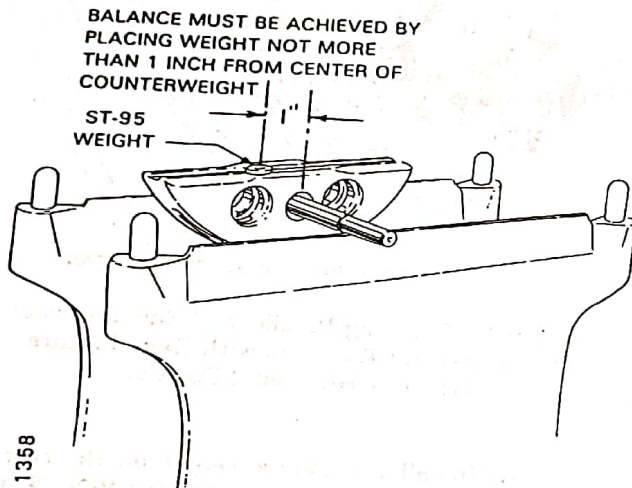


Figure 12. Counterweight Balanced by Weight ST-95 Placed Within One Inch from Center

B. If the counterweight is in perfect balance it will remain in any position it is placed. See Figure 11. If it has a tendency to move, try to keep it in

balance by placing the center of the P/N ST-95 weight not more than 1" from the center of the arbor. See Figure 12. If the counterweight can be brought into balance with the addition of this weight the balance can be considered satisfactory.

C. If the counterweight cannot be brought into balance by the addition of the P/N ST-95 weight, carefully grind the heavy end at the locations shown in Figure 13.

8. Counterweight Weight Limitations - A weight check is not necessary unless the counterweight has been ground to correct an improper balance condition. If the counterweight has been ground it must meet the minimum weight requirements shown in the table with Figure 6. Do not install any counterweight weighing less than the minimum weight, listed in the table, in any engine.

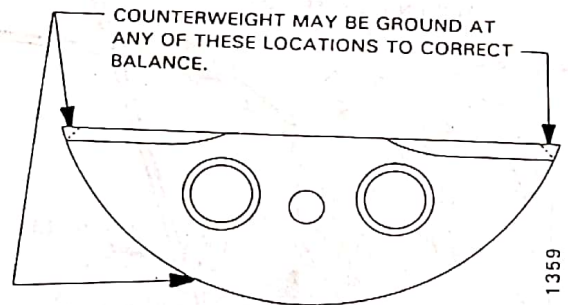


Figure 13. Location of Areas on Counterweight for Grinding

**PARTS REQUIRED:**

Part No.	Nomenclature
71903-A	Bushing, dynamic counterweight (Identification letter "A" .9395/.9390 OD)
71903-B	Bushing, dynamic counterweight (Identification letter "B" .9410/.9405 OD)

SERVICE INSTRUCTION

**SPECIAL TOOLS REQUIRED:**

Tool No.	Nomenclature
ST-73	Dial bore gage (measure .7485/.7505 inside diameter of bushing)
ST-91	Squareness gage (check parallel and squareness of finished bushing bores)
ST-92	Driver (remove and install bushings)
ST-93	Assembly fixture (install bushings in counterweight)
ST-94	Location Gage (check hole location after grinding)
ST-95	Weight, balance (.004 pound - check balance of counterweight after rebushing)
ST-96	Balancing arbor (check balance of counterweight after rebushing)
64878	Grinding fixture (hold counterweight during bushing grinding)

Service Instruction No. 1143B

**NOTE:** Revision "B" changes text, adds tooling update, adds new counterweight part numbers.

22254, 22734, 22734-A, 22734-B — These numbers for Textron Lycoming reference only.

**TEXTRON** Lycoming

Reciprocating Engine Division/  
Subsidiary of Textron Inc.  
652 Oliver Street  
Williamsport, PA 17701 U.S.A.

# SERVICE INSTRUCTION

May 28, 1992

Supplement No. 2

for

Service Instruction No. 1143B

This publication replaces Supplement No. 1 for Service Instruction No. 1143B in its entirety. Remove and discard Supplement No. 1.

A recent revision to P/N's LW-19225, LW-19226 and LW-19227 counterweight assemblies changes the distance from the centerline of the counterweight bushing bore to the flat edge of the counterweight on applicable counterweights that are identified with the letter "E", as a suffix to the counterweight part number. (Refer to Dimension "A", in the revised Figure 6, included with this Supplement.) Applicable counterweights that were placed in service, prior to distribution of this Supplement, that are not identified with a letter suffix in the part number will have to be measured to determine the "A" dimension. After the "A" dimension has been determined, vibropeen the correct identification letter on the counterweight as a suffix to the part number.

Although applicable counterweights that are identified with the letter "E" suffix in the part number, fit and perform perfectly on the lobes of crankshafts installed in direct drive engines it is impossible to assemble them on crankshafts that are installed in reduction gear equipped engines. For this reason production of counterweights with the relocated bushing bores has been discontinued and all applicable counterweights will be manufactured to the original "A" dimension which

is listed with the part number that contains the "D" suffix in the revised Figure 6. New counterweights that are manufactured to the original "A" dimension will be identified with the letter "F" or a subsequent letter (G, H, etc.) as a suffix to the part number.

## CAUTION

TO INSURE PROPER COUNTERWEIGHT OPERATION DO NOT ASSEMBLE A P/N LW-19225E, LW-19226E OR LW-19227E AT ANY DESIGNATED LOCATION ON THE CRANKSHAFT OF A REDUCTION GEAR EQUIPPED ENGINE. USE THESE COUNTERWEIGHTS ON DIRECT DRIVE CRANKSHAFTS ONLY. APPLICABLE COUNTERWEIGHTS THAT ARE IDENTIFIED WITH REVISION LETTERS D, F OR SUBSEQUENT LETTERS CAN BE USED AT ANY DESIGNATED LOCATION. REFER TO THE LATEST REVISION TO SERVICE INSTRUCTION NO. 1012 FOR COUNTERWEIGHT APPLICATION.

Counterweight Part No.	Spacer Detail Part No.	Dimensions		Weight (Lbs.) Minimum
		A	B ± .002	
71904	12	.825	.425	1.796
LW-19225D	27	.855	.395	1.796
LW-19225E	17	.875	.375	1.796
71905	12	.825	.425	1.752
LW-19226D	27	.855	.395	1.756
LW-19226E	17	.875	.375	1.756
72801	10	.715	.535	1.846
LW-19227D	28	.740	.510	1.846
LW-19227E*	30	.760	.490	1.846
72534	13	.950	.300	2.246
LW-19213	29	.965	.285	2.246
73643	15	.805	.445	2.212
LW-19211	12	.825	.425	2.212
73644	11	.741	.509	2.166
LW-19210	30	.761	.489	2.166
73812	16	.908	.342	2.266
LW-19212	31	.923	.327	2.266
74901	20	.720	.530	1.470
75636	20	.720	.530	1.600
75637	17	.875	.375	1.678
76044	18	.730	.520	1.810
78988	18	.730	.520	1.600

\* Use spacer No. 30 and .001 inch thick shim stock to achieve .490 spacer thickness when grinding the bushings in a P/N LW-19227E counterweight.

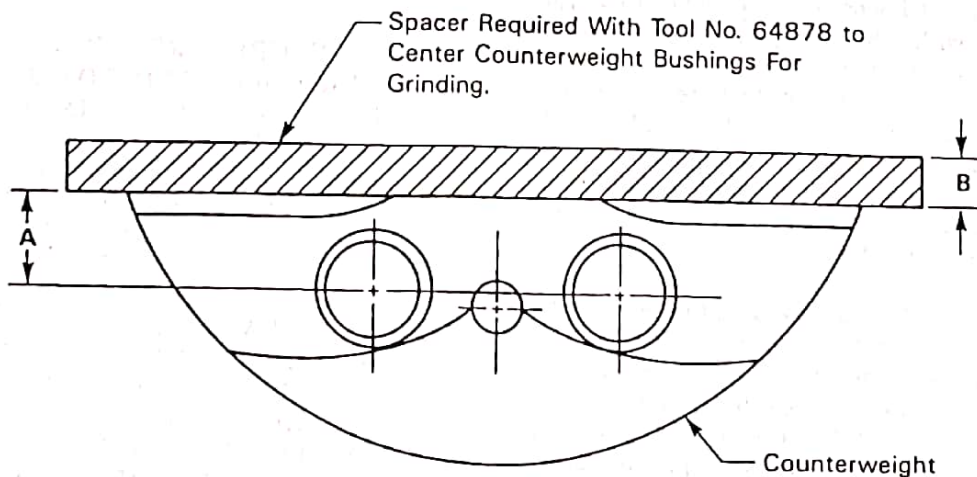


Figure 6. (Revised) Identification of Dimension "A" and "B"



**TOOL DATA:**

There is no change to the tooling update kits offered in Service Letter No. L217; however, as can be seen by the dimensional changes listed in the revised Figure 6, different tools and set-up procedures are required with counterweights that are identified with the letter "E" as a suffix to the part number.

These changes are:

1. Use spacers as listed in the revised Figure 6.

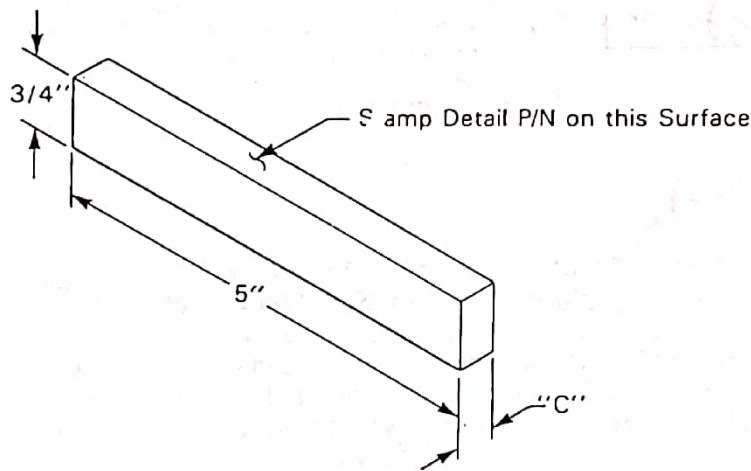
**NOTE**

Use .001 inch thick shim stock between the P/N 64878 fixture and the P/N 64878-30

spacer to align the P/N LW-19227E counterweight.

2. When checking the distance from the centerline of the bushing bore to the flat edge of the P/N LW-19227E counterweight with the P/N ST-94 fixture, use the .0761 step of the P/N ST-94-10 set master, set the preloaded dial indicator to + .001 inch to compensate for the .001 difference between the counterweight measurement and the set master.

3. Figure 3 is revised and included with this Supplement, to show spacer application for the revised counterweights. Figure 3A is added to illustrate an undercut to the P/N ST-91-6 knurled screw. This undercut is required to allow use of existing spacers with the revised counterweights.



DETAIL PART NUMBER	DIMENSION "C"	USE WITH COUNTERWEIGHT P/N
ST-91-7	$\frac{5}{64}$	73643, 73644, 72534, 73812
ST-91-8	$\frac{11}{64}$	72801, LW-19225E, LW-19226E
ST-91-9	$\frac{13}{64}$	71904, 71905, LW-19210
ST-91-10	$\frac{7}{64}$	LW-19225D, LW-19226D, 75637
ST-91-11	$\frac{7}{32}$	LW-19227D
ST-91-12	$\frac{9}{64}$	LW-19211, LW-19227E
ST-91-13	$\frac{1}{32}$	LW-19212
ST-91-14	$\frac{1}{4}$	75636, 76044, 78988

Figure 3. (Revised) Dimensions of New Spacers for ST-91 Gage

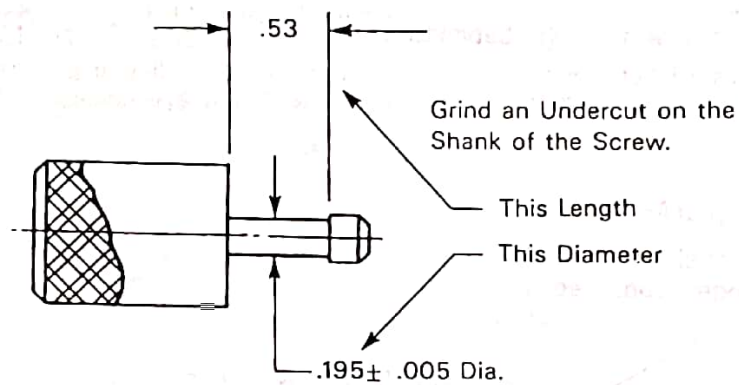


Figure 3A. Modifications to P/N ST-91-6 Knurled Screw

22971, 22971-A — These numbers for Textron Lycoming reference only.

United States of America  
Department of Transportation — Federal Aviation Administration  
**Supplemental Type Certificate**

Number SE3552NM

This certificate, issued to Johnston Aircraft Service, Inc.

certifies that the change in the type design for the following product with the limitations and conditions therefor as specified hereon meets the airworthiness requirements of Part 13 of the Civil Air Regulations, effective June 15, 1956, as amended by 13-1 and 13-2.

Original Product — Type Certificate Number: E-295  
Make: Lycoming  
Model: O-540-A1A, -A1A5, -A1B5, -A1C5, -A1D5

Description of Type Design Change: Modification of crankshaft damper configuration in accordance with FAA sealed Johnston Aircraft Service, Inc. Report CPR-2 "NC" dated December 10, 1986, or later FAA approved revision.

Limitations and Conditions: The approval of this change in type design applies to the basic engine of the specified models that are otherwise unmodified. This approval should not be extended to other specific engines of these models on which other previously approved modifications are incorporated, unless it is determined that the interrelationship between this change and any of those other previously approved modifications will introduce no adverse effect upon the airworthiness of that engine.

This certificate and the supporting data which is the basis for approval shall remain in effect until surrendered, suspended, revoked, or a termination date is otherwise established by the Administrator of the Federal Aviation Administration.

Date of application: November 25, 1986

Date issued:

Date of issuance: December 10, 1986

Date amended:



By direction of the Administrator

*Marvin F. Kimmelberg*  
Manager, Western Aircraft  
Certification Office

(Title)

Any alteration of this certificate is punishable by a fine of not exceeding \$1,000, or imprisonment not exceeding 3 years, or both.

This certificate may be transferred in accordance with FAR 21.47.

# TEXTRON Lycoming

652 Oliver Street  
Williamsport, PA 17701 U.S.A.  
717/323-6181

# SERVICE LETTER

Service Letter No. L235A  
(Supersedes Service Letter No. L235)  
June 29, 1998

**TO:** All Owners and Operators of Textron Lycoming O-540-A1A5, -A1B5, -A1C5, -A1D5 and IO-540-C1B5 model engines.

**SUBJECT:** Installation of Hartzell Compact Aluminum Hub Propeller on Comanche 250 Aircraft.

Textron Lycoming has been notified that some owners of the Comanche 250 aircraft would like to install the Hartzell compact aluminum hub propeller. This propeller is only compatible with the following crankshaft counterweight and roller configuration.

Counterweight	72801 or LW-19227
No. 5 Roller	72965
No. 6 Roller	72797

The engine models which incorporate this counterweight system are the O-540-A4A5, -A4B5, -A4C5, -A4D5 and IO-540-C4B5 model engines.

JOHNSTON AIRCRAFT SERVICE, INC.

P.O. BOX 1457

TULARE, CALIFORNIA 93275

JOHNSTON AIRCRAFT SERVICE, INC. REPORT CPR-2

ENTITLED

Technical Details for Changing the Lycoming O-540 A1A, A1A5, A1B5, A1C5, A1D5 and Lycoming IO-540 C1B5 to be eligible for the Hartzell Compact Propeller, HC-C2YK-1BF/F8477D-5R.

F.A.A. APPROVED PER S.T.C. NO. SE 3552NM  
SE 3553NM

Date: DEC 10 1986

Page 1 of 6 Pages

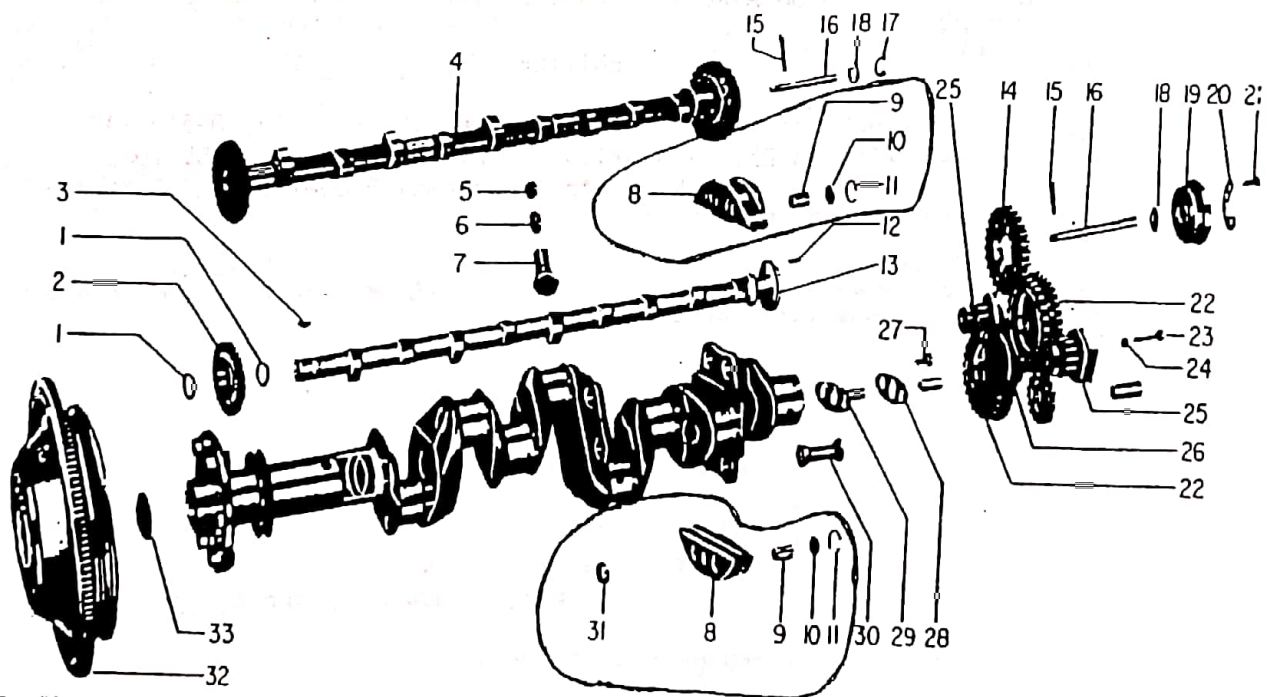
CYLINDER REMOVAL

1. Remove Left Rear (#6) Cylinder and Piston Assembly from Engine using instructions contained in Lycoming Overhaul Manual for Direct Drive Engines, P/N 60294-7. Leave the Piston and Rings inside the Cylinder with only enough Piston showing for access to the Piston Pin.
2. You now have access to the Counterweights through the # 6 Cylinder hole in the Crankcase.

COUNTERWEIGHT REMOVAL

1. Remove the two (2) Lycoming Counterweights, P/N 71904, and (2) rollers, P/N 70416 and (2) P/N 72022, merely by removing the retaining rings, ref. 11, after which the Washers, ref. 10, Rollers, ref. 9, and Counterweights, ref. 8, may be detached from the Crankshaft Lug.
2. After removing 71904 Counterweights and prior to installing 72801 Counterweights, dimensionally check bushings in Crankshaft Counterweight Cheeks. Any bushings not meeting New Lycoming specifications must be replaced per latest version of Lycoming Service Instruction 1142.

Use Figure 1 (Typical Crankshaft and Related Parts) as shown below to aid in Counterweight Removal and Installation.



REF. #'s

- |                             |                            |  |
|-----------------------------|----------------------------|--|
| 1. Retaining Rings          | 12. Stepped Dowel          | 23. Screw                                    |
| 2. Camshaft Gov. Drive Gear | 13. Camshaft               | 24. Washer                                   |
| 3. Woodruff Key             | 14. Camshaft Gear          | 25. Magneto Drive Gear                       |
| 4. Camshaft (Integral Gear) | 15. Pin                    | 26. Crankshaft Gear                          |
| 5. Tappet Socket            | 16. Tachometer Shaft       | 27. Hex Head Screw                           |
| 6. Tappet Plunger Assy.     | 17. Retaining Ring         | 28. Lockplate                                |
| 7. Tappet Body              | 18. Spacer                 | 29. Idler Gear Shaft                         |
| 8. Counterweight            | 19. Breather Slinger       | 30. Sludge Tube (not used on current models) |
| 9. Roller                   | 20. Lockplate              | 31. Crankshaft Counterweight Bushing         |
| 10. Washer                  | 21. Hex Head Screw         | 32. Ring Gear Support Assy.                  |
| 11. Retaining Ring          | 22. Crankshaft Idler Gears | 33. Expansion Plug                           |

COUNTERWEIGHT INSTALLATION

- Per Lycoming Service Instruction 1012 (Latest Version), install New 71907 Washers, ref. 10, and New LW14820 (71906) Retaining Rings, ref. 11, on one side of New Style Rebuilt or New Counterweight Assembly, P/N 72801, ref. 8, and place the Counterweight on its proper lug on the Crankshaft per Figure 4 Service Instruction 1012 (latest version). Insert (2) New Rollers, P/N 72797, ref. 9, and secure assembly by installing New 71907 Washers and LW 14820 (71906) Circlips on the other side of the Counterweight. All the Bushings, P/N 71903, in the Counterweights must be New and Finished per Lycoming Service Instruction 1143 (latest version). Circlips are inserted with sharp edge outward (see Figure 2). Two gages will check all circlips in any Avco Lycoming Counterweight. See table on Figure 3.

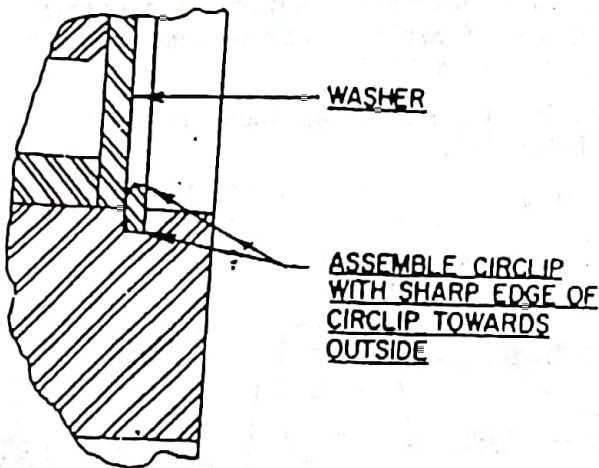


Figure 2  
Assembly of Circlips in Counterweight

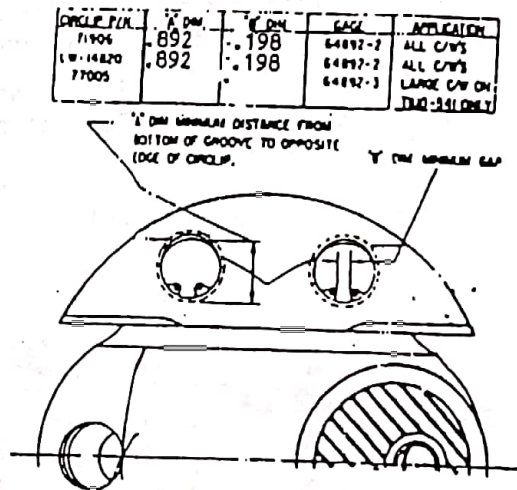


Figure 3  
Diagram of Assembled Counterweight  
Showing Dimensions for Checking Circlip

CAUTION

Be sure the correct rollers are installed in identical pairs only. Under no circumstances are two different rollers to be installed on any one Counterweight installation. Check roller part number CAREFULLY.

Insert one end of the Counterweight Retaining Gap Gage, Avco Lycoming P/N 64892-2 or -3 between the ends of the Counterweight Retaining Ring; see Figure 3 for gap dimensions and gage selection. Be sure the gage is resting on the bottom of the groove. The gage must pass between the ends of the Retaining Ring and when rocked back and forth, must clear the inside edge of the top of the Retaining Rings. If the gage does not pass freely between the ends and under the top of the ring, the ring is not properly seated. Be sure all rings are properly seated.

COUNTERWEIGHT INSTALLATION CONTINUED.

NOTE:

A recent revision to Lycoming Part Number 64892 gage set eliminated the 64892-1 gage from the set. The 64892-2 that is to be used for checking both the 71906 and LW14820 Circlips, must be modified to the specifications listed in the table section of figure 3 or a new gage set can be purchased through Avco Lycoming Williamsport Division.

SPECIAL TOOLS REQUIRED.

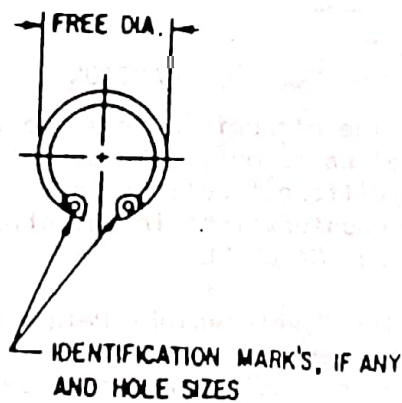
Avco Lycoming Part Number 64892 Gauge Set, now consists of:

- 64892-2 Gauge
- 64892-3 Gauge

Repeat the same procedures with the second New Style Counterweight, Part Number 72801, but use two (2) New Rollers, Part Number 72965, in the second assembly.

CIRCLIP IDENTIFICATION

FREE DIA.	HOLE SIZE	STAMPED MARK	P/N
1.056	.072/.060	93	71906
1.056	.093/.076	N/A	LW-14820
1.344	.090/.076	N/A	77005



**Figure 4 Circlip Identification**



COUNTERWEIGHT INSTALLATION

- Per Lycoming Service Instruction 1012 (Latest Version), install New 71907 Washers, ref. 10, and New LW14820 (71906) Retaining Rings, ref. 11, on one side of New Style Rebuilt or New Counterweight Assembly, P/N 72801, ref. 8, and place the Counterweight on its proper lug on the Crankshaft per Figure 4 Service Instruction 1012 (latest version). Insert (2) New Rollers, P/N 72797, ref. 9, and secure assembly by installing New 71907 Washers and LW 14820 (71906) Circlips on the other side of the Counterweight. All the Bushings, P/N 71903, in the Counterweights must be New and Finished per Lycoming Service Instruction 1143 (latest version). Circlips are inserted with sharp edge outward (see Figure 2). Two gages will check all circlips in any Avco Lycoming Counterweight. See table on Figure 3.

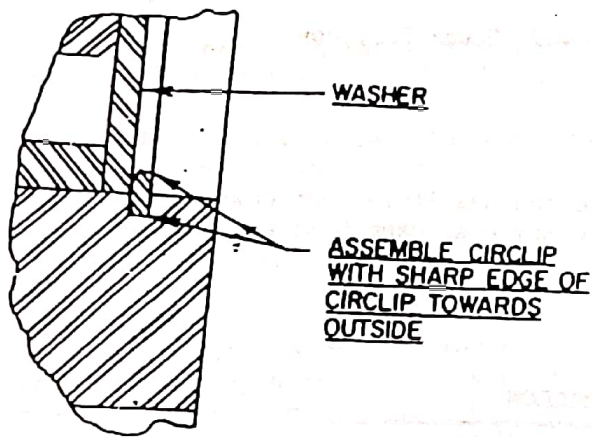


Figure 2  
Assembly of Circlips in Counterweight

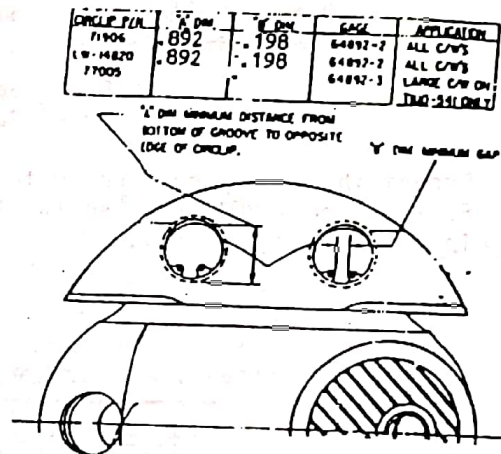


Figure 3  
Diagram of Assembled Counterweight Showing Dimensions for Checking Circlip

CAUTION

Be sure the correct rollers are installed in identical pairs only. Under no circumstances are two different rollers to be installed on any one Counterweight installation. Check roller part number CAREFULLY.

Insert one end of the Counterweight Retaining Gap Gage, Avco Lycoming P/N 64892-2 or -3 between the ends of the Counterweight Retaining Ring; see Figure 3 for gap dimensions and gage selection. Be sure the gage is resting on the bottom of the groove. The gage must pass between the ends of the Retaining Ring and when rocked back and forth, must clear the inside edge of the top of the Retaining Rings. If the gage does not pass freely between the ends and under the top of the ring, the ring is not properly seated. Be sure all rings are properly seated.

COUNTERWEIGHT INSTALLATION CONTINUED.

NOTE:

A recent revision to Lycoming Part Number 64892 gage set eliminated the 64892-1 gage from the set. The 64892-2 that is to be used for checking both the 71906 and LW14820 Circlips, must be modified to the specifications listed in the table section of figure 3 or a new gage set can be purchased through Avco Lycoming Williamsport Division.

SPECIAL TOOLS REQUIRED.

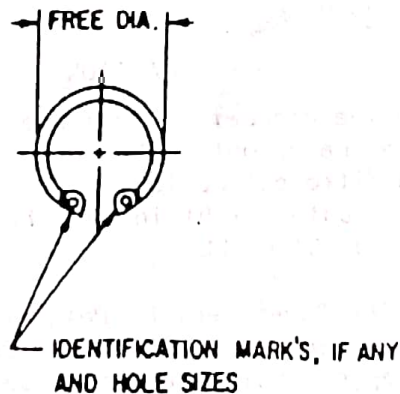
Avco Lycoming Part Number 64892 Gauge Set, now consists of:

- 64892-2 Gauge
- 64892-3 Gauge

Repeat the same procedures with the second New Style Counterweight, Part Number 72801, but use two (2) New Rollers, Part Number 72965, in the second assembly.

CIRCLIP IDENTIFICATION

FREE DIA.	HOLE SIZE	STAMPED MARK	P/N
1.056	.072/.060	93	71906
1.056	.093/.076	N/A	LW-14820
1.344	.090/.076	N/A	77005



**Figure 4 Circlip Identification**

CYLINDER INSTALLATION

1. Re-install # 6 Cylinder and Piston Assembly on its pad using a New Cylinder Base Seal. Initially tighten  $\frac{1}{2}$  inch cylinder hold-down nuts, to a torque of 300 in. lb (25 ft. lb.) in the sequence shown in Figure 5. On engines with cylinder hold-down plates, follow instructions in figure 6.
2. Install  $\frac{3}{8}$  inch nuts on the remaining cylinder base studs and torque to 300 in. lbs. (25ft.lbs). The sequence for tightening these nuts is optional.
3. Using the same sequence as described in paragraphs 1 and 2, and shown in figure 5, check all  $\frac{1}{2}$  inch nuts for tightness by bringing torque to 600 in.lb (50ft.lb). Be sure shims are removed before final torquing engines using cylinder hold-down plates.
4. Check  $\frac{3}{8}$  inch nuts for tightness on the remaining cylinder base studs by bringing torque up to 300 in.lb (25ft.lb). Sequence is optional.
5. After all cylinder base nuts have been tightened, remove any nicks in cylinder fins by de-burring or filing.
6. After tightening cylinder base nuts, install the remaining cylinder parts in the opposite sequence you removed them. Use all new gaskets and seals during assembly. Be sure to collapse Lifter Plungers and check for proper dry clearance of .028 to .080 between Rocker Arms and Valves with Piston at Top Dead Center on compression stroke. If your engine WAS performing normally and you cannot obtain proper Valve clearance then re-check your cylinder installation for problems ( refer to Lycoming Direct Drive Overhaul Manual, P/N 60294-7)

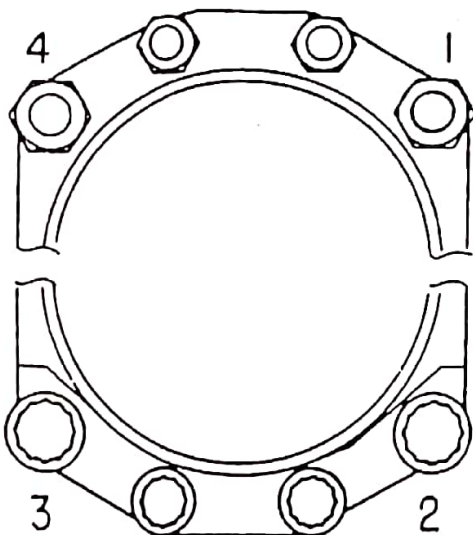


Figure 5 Sequence for Tightening Cylinder Base nuts

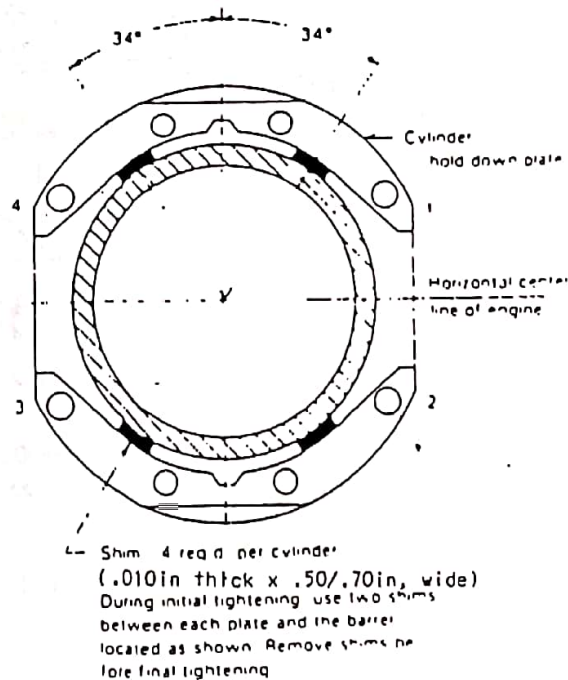


Figure 6 Location of Shims Between Cylinder Barrel and Hold-Down Plates

COUNTERWEIGHT INSTALLATION CONTINUED.

NOTE:

A recent revision to Lycoming Part Number 64892 gage set eliminated the 64892-1 gage from the set. The 64892-2 that is to be used for checking both the 71906 and LW14820 Circlips, must be modified to the specifications listed in the table section of figure 3 or a new gage set can be purchased through Avco Lycoming Williamsport Division.

SPECIAL TOOLS REQUIRED.

Avco Lycoming Part Number 64892 Gauge Set, now consists of:

- 64892-2 Gauge
- 64892-3 Gauge

Repeat the same procedures with the second New Style Counterweight, Part Number 72801, but use two (2) New Rollers, Part Number 72965, in the second assembly.

CIRCLIP IDENTIFICATION

FREE DIA.	HOLE SIZE	STAMPED MARK	P/N
1.056	.072/.060	93	71906
1.056	.093/.076	N/A	LW-14820
1.344	.090/.076	N/A	77005

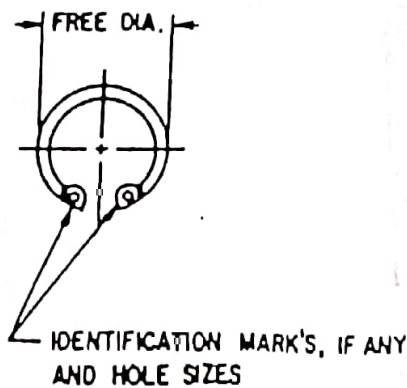


Figure 4 Circlip Identification

JOHNSTON AIRCRAFT SERVICE, INC. REPORT CPR-2

1. All the Engines listed for this Modification now have the same rotational dampening system as the Lycoming O-540 E4A5 and IO-540 D4A5, both rated at 260 H.P. at 2700 R.P.M., per current Lycoming Parts Manuals, PC-115 and 215, and current Lycoming Certified Aircraft Engine Manual SSP 283.
2. One other determining factor is the Camshaft. Any Engine equipped with early Camshaft, Part Number 71642, is not eligible for the H.P. or R.P.M. increase.
3. All Engines changed by this modification shall have (M) followed by the S.T.C. number marked on the Engine Data Plate following the Engine Model designation.
4. Johnston Aircraft Service, Inc. has Rebuilt and New Counterweight Modification Kits available for sale.

REFERENCE MATERIAL

Lycoming Service Instruction 1012 ( Latest Version)  
Lycoming Service Instruction 1142 ( Latest Version)  
Lycoming Service Instruction 1143 ( Latest Version)  
Lycoming Direct Drive Overhaul Manual  
P/N 60294-7 ( Latest Version)  
Lycoming Parts Catalog, P/N PC-115, for O-540 Series  
Aircraft Engines (Latest Version)

# TEXTRON Lycoming

Williamsport Plant  
Textron Lycoming/Subsidiary of Textron Inc.  
652 Oliver Street  
Williamsport, PA 17701 U.S.A.

# SERVICE INSTRUCTION

DATE: October 31, 1988

Service Instruction No. 1012F  
(Supersedes Service Instruction No. 1012E)  
Engineering Aspects are  
FAA Approved

SUBJECT: PART I: Correct Location for Counterweights and Rollers on a Crankshaft  
PART II: Proper Assembly Procedure for Counterweights and Rollers on a Crankshaft

MODELS AFFECTED: All Textron Lycoming engines employing counterweights.

TIME OF COMPLIANCE: As Required.

The purpose of this service instruction is to provide correct assembly procedures and identify the correct location on the crankshaft for the various counterweights and rollers utilized on Textron Lycoming reciprocating aircraft engines. Since the original edition of this publication; counterweight design changes,

material improvements and improvements in manufacturing methods have resulted in a number of counterweight supersedures. The following table lists applicable counterweight part number supersedures in the sequence of occurrence. The referenced notes following the table describe the supersedure.

## COUNTERWEIGHT AND ROLLER SUPERSEDURE HISTORY

Original Counterweight Part Number	Superseding Counterweight Part Number	Original Roller Part Number	Superseding Roller Part Number
* 69393	71904	† 76787	73648
* 69394	71905		
** 69349	71905		
** 65602	71904		
** 65640	71904		
+ 71904	LW-19225		
+ 71905	LW-19226		
+ 72801	LW-19227		
+ 72534	LW-19213		
+ 73643	LW-19211		
+ 73644	LW-19210		
+ 73812	LW-19212		

- \* P/N 69393 and 69394 counterweights are cast iron and did not incorporate bushings in the roller bores. These counterweights must be replaced at overhaul. (Not interchangeable.)
- \*\* P/N's 69349, 65602 and 65640 counterweights incorporate screw in plugs and circlips to secure the rollers in the counterweight. When it becomes necessary to replace one of these counterweights, all counterweights on that certain crankshaft must be replaced. (Not interchangeable.)
- + P/N's 71904, 71905, 72801, 72534, 73643, 73644 and 73812 counterweights have been superseded as a result of manufacturing process changes. Each one is completely interchangeable with its respective replacement counterweight. Existing stock of these counterweights is usable until depleted.
- † P/N 76787 roller was replaced by P/N 73648 as a product improvement and to eliminate a dispensible part.

**NOTE**

Any O-540-A1A model engine installed in a Piper aircraft must be converted to the O-540-A1A5 configuration at overhaul. This is accomplished by installing two (2) fifth order counterweight rollers P/N 72022, in place of two (2) of the four (4) sixth order P/N 70416 rollers, on one of the two (2) rear crankshaft lugs. When this modification has been completed, stamp the number "5" after the model number on the engine nameplate.

**PART I**

Part I separates applicable engines into groups that utilize the same basic crankshaft design with the same counterweight and roller configuration. The location column in the table that accompanies each group references the group to a numbered figure which is an illustration that is typical of the crankshaft installed in the engines listed with the group. Each counterweight lobe position is numbered on the illustration and the location column in the table assigns each counterweight and roller combination to one or more of these numbered positions.

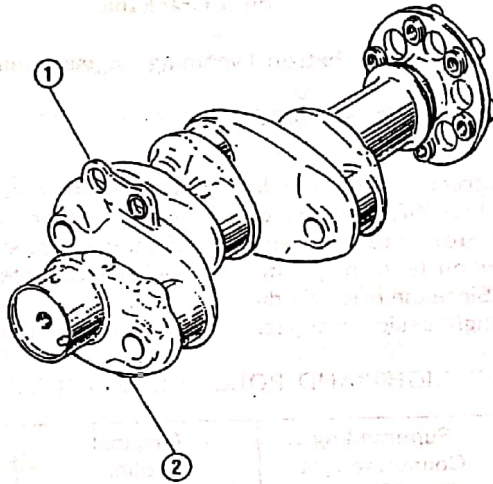


Figure 1.  
Counterweights and Rollers - Group 1

Group	Counterweights P/N	Qty. No.	Roller P/N	Qty. No.	Location
<b>Group 1 (4 Cyl. Direct Drive Engines)</b>					Figure 1
0-360-A1F6, -A1F6D, -A1G6, -A1G6D, -E1A6D, -F1A6, -G1A6; LO-360-A1G6D, -E1A6D; IO-360- A1B6, -A1B6D, -A1D6, -A1D6D, -A3B6D, -A3D6D, -B2F6, -C1C6, -C1D6, -C1E6, -J1A5D; AEIO-360-A1B6, -B1G6; LIO-360-C1E6; TO-360- C1A6D, -E1A6D, -F1A6D; LTO-360-E1A6D; TIO- 360-A3B6, -C1A6D.	LW-19227 LW-19227	1 1	LW-10977 LW-10945	2 2	Either Position Either Position

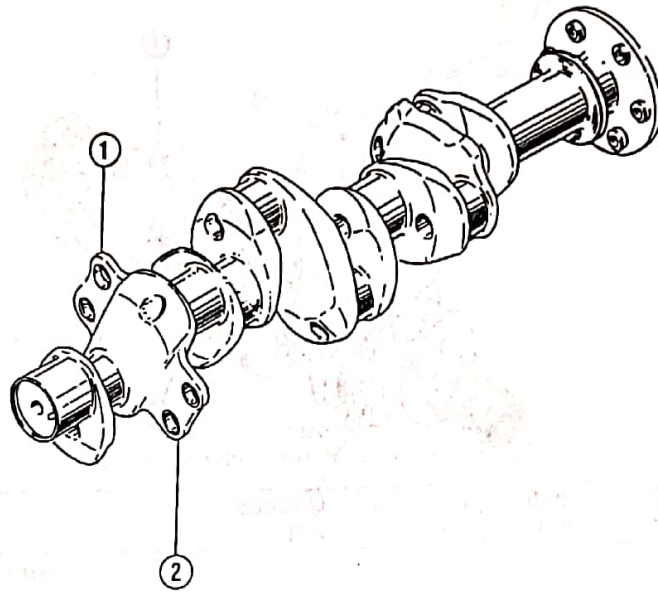


Figure 2.  
Counterweights and Rollers - Group 2, 3, 4, 5, 6, 7

Group	Counterweights P/N	Qty. No.	Roller P/N	Qty. No.	Location
<b>Group 2 (6 Cyl. Direct Drive Engines)</b> 0-540-A1D, -A2B.	LW-19225	2	70416	4	Figure 2 Position 1, 2
<b>Group 3 (6 Cyl. Direct Drive Engines)</b> 0-540-A1A, -A1A5, -A1B5, -A1C5, -A1D5, -A3D5, -B1A5, -B1B5, -B2B5, -B2C5, -F1A5, -F1B5, -G1A5, -G2A5, -H1B5D, -H2A5, -H2B5D; IO-540-C1B5, -C1C5.	LW-19225 LW-19225	1 1	70416 72022	2 2	Figure 2 Either Position Either Position
<b>Group 4 (6 Cyl. Direct Drive Engines)</b> 0-540-A4D5, -B4B5, -E4A5, -E4B5, -E4C5, -J1A5D; IO-540-A1A5, -B1A5, -B1B5, -B1C5, -C1B5, -C4B5, -C4C5, -C4D5D, -D4A5, -E1A5, -E1B5, -G1A5, -G1B5, -G1C5, -G1D5, -G1E5, -G1F5, -J4A5, -P1A5, -T4A5D, -T4B5D, -T4C5D, -W1A5D; AEIO-540-D4A5, -D4B5, -L1B5D; TIO- 540-C1A, -E1A, -G1A, -H1A, -AA1A5, -AB1AD.	LW-19227 LW-19227	1 1	72965 72797	2 2	Figure 2 Either Position Either Position
<b>Group 5 (6 Cyl. Direct Drive Engines)</b> IO-540-K1A5, -K1A5D, -K1B5, -K1C5, -K1D5, -K1E5, K1E5D, -K1F5, -K1F5D, -K1G5, -K1G5D, -K1H5, -K1J5, -K1J5D, -K1K5, -L1A5, -L1A5D, -L1B5D, -L1C5, -M1A5, -M1A5D, -M1B5D, -M2A5D, -N1A5, -R1A5, -R1A5D, -S1A5, -U1B5D, -AA1A5; AEIO-540-L1B5D; HIO-540-A1A; TIO-540-A1A, -A1B, -A2A, -A2B, -A2C, -F2BD, -J2B, -J2BD, -N2BD, -R2AD, -S1AD, -T2AD, -U2A, -V2AD, -W2A; LTIO-540- F2BD, -J2B, -J2BD, -N2BD, -U2A, -V2AD, -W2A.	LW-19210 LW-19210	1 1	73648 76788	2 2	Figure 2 Either Position Either Position
<b>Group 6 (6 Cyl. Direct Drive Engines)</b> 0-540-J3A5, -J3A5D, -J3C5D, -L3C5D; IO-540- W3A5D.	LW-19210 LW-19210	1 1	LW-15558 76788	2 2	Figure 2 Either Position Either Position
<b>Group 7 (6 Cyl. Direct Drive Integral Accessory Housing Engines)</b> TIO-541-A1A	76044 76044	1 1	76042 76043	2 2	Figure 2 Either Position Either Position



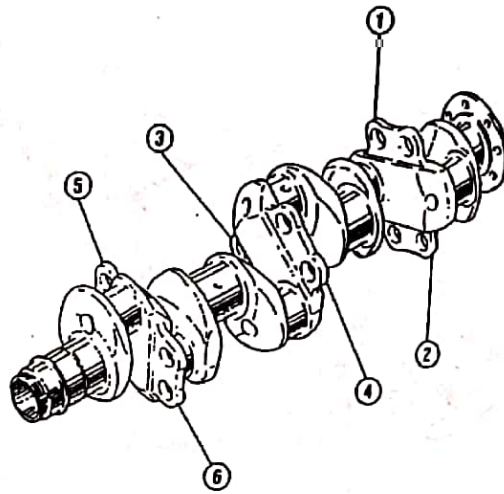


Figure 3.  
Counterweights and Rollers - Group 8, 9, 10, 11, 12, 13, 14

Group	Counterweights P/N	Qty. No.	Roller P/N	Qty. No.	Location
<b>Group 8 (6 Cyl. Geared Engines)</b> GO-435-C2, -C2A, -C2A2, -C2B, -C2B1, -C2B2, -C2C, -C2E; GO-480-B series (except -B1A6, -B1E6) -C2C6, -C2D6, -D series; IGO-480-A1B6	LW-19225	6	69433	12	Figure 3 All Positions
<b>Group 9 (6 Cyl. Geared Engines)</b> GO-435-C2B2-6; GO-480-B1A6*, -B1E6, -C series; -F series, -G series; GSO-480 series (except -B1B3); IGSO-480 series (except -A1F3)	LW-19225 LW-19225 LW-19226	4 1 1	69433 70416 69433	8 2 2	Figure 3 Positions 1, 2, 3, 4 Position 6 Position 5
<b>Group 10 (6 Cyl. Geared Engines) (Special)</b> GO-480-B1A6 with the following S/N's: L-567-28, L-569-28, L-573-28, L-574-28, L-575-28, L-576-28.	LW-19225	6	70416	12	Figure 3 All Positions
<b>Group 11 (6 Cyl. Geared Engines)</b> GSO-480-B1B3; IGSO-480-A1F3.	LW-19210 LW-19213	2 4	76788 69433	4 8	Figure 3 Positions 1, 2 Positions 3, 4, 5, 6
<b>Group 12 (6 Cyl. Geared Engines)</b> IGO-540-A, -B series	LW-19213 LW-19225 LW-19226	4 1 1	73287 70416 73287	8 2 2	Figure 3 Positions 1, 2, 3, 4 Position 6 Position 5
<b>Group 13 (6 Cyl. Geared Engines)</b> IGSO-540-A, -B series	LW-19213 LW-19225 LW-19226	4 1 1	69433 70416 69433	8 2 2	Figure 3 Positions 1, 2, 3, 4 Position 6 Position 5
<b>Group 14 (6 Cyl. Vertical Engines)</b> VO-540-B1B3, -C1C3	LW-19213	6	73338	12	Figure 3 All Positions

\* See Group 10 also.

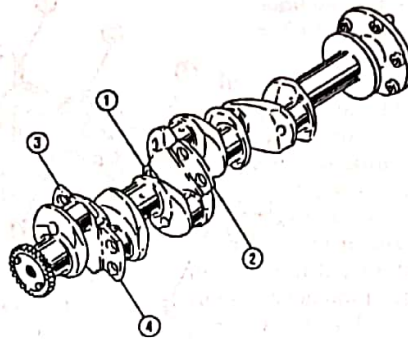


Figure 4.  
Counterweights and Rollers - Group 15

Group	Counterweights P/N	Qty. No.	Roller P/N	Qty. No.	Location
<b>Group 15* (6 Cyl. Direct Drive Integral Accessory Housing Engines)</b>					<b>Figure 4</b>
TIO-541-E1A4, -E1B4, S/N's 101-59 thru S/N's 297-59	75637	1	77386	2	Position 1
	76044	1	76042	2	Position 3
	76044	1	76043	2	Position 4
	75636	1	77385	2	Position 2
TIO-541-E1A4, -E1B4, S/N's 298-59 and up, -E1C4, -E1D4	75637	1	77386	2	Position 1
	76044	1	76042	2	Position 3
	76044	1	76043	2	Position 4
	78988 *	1	77385	2	Position 2

\* - Change 77887 crankshaft and counterweight assembly to 78989 at engine overhaul by using 78988 counterweight instead of 75636.

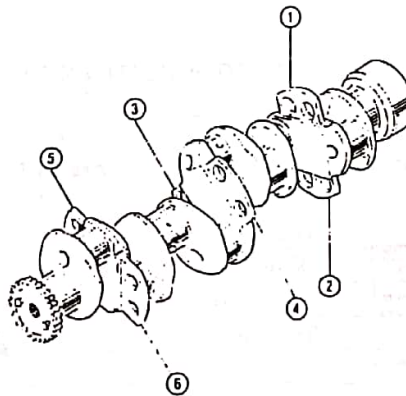


Figure 5.  
Counterweights and Rollers - Group 16

Group	Counterweights P/N	Qty. No.	Roller P/N	Qty. No.	Location
<b>Group 16 (6 Cyl. Geared Integral Accessory Housing Engines)</b>					<b>Figure 5</b>
TIGO-541-B1A, -D1A, -D1B, -E1A	75637	5	75631	10	Positions 2, 3, 4, 5, 6
	77002	1	77007	2	Position 1

When assembling TIGO-541 counterweight P/N 77002 to No. 1 position on the crankshaft, do not use 71906 or LW-14820 circlips and 71907 washers. Use washer P/N 77004 and circlip P/N 77005.

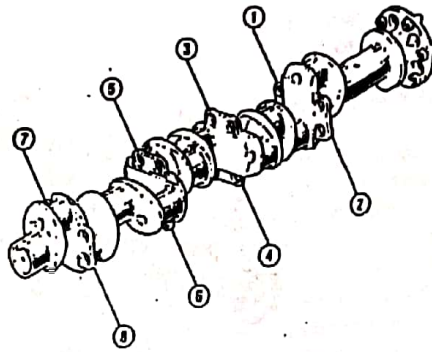


Figure 6.  
Counterweights and Rollers - Group 6

Group	Counterweights P/N	Qty. No.	Roller P/N	Qty. No.	Location
Group 17 (8 Cyl. Direct Drive Engines)					
Figure 6					
10-720-A, -B, -C, -D series	(73643) LW-19211	6	73649	12	Positions 1, 2, 4, 5, 7, 8
	(73812) LW-19212	1	73814	2	Position 3
	(73644) LW-19210	1	73648	2	Position 6



Figure 7.  
Typical Counterweight Installation

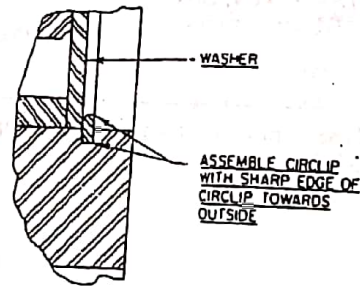


Figure 8.  
Assembly of Circlips in Counterweight

CIRCLIP P/N	"A" DIM	"B" DIM	GAGE	APPLICATION
71906	872	998	64892-2	ALL C/W'S
LW-14820	892	998	64892-2	ALL C/W'S
71005	1132	245	64892-3	LARGE C/W OH 1600-541 OHLE

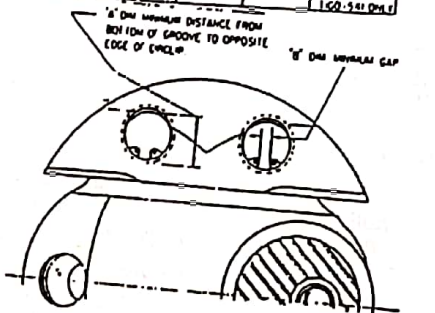


Figure 9.  
Diagram of Assembled Counterweight  
Showing Dimensions for Checking Circlip

CIRCLIP IDENTIFICATION			
FREE DIA	HOLE SIZE	STAMPED MARK	P/N
1056	Ø12/Ø60	91	71906
1056	Ø93/Ø76	N/A	LW-14820
1344	Ø90/Ø76	N/A	71005



Figure 10.  
Circlip Identification

PART II

CAUTION

The practice of marking crankshafts, counterweights and rollers, to insure proper location at reassembly, should not be accomplished with permanent markings of any kind. Refer to the latest Revision of Service Instruction No. 1152. Scoring, scratching, etching or other type of permanent marking could result in counterweight failure. See figure 7.

Install washers, P/N 71907 and circlips, P/N 71906 or LW-14820 on one side of the counterweight and place the counterweight on the proper crankshaft lobe. Insert the proper rollers and secure the assembly by installing washers and circlips on the other side of the counterweight (refer to figure 7). Circlips are inserted with the sharp edge outward (see figure 8). Two gages will check all circlips installed in any Textron Lycoming counterweight. See table with figure 9.

CAUTION

Install the correct rollers in identical pairs only. Under no circumstance are two different rollers to be installed on any one counterweight installation. Check roller part

number and size by using the table at the end of this instruction.

Insert one end of the counterweight circlip gap gage, P/N 64892-2 or -3 between the ends of the circlip; see figure 9 for gap dimension and gage selection. Be sure the gage is resting on the bottom of the groove. The gage must pass between the ends of the circlip and when rocked back and forth, must clear the inside edge of the top of the circlip. If the gage does not pass freely between the ends and under the top of the circlip, the circlip is not properly seated. Insure all circlips are properly seated.

NOTE

A recent revision to P/N 64892 gage set eliminated the 64892-1 gage from the set. The 64892-2 gage that is to be used for checking both the 71906 and LW-14820 circlips, must be modified to the specifications listed in the table section of figure 9 or a new gage set P/N 64892 can be purchased through any Textron Lycoming authorized Distributor.

SPECIAL TOOLS REQUIRED:

Textron Lycoming P/N 64892 gage set, now consists of:

- 64892-2 Gage
- 64892-3 Gage

ROLLER OUTSIDE DIAMETERS

P/N	OD	P/N	OD	P/N	OD
69433	.5050/.5045	73648	.6572/.6567	76788	.6895/.6890
70416	.6950/.6945	73649	.6098/.6093	77007	.5167/.5162
72022	.6655/.6650	73814	.5652/.5647	77385	.5845/.5840
72797	.6915/.6910	75631	.4741/.4736	77386	.5333/.5328
72965	.6602/.6597	76042	.6420/.6415	LW-10945	.6915/.6910
73287	.5194/.5189	76043	.6795/.6790	LW-10977	.7141/.7136
73338	.5260/.5255			LW-15558	.6451/.6446

NOTE: Revision F'' adds new models, changes text, updates part numbers as applicable.

18297, 19215, 19563, 19215A, 20196, 22254, 22636, 22734A, 22734B — These numbers for Textron Lycoming reference only.

**TEXTRON** Lycoming

Reciprocating Engine Division/  
Subsidiary of Textron Inc.  
652 Oliver Street  
Williamsport, PA 17701 U.S.A.

# SERVICE INSTRUCTION

May 28, 1992

Supplement No. 1

for

Service Instruction No. 1012F

A recent revision to P/N's LW-19225, LW-19226 and LW-19227 counterweight assemblies changes the distance from the centerline of the counterweight bushing bore to the flat edge of the counterweight on applicable counterweights that are identified with the letter "E", as a suffix to the counterweight part number. (Refer to Dimension "A", in the revised Figure 6, from Supplement No. 2 to Service Instruction No. 1143B which is also included with this supplement for reference purposes.) Applicable counterweights that were placed in service, prior to distribution of this Supplement, that are not identified with a letter suffix in the part number will have to be measured to determine the "A" dimension. After the "A" dimension has been determined, vibropeen the correct identification letter on the counterweight as a suffix to the part number.

Although applicable counterweights that are identified with the letter "E" suffix in the part number, fit and perform perfectly on the lobes of crankshafts installed in direct drive engines it is impossible to assemble them on crankshafts that are installed in reduction gear equipped engines. For this reason production of counterweights with the relocated bushing bores has

been discontinued and all applicable counterweights will be manufactured to the original "A" dimension which is listed with the part number that contains the "D" suffix in the revised Figure 6. New counterweights that are manufactured to the original "A" dimension will be identified with the letter "F" or a subsequent letter (G, H, etc.) as a suffix to the part number.

## CAUTION

TO INSURE PROPER COUNTERWEIGHT OPERATION DO NOT ASSEMBLE A P/N LW-19225E, LW-19226E OR LW-19227E AT ANY DESIGNATED LOCATION ON THE CRANKSHAFT OF A REDUCTION GEAR EQUIPPED ENGINE. USE THESE COUNTERWEIGHTS ON DIRECT DRIVE CRANKSHAFTS ONLY. APPLICABLE COUNTERWEIGHTS THAT ARE IDENTIFIED WITH REVISION LETTERS D, F OR SUBSEQUENT LETTERS CAN BE USED AT ANY DESIGNATED LOCATION.

Counterweight Part No.	Spacer Detail Part No.	Dimensions		Weight (Lbs.) Minimum
		A	B ± .002	
71904	12	.825	.425	1.796
LW-19225D	27	.855	.395	1.796
LW-19225E	17	.875	.375	1.796
71905	12	.825	.425	1.752
LW-19226D	27	.855	.395	1.756
LW-19226E	17	.875	.375	1.756
72801	10	.715	.535	1.846
LW-19227D	28	.740	.510	1.846
LW-19227E*	30	.760	.490	1.846
72534	13	.950	.300	2.246
LW-19213	29	.965	.285	2.246
73643	15	.805	.445	2.212
LW-19211	12	.825	.425	2.212
73644	11	.741	.509	2.166
LW-19210	30	.761	.489	2.166
73812	16	.908	.342	2.266
LW-19212	31	.923	.327	2.266
74901	20	.720	.530	1.470
75636	20	.720	.530	1.600
75637	17	.875	.375	1.678
76044	18	.730	.520	1.810
78988	18	.730	.520	1.600

\* Use spacer No. 30 and .001 inch thick shim stock to achieve .490 spacer thickness when grinding the bushings in a P/N LW-19227E counterweight.

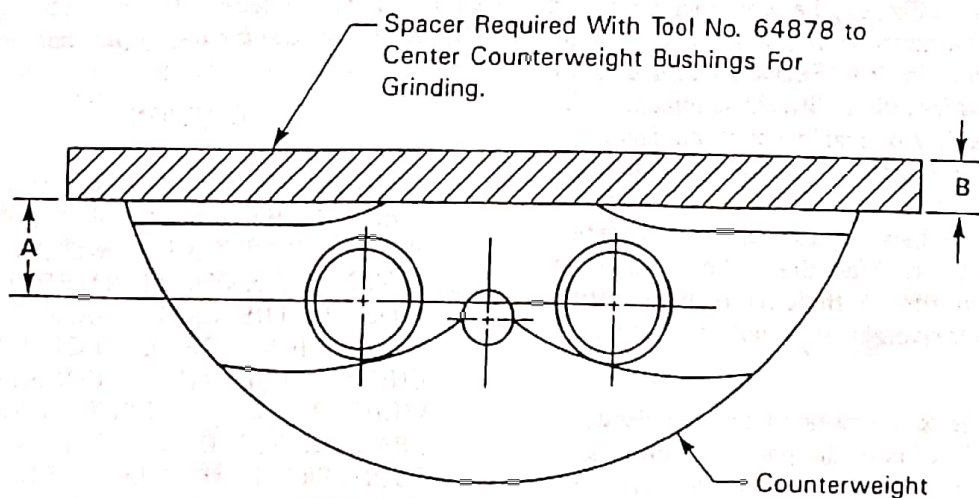


Figure 6. (Revised) Identification of Dimension "A" and "B"  
 (From Supplement No. 2 to Service Instruction No. 1143B, included for reference purposes)



# Service Instruction

LYCOMING DIVISION  
WILLIAMSPORT, PA. 17701



DATE: May 7, 1971

Service Instruction No. 1142B  
(Supersedes Service Instruction No. 1142A)  
Engineering Aspects are  
FAA (DEER) Approved

SUBJECT: Replacement of Crankshaft Counterweight Bushings  
MODELS AFFECTED: O-360-A1E6, -A1F6, -A1G6, IO-360-A1B6, -A1C6, -A1D6, -C1D6, -C1E6, LIO-360-C1E6, GO-435, GO-480, GSO-480, ICSO-480, O-540, IO-540, IGO-540, ICSO-540, VO-540, TIO-541, TIGO-541 and IO-720 series engines.  
TIME OF COMPLIANCE: At overhaul.

All of the above engines incorporate dynamic counterweight and roller combinations as an effective means of dampening vibrations. Each roller used to attach the counterweight is supported by three hardened steel bushings, two of which are located in the counterweight and the other in the crankshaft lug.

Wear on the steel bushings in the crankshaft counterweight lugs is confined to a localized area opposite the longitudinal centerline of the crankshaft. This wear will appear as an out-of-round condition, which can readily be measured.

### CAUTION

If an engine is disassembled prior to its normal overhaul time, check the inside diameter of the counterweight bushings in the crankshaft. If any bushing is more than .0007 inch out-of-round, it must be replaced.

Also, the bushings are occasionally found to be cracked on the outside surface, a condition not visible until the bushing has been removed. Consequently, all bushings in the crankshaft lugs should be replaced during overhaul. The crankshaft may be returned to the factory for rebushing, or it may be accomplished in the following manner:

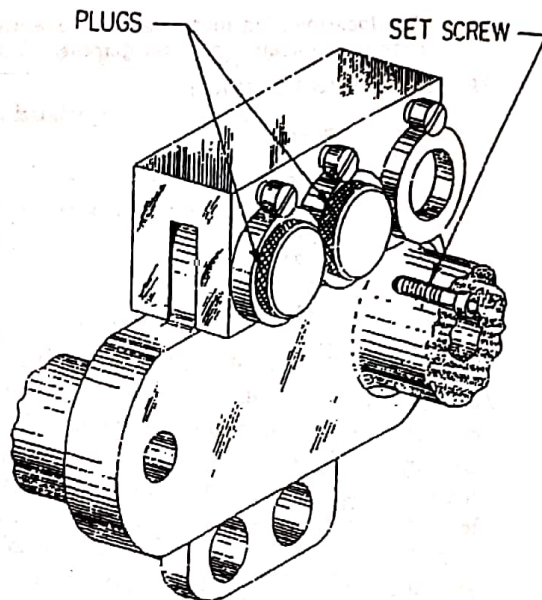
### NOTE

For replacement of the bushings in the counterweights at overhaul, see the latest edition of Service Instruction No. 1143.

1. Assemble puller (Avco Lyc. P/N 64872, figure 1) and remove the old bushing from crankshaft lug.



Figure 1. No. 64872 Puller to Remove and Install Bushings



WITH PLUGS IN PLACE TIGHTEN SET SCREW

Figure 2. No. ST-280 Reaming Fixture Assembled to Crankshaft

2. Measure the hole and determine what size bushing is required by the following chart. If the hole is within standard limits, reaming the hole is not necessary. If, however, it is determined that a larger oversize bushing is required, steps 3 and 4 must be completed before installing the new bushing.

Hole Size	Nominal Size	Reamer Size
.9369/.9377	Std.	None
.9420/.9425	P05	64874 (.005 o/s)
.9445/.9450	P075	ST 210 (.0075 o/s)
.9470/.9475	P010	64875 (.0010 o/s)
.9495/.9500	P0125	ST 211 (.0125 o/s)
.9520/.9525	P15	64876 (.015 o/s)

3. Determine reamer needed (.005 o/s, .0075 o/s, .010 o/s, .0125 o/s or .015 o/s) and assemble the reaming fixture (Avco Lyc. P/N ST-280) over the crankshaft lug. Use the two plugs provided to line up the holes and secure the fixture by tightening the Allen head set screws. See figure 2.

**NOTE**

On fixture ST-280 select proper set of holes for crankshaft being reamed. Wide set of holes are spaced 2.125 apart. The narrow set are spaced 1.800 apart.

4. Assemble the reamer to be used with a universal joint drive. Remove one plug from the fixture and proceed to hand ream the hole to proper size. Following the above procedure ream the remaining hole.

**NOTE**

One location plug must be in fixture when reaming to assure proper spacing.

**SPECIAL TOOLS REQUIRED:**

Part No.	Nomenclature
64872	Puller - Remove and install counterweight bushings
ST-280	Fixture - Ream crankshaft counterweight holes
64874	Reamer - .005 o/s counterweight bushing holes
ST-210	Reamer - .0075 o/s counterweight bushing holes
64875	Reamer - .010 o/s counterweight bushing holes
ST-211	Reamer - .0125 o/s counterweight bushing holes
64876	Reamer - .015 o/s counterweight bushing holes
ST-212	Wedge blocks, parallel - counterweight bushing

**PARTS REQUIRED:**

Part No.	Nomenclature
70256	Bushing - Crankshaft counterweight Std.
70256-P05	Bushing - Crankshaft counterweight .005 o/s
70256-P075	Bushing - Crankshaft counterweight .0075 o/s
70256-P10	Bushing - Crankshaft counterweight .010 o/s
70256-P125	Bushing - Crankshaft counterweight .0125 o/s
70256-P15	Bushing - Crankshaft counterweight .015 o/s
73810	Bushing - Crankshaft counterweight Std.
73810-P05	Bushing - Crankshaft counterweight .005 o/s
73810-P075	Bushing - Crankshaft counterweight .0075 o/s
73810-P10	Bushing - Crankshaft counterweight .010 o/s
73810-P125	Bushing - Crankshaft counterweight .0125 o/s
73810-P15	Bushing - Crankshaft counterweight .015 o/s
74876	Bushing - Crankshaft counterweight Std.
74876-P05	Bushing - Crankshaft counterweight .005 o/s
74876-P075	Bushing - Crankshaft counterweight .0075 o/s
74876-P10	Bushing - Crankshaft counterweight .010 o/s
74876-P125	Bushing - Crankshaft counterweight .0125 o/s
74876-P15	Bushing - Crankshaft counterweight .015 o/s

**NOTE**

See applicable parts catalog for correct bushing part number for installation in particular crankshafts.

NOTE: Revision "B" adds model TIGO-541; additional fixture plug and removes 64873 fixture.

12179, 13623, OS-5094 - These numbers for Avco Lycoming reference only.

5. Assemble the new bushing on the puller and proceed to pull the bushing into the hole. (Reference 578, Table of Limits, Service Bulletin No. 268.)

**CAUTION**

The inside diameter of this bushing is finished at the factory and no further finishing of the bushing is necessary. Caution must be exercised when installing the bushing so that the finished ID is not damaged. Because of possible damage to the crankshaft lug, never under any circumstances remove or install these bushings by use of a drill.

6. After the bushing is installed, check its alignment with the main bearings by placing the crankshaft in vee blocks on a surface plate. Install the wedge blocks, Tool No. ST-212, in the bushing and compare parallelism of the wedge blocks with that of main journals within .002 per inch. Support the crankshaft in the vee blocks at journals adjacent to the bushing location.



# **TEXTRON** Lycoming

Williamsport Plant  
Textron Lycoming/Subsidiary of Textron Inc.  
652 Oliver Street  
Williamsport, PA 17701 U.S.A.

# SERVICE INSTRUCTION

DATE: April 11, 1988

Service Instruction No. 1143B  
(Supersedes Service Instruction No. 1143A)  
Engineering Aspects are  
FAA Approved

SUBJECT: PART I - Counterweight Bushing Tooling Update.

PART II - Counterweight Bushing Replacement.

MODELS AFFECTED: All Textron Lycoming piston aircraft engines with dynamic counterweights employing 3/4 inch I.D. bushings.

TIME OF COMPLIANCE: During engine overhaul.

Dynamic counterweights are installed on piston engine crankshafts to eliminate vibrations that are caused by torsional frequency changes that occur at different engine speeds and operating conditions. The counterweight is mounted on the crankshaft with two steel rollers that allow the counterweight to move as required to maintain crankshaft balance. Both the counterweight supporting lug of the crankshaft and the counterweight contain hardened steel bushings that are ground to a very smooth and annular finish. If any of these bushings become damaged or worn out of round, the counterweight will become ineffective and cause vibrations that will lead to severe engine damage or failure.

The procedure for inspecting and replacing the hardened steel bushings in a crankshaft is described in the latest revision of Service Instruction No. 1142. This publication describes the procedures and tooling required to inspect and replace the steel bushings installed in a counterweight assembly.

A recent change in counterweight manufacturing

procedures has affected the finished dimensions of some of the counterweights that were included in previous editions of this publication. This change in the finished dimensions of the counterweight requires changes in some of the special counterweight bushing tooling listed in the special tools section of this publication. Textron Lycoming Service Letter No. L217 briefly describes these tooling changes and offers update kits on a limited time special price basis. This publication will completely describe the tooling changes and include the necessary illustrations and dimensions of the detail parts required to update each tool.

To control the inventory of new and superseded counterweights, all counterweights that are machined to the new specifications have been issued new part numbers. The table with Figure 6 of this publication matches new counterweight part numbers with the respective superseded counterweight part number. All new counterweights are completely interchangeable with the respective superseded counterweight.

**PART I. COUNTERWEIGHT BUSHING TOOLING UPDATE**

Spacers are used with the P/N 64878 fixture to align the bushing bore of the counterweight with the center of the fixture. The "A" dimension from Figure 6 which is the distance from the center line of the counterweight bushing bore to the flat edge of the spacer. As can be seen in the table with Figure 6, the counterweights that are machined to the new specifications do not have the same "A" dimension as the counterweights that they replace. Owners of P/N 64878 fixtures who do not wish to purchase the P/N 64878-50 update kit can make the spacers required to align these new counterweights from hardened and ground steel using the dimensions

shown in Figure 1. Stamp or vibra-peen each spacer with the correct part number on a surface that will not interfere with counterweight alignment.

A new set-master is required for the P/N ST-94 gaging fixture. Figure 2 illustrates the new set master and finish grinding dimensions. Stamp or vibra-peen the step height dimension, on each step, as shown in Figure 2. This dimension is the distance from the center line of the set master to the surface of the step which can be matched with an "A" dimension in the table with Figure 6. This tool is made from oil hardened tool steel and ground to the finish dimensions.

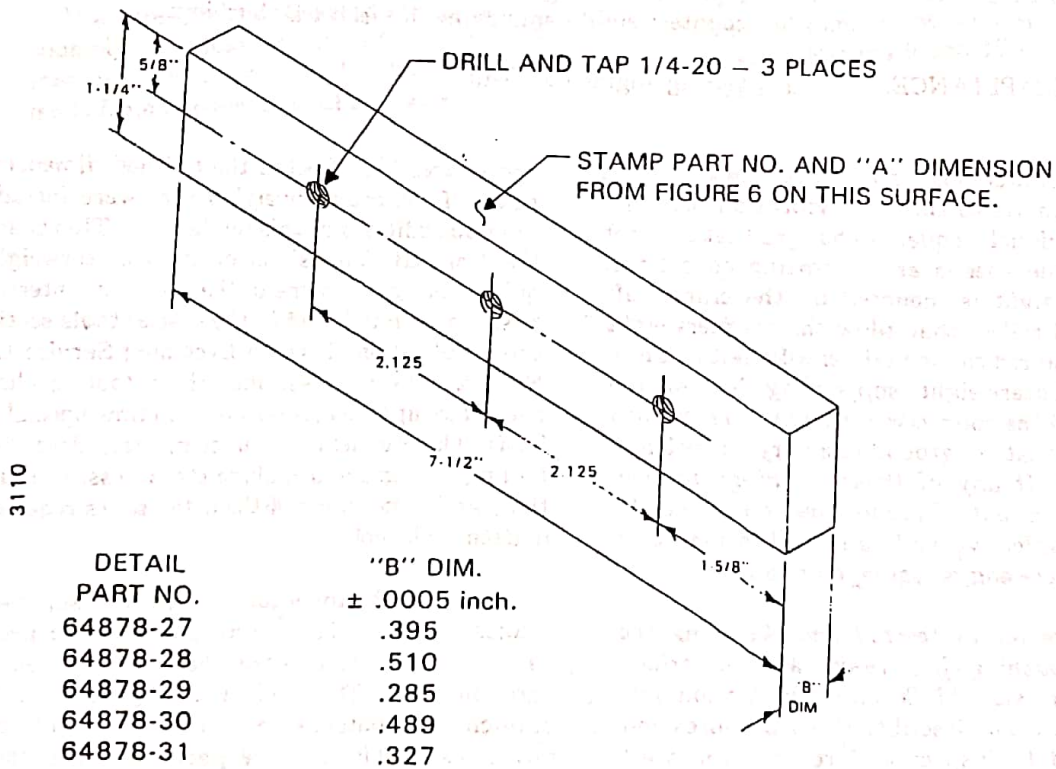


Figure 1. Dimensions of New Spacers for P/N 64878 Fixture

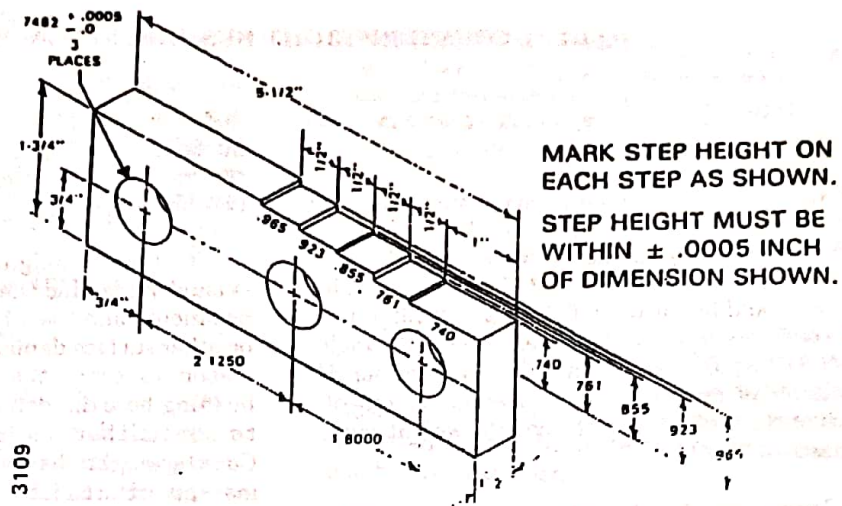
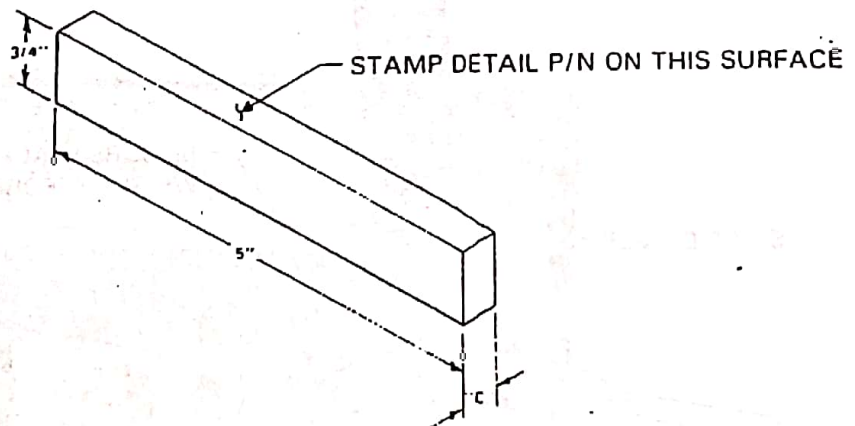


Figure 2. Dimensions of New Set Master P/N ST-94-10

To insure the counterweight is properly and squarely mounted to the P/N ST-91, fixture spacers have been added. These spacers are made from hardened steel and ground to finish

dimensions. Refer to Figure 3 for part numbers, finished dimensions, and application of these spacers. Figures 9 and 10 illustrate use of the spacers.



DETAIL PART NUMBER	DIMENSION "C"	USE WITH COUNTERWEIGHT P/N
ST-91-7	5/64	73643, 73644, 72534 73812
ST-91-8	11/64	72801
ST-91-9	13/64	71904, 71905, LW-19210
ST-91-10	7/64	LW-19225, LW 19226, 75637
ST-91-11	7/32	LW-19227
ST-91-12	9/64	LW-19211
ST-91-13	1/32	LW-19212
ST-91-14	1/4	75636, 76044, 78988

Figure 3. Dimensions of New Spacers for ST-91 Gage

## PART II. COUNTERWEIGHT BUSHING REPLACEMENT

The procedure for replacing counterweight bushings is as follows:

1. Counterweight Bushing Inspection - Wear in the counterweight bushings is usually evident as out-of-round on the inside diameter. Check each bushing with the P/N ST-73 bore gage. The diameter should be between 0.7485 and 0.7505 inch and the out-of-round should not exceed 0.0005 inch. The P/N ST-73 gage can be set with a micrometer. If the diameter of any bushing is oversize or out-of-round all of the bushings in the counterweight must be replaced.

2. Counterweight Bushing Removal - The bushings can be pressed from the counterweight with an arbor press and special driver P/N ST-92. Refer to Figure 4. Insure the counterweight lays flat

and square with the arbor press spindle. Press both bushings from one side of the counterweight, turn the counterweight over and press out the remaining two bushings.

3. Counterweight Bushing Bore Inspection - Visually examine the bushing bore. The bore must be smooth and free of scratches, tool marks, galling or other surface damage. Any evidence of damage is reason to scrap the counterweight. Measure the bushing bore diameter; bushing bores will be found to be either .9369/.9377 or .9384/.9392. Counterweights having the larger diameter bore are marked with the letter "B" near each bore. Refer to the "Parts Required" section of this publication. Using the magnetic particle method check the counterweight for cracks. Any indication of cracks is reason to reject the counterweight.

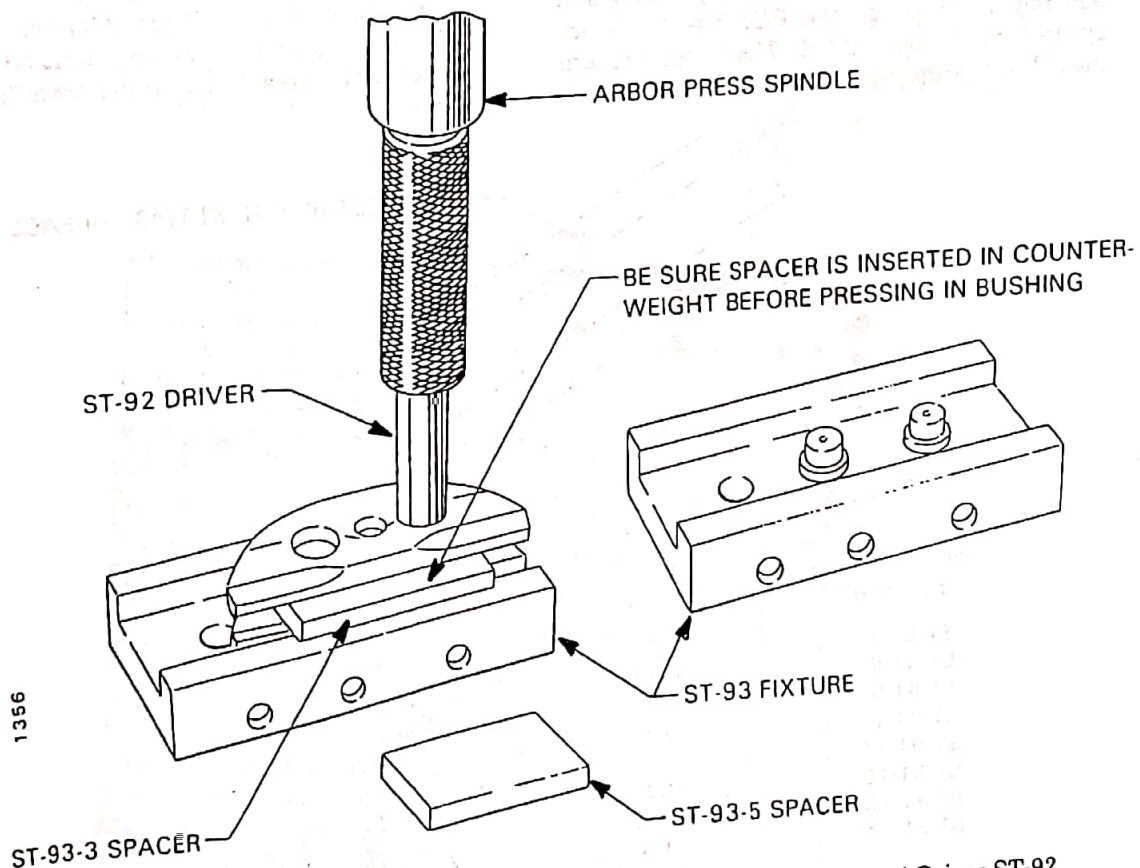


Figure 4. Installing Counterweight Bushing Using Fixture ST-93 and Driver ST-92

**CAUTION**

It is not permissible under any circumstance to attempt to enlarge the bushing bore in a counterweight. Eventual engine damage will result from any operation that will reduce the snap ring groove depth in the counterweight bushing bores.

**4. Counterweight Bushing Installation -**

**CAUTION**

The spacers provided with fixture P/N ST-93 are used to control the depth that the bushings are driven into the counterweight. The bushing must be flush to .002 inch from protruding into the slot of the counterweight.

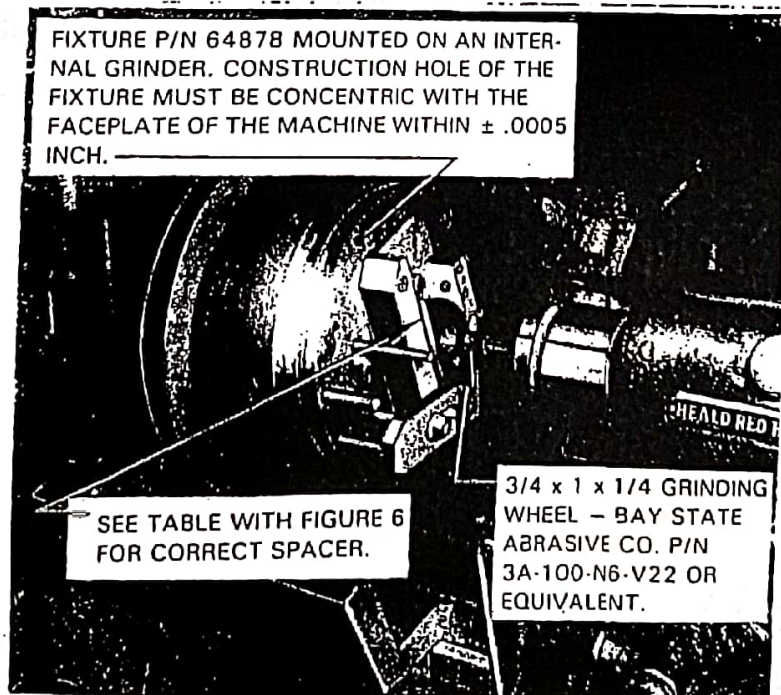
Measure the center to center distance of the bushing bore in the counterweight. Select the two holes in the P/N ST-93 fixture that correspond with this measurement and install the two P/N ST-93-2

locating pins in these holes. Refer to Figure 4. Install the correct spacer either ST-93-3 or ST-93-5 in the counterweight and position it on the P/N ST-93 fixture with the P/N ST-93-2 pins located in the bushing bores. Using an arbor press and the P/N ST-92 driver press the new bushings in place. Turn the counterweight over and install new bushings in the opposite side of the counterweight in the same manner.

5. Finish grinding of the counterweight bushing I.D. — grinding the inside diameter of the new bushing to the correct size and surface finish is the most important step in the rebushing procedure. Do not attempt to substitute any other process for the one herein described.

**NOTE**

The fixture P/N 64878 is sold without any mounting or locating holes drilled in its base. This allows the fixture to be mounted on any suitable machine without interference from pre-drilled holes.



1.355

Figure 5. Counterweight and 64878 Fixture Assembled on an Internal Grinding Machine

A. Secure the P/N 64878 fixture on the faceplate of an internal grinding machine. Insure the 1-1/8 inch diameter construction hole in the center of the fixture is concentric with the center of the faceplate. Concentricity must be held to within  $\pm .0005$  inch total indicated reading. Refer to Figure 5.

**NOTE**

In the following table the new superseding counterweight part number is listed in the same block with the part number of the counterweight that it replaces. The new number is the lower number in each block.

B. Select and install the correct spacer on the fixture and secure it to the alignment bar of the fixture with the three 1/4-20 socket head screws. The detail part number is stamped on the spacer. Refer to the table with Figure 6 for the correct spacer to use with each counterweight.

Counterweight Part No.	Spacer Detail Part No.	Dimensions		Weight (Lbs.) Minimum
		A	B $\pm .002$	
71904	12	.825	.425	1.796
LW-19225	27	.855	.395	1.796
71905	12	.825	.425	1.752
LW-19226	27	.855	.395	1.756
72801	10	.715	.535	1.846
LW-19227	28	.740	.510	1.846
72534	13	.950	.300	2.246
LW-19213	29	.965	.285	2.246
73643	15	.805	.445	2.212
LW-19211	12	.825	.425	2.212
73644	11	.741	.509	2.166
LW-19210	30	.761	.489	2.166
73812	16	.908	.342	2.266
LW-19212	31	.923	.327	2.266
74901	20	.720	.530	1.470
75636	20	.720	.530	1.600
75637	17	.875	.375	1.678
76044	18	.730	.520	1.810
78988	18	.730	.520	1.600

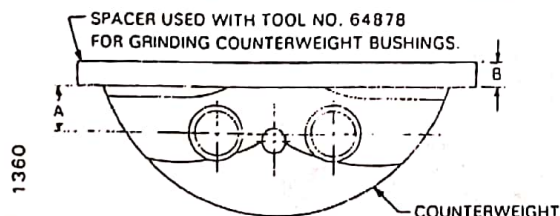


Figure 6. Identification of Dimension "A" and "B"

**NOTE**

Locating pin P/N 64878-2 is used to align the counterweight through an unfinished bushing. P/N 64878-6 locating pin is larger and is used to align the fixture through bushings that have been ground to size. These locating pins are off-set to accommodate the two different center to center bushing bore distances that will be found on counterweights.

C. Install and rotate the smaller pin P/N 64878-2 to the position required to place one set of bushings on the center line of the fixture. Lock the locating pin in this position by tightening the 10-32 socket head screw that secures the P/N 64878-23 locating clamp.

D. Install the counterweight on the fixture as shown in Figure 5. Insure the counterweight and fixture mating surfaces are clean. Tighten the applicable knurled head screw to secure the counterweight against the spacer. If the threaded end of the screw attempts to enter the slot in the counterweight, install the metal block P/N 64878-21 on the end of the screw. Adjust the fibre block of the hold down clamp over the center of the counterweight and tighten the socket head screw to secure the counterweight to the fixture.

E. Grind the inside diameter of both bushings to 0.7485/0.7505 inch diameter. Surface finish of the finished bushing must be 15 micro inches. The 3/4 x 1 x 1/4 grinding wheel shown in Figure 5 is satisfactory for this purpose. It can be purchased from Bay State Division, Dresser Industries Inc., 12 Union Street, Westboro, Mass. 01581. Order P/N 3A-100-N6-V22.

F. Remove the counterweight from the fixture and remove the small locating pin P/N 64878-2. Install the larger locating pin P/N 64878-6 in the opposite hole. Rotate the pin to align the unground bushings with the center line of the fixture. Secure the pin and counterweight as described in steps C and D. Proceed to grind the remaining bushing as described in step E.

6. Inspection of Finished Counterweight Bushings —

A. Inspect the newly ground counterweight bushings using the magnetic particle method to determine if grinding cracks are present in the finished bushing. Replace any bushings that are found to be cracked.

B. Fixture P/N ST-94 is used to check the finished bushing bores for correct location. To set up the fixture, install the P/N ST-94-2 relieved locating pin in the center hole with the locating diameters in the vertical position as shown in Figure 7. Install the P/N ST-94-3 solid locating pin in the outside hole that has the same center to center distance as the counterweight bushing bores. The P/N ST-94-2 pin can remain permanently installed in the center hole with the P/N ST-94-3 being moved as required to adapt to the counterweight being inspected. If the pins do not fit into the newly ground bushing, it may be concluded that the bores are mislocated and the bushings must be replaced and reground again. If the counterweight fits, proceed to step C.

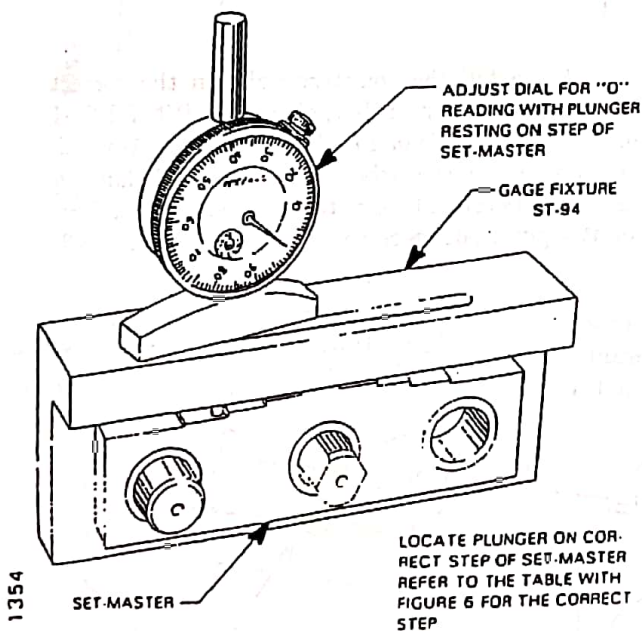


Figure 7. Depth Gage Adjusted with Set-Master Preparatory to Checking Line Position of Counterweight Bushings

C. Also check the distance from the center of the bushing bore to the flat edge of the counterweight with the fixture P/N ST-94 and

either P/N ST-94-5 or ST-94-10 set-master in the following manner. Place the set-master over the locating pins of the fixture (refer to Figure 7), preload the depth gage approximately .010 inch, set the dial gage to "0" with the plunger resting on the appropriate step of the set-master. The steps are identified by the "A" dimensions from the table with Figure 6. Remove the set-master and install the counterweight over the pins. Set the depth indicator thru the fixture and onto the counterweight. Refer to Figure 8. No more than  $\pm .004$  inch difference between this measurement and the measurement obtained with the set-master is allowed.

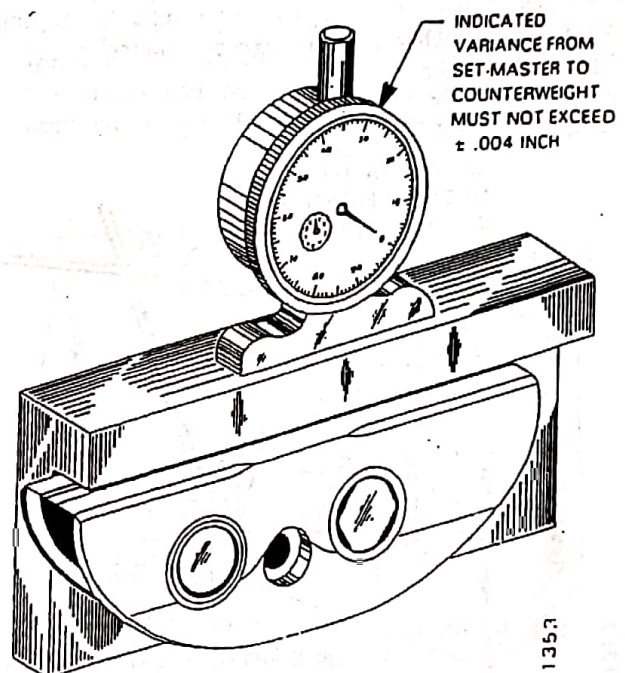


Figure 8. Checking Center Line Position of Counterweight Using Gage Fixture ST-94

NOTE

During the following step (D) if erratic or excessively "out of limits" measurements are observed, remove the counterweight and insert it on the P/N ST-91 fixture so that the opposite inner face of the counterweight is located against the fixture. Then repeat the measurements. Only one of the inner faces of the counterweight is square with the bushing bores.

D. Select the proper spacer either P/N ST-91-7, ST-91-8, ST-91-9, ST-91-10, ST-91-11, ST-91-12, ST-91-13, or ST-91-14 and install it and the counterweight on the fixture. Refer to Figure 3 for spacer application. Press the counterweight squarely against the spacer and tighten the knurled screw to secure the counterweight firmly against the locating surface of the fixture. Install the gaging arbors P/N ST-91-3 through each of the finished bushings as illustrated in Figure 6. Place the fixture on a surface plate and indicate both ends of each arbor as illustrated in Figure 9. Turn the fixture over to rest on its adjacent side and again indicate both ends of the gaging arbors. See Figure 10. The difference in measurements from one end of the gaging arbor to the other must not exceed .003 inch per inch in any instance.

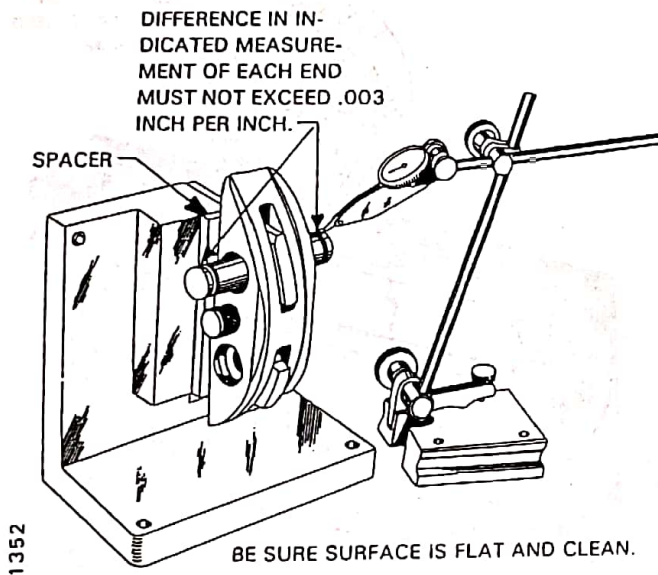


Figure 9. Checking Parallel and Squareness of Counterweight Bushings with Gage Fixture ST-91 - Vertical Position

7. Counterweight Balance Procedure - The center of gravity of the counterweight is located at the center of the 1/4 inch or 3/8 inch diameter drilled hole that is located between the bushing bores. The balance of the counterweight in relation to its center of gravity is quite important and may have been changed when the new bushings were installed. Check the balance of the counterweight in the following manner.

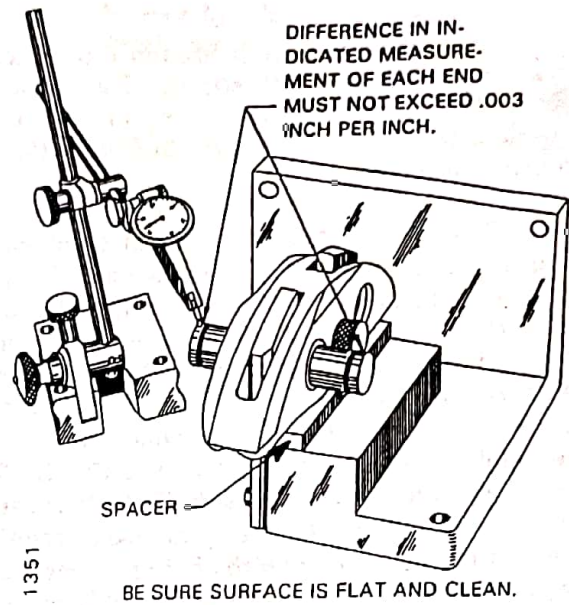


Figure 10. Checking Parallel and Squareness of Counterweight Bushings with Gage Fixture ST-91 - Horizontal Position

A. Install the counterweight on the correct P/N ST-96 balancing arbor, either the P/N ST-96-1 for the 3/8 inch hole or P/N ST-96-2 for the 1/4 inch hole, and place the arbor on a pair of balancing ways. Insure each blade of the ways engages the arbor at a point not more than 1-1/2" from each end.

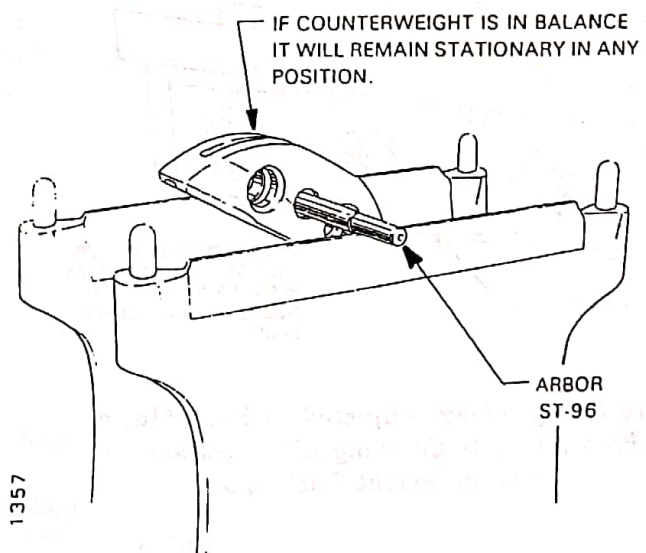


Figure 11. Counterweight Mounted on ST-96 Arbor for Balancing



**NOTE**

The center of both of the P/N ST-96 arbors is tapered to compensate for slight variations in the diameter of the hole. The first 1-1/2 inches of each end of the arbor is carefully ground to insure concentric diameters.

BALANCE MUST BE ACHIEVED BY PLACING WEIGHT NOT MORE THAN 1 INCH FROM CENTER OF COUNTERWEIGHT

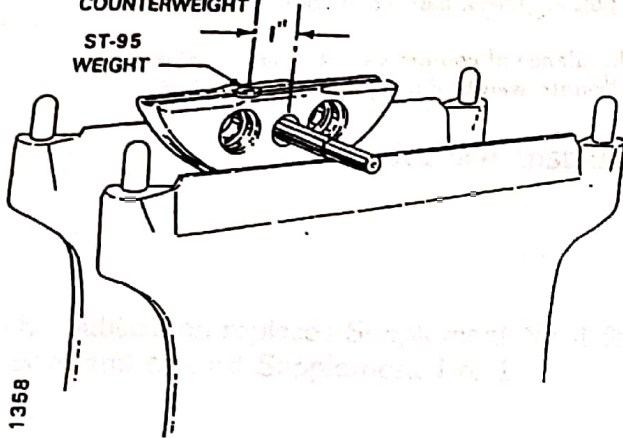


Figure 12. Counterweight Balanced by Weight ST-95 Placed Within One Inch from Center

B. If the counterweight is in perfect balance it will remain in any position it is placed. See Figure 11. If it has a tendency to move, try to keep it in

balance by placing the center of the P/N ST-95 weight not more than 1" from the center of the arbor. See Figure 12. If the counterweight can be brought into balance with the addition of this weight the balance can be considered satisfactory.

C. If the counterweight cannot be brought into balance by the addition of the P/N ST-95 weight, carefully grind the heavy end at the locations shown in Figure 13.

8. Counterweight Weight Limitations - A weight check is not necessary unless the counterweight has been ground to correct an improper balance condition. If the counterweight has been ground it must meet the minimum weight requirements shown in the table with Figure 6. Do not install any counterweight weighing less than the minimum weight, listed in the table, in any engine.

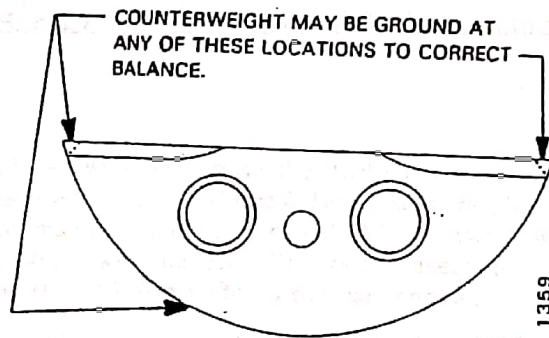


Figure 13. Location of Areas on Counterweight for Grinding

**PARTS REQUIRED:**

Part No.	Nomenclature
71903-A	Bushing, dynamic counterweight (Identification letter "A" .9395/.9390 OD)
71903-B	Bushing, dynamic counterweight (Identification letter "B" .9410/.9405 OD)

**SPECIAL TOOLS REQUIRED:**

Tool No.	Nomenclature
ST-73	Dial bore gage (measure .7485/.7505 inside diameter of bushing)
ST-91	Squareness gage (check parallel and squareness of finished bushing bores)
ST-92	Driver (remove and install bushings)
ST-93	Assembly fixture (install bushings in counterweight)
ST-94	Location Gage (check hole location after grinding)
ST-95	Weight, balance (.004 pound - check balance of counterweight after rebushing)
ST-96	Balancing arbor (check balance of counterweight after rebushing)
64878	Grinding fixture (hold counterweight during bushing grinding)

NOTE: Revision "B" changes text, adds tooling update, adds new counterweight part numbers.

22254, 22734, 22734-A, 22734-B — These numbers for Textron Lycoming reference only.

**TEXTRON** Lycoming

Reciprocating Engine Division/  
Subsidiary of Textron Inc.  
652 Oliver Street  
Williamsport, PA 17701 U.S.A.

# SERVICE INSTRUCTION

May 28, 1992

Supplement No. 2

for

Service Instruction No. 1143B

This publication replaces Supplement No. 1 for Service Instruction No. 1143B in its entirety. Remove and discard Supplement No. 1.

A recent revision to P/N's LW-19225, LW-19226 and LW-19227 counterweight assemblies changes the distance from the centerline of the counterweight bushing bore to the flat edge of the counterweight on applicable counterweights that are identified with the letter "E", as a suffix to the counterweight part number. (Refer to Dimension "A", in the revised Figure 6, included with this Supplement.) Applicable counterweights that were placed in service, prior to distribution of this Supplement, that are not identified with a letter suffix in the part number will have to be measured to determine the "A" dimension. After the "A" dimension has been determined, vibropeen the correct identification letter on the counterweight as a suffix to the part number.

Although applicable counterweights that are identified with the letter "E" suffix in the part number, fit and perform perfectly on the lobes of crankshafts installed in direct drive engines it is impossible to assemble them on crankshafts that are installed in reduction gear equipped engines. For this reason production of counterweights with the relocated bushing bores has been discontinued and all applicable counterweights will be manufactured to the original "A" dimension which

is listed with the part number that contains the "D" suffix in the revised Figure 6. New counterweights that are manufactured to the original "A" dimension will be identified with the letter "F" or a subsequent letter (G, H, etc.) as a suffix to the part number.

## CAUTION

TO INSURE PROPER COUNTERWEIGHT OPERATION DO NOT ASSEMBLE A P/N LW-19225E, LW-19226E OR LW-19227E AT ANY DESIGNATED LOCATION ON THE CRANKSHAFT OF A REDUCTION GEAR EQUIPPED ENGINE. USE THESE COUNTERWEIGHTS ON DIRECT DRIVE CRANKSHAFTS ONLY. APPLICABLE COUNTERWEIGHTS THAT ARE IDENTIFIED WITH REVISION LETTERS D, F OR SUBSEQUENT LETTERS CAN BE USED AT ANY DESIGNATED LOCATION. REFER TO THE LATEST REVISION TO SERVICE INSTRUCTION NO. 1012 FOR COUNTERWEIGHT APPLICATION.

Counterweight Part No.	Spacer Detail Part No.	Dimensions		Weight (Lbs.) Minimum
		A	B ± .002	
71904	12	.825	.425	1.796
LW-19225D	27	.855	.395	1.796
LW-19225E	17	.875	.375	1.796
71905	12	.825	.425	1.752
LW-19226D	27	.855	.395	1.756
LW-19226E	17	.875	.375	1.756
72801	10	.715	.535	1.846
LW-19227D	28	.740	.510	1.846
LW-19227E*	30	.760	.490	1.846
72534	13	.950	.300	2.246
LW-19213	29	.965	.285	2.246
73643	15	.805	.445	2.212
LW-19211	12	.825	.425	2.212
73644	11	.741	.509	2.166
LW-19210	30	.761	.489	2.166
73812	16	.908	.342	2.266
LW-19212	31	.923	.327	2.266
74901	20	.720	.530	1.470
75636	20	.720	.530	1.600
75637	17	.875	.375	1.678
76044	18	.730	.520	1.810
78988	18	.730	.520	1.600

\* Use spacer No. 30 and .001 inch thick shim stock to achieve .490 spacer thickness when grinding the bushings in a P/N LW-19227E counterweight.

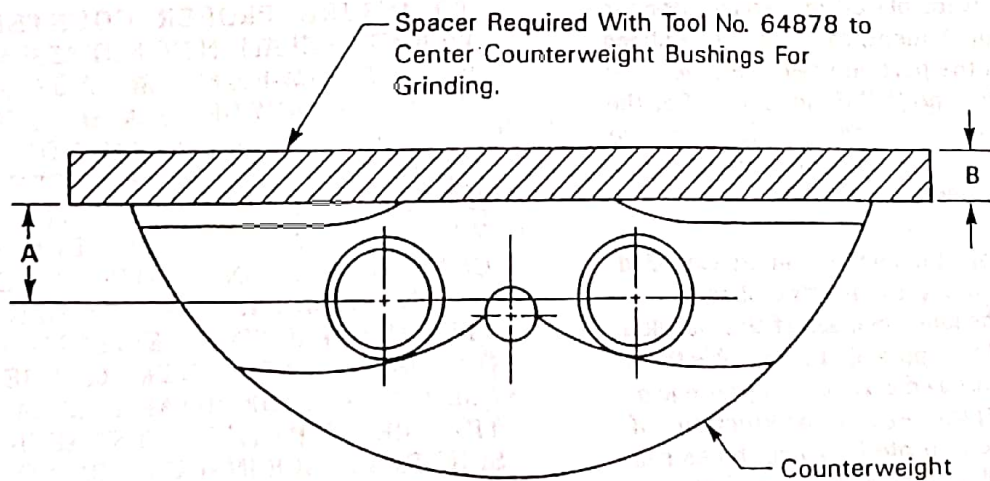


Figure 6. (Revised) Identification of Dimension "A" and "B"

**TOOL DATA:**

There is no change to the tooling update kits offered in Service Letter No. L217; however, as can be seen by the dimensional changes listed in the revised Figure 6, different tools and set-up procedures are required with counterweights that are identified with the letter "E" as a suffix to the part number.

These changes are:

1. Use spacers as listed in the revised Figure 6.

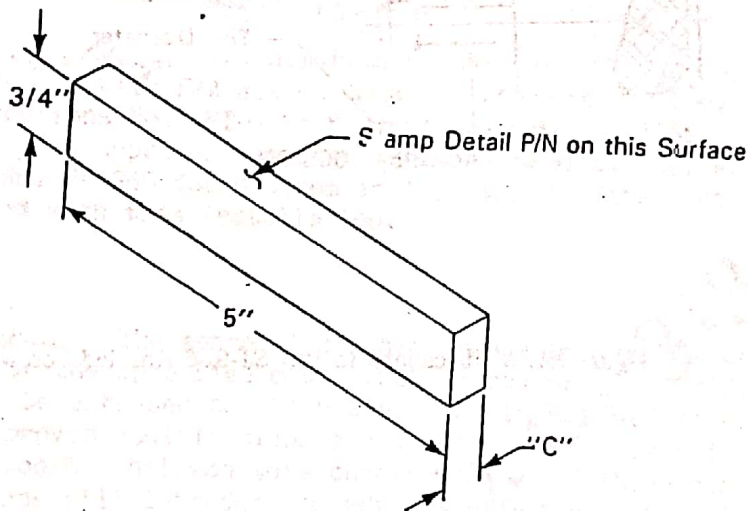
**NOTE**

Use .001 inch thick shim stock between the P/N 64878 fixture and the P/N 64878-30

spacer to align the P/N LW-19227E counterweight.

2. When checking the distance from the centerline of the bushing bore to the flat edge of the P/N LW-19227E counterweight with the P/N ST-94 fixture, use the .0761 step of the P/N ST-94-10 set master, set the preloaded dial indicator to + .001 inch to compensate for the .001 difference between the counterweight measurement and the set master.

3. Figure 3 is revised and included with this Supplement, to show spacer application for the revised counterweights. Figure 3A is added to illustrate an undercut to the P/N ST-91-6 knurled screw. This undercut is required to allow use of existing spacers with the revised counterweights.



DETAIL PART NUMBER

DIMENSION "C"

USE WITH COUNTERWEIGHT P/N

ST-91-7  
ST-91-8  
ST-91-9  
ST-91-10  
ST-91-11  
ST-91-12  
ST-91-13  
ST-91-14

5/64  
11/64  
13/64  
7/64  
7/32  
9/64  
1/32  
1/4

73643, 73644, 72534, 73812  
72801, LW-19225E, LW-19226E  
71904, 71905, LW-19210  
LW-19225D, LW-19226D, 75637  
LW-19227D  
LW-19211, LW-19227E  
LW-19212  
75636, 76044, 78988

Figure 3. (Revised) Dimensions of New Spacers for ST-91 Gage

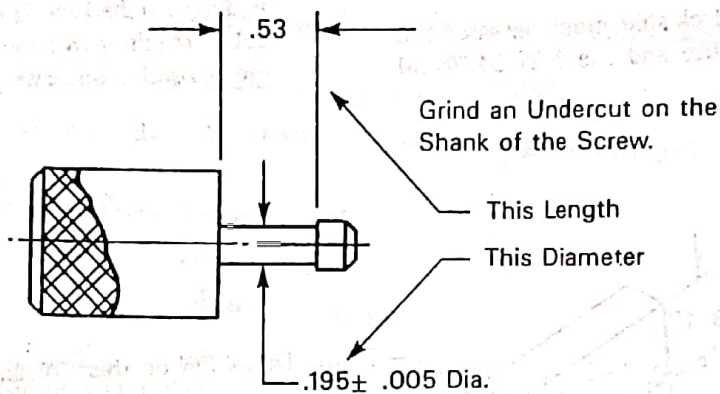


Figure 3A. Modifications to P/N ST-91-6 Knurled Screw

22971, 22971-A — These numbers for Textron Lycoming reference only.

United States of America  
Department of Transportation — Federal Aviation Administration  
**Supplemental Type Certificate**

Number SA3550NM

This certificate, issued to Johnston Aircraft Service, Inc.

certifies that the change in the type design for the following product with the limitations and conditions therefor as specified hereon meets the airworthiness requirements of Part 3 of the Civil Air Regulations, effective November 1, 1949, including Amendments 3-1 to 3-12, inclusive.

Original Product — Type Certificate Number: 1A15  
Make: Piper  
Model: PA-24-250

Description of Type Design Change: Installation of Hartzell HC-C2YK-1BF/F8477D-5R propeller in accordance with FAA sealed Johnston Aircraft Service, Inc. Installation Instructions No. CPI-2 "NC" dated December 10, 1986, or later FAA approved revision. FAA Approved Johnston Aircraft Service, Inc. Airplane Flight Manual Supplement No. 24-250 dated December 10, 1986, or later FAA approved revision is required with this installation.

Limitations and Conditions: The approval of this change in type design applies to the basic aircraft of the specified model that is otherwise unmodified. This approval should not be extended to other specific airplanes of this model on which other previously approved modifications are incorporated, unless it is determined that the interrelationship between this change and any of those other previously approved modifications will introduce no adverse effect upon the airworthiness of that airplane.

This certificate and the supporting data which is the basis for approval shall remain in effect until surrendered, suspended, revoked, or a termination date is otherwise established by the Administrator of the Federal Aviation Administration.

Date of application: November 29, 1986

Date reissued:

Date of issuance: December 10, 1986

Date amended:



By direction of the Administrator  
*Marvin J. Kaminski*  
for Manager, Western Aircraft  
Certification Office

(Title)

Any alteration of this certificate is punishable by a fine of not exceeding \$1,000, or imprisonment not exceeding 3 years, or both.

United States of America  
Department of Transportation—Federal Aviation Administration  
**Supplemental Type Certificate**  
(Continuation Sheet)

(I) December 10, 1986

*Number* SA3550NM

SUPPLEMENTAL TYPE CERTIFICATE ADDENDUM NO. SA3550NM

The conditions and limitations of Aircraft Specification No. 1A15 apply except as follows:

This Addendum, which is part of Supplemental Type Certificate No. SA3550NM prescribes conditions and limitations under which the product for which the STC was issued meets the airworthiness requirements of the Civil Air Regulations. A copy of this Addendum shall be maintained as part of the modified aircraft permanent records.

Supplemental Type Certificate Holder: Johnston Aircraft Service, Inc.

II - Model PA-24-250, as modified by STC SA3550NM

Engine	Lycoming IO-540-C1B5, modified per STC SE3553NM. or Lycoming O-540-A1A, -A1A5, -A1B5, -A1C5, -A1D5, modified per STC SE3552NM.
Engine Limits	All Operations: 2575 r.p.m. (250 h.p.) Maximum Normal Operating: 2515 r.p.m. (247 h.p.), 28.8" MP
Propeller and Propeller Limits	Hartzell HC-C2Y Hub Model: HC-C2YK-1BF Blade Model: F8477D-5R Diameter: not over 79 in., not under 76 in. Pitch Settings at 30 in. Station: Low $15.5^{\circ} \pm .2^{\circ}$ High $32^{\circ} \pm 1^{\circ}$
	Governor: Hartzell Model F-4-4 or F-4-4A or Woodward Models 210185, A210185 or A210305 reworked per Johnston Aircraft Service, Inc. Installation Instructions CPI-2.
	Spinner: Hartzell Model 82-A3519
Powerplant Markings	Tachometer: Maximum 2575 r.p.m. (Red Radial) Normal 500 to 2515 r.p.m. (Green Arc)

Any alteration of this certificate is punishable by a fine of not exceeding \$1,000, or imprisonment not exceeding 3 years, or both.

FAA FORM 8110-2-1 (10-69)

*This certificate may be transferred in accordance with FAR 21.47.*



United States of America  
Department of Transportation—Federal Aviation Administration  
**Supplemental Type Certificate**  
(Continuation Sheet)

(I) December 10, 1986

*Number* SA3550NM

SUPPLEMENTAL TYPE CERTIFICATE ADDENDUM NO. SA3550NM (cont.)

Required Equipment In addition to the equipment applicable and required by Aircraft Specification No. 1A15, the following equipment must be installed as a result of incorporating STC SA3550NM:

- INSTALLATION OF
- (a) Equipment specified in Johnston Aircraft Service, Inc. Installation Instructions No. CPI-2 dated December 10, 1986, or later FAA approved revision.
  - (b) Johnston Aircraft Service, Inc. Airplane Flight Supplement No. 24-250 dated December 10, 1986, or later FAA approved revision.

NOTE 1. Current weight and balance report including list of equipment included in certified empty weight, and loading instructions when necessary, must be in the aircraft.

NOTE 2. Placards (Ref.) No Change.

NOTE 3. Reserved.

NOTE 4. Noise Characteristics

For this modification the maximum normal operating power has been limited to 247 HP, and 2515 RPM which results in no acoustical change as defined in paragraph 21.93(b) of the Federal Aviation Regulations.

--END--

Any alteration of this certificate is punishable by a fine of not exceeding \$1,000, or imprisonment not exceeding 3 years, or both.

FAA FORM 8110-2-1 (10-69)

*This certificate may be transferred in accordance with FAR 21.47.*

PAGE 4 OF 4 PAGES

STANDARD AIRCRAFT SERVICE, INC.

INSTALLATION JOHNSTON AIRCRAFT SERVICE, INC.

P.O. Box 1457 Mefford Field

Tulare, California 93275

INSTALLATION INSTRUCTIONS NO. CPI-2

for

INSTALLATION OF HARTZELL PROPELLER HC-C2YK-1BF/F8477D-5R

for PA24-250

FAA APPROVED PER S.T.C. NO. SA3550NM

***THIS S.T.C. IS ELIGIBLE ONLY WITH AIRCRAFT***

***THAT HAVE ENGINES MODIFIED PER S.T.C. SE 3553 NM or SE 3552 NM***

page 1 of 11 pages

DATE: DEC 10 1986

JOHNSTON AIRCRAFT SERVICE, INC.  
INSTALLATION INSTRUCTIONS NO. CPI-2

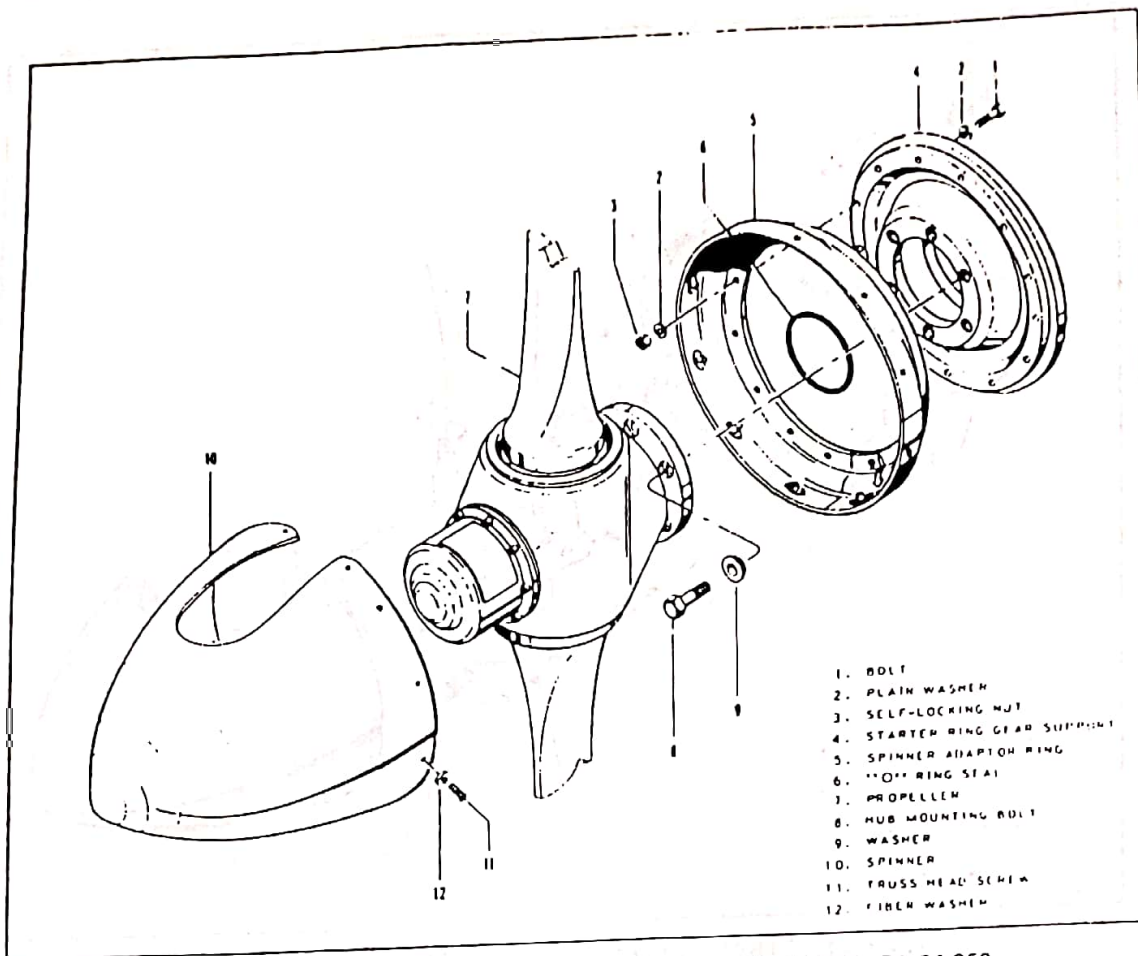
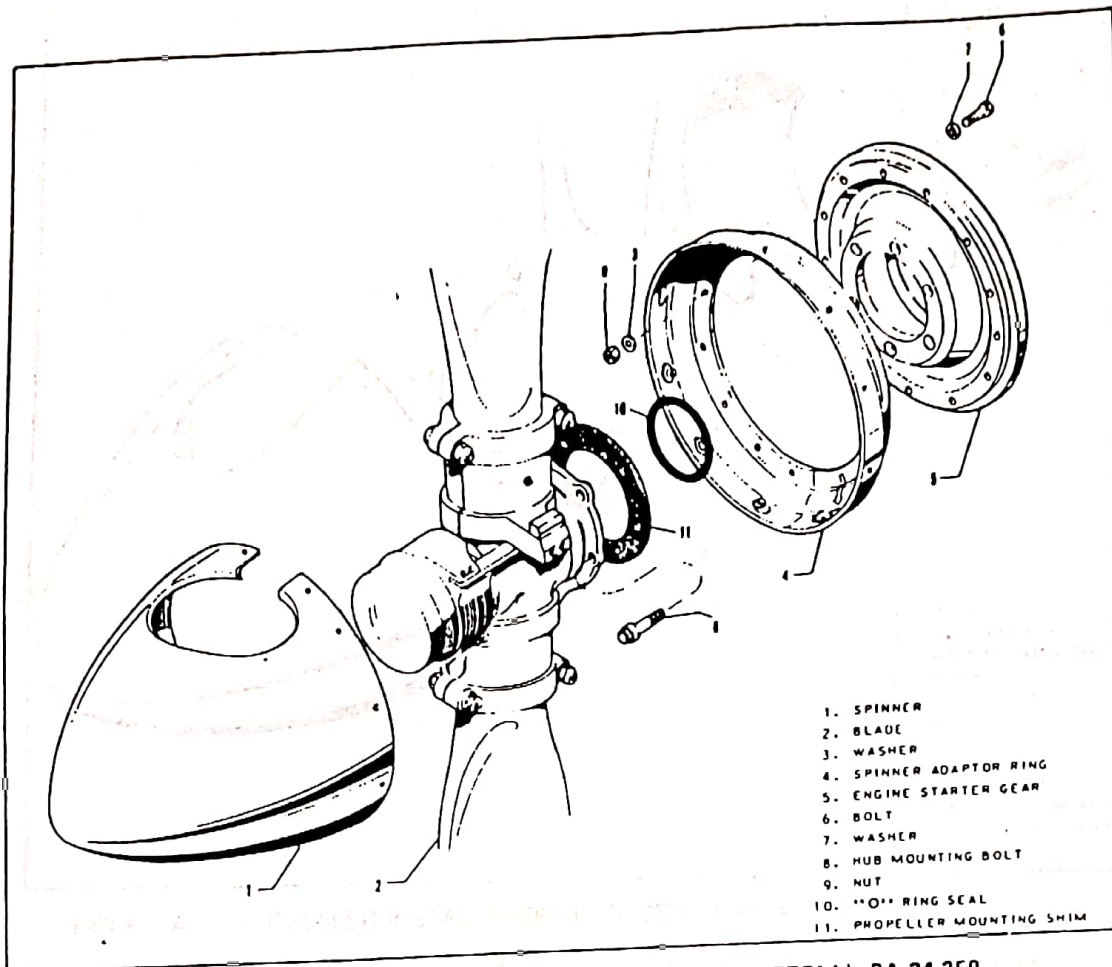


FIGURE A-1. PROPELLER INSTALLATION (MCCAULEY) PA-24-250

A-1 Removal Of Propeller. (McCauley) (PA-24-250) (Refer to Figure A-1)

- a. Remove the spinner (10) by removing the screws (11) that secure it to the spinner bulkhead (5)
- b. Place a drip pan under the propeller to catch oil spillage
- c. Cut the safety wire around the propeller mounting bolts (8) and remove the bolts from the engine crankshaft flange
- d. Pull the propeller from the engine crankshaft
- e. Remove the propeller "O" ring (6) from the propeller hub bore
- f. The spinner bulkhead (5) may be removed from the starter ring gear (4) by removing nuts, washers and bolts.

**JOHNSTON AIRCRAFT SERVICE, INC.**  
**INSTALLATION INSTRUCTIONS NO. CPI-2**



**FIGURE A-2. PROPELLER INSTALLATION (HARTZELL) PA-24-250**

**A-2 Removal Of Propeller. (Hartzell) (PA-24-250) (Refer to Figure A-2.)**

- a. Ascertain that the master switch and magneto switches are in the OFF position.
- b. Remove the spinner (1) by removing the screws that secure it to the spinner bulkhead (4).
- c. Place a drip pan under the propeller to catch oil spillage
- d. Cut the safety wire around the propeller mounting bolts (8) and remove them from the engine crankshaft flange.
- e. Pull the propeller from the engine crankshaft.
- f. Remove the propeller "O" ring (10) and shim (11) from the engine flange
- g. The spinner bulkhead (4) may be removed from the starter ring gear (8) by removing nuts, washers and bolts

JOHNSTON AIRCRAFT SERVICE, INC.  
 INSTALLATION INSTRUCTIONS NO. CPI-2

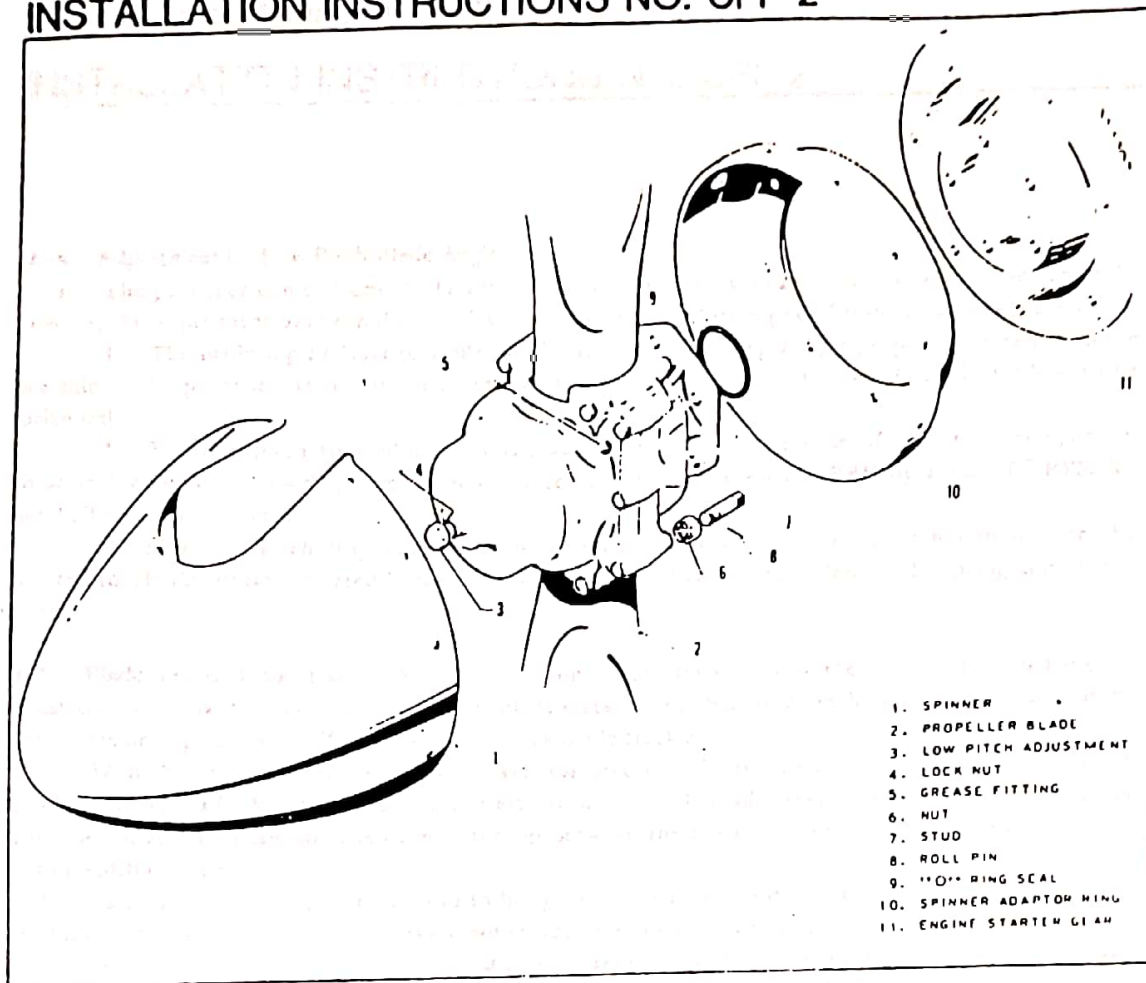


FIGURE A-3. PROPELLER INSTALLATION (HARTZELL) PA-24-250 (MODIFIED)

A-3. Installation Of Propeller, Hartzell Model HC-C2YK-1BF/8477D-5R and Hartzell Spinner Assembly, Part No. 82-A3519 (Refer to Figure A-3)

- a. Clean propeller and engine flanges.
- b. Install spinner bulkhead (10) on starter ring gear (11) and torque bolts to specifications given in Table A-1.
- c. Observe the starter ring gear to make sure it is mounted properly on the engine crankshaft flange. The crankshaft flange is stamped with an "O" mark and the starter ring gear is likewise identified by an "O" mark. Upon installation of the starter ring gear, the markings shall be mated to insure proper installation.
- d. Lubricate and install O-ring (9) in the propeller hub O-ring groove.
- e. Mount propeller on engine. Screw each stud (7) into its mating flange bushing a few threads at a time until all are tight. Torque bolts to specifications given in Table A-1. Safety the mounting bolts with MS20995C41 wire, routing the wire through the lock pins (8).
  - f. Check blade track per paragraph A-5.
  - g. Check low pitch blade angle. (Refer to paragraph A-4.)
  - h. Install engine cowling if removed.
  - i. Install spinner (1) and secure with screws

# JOHNSTON AIRCRAFT SERVICE, INC.

## INSTALLATION INSTRUCTIONS NO. CPI-2

---

### A-4. Adjustment Of Low Pitch Blade Angle Stop.

a. The propeller comes from the factory with the low pitch stop adjusted for proper blade angle. If, however, this adjustment has been disturbed, the following procedure is given for obtaining blade angle:

1. The blade angle (Refer to Table A-1) is determined by placing a propeller protractor on the face side of the propeller, at the 30 inch station, as measured from the hub center line. The blade must be horizontal.

2. The low pitch stop adjustment is made by a screw in the nose of the propeller cylinder. Rotating the screw clockwise increases the low pitch and reduces the static RPM by about 100 RPM for each half turn; or vice versa.

b. After the low pitch stop has been adjusted for proper blade angle, the governor should then be adjusted to obtain maximum rated engine RPM during take-off and climb as described in paragraph A-9 or A-10.

**A-5. Blade Track.** Blade track is the ability of one blade tip to follow the other, while rotating, in almost the same plane. Excessive difference in blade track - more than .0625 inch - may be an indication of bent blades or improper propeller installation. Check blade track as follows:

a. With the engine shut down and blades vertical, secure to the aircraft a smooth board just under the tip of the lower blade. Move the tip fore and aft through its full "blade-shake" travel, making small marks with a pencil at each position. Then center the tip between these marks and scribe a line on the board for the full width of the tip.

b. Carefully rotate propeller by hand to bring the opposite blade down. Center the tip and scribe a pencil line as before and check that lines are not separated more than .0625 inch.

c. Propellers having excess blade track should be removed and inspected for bent blades or for parts of sheared "O" ring, or foreign particles, which have lodged between hub and crankshaft mounting faces. Bent blades will require repair and overhaul of assembly.

# JOHNSTON AIRCRAFT SERVICE, INC.

## INSTALLATION INSTRUCTIONS NO. CPI-2

TABLE A-1

PROPELLER SPECIFICATIONS		
Blade Angle PA-24-250	Low Pitch (High RPM) High Pitch (Low RPM)	15.5° 32° to 34°
Propeller RPM Setting	Engine Static High RPM 24-250 (Modified)  Engine Static Low RPM 24-250 (Modified)	2575 RPM Max.  1600 ± 50 RPM Min.
Propeller Torque Limits	Description	Required Torque (Dry)
	Spinner Bulkhead	
	Bulkhead to Starter	
	Ring Gear	100 inch pounds
	Bulkhead to Propeller	22 foot pounds
	Hub	
	Propeller Mounting	
	Bolts	55 to 60 foot pounds
	Studs	60 to 70 foot pounds
	Spinner Attachment	
	Screws	40 inch pounds

# JOHNSTON AIRCRAFT SERVICE, INC.

## INSTALLATION INSTRUCTIONS NO. CPI-2

### A-6. Removal Of Propeller Governor.

- a. Lift the left side panel of the engine cowling.
- b. Disconnect control cable from governor control arm.
- c. Remove the governor mounting stud nuts. It will be necessary to raise the governor as the nuts are being removed before the nuts can be completely removed.
- d. Remove the mounting gasket. If the governor is to be removed for a considerable length of time and another unit is not substituted, it is advisable to cover the mounting pad to prevent damage caused by foreign matter.

### A-7. Governor Change.

- a. If your governor is a Hartzell B-4-2 Model, it must be replaced with Hartzell Model F4-4A Governor or a reworked Woodward Governor (see next sentence). If your governor is a Woodward Model 210185 or 210305 then it can be reworked to be compatible with the Hartzell Compact Propeller. See Page 10 of these Instructions.

### A-8. Installation Of Propeller Governor.

- a. Clean the mounting pad thoroughly making very certain that there are no foreign particles in the recess around the drive shaft.
- b. Place the governor mounting gasket in position with the raised portion of the screen facing away from the engine.
- c. Align the splines on the governor shaft with the engine drive and slide the governor in position.
- d. Raise governor off mounting pad enough to install washers and start mounting nuts. Torque nuts evenly.
- e. Connect the control cable end to the governor control arm.
- f. Adjust governor control per paragraph A-9 or A-10, if necessary!

### A-9. Adjustment Of Propeller Governor. (Modified Woodward) (Refer to Figure A-4)

- a. Start the engine in accordance with the directions given in Owner's Operating Manual and allow to warm up.
- b. Push the "PROPELLER" cockpit control as far forward as it will go. At this position the governor speed adjusting control lever will be against the hi-rpm fine adjusting screw.
- c. Observe engine speed. Adjust the governor speed by means of the fine adjustment screw for 2575 rpm. To do this, release the fasteners and lift the side engine cowling. Release the speed control lever clamp screw (4) and move the lever relative to the cover serrations. Once serration movement in a clockwise direction produces a decrease in speed of 100 rpm; one serration counter-clockwise increases the speed 100 rpm. One revolution of the hi-rpm fine adjustment screw in a clockwise direction decreases engine speed 25 rpm, counter-clockwise rotation increases engine speed 25 rpm, for each revolution of the screw.
- d. After setting the engine rpm at 2575, tighten the control lever clamping screw, and run the self-locking nut on the fine adjustment screw against the stop ring projection. Then safety-wire the head of the screw to the projection.
- e. Fasten cowling on both sides.



JOHNSTON AIRCRAFT SERVICE, INC.  
 INSTALLATION INSTRUCTIONS NO. CPI-2

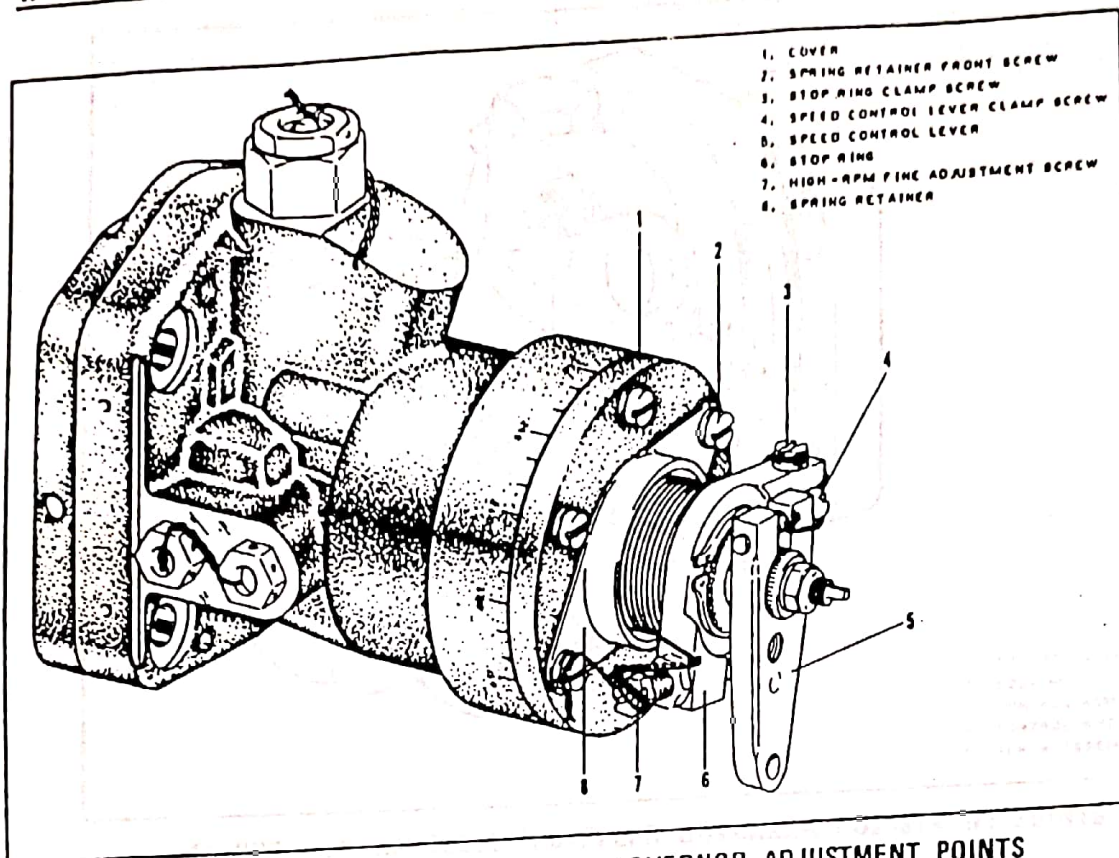


FIGURE A-4. WOODWARD PROPELLER GOVERNOR ADJUSTMENT POINTS

A-10. Adjustment Of Propeller Governor. (Hartzell) (Refer to Figure A-5.)

- a. Release the fasteners and lift the left side engine cowling.
- b. Start the engine in accordance with the directions given in the Owner's Flight Manual and allow to warm up.
- c. Push the "PROPELLER" cockpit control as far forward as it will go. At this position the governor speed adjusting control lever will be against the hi-rpm fine adjusting screw.
- d. Observe engine speed. Adjust the governor by means of the fine adjustment screw for 2575 RPM. To do this, loosen the fine adjustment screw locknut and turn the hi-rpm fine adjustment screw in a clockwise direction to decrease engine speed and a counterclockwise rotation to increase engine speed. One revolution of the fine adjustment screw increases or decreases the propeller speed approximately 15 RPM.
- e. After setting the governor for high RPM, run the self-locking nut on the fine adjustment screw against the base projection to lock.
- f. Pull the "PROPELLER" cockpit control aft to the low RPM position.
- g. Observe engine speed. Set to 1600 RPM either by threading the fitting at the governor control arm onto the cable, or by turning it in the direction tending to remove the fitting from the cable, depending on whether it is required to decrease or increase engine speed, respectively. It will be necessary, of course, prior to adjusting, to remove the self-locking nut and disconnect it from the governor control arm and to release the fitting locknut.
- h. Reconnect cable to governor control arm, apply fitting locknut and recheck engine by moving cockpit control in and out of the appropriate setting.
- i. Secure the cowling.

JOHNSTON AIRCRAFT SERVICE, INC.  
INSTALLATION INSTRUCTIONS NO. CPI-2

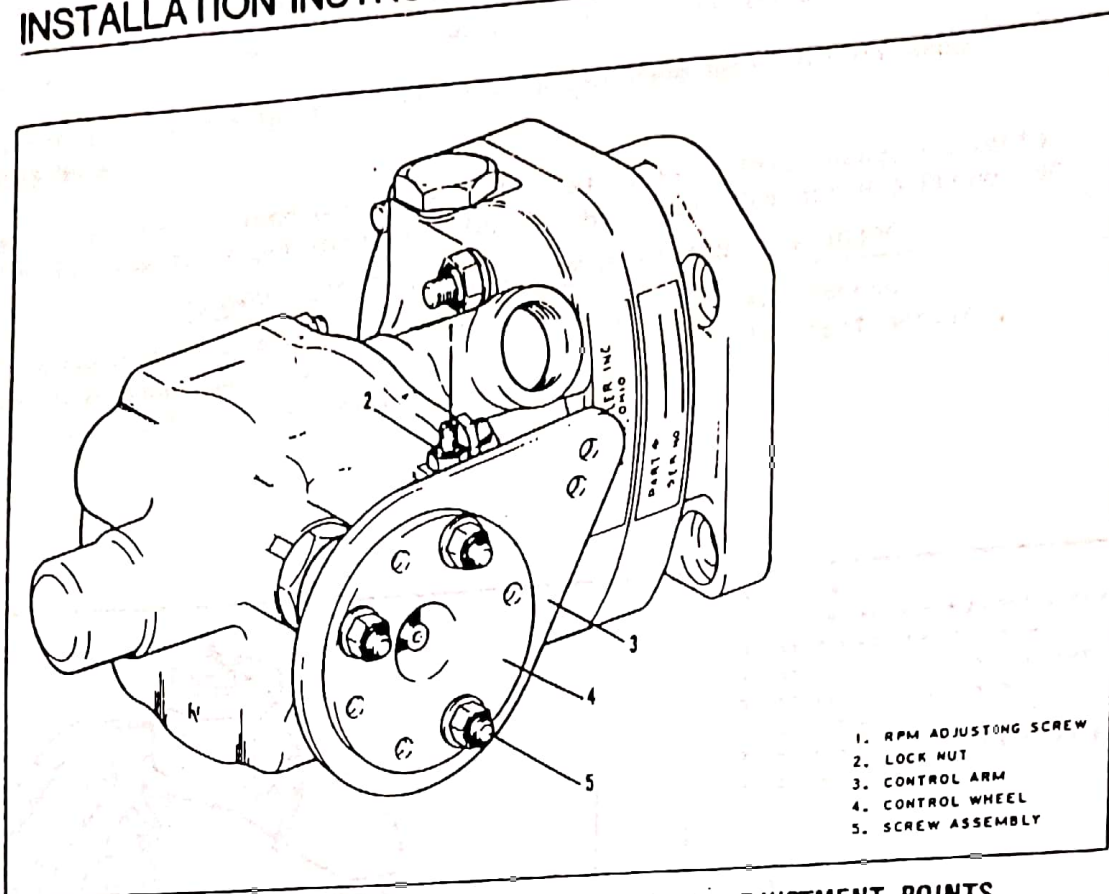


FIGURE A-5. HARTZELL PROPELLER GOVERNOR ADJUSTMENT POINTS

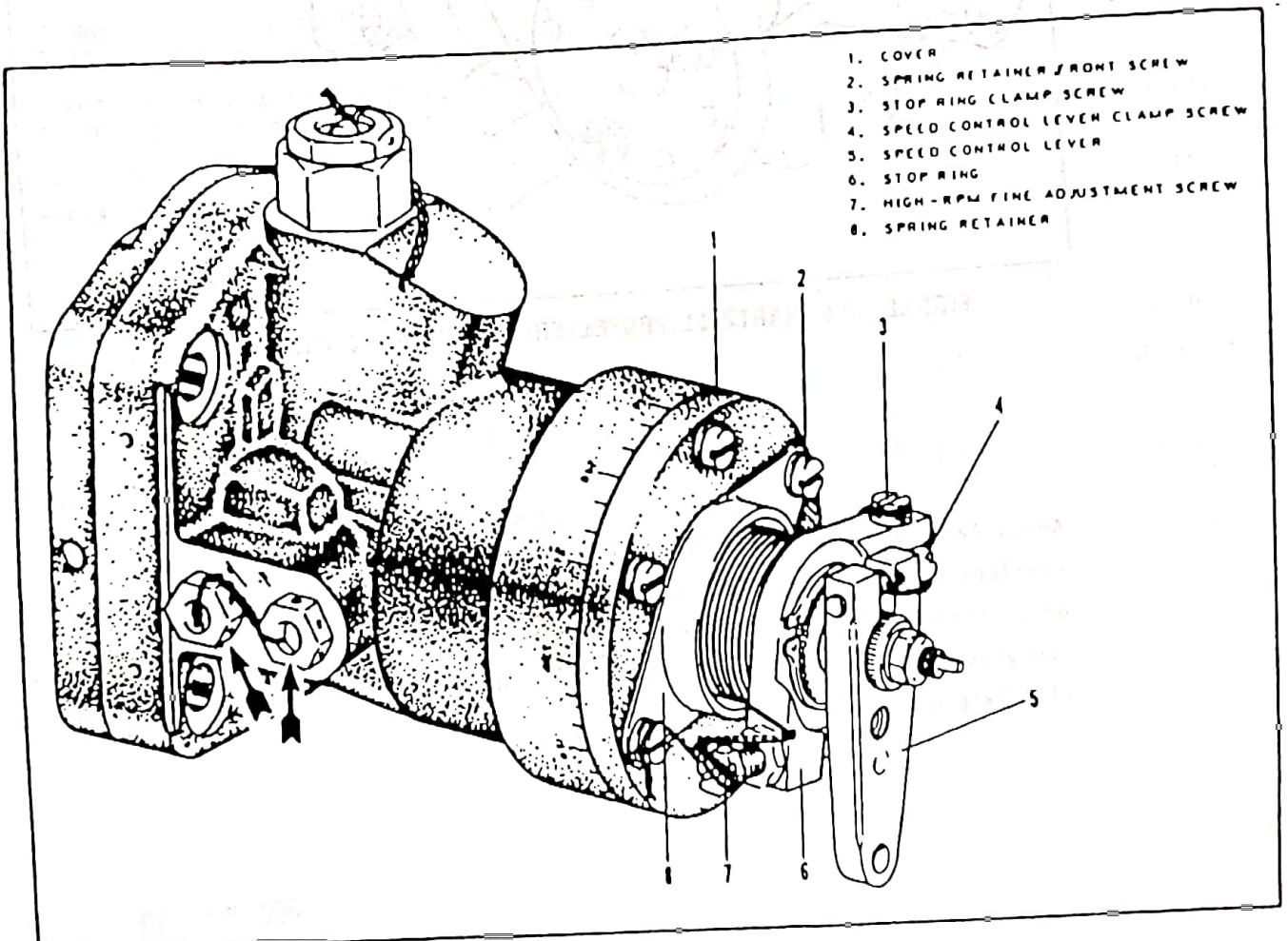
A-11. Perform weight and balance calculation making sure aircraft is in C.G. envelope and make change to useful load. Fill out FAA Form 337 with brief description of change and show approval in accordance with S.T.C. No. SABSSONM. Johnston Aircraft Service, Inc.'s Weight and Balance Supplement, Report 1359, will help with calculations.

WOODWARD 210185 GOVERNOR MODIFICATION TO A210185

1. Remove (2)  $\frac{1}{2}$  inch Hex Plugs (shown by arrows in illustration).
2. Switch  $\frac{5}{32}$  inch Allen Cap Screw from Right Hand hole to Left Hand Hand Hole.
3. Re-install (2)  $\frac{1}{2}$  inch Hex Plugs and Safety Wire. This change converts the Oil Flow to proper direction for the Hartzell Compact Hub Propeller.

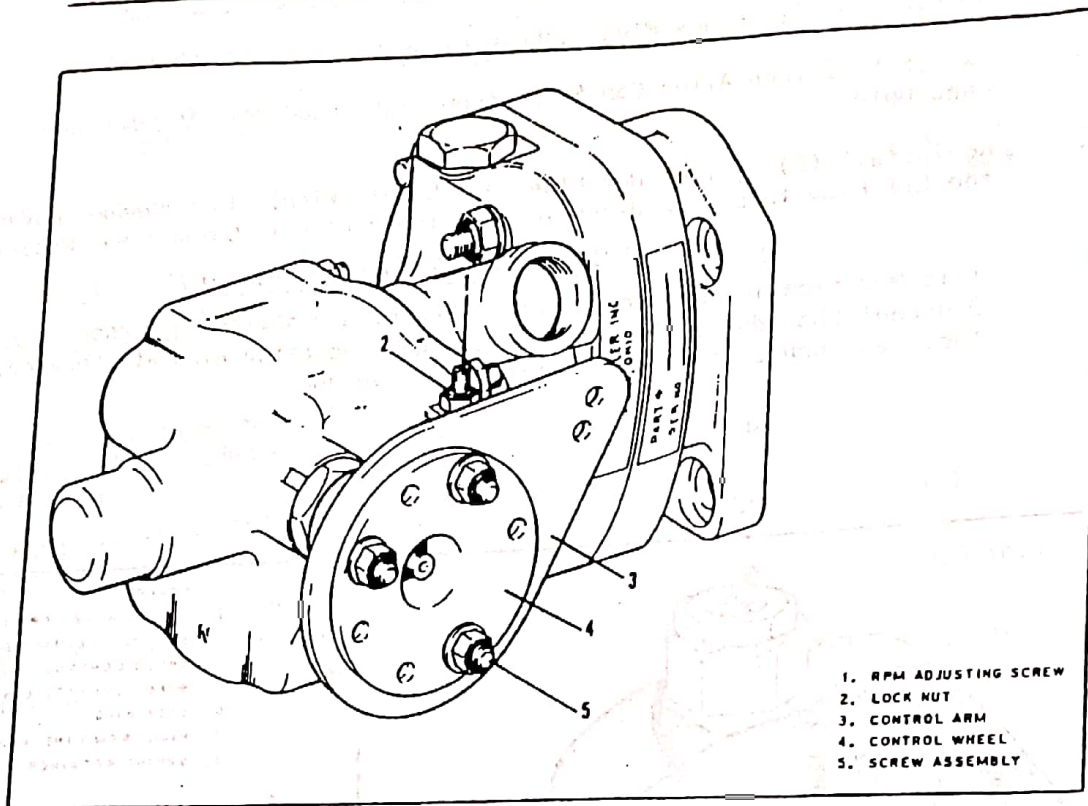
WOODWARD 210305 GOVERNOR MODIFICATION TO A210305

This Modification MUST be accomplished by a qualified Governor Overhaul Shop due to Pilot Valve change. Johnston Aircraft Service, Inc. can furnish a re-worked Exchange Governor.



WOODWARD PROPELLER GOVERNOR

**JOHNSTON AIRCRAFT SERVICE, INC.  
INSTALLATION INSTRUCTIONS NO. CPI-2**



**FIGURE A-5. HARTZELL PROPELLER GOVERNOR ADJUSTMENT POINTS**

A-11. Perform weight and balance calculation making sure aircraft is in C.G. envelope and make change to useful load. Fill out FAA Form 337 with brief description of change and show approval in accordance with S.T.C. No. SA3550AM. Johnston Aircraft Service, Inc.'s Weight and Balance Supplement, Report 1359, will help with calculations.

report 1000  
 Page 5A Sec. 2  
 Model PA24-250  
 Serial Nos. All

JOHNSTON AIRCRAFT SERVICE, INC.  
 WEIGHT AND BALANCE SUPPLEMENT 250  
 MODEL PA24-250 COMANCHE  
 EQUIPMENT LIST

ITEM

WEIGHT

ARM - IN.  
AFT DATUM

PROPELLERS AND PROPELLER ACCESSORIES

DELETE

Propeller - Hartzell Model HC-A2XK-1 or HC-82XK-1D with 8433-7 Blades or HC-A2VK-1 with V8433N-7, or

63 Lb

1.5 In.

Propeller - McCauley Model 2D36C28 with 80MM - 6 Blades

60 Lb

1.5 In.

Governor - Hartzell B-4-2 or Woodward 210185, 210250, A210185 and A210305

5 Lb

10.0 In.

Propeller Spinner Dome and Bulkhead Adapter

3 Lb

1.5 In.

ADD

Propeller - Hartzell Model HC-C2YK-1BF/8477D-5R

57.5 Lb

1.5 In.

Governor - Hartzell F-4-4A or

6 Lb

10.0 In.

Reworked Woodward 210185, A210185 or A210305

5 Lb

10.0 In.

Propeller Spinner Dome and Bulkhead Adapter - Hartzell Model 82-A3519

5.7 Lb

1.5 In.

DATE: DEC 10 1986

JOHNSTON AIRCRAFT SERVICE, INC.  
P.O. BOX 1457  
TULARE, CALIFORNIA 93275  
SUPPLEMENT NO. 24-250

SUPPLEMENT TO  
PIPER PA24-250 AFM

S.T.C. No. SA 3550NM

F.A.A. APPROVED SUPPLEMENT TO  
PIPER PA24-250  
AIRPLANE FLIGHT MANUAL

Aircraft Serial No. \_\_\_\_\_

Registration No. \_\_\_\_\_

This supplement must be attached to the F.A.A Approved Flight Manual when the airplane is modified by the installation of Hartzell HC-C2YK-1BF/F 8477D-5R Propeller in accordance with S.T.C. No. SA3550NM

The information contained herein supplements or supersedes the basic manual only in those areas listed herein. For limitations, procedures, and performance information not contained in this supplement, consult the basic Airplane Flight Manual.

F.A.A. Approved Marvin F. Rammelsberg  
Supervisor, Technical/Administrative Support Section  
Federal Aviation Administration  
Western Aircraft Certification Office  
Northwest Mountain Region.

F.A.A. APPROVED DATE: 12/10/86

JOHNSTON AIRCRAFT SERVICE, INC.  
 P.O. BOX 1457  
 TULARE, CALIFORNIA 93275  
 SUPPLEMENT NO. 24-250

SUPPLEMENT TO  
 PIPER PA24-250 AFM  
 S.T.C. No. SA3550NM

LOG OF PAGES ( INCLUDING REVISIONS )

REV NO	NO. OF PAGES	DATE	DESCRIPTION	APPROVED
Orig.	1 thru 3	12/10/86	Complete Supplement	<i>Herwin F. Rimmelsberg</i> Supervisor, Technical Administrative Support Section, WACO. F.A.A.

F.A.A. APPROVED DATE: 12/10/86

JOHNSTON AIRCRAFT SERVICE, INC.  
P.O. BOX 1457  
TULARE, CALIFORNIA 93275  
SUPPLEMENT NO. 24-250

SUPPLEMENT TO  
PIPER PA 24-250  
AFM

S.T.C. No. SA 3550 NM

1. LIMITATIONS:

Engine Lycoming Model O-540 A1A, A1A5, A1B5, A1C5, A1D5,  
modified per S.T.C. SE 3552 NM  
- oR -  
Lycoming Model IO-540-C1B5, Modified per S.T.C.  
SE 3553 NM

Engine Limits Maximum 2575 r.p.m. (250 h.p.)  
Maximum Normal Operating 2515 r.p.m. (247 h.p.)

Fuel Grade Aviation Gasoline - 91/96 Minimum Octane

Propeller Hartzell Constant Speed Controllable;  
Hub Model HC-C2YK-1BF  
Blade Model F8477D-5R  
Pitch Settings at 30 inch Station:  
Low 15.5° ±.2° ; High 32° ± 1°  
Diameter: 79 inches maximum  
76 inches maximum

Engine Instruments and Indicators Governor: Hartzell Model F-4-4A  
See Johnston Aircraft Service, Inc. Installation  
Instructions CPI-2, dated, **DEC 10 1986** for  
other Models eligible.  
Spinner: Hartzell Model 82-A3519  
Tachometer: Green Arc ( Normal Operating Range )  
500 to 2515 r.p.m. ;  
Red Line (maximum continuous) 2575 r.p.m.

2. PROCEDURES

No Change

3. PERFORMANCE

Equal to or Better Than That of the Basic Unmodified  
Aircraft.

F.A.A. APPROVED DATE:

12/10/86



United States of America  
Department of Transportation—Federal Aviation Administration  
**Supplemental Type Certificate**  
(Continuation Sheet)

(I) December 10, 1986

*Number* SA3550NM

SUPPLEMENTAL TYPE CERTIFICATE ADDENDUM NO. SA3550NM

The conditions and limitations of Aircraft Specification No. 1A15 apply except as follows:

This Addendum, which is part of Supplemental Type Certificate No. SA3550NM prescribes conditions and limitations under which the product for which the STC was issued meets the airworthiness requirements of the Civil Air Regulations. A copy of this Addendum shall be maintained as part of the modified aircraft permanent records.

Supplemental Type Certificate Holder: Johnston Aircraft Service, Inc.

II - Model PA-24-250, as modified by STC SA3550NM

Engine	Lycoming IO-540-C1B5, modified per STC SE3553NM. or Lycoming O-540-A1A, -A1A5, -A1B5, -A1C5, -A1D5, modified per STC SE3552NM.
Engine Limits	All Operations: 2575 r.p.m. (250 h.p.) Maximum Normal Operating: 2515 r.p.m. (247 h.p.), 28.8" MP
Propeller and Propeller Limits	Hartzell HC-C2Y Hub Model: HC-C2YK-1BF Blade Model: F8477D-5R Diameter: not over 79 in., not under 76 in. Pitch Settings at 30 in. Station: Low $15.5^{\circ} \pm .2^{\circ}$  High $32^{\circ} \pm 1^{\circ}$
	Governor: Hartzell Model F-4-4 or F-4-4A or Woodward Models 210185, A210185 or A210305 reworked per Johnston Aircraft Service, Inc. Installation Instructions CPI-2.
	Spinner: Hartzell Model 82-A3519
Powerplant Markings	Tachometer: Maximum 2575 r.p.m. (Red Radial) Normal 500 to 2515 r.p.m. (Green Arc)

*Any alteration of this certificate is punishable by a fine of not exceeding \$1,000, or imprisonment not exceeding 3 years, or both.*

FAA FORM 8110-2-1 (10-69)

*This certificate may be transferred in accordance with FAR 21.47.*

United States of America  
Department of Transportation—Federal Aviation Administration  
**Supplemental Type Certificate**  
(Continuation Sheet)

(I) December 10, 1986

*Number* SA3550NM

SUPPLEMENTAL TYPE CERTIFICATE ADDENDUM NO. SA3550NM (cont.)

Required Equipment In addition to the equipment applicable and required by Aircraft Specification No. 1A15, the following equipment must be installed as a result of incorporating STC SA3550NM:

- INSTALLATION OF
- (a) Equipment specified in Johnston Aircraft Service, Inc. Installation Instructions No. CPI-2 dated December 10, 1986, or later FAA approved revision.
  - (b) Johnston Aircraft Service, Inc. Airplane Flight Supplement No. 24-250 dated December 10, 1986, or later FAA approved revision.

NOTE 1. Current weight and balance report including list of equipment included in certified empty weight, and loading instructions when necessary, must be in the aircraft.

NOTE 2. Placards (Ref.) No Change.

NOTE 3. Reserved.

NOTE 4. Noise Characteristics

For this modification the maximum normal operating power has been limited to 247 HP, and 2515 RPM which results in no acoustical change as defined in paragraph 21.93(b) of the Federal Aviation Regulations.

--END--

*Any alteration of this certificate is punishable by a fine of not exceeding \$1,000, or imprisonment not exceeding 3 years, or both.*

FAA FORM 8110-2-1 (10-69)

*This certificate may be transferred in accordance with FAR 21.47.*

JOHNSTON AIRCRAFT SERVICE, INC.

INSTALLATION JOHNSTON AIRCRAFT SERVICE, INC.

P.O. Box 1457 Mefford Field

Tulare, California 93275

INSTALLATION INSTRUCTIONS NO. CPI-2

for

INSTALLATION OF HARTZELL PROPELLER HC-C2YK-1BF/F8477D-5R

for PA24-250

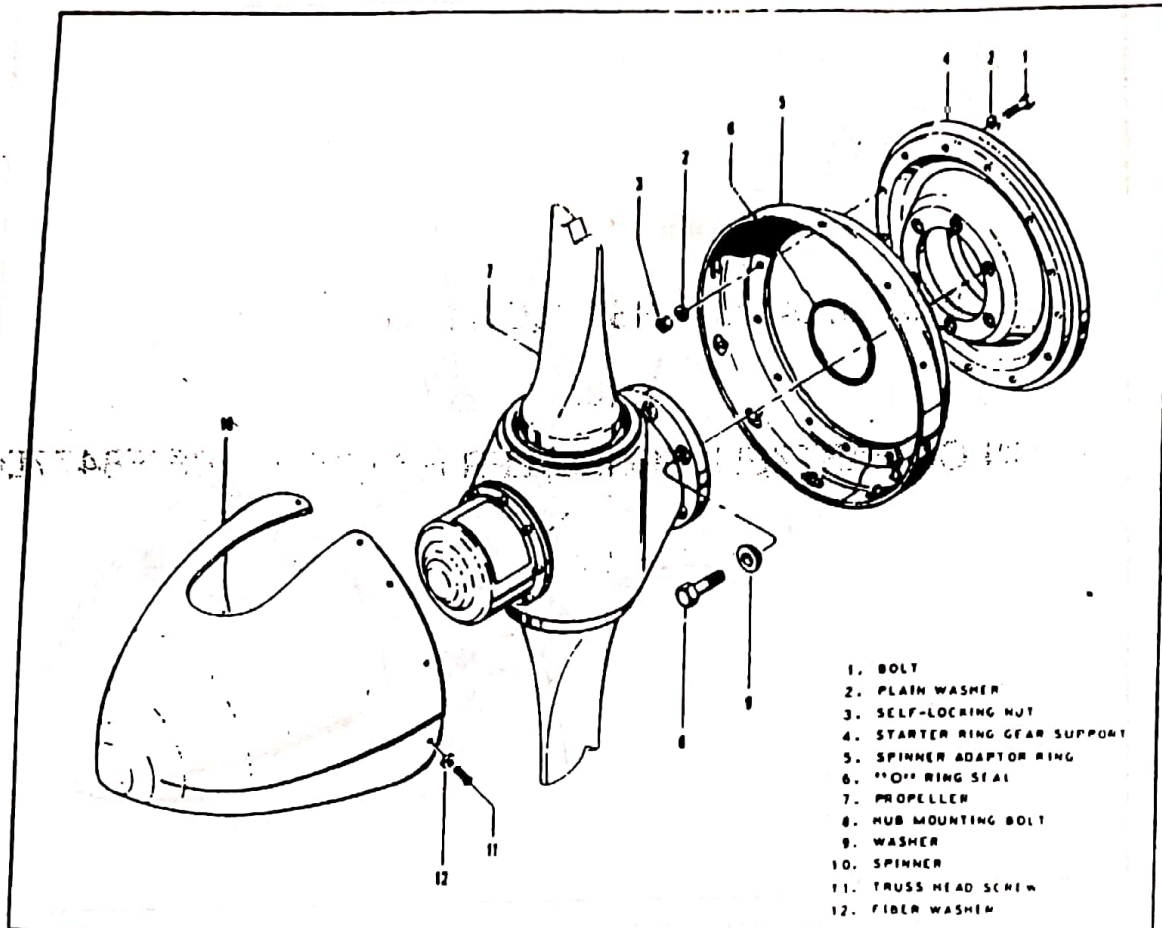
FAA APPROVED PER S.T.C. NO. SA3550NM

*THIS S.T.C. IS ELIGIBLE ONLY WITH AIRCRAFT*

*THAT HAVE ENGINES MODIFIED PER S.T.C. SE 3553 NM or SE 3552 NM*

**JOHNSTON AIRCRAFT SERVICE, INC.**

**INSTALLATION INSTRUCTIONS NO. CPI-2**



**FIGURE A-1. PROPELLER INSTALLATION (MCCAULEY) PA-24-250**

**A-1 Removal Of Propeller. (McCauley) (PA-24-250) (Refer to Figure A-1.)**

- a. Remove the spinner (10) by removing the screws (11) that secure it to the spinner bulkhead (5)
- b. Place a drip pan under the propeller to catch oil spillage
- c. Cut the safety wire around the propeller mounting bolts (8) and remove the bolts from the engine crankshaft flange
- d. Pull the propeller from the engine crankshaft.
- e. Remove the propeller "O" ring (6) from the propeller hub bore
- f. The spinner bulkhead (5) may be removed from the starter ring gear (4) by removing nuts, washers and bolts.

JOHNSTON AIRCRAFT SERVICE, INC.  
INSTALLATION INSTRUCTIONS NO. CPI-2

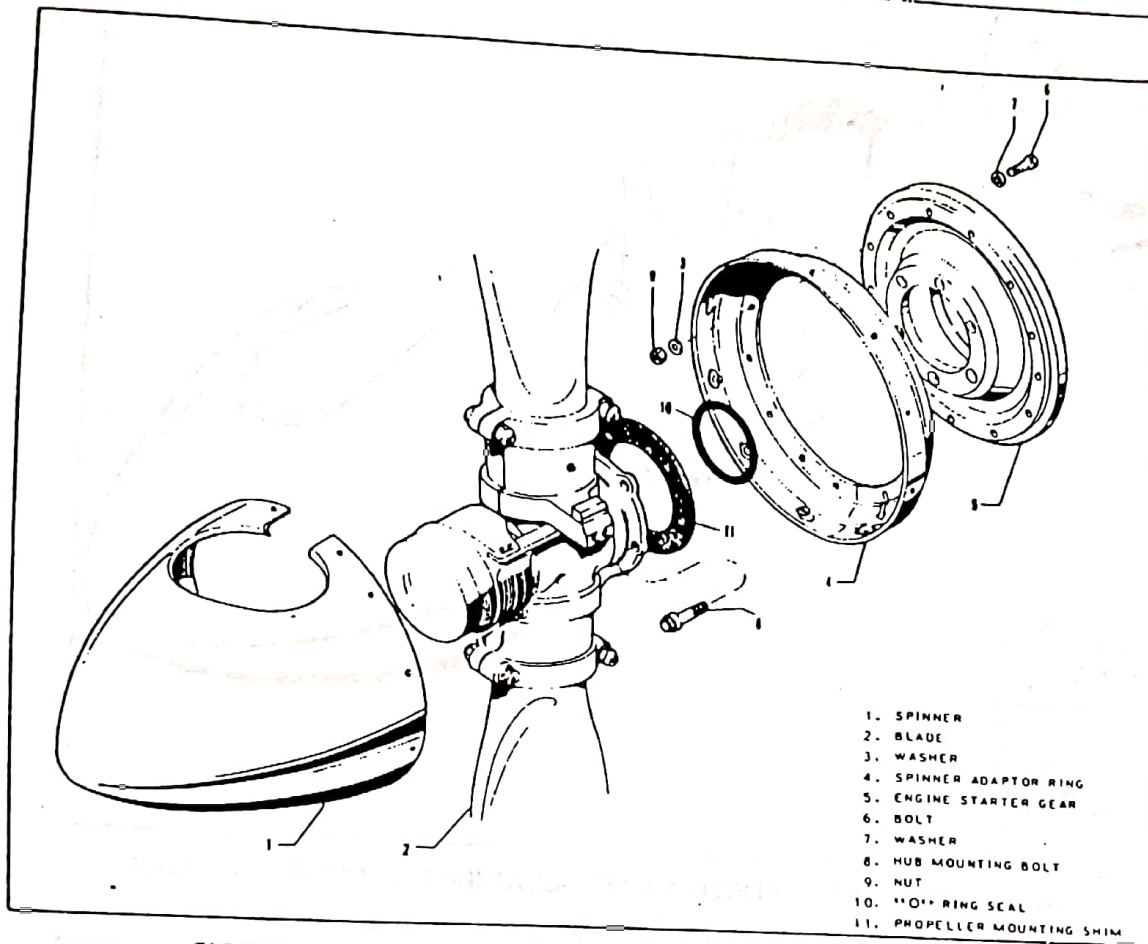


FIGURE A-2. PROPELLER INSTALLATION (HARTZELL) PA-24-250

A-2 Removal Of Propeller. (Hartzell) (PA-24-250) (Refer to Figure A-2.)

- a. Ascertain that the master switch and magneto switches are in the OFF position.
- b. Remove the spinner (1) by removing the screws that secure it to the spinner bulkhead (4).
- c. Place a drip pan under the propeller to catch oil spillage
- d. Cut the safety wire around the propeller mounting bolts (8) and remove them from the engine crankshaft flange.
- e. Pull the propeller from the engine crankshaft.
- f. Remove the propeller "O" ring (10) and shim (11) from the engine flange
- g. The spinner bulkhead (4) may be removed from the starter ring gear (8) by removing nuts, washers and bolts.

JOHNSTON AIRCRAFT SERVICE, INC.  
 INSTALLATION INSTRUCTIONS NO. CPI-2

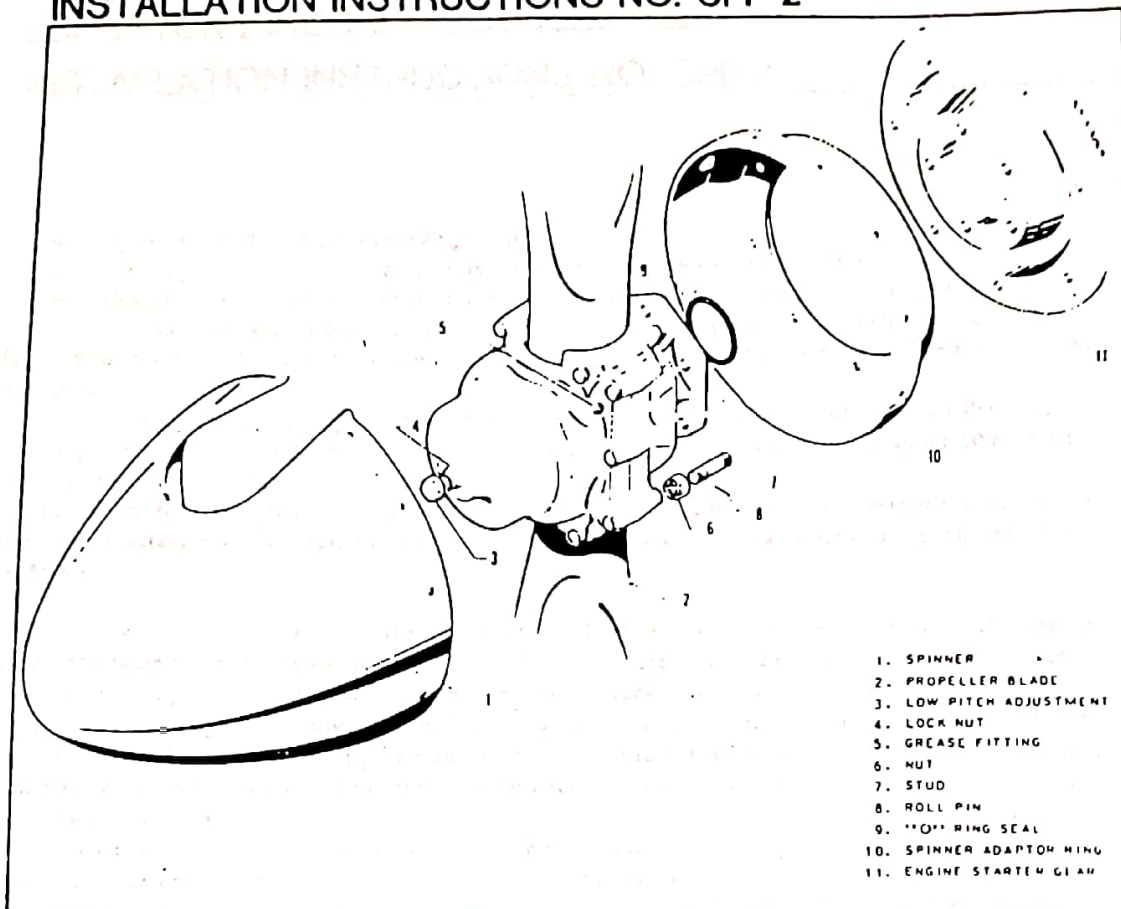


FIGURE A-3. PROPELLER INSTALLATION (HARTZELL) PA-24-250 (MODIFIED)

A-3. Installation Of Propeller, Hartzell Model HC-C2YK-1BF/8477D-5R and Hartzell Spinner Assembly, Part No. 82-A3519 (Refer to Figure A-3)

- a. Clean propeller and engine flanges.
- b. Install spinner bulkhead (10) on starter ring gear (11) and torque bolts to specifications given in Table A-1.
- c. Observe the starter ring gear to make sure it is mounted properly on the engine crankshaft flange. The crankshaft flange is stamped with an "O" mark and the starter ring gear is likewise identified by an "O" mark. Upon installation of the starter ring gear, the markings shall be mated to insure proper installation.
- d. Lubricate and install O-ring (9) in the propeller hub O-ring groove.
- e. Mount propeller on engine. Screw each stud (7) into its mating flange bushing a few threads at a time until all are tight. Torque bolts to specifications given in Table A-1. Safety the mounting bolts with MS20995C41 wire, routing the wire through the lock pins (8).
- f. Check blade track per paragraph A-5.
- g. Check low pitch blade angle. (Refer to paragraph A-4.)
- h. Install engine cowling if removed.
- i. Install spinner (1) and secure with screws

# JOHNSTON AIRCRAFT SERVICE, INC.

## INSTALLATION INSTRUCTIONS NO. CPI-2

---

### **A-4. Adjustment Of Low Pitch Blade Angle Stop.**

a. The propeller comes from the factory with the low pitch stop adjusted for proper blade angle. If, however, this adjustment has been disturbed, the following procedure is given for obtaining blade angle:

1. The blade angle (Refer to Table A-1) is determined by placing a propeller protractor on the face side of the propeller, at the 30 inch station, as measured from the hub center line. The blade must be horizontal.

2. The low pitch stop adjustment is made by a screw in the nose of the propeller cylinder. Rotating the screw clockwise increases the low pitch and reduces the static RPM by about 100 RPM for each half turn; or vice versa.

b. After the low pitch stop has been adjusted for proper blade angle, the governor should then be adjusted to obtain maximum rated engine RPM during take-off and climb as described in paragraph A-9 or A-10.

**A-5. Blade Track.** Blade track is the ability of one blade tip to follow the other, while rotating, in almost the same plane. Excessive difference in blade track - more than .0625 inch - may be an indication of bent blades or improper propeller installation. Check blade track as follows:

a. With the engine shut down and blades vertical, secure to the aircraft a smooth board just under the tip of the lower blade. Move the tip fore and aft through its full "blade-shake" travel, making small marks with a pencil at each position. Then center the tip between these marks and scribe a line on the board for the full width of the tip.

b. Carefully rotate propeller by hand to bring the opposite blade down. Center the tip and scribe a pencil line as before and check that lines are not separated more than .0625 inch.

c. Propellers having excess blade track should be removed and inspected for bent blades or for parts of sheared "O" ring, or foreign particles, which have lodged between hub and crankshaft mounting faces. Bent blades will require repair and overhaul of assembly.

**JOHNSTON AIRCRAFT SERVICE, INC.**  
**INSTALLATION INSTRUCTIONS NO. CPI-2**

TABLE A-1

PROPELLER SPECIFICATIONS		
Blade Angle PA-24-250	Low Pitch (High RPM)	15.5°
	High Pitch (Low RPM)	32° to 34°
Propeller RPM Setting	Engine Static High RPM 24-250 (Modified)	2575 RPM Max.
	Engine Static Low RPM 24-250 (Modified)	1600 ± 50 RPM Min.
Propeller Torque Limits	Description	Required Torque (Dry)
	Spinner Bulkhead	
	Bulkhead to Starter	
	Ring Gear	100 inch pounds
	Bulkhead to Propeller	22 foot pounds
	Hub	
	Propeller Mounting	
	Bolts	55 to 60 foot pounds
Studs	60 to 70 foot pounds	
Spinner Attachment		
	Screws	40 inch pounds



# JOHNSTON AIRCRAFT SERVICE, INC.

## INSTALLATION INSTRUCTIONS NO. CPI-2

### A-6. Removal Of Propeller Governor.

- a. Lift the left side panel of the engine cowling.
- b. Disconnect control cable from governor control arm.
- c. Remove the governor mounting stud nuts. It will be necessary to raise the governor as the nuts are being removed before the nuts can be completely removed.
- d. Remove the mounting gasket. If the governor is to be removed for a considerable length of time and another unit is not substituted, it is advisable to cover the mounting pad to prevent damage caused by foreign matter.

### A-7. Governor Change.

- a. If your governor is a Hartzell B-4-2 Model, it must be replaced with Hartzell Model F4-4A Governor or a reworked Woodward Governor (see next sentence). If your governor is a Woodward Model 210185 or 210305 then it can be reworked to be compatible with the Hartzell Compact Propeller. See Page 10 of these Instructions.

### A-8. Installation Of Propeller Governor.

- a. Clean the mounting pad thoroughly making very certain that there are no foreign particles in the recess around the drive shaft.
- b. Place the governor mounting gasket in position with the raised portion of the screen facing away from the engine.
- c. Align the splines on the governor shaft with the engine drive and slide the governor in position.
- d. Raise governor off mounting pad enough to install washers and start mounting nuts. Torque nuts evenly.
- e. Connect the control cable end to the governor control arm.
- f. Adjust governor control per paragraph A-9 or A-10, if necessary!

### A-9. Adjustment Of Propeller Governor. (Modified Woodward) (Refer to Figure A-4)

- a. Start the engine in accordance with the directions given in Owner's Operating Manual and allow to warm up.
- b. Push the "PROPELLER" cockpit control as far forward as it will go. At this position the governor speed adjusting control lever will be against the hi-rpm fine adjusting screw.
- c. Observe engine speed. Adjust the governor speed by means of the fine adjustment screw for 2575 rpm. To do this, release the fasteners and lift the side engine cowling. Release the speed control lever clamp screw (4) and move the lever relative to the cover serrations. Once serration movement in a clockwise direction produces a decrease in speed of 100 rpm; one serration counter-clockwise increases the speed 100 rpm. One revolution of the hi-rpm fine adjustment screw in a clockwise direction decreases engine speed 25 rpm, counter-clockwise rotation increases engine speed 25 rpm, for each revolution of the screw.
- d. After setting the engine rpm at 2575, tighten the control lever clamping screw, and run the self-locking nut on the fine adjustment screw against the stop ring projection. Then safety-wire the head of the screw to the projection.
- e. Fasten cowling on both sides.

JOHNSTON AIRCRAFT SERVICE, INC.  
INSTALLATION INSTRUCTIONS NO. CPI-2

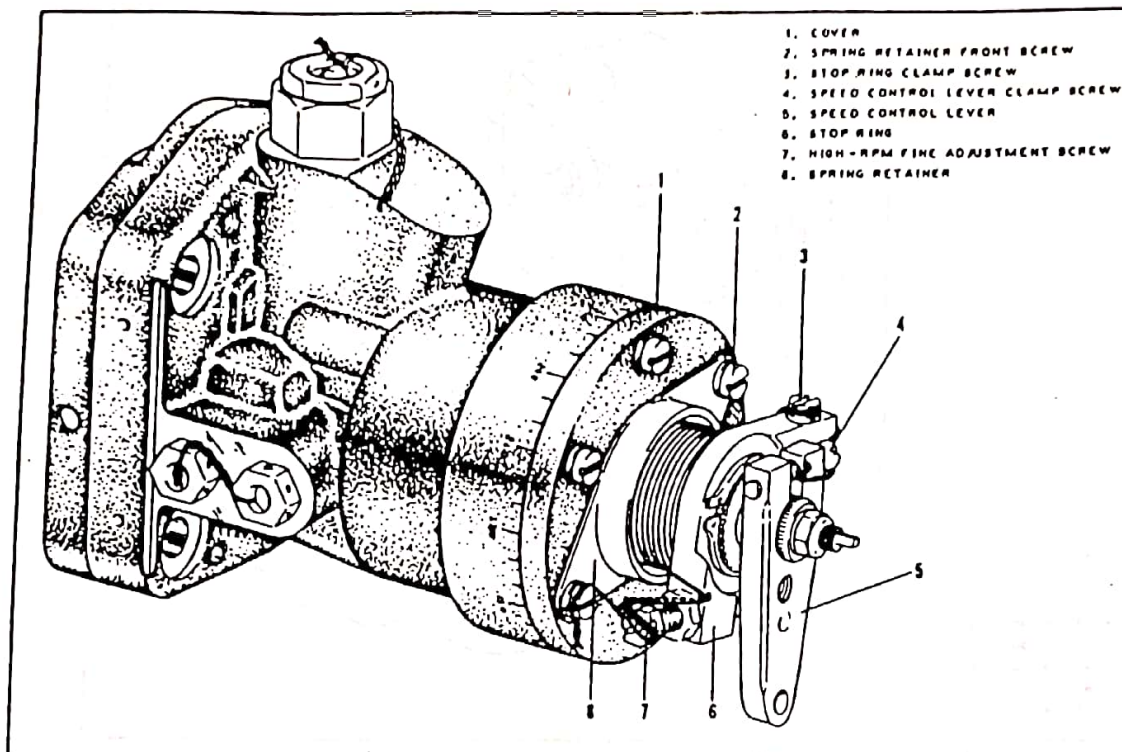


FIGURE A-4. WOODWARD PROPELLER GOVERNOR ADJUSTMENT POINTS

A-10. Adjustment Of Propeller Governor. (Hartzell) (Refer to Figure A-5.)

- a. Release the fasteners and lift the left side engine cowling.
- b. Start the engine in accordance with the directions given in the Owner's Flight Manual and allow to warm up.
- c. Push the "PROPELLER" cockpit control as far forward as it will go. At this position the governor speed adjusting control lever will be against the hi-rpm fine adjusting screw.
- d. Observe engine speed. Adjust the governor by means of the fine adjustment screw for 2575 RPM. To do this, loosen the fine adjustment screw locknut and turn the hi-rpm fine adjustment screw in a clockwise direction to decrease engine speed and a counterclockwise rotation to increase engine speed. One revolution of the fine adjustment screw increases or decreases the propeller speed approximately 15 RPM.
- e. After setting the governor for high RPM, run the self-locking nut on the fine adjustment screw against the base projection to lock.
- f. Pull the "PROPELLER" cockpit control aft to the low RPM position.
- g. Observe engine speed. Set to 1600 RPM either by threading the fitting at the governor control arm onto the cable, or by turning it in the direction tending to remove the fitting from the cable, depending on whether it is required to decrease or increase engine speed, respectively. It will be necessary, of course, prior to adjusting, to remove the self-locking nut and disconnect it from the governor control arm and to release the fitting locknut.
- h. Reconnect cable to governor control arm, apply fitting locknut and recheck engine by moving cockpit control in and out of the appropriate setting.
- i. Secure the cowling.

JOHNSTON AIRCRAFT SERVICE, INC.  
INSTALLATION INSTRUCTIONS NO. CPI-2

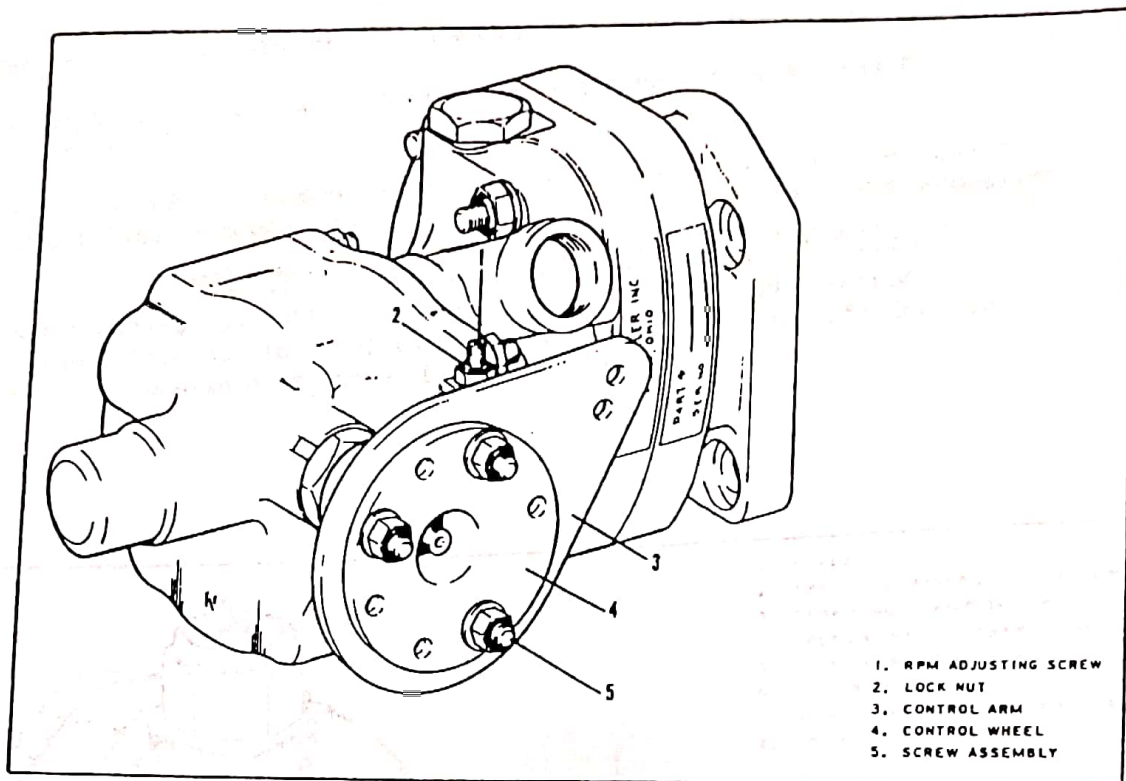


FIGURE A-5. HARTZELL PROPELLER GOVERNOR ADJUSTMENT POINTS

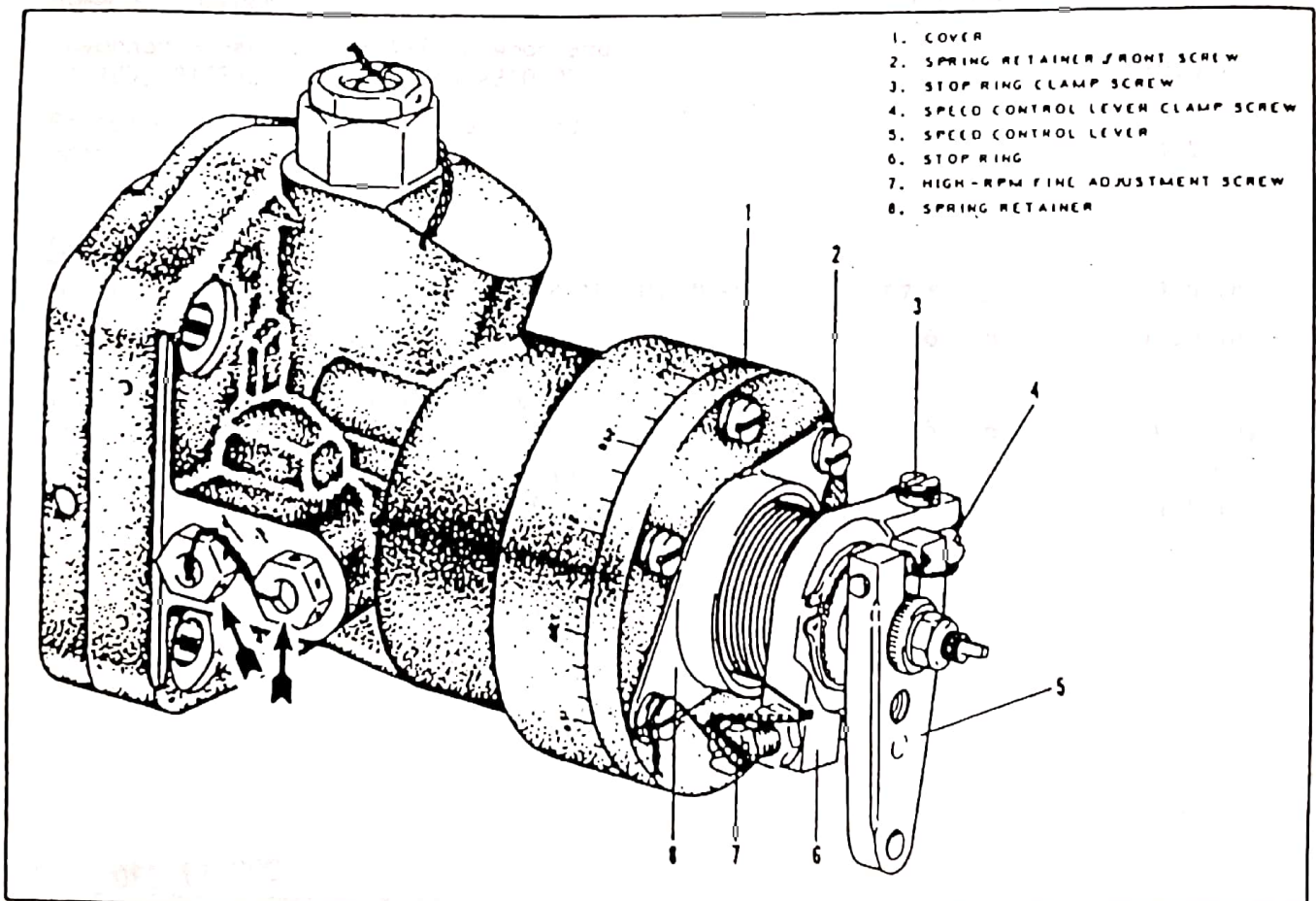
A-11. Perform weight and balance calculation making sure aircraft is in C.G. envelope and make change to useful load. Fill out FAA Form 337 with brief description of change and show approval in accordance with S.T.C. No. SAB550NM. Johnston Aircraft Service, Inc.'s Weight and Balance Supplement, Report 1359, will help with calculations.

WOODWARD 210185 GOVERNOR MODIFICATION TO A210185

1. Remove (2)  $\frac{1}{2}$  inch Hex Plugs (shown by arrows in illustration).
2. Switch  $\frac{5}{32}$  inch Allen Cap Screw from Right Hand hole to Left Hand Hand Hole.
3. Re-install (2)  $\frac{1}{2}$  inch Hex Plugs and Safety Wire. This change converts the Oil Flow to proper direction for the Hartzell Compact Hub Propeller.

WOODWARD 210305 GOVERNOR MODIFICATION TO A210305

This Modification MUST be accomplished by a qualified Governor Overhaul Shop due to Pilot Valve change. Johnston Aircraft Service, Inc. can furnish a re-worked Exchange Governor.



WOODWARD PROPELLER GOVERNOR

report 1000  
 Page 5A Sec. 2  
 Model PA24-250  
 Serial Nos. All

JOHNSTON AIRCRAFT SERVICE, INC.  
 WEIGHT AND BALANCE SUPPLEMENT 250  
 MODEL PA24-250 COMANCHE  
 EQUIPMENT LIST

<u>ITEM</u>	<u>WEIGHT</u>	<u>ARM - IN. AFT DATUM</u>
<u>PROPELLERS AND PROPELLER ACCESSORIES</u>		
<u>DELETE</u>		
Propeller - Hartzell Model HC-A2XK-1 or HC-82XK-1D with 8433-7 Blades or HC-A2VK-1 with V8433N-7, or	63 Lb	1.5 In.
Propeller - McCauley Model 2D36C28 with 80MM - 6 Blades	60 Lb	1.5 In.
Governor - Hartzell B-4-2 or Woodward 210185, 210250, A210185 and A210305	5 Lb	10.0 In.
Propeller Spinner Dome and Bulkhead Adapter	3 Lb	1.5 In.
<u>ADD</u>		
Propeller - Hartzell Model HC-C2YK-1BF/8477D-5R	57.5 Lb	1.5 In.
Governor - Hartzell F-4-4A or	6 Lb	10.0 In.
Reworked Woodward 210185, A210185 or A210305	5 Lb	10.0 In.
Propeller Spinner Dome and Bulkhead Adapter - Hartzell Model 82-A3519	5.7 Lb	1.5 In.

DATE: DEC 10 1986

JOHNSTON AIRCRAFT SERVICE, INC.  
P.O. BOX 1457  
TULARE, CALIFORNIA 93275  
SUPPLEMENT NO. 24-250

SUPPLEMENT TO  
PIPER PA 24-250  
AFM  
S.T.C. No. SA 3550 NM

1. LIMITATIONS:

Engine Lycoming Model O-540 A1A, A1A5, A1B5, A1C5, A1D5,  
modified per S.T.C. SE 3552 NM  
-OR-  
Lycoming Model IO-540-C1B5, Modified per S.T.C.  
SE 3553 NM

Engine Limits Maximum 2575 r.p.m. (250 h.p.)  
Maximum Normal Operating 2515 r.p.m. (247 h.p.)

Fuel Grade Aviation Gasoline - 91/96 Minimum Octane

Propeller Hartzell Constant Speed Controllable;  
Hub Model HC-C2YK-1BF  
Blade Model F8477D-5R  
Pitch Settings at 30 inch Station:  
Low 15.5° ±.2° ; High 32° ± 1°  
Diameter: 79 inches maximum  
76 inches maximum

Engine Instruments and Indicators Governor: Hartzell Model F-4-4A  
See Johnston Aircraft Service, Inc. Installation  
Instructions CPI-2, dated, DEC 10 1986 for  
other Models eligible.  
Spinner: Hartzell Model 82-A3519  
Tachometer: Green Arc ( Normal Operating Range)  
500 to 2515 r.p.m. ;  
Red Line (maximum continuous) 2575 r.p.m.

2. PROCEDURES

No Change

3. PERFORMANCE

Equal to or Better Than That of the Basic Unmodified  
Aircraft.

F.A.A. APPROVED DATE:

12/10/86

United States of America  
Department of Transportation — Federal Aviation Administration  
**Supplemental Type Certificate**

Number SA3550NM

This certificate, issued to Johnston Aircraft Service, Inc.

certifies that the change in the type design for the following product with the limitations and conditions therefor as specified hereon meets the airworthiness requirements of Part 3 of the Civil Air Regulations, effective November 1, 1949, including Amendments 3-1 to 3-12, inclusive.

Original Product — Type Certificate Number: 1A15  
Make: Piper  
Model: PA-24-250

Description of Type Design Change: Installation of Hartzell HC-C2YK-1BF/F8477D-5R propeller in accordance with FAA sealed Johnston Aircraft Service, Inc. Installation Instructions No. CPI-2 "NC" dated December 10, 1986, or later FAA approved revision. FAA Approved Johnston Aircraft Service, Inc. Airplane Flight Manual Supplement No. 24-250 dated December 10, 1986, or later FAA approved revision is required with this installation.

Limitations and Conditions: The approval of this change in type design applies to the basic aircraft of the specified model that is otherwise unmodified. This approval should not be extended to other specific airplanes of this model on which other previously approved modifications are incorporated, unless it is determined that the interrelationship between this change and any of those other previously approved modifications will introduce no adverse effect upon the airworthiness of that airplane.

This certificate and the supporting data which is the basis for approval shall remain in effect until surrendered, suspended, revoked, or a termination date is otherwise established by the Administrator of the Federal Aviation Administration.

Date of application: November 29, 1986

Date reissued:

Date of issuance: December 10, 1986

Date amended:



By direction of the Administrator  
Marvin J. Kaminski  
for Manager, Western Aircraft  
Certification Office

(Title)

Any alteration of this certificate is punishable by a fine of not exceeding \$1,000, or imprisonment not exceeding 3 years, or both.

AD Number	PDF	Rec	Subject	Effective	compliance
<u>59-06-05</u>	<u>PDF</u>	No	Nose gear bungee	06/01/59	n/a by sn
<u>59-12-09</u>	<u>PDF</u>	No	Control wheel sprocket stud	07/30/59	n/a by sn
<u>59-13-02</u>	<u>PDF</u>	No	Aileron balance weight	10/01/59	n/a by sn
<u>59-26-02</u>	<u>PDF</u>	No	Fuel cell vent tubes	01/15/60	n/a by sn
<u>60-24-03</u>	<u>PDF</u>	No	Fuel vent tubes	12/19/60	n/a by sn
<u>61-16-06</u>	<u>PDF</u>	No	Fuel selector valve handles	08/31/61	n/a by sn
<u>61-20-02</u>	<u>PDF</u>	Yes	Exhaust stack reinforcement	10/20/61	n/a by sn
<u>62-10-03</u>	<u>PDF</u>	No	Aileron counterweight bay rework	04/26/62	n/a by sn
<u>62-26-05</u>	<u>PDF</u>	No	Exhaust system	12/05/62	muffler hollow with brace 6-13-2003
<u>63-27-03</u>	<u>PDF</u>	No	Landing gear retraction motor circuit	01/23/64	chanced 25 amp cb to 30 amp
<u>64-10-04</u>	<u>PDF</u>	No	Carburetor air box deflector vanes	05/12/64	removed vanes 6-13-2013
<u>64-22-03</u>	<u>PDF</u>	No	Landing gear safety switch	09/28/64	kit 754-475 installed 10/03/1962
<u>65-11-04</u>	<u>PDF</u>	No	Stabilator control system	05/15/65	n/a by sn
<u>65-25-03</u>	<u>PDF</u>	no	Nose landing gear drag link clevis	12/10/65	kit 756-911 installed 8-20-65 terminated recurring status muffler hollow with brace 6-13-2003 this terminates recurrence per para (i)
<u>68-05-01</u>	<u>PDF</u>	no	Exhaust mufflers	03/05/69	
<del>70-17</del> <u>68-13-03</u>	<u>PDF</u>	Yes	Fuel cell collapse	03/05/69	
<u>72-22-05</u>	<u>PDF</u>	No	Operation limitation placard	12/26/74	marked on airspeed indicator 6-13-2019



<u>74-10-03 R</u>	<u>PDF</u>	No	<u>Superseded by</u>	01/01/74	
<u>74-13-01</u>	<u>PDF</u>	No	<u>Superseded by</u>	06/18/74	
<u>74-13-03</u>	<u>PDF</u>	no	Stabilator attach bolts	04/30/76	Attach bolts are stainless steel this terminated recurring status
<u>75-05-02</u>	<u>PDF</u>	Yes	Engine oil - Beryl Aviation filtrator assembly - STC	02/21/75	n/a
<u>75-12-06</u>	<u>PDF</u>	Yes	SA2653WE Fin forward spar	06/05/75	
<u>75-27-08</u>	<u>PDF</u>	No	Torque tube bearing fittings	06/03/76	pcw 1-7-1976
<u>76-19-07</u>	<u>PDF</u>	No	Stabilator weight assy	09/29/76	not installed kit 760-914 installed 8-25- 2005 terminates recurring per para (b)
<u>77-08-01</u>	<u>PDF</u>	Yes	Aileron spar cracks Prevent landing gear collapse	04/18/77	
<u>77-13-21</u>	<u>PDF</u>	Yes	Incorporation of Piper Kit 763893	12/16/77	
<u>79-20-10</u>	<u>PDF</u>	Yes	Placard near flap actuator	10/04/79	PCW 9-3-1984
<u>82-23-01 R1</u>	<u>PDF</u>	No	Lower spar cap inspection	04/07/83	n/a robertson stc
<u>83-19-03</u>	<u>PDF</u>	No	Brake operation placard P/N 81090-02	09/30/83	pcw 9-3-1984
<u>85-02-05 R1</u>	<u>PDF</u>	No	Stabilator torque tube	11/21/97	pcw
<u>94-13-10</u>	<u>PDF</u>	no	Superseded by 97-01-01 (97-01-01 C1, 97-01-01 R1)	08/12/94	pma mod no longer required
<u>95-20-07 C1</u>	<u>PDF</u>	Yes	Cracks - main gear sidebrace studs	11/17/95	
<u>97-01-01 R1</u>	<u>PDF</u>	Yes		12/08/98	due 8364.2

<u>99-05-09</u>	<u>PDF</u>	No	Facet Purolator induction air filters	03/19/99 due at 6352
<u>2012-17-06</u>	<u>PDF</u>	Yes	Cracks - stabilator horn assembly POH/AFM change - fuel system management placard	10/22/12 terminated by installation of austrailian horn
<u>2015-24-05</u>	<u>PDF</u>	No		01/12/16
<u>2001-23-17</u>	<u>PDF</u>	No	GNS 430 Circuitry changes - deviation & flag outputs	12/28/01 —
AD Number	PDF	Rec	Subject	Effective
<u>63-14-03</u>	<u>PDF</u>	Yes	Drive shaft	07/06/63 replaced with new style
<u>66-20-04</u>	<u>PDF</u>	No	Oil filter adapter gasket	08/27/66
<u>73-23-01</u>	<u>PDF</u>	No	Piston pins	01/13/77
<u>75-08-09</u>	<u>PDF</u>	No	Oil pump failure	08/18/77
<u>75-09-15</u>	<u>PDF</u>	No	Fuel starvation	04/30/75
<u>78-23-10</u>	<u>PDF</u>	No	Center body bellows seal assembly	11/07/78
<u>79-04-05</u>	<u>PDF</u>	No	Regulator diaphragm stem assembly	09/26/79
<u>81-03-05</u>	<u>PDF</u>	No	Mixture control shaft assembly	02/11/81
<u>81-18-04 R2</u>	<u>PDF</u>	No	<u>Superseded by</u> <u>Superseded</u> <u>by 2004-10-14</u> <u>(2004-10-14</u> <u>C1)</u>	06/07/82  complied with at last engine overhaul 11-12- 2015
<u>91-14-22</u>	<u>PDF</u>	Yes		08/19/91
<u>92-12-05</u>	<u>PDF</u>	No	Piston pins	07/10/92
<u>93-02-05</u>	<u>PDF</u>	Yes	<u>Superseded by</u>	06/14/93

<u>95-07-01</u>	<u>PDF</u>	No	Connecting rod bolt failure	04/12/95
<u>96-09-10</u>	<u>PDF</u>	No	Iron and aluminum impellers in oil pumps	07/15/96
<u>96-23-03</u>	<u>PDF</u>	No	High pressure fuel pumps	12/17/96
<u>97-01-03</u>	<u>PDF</u>	No	<u>Superseded by</u>	01/21/97
<u>97-15-11</u>	<u>PDF</u>	No	Defective piston pins Crankshafts serviced by Nelson	08/12/97
<u>98-17-11</u>	<u>PDF</u>	No	Balancing Crankshafts serviced by Nelson	10/19/98
<u>98-17-11 C1</u>	<u>PDF</u>	No	Balancing	10/19/98
<u>98-18-12</u>	<u>PDF</u>	Yes	<u>Superseded by</u>	09/28/98
<u>2002-19-03</u>	<u>PDF</u>	No	Crankshaft failure	09/20/02
<u>2002-20-51 E</u>	<u>PDF</u>	No	<u>Superseded by</u>	10/01/02
<u>2002-23-06</u>	<u>PDF</u>	No	<u>Superseded by</u>	11/19/02
<u>2002-26-01</u>	<u>PDF</u>	Yes	<u>Superseded by</u>	01/31/03
<u>2003-14-03</u>	<u>PDF</u>	Yes	Non-TC Holder - Crane/Lear Romec AN-Type rotary fuel pumps Crankshaft gear retaining bolts	08/14/03
<u>2004-05-24</u>	<u>PDF</u>	No	Prop Strike - crankshaft gear installation	03/30/04
<u>2004-10-14</u>	<u>PDF</u>	Yes		06/25/04
<u>2005-26-10</u>	<u>PDF</u>	No	<u>Superseded by</u>	01/31/06
<u>2006-10-21</u>	<u>PDF</u>	No	Non-TC Holder - ECi connecting rods	06/22/06
<u>2006-12-07</u>	<u>PDF</u>	No	Non-TC Holder - ECi cylinder assemblies	07/11/06

<u>2007-04-19 R1</u>	<u>PDF</u>	No	Non-TC Holder - Superior Air Parts - Cylinder Assemblies	06/01/07
<u>2008-06-51 E</u>	<u>PDF</u>	Yes	<u>Superseded by</u>	03/12/08
<u>2008-08-14</u>	<u>PDF</u>	Yes	<u>Superseded by</u>	04/29/08
<u>2008-14-07</u>	<u>PDF</u>	Yes	<u>Superseded by</u>	08/14/08
<u>2008-19-05</u>	<u>PDF</u>	Yes	<u>Superseded by</u>	10/20/08
			Non-TC Holder- Precision Airmotive RSA-5 & RSA-10 series fuel injection servos	02/09/09
<u>2009-02-03</u>	<u>PDF</u>	Yes	Non-TC Holder - ECI cylinder assemblies; P/N AEL65102 Series	02/04/10
<u>2009-26-12</u>	<u>PDF</u>	Yes	<u>Superseded by</u>	08/16/11
<u>2011-15-10</u>	<u>PDF</u>	No	<u>Superseded by</u>	01/25/12
<u>2011-26-04</u>	<u>PDF</u>	Yes	Non-TC Holder - AVStar - fuel servos - diaphragm P/Ns AV2541801, AV2541803	02/24/12
<u>2012-03-06</u>	<u>PDF</u>	No	Crankshafts	10/24/12
<u>2012-19-01</u>	<u>PDF</u>	No	Externally mounted fuel injector fuel lines	11/03/15
<u>2015-19-07</u>	<u>PDF</u>	Yes	Connecting rod small end bushings	08/16/17
<u>2017-16-11</u>	<u>PDF</u>	No		

The Following

Owners Name(s): N7905P LLC		Nr: N7905P	Date: 5-26-19	Inspection Location: VGT
		Hobbs: 0	Tachometer: 895.2	
		ELT Battery Due: 6/30/2026	Transponder Test:	Pilot Static Test:
Home Phone #:	Cell. Phone #:	Work Phone #:	Oxygen System:	Fire Extinguisher:

Airworthiness Cert.: Y / N	Aircraft Registration: Y / N	Radio Station License: Y / N	Pilot Op. Handbook: Y / N	Weight and Balance: Y / N	Crash Tag on Airframe: Y / N
Exterior Clean: Y / N	Interior Clean: Y / N	Under Flooring Clean: Y / N	Inside Wings Clean: Y / N	Left Engine Clean: Y / N	Right Engine Clean: Y / N

Full Power RPM:	Idle RPM / Cut-Off:	Nose / Main Tire PSI:	Nose / Main Strut (Inches):	Engine Timing (BTDC):	Engine Oil:
	/	/	/		

	Make	Model Number	Serial Number	Total Time	TSMOH / Serial Number
Aircraft	Piper	PA24-250	24-3136	7364.20	
Engine	Teledyne Continental	IO-540-A1A5	L-5178-40	5469.00	0.00
Propeller	Hartzell	HC-C2YK-1BF/F8477D-5R	NS3592B	0.00	0.00
Blade	Hartzell	L76322			
Blade		L76324			
E.L.T.	Airtex	ELT 345	381672-039	58 sec	Jun 26
Engine Monitor	JPI	EDM700			
Airframe	Make	Model Number	Part Number	Serial Number	Notes
Battery	CONCORD	GX35	sealed		
Ignition Switch					
Seat Belts					
Compass	Precision Aviation		PA1-700	24477	
Com. #1					
Com. #2	APOLLO	SL30	430-6040-301	6032326	MOD-J,K
GPS - Receiver		GNS 430	011-00280-00	96304750	
GPS - Antenna					
Nav. #1					
Nav. #2					
Nav head #2	APOLLO	MX 20	430-0270-500	6022969	MOD- ABCDEFHJKMNR
Transponder:	GARMIN	GTX 327	011-00490-00	83724654	
ADF - Receiver					
ADF - Indicator					
ADF - Antenna					
Audio Panel		MA7000		K04759	
Encoding Altimeter:					

Engine	Make	Model Number	Part Number	Serial Number	Notes
Alternator / Governor					
Voltage Regulator	InterAV				
Air Filter					Jun-06
Flexible Hoses					
Carb. / Throttle Body		MA-4-5	10-4404		
Fuel: Pump		LW-15472		306	
Fuel: Pump - Aux.					
Magneto: Left		S6LN-200	10-163010-10	785933	
Magneto: Right		S6LN-204	10-163050-9	321363	
Spark Plugs					
Oil Filter					
Oil Pump	Lycoming	05K19423-S			
Oil Cooler					12/28/2013
Starter				112173	
Vacuum Pump		215CC			
Prop Governor			H4-4A		new 6-30-06
Magneto harness					8/15/03

Turn Coordinator

24506 or 16385

*Revised inspection intervals: magneto riveted & snap-ring impulse coupling assemblies Replacement: ECI connecting rods, P/N AEL11750 Superior Air Parts Cylinder Assembly removal*

2005-12-06 PDF Yes 07/19/05 ---  
2006-10-21 PDF No 06/22/06 ---  
2007-04-19 R1 PDF No 06/01/07 ---

<b>Airworthiness Directives: Compliance Report - Appliance</b>		
Make: Model:	N-No.: Serial:	Total AC Hours: Hrs. Since Last:

AD 73-07-04	Amdt. 39-1731	Issued: 05/26/05	Effective: 10/11/73	Recurring: No	Hrs:
Subject: Bendix S4LN or S4RN, S6LN or S6RN and S8LN or S8RN Magnetos With Series Numbers -20 Through -26, -200 Through -206, -600 Through -604 And -1200 Through -1227 - Superseded by 94-01-03			Supersedes:		Due:
Method:					SB#:
Terminated by:					SB#:
Name:		Sig.	Cert.	Date:	

AD 82-20-01	Amdt. 39-4658	Issued: 06/04/05	Effective: 06/14/83	Recurring: No	Hrs:
Subject: Bendix Model S4LN, S4RN, S6LN, S6RN, D4LN, D4RN, D6LN & D6RN Series Magnetos - Impulse Coupling			Supersedes:		Due:
Method:					SB#:
Terminated by:					SB#:
Name:		Sig.	Cert.	Date:	

AD 89-04-02	Amdt. 39-6109	Issued: 06/11/05	Effective: 03/08/89	Recurring: No	Hrs:
Subject: Facet Aerospace MA-4-5, MA-5, & MA-6AA Carburetors - SB A1-88 Replacement Of Air Metering Stop Pin			Supersedes:		Due:
Method:					SB#:
Terminated by:					SB#:
Name:		Sig.	Cert.	Date:	

AD 99-05-09	Amdt. 39-11057	Issued: 03/03/99	Effective: 03/19/99	Recurring: No	Hrs:
Subject: Facet - Purolator Products Induction Air Filters Installed On Piper PA-23, PA-24, PA-28, PA-32 And PA-34			Supersedes:		Due:
Method:					SB#:
Terminated by:					SB#:
Name:		Sig.	Cert.	Date:	

AD 2001-23-17	Amdt. 39-12516	Issued: 12/03/01	Effective: 12/28/01	Recurring: No	Hrs:
Subject: GARMIN Int'l. GNS 430 Units - Deviation And Flag Outputs; Part Number 011-00280-00			Supersedes:		Due:
Method:					SB#:
Terminated by:					SB#:
Name:		Sig.	Cert.	Date:	

AD 84-26-02	Amdt. 39-4966	Issued: 06/06/05	Effective: 01/29/85	Recurring: Yes	Hrs:
Subject: Induction Air Filters All Paper Induction Air Filters - Inspect For Deterioration & Possible Engine Ingestion			Supersedes:		Due:
Method:					SB#:
Terminated by:					SB#:
Name:		Sig.	Cert.	Date:	

AD 63-22-03	Amdt. 636	Issued: 05/16/05	Effective: 12/02/63	Recurring: No	Hrs:
Subject: Marvel-Schebler Model MA4-5 Carburetors - Replacement of Primary & Main Venturi			Supersedes:		Due:
Method:					SB#:
Terminated by:					SB#:
Name:		Sig.	Cert.	Date:	

AD 69-24-03	Amdt. 39-881	Issued: 05/22/05	Effective: 11/29/69	Recurring: No	Hrs:
Subject: Marvel-Schebler MA-3, -4, -5, -6 & HA-6 Carburetors - SB A1-69 <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> SB A1-69 Amdt - Flush & Clean Carburetor & Inspect Drain Plug Cavity			Supersedes:		Due:
Method:					SB#:
Terminated by:					SB#:
Name:		Sig.	Cert.	Date:	

AD 72-06-05 R2	Amdt. 39-5338	Issued: 05/25/05	Effective: 07/03/86	Recurring: No	Hrs:
Subject: Marvel-Schebler MA-3, -4, -5, -6 & HA-6 Carburetors - Inspection Of Throttle Arm To Prevent Separation			Supersedes:		Due:
Method:					SB#:
Terminated by:					SB#:
Name:		Sig.	Cert.	Date:	

AD 86-01-06	Amdt. 39-5206	Issued: 06/08/05	Effective: 01/31/86	Recurring: No	Hrs:
Subject: Parker Hannifin Airborne Dry Air Pumps & Auxillary Dry Air Pumps Installed On Piston Engine Airplanes			Supersedes:		Due:
Method:					SB#:
Terminated by:					SB#:
Name:		Sig.	Cert.	Date:	

AD 98-23-01 L	Amdt.	Issued: 10/29/98	Effective: 1998	Recurring: No	Hrs:
Subject: Parker Hannifin Airborne Dry Air Pumps; 211CC, 211CC-9, E211CC, 212CW, E212CW, 215CC, 216CW, Conversion Kits 300-1, 300-2, 300-3, 350			Supersedes:		Due:
Method:					SB#:
Terminated by:					SB#:
Name:		Sig.	Cert.	Date:	

AD 98-23-01	Amdt. 39-10882	Issued: 11/17/98	Effective: 11/20/98	Recurring: No	Hrs:
Subject: Parker Hannifin Airborne Dry Air Pumps; 211CC, 211CC-9, E211CC, 212CW, E212CW, 215CC, 216CW, Conversion Kits 300-1, 300-2, 300-3; Coupling Kit 350			Supersedes:		Due:



US Department of Transportation  
Federal Aviation Administration

## MAJOR REPAIR AND ALTERATION (Airframe, Powerplant, Propeller, or Appliance)

OMB No. 2120-0020  
Exp: 5/31/2018

Electronic Tracking Number

For FAA Use Only

**INSTRUCTIONS:** Print or type all entries. See Title 14 CFR §43.9, Part 43 Appendix B, and AC 43.9-1 (or subsequent revision thereof) for instructions and disposition of this form. This report is required by law (49 U.S.C. §44701). Failure to report can result in a civil penalty for each such violation. (49 U.S.C. §46301(a))

<b>1. Aircraft</b>	Nationality and Registration Mark <b>N7905P</b>	Serial No. <b>24-3136</b>	
	Make <b>piiper</b>	Model <b>pa24-250</b>	Series
<b>2. Owner</b>	Name (As shown on registration certificate) <b>N7905P LLC</b>		
	Address (As shown on registration certificate) Address <b>PO Box 128</b> State <b>NV</b>		
	City <b>Logandale</b>		
	Zip <b>89021</b> Country <b>USA</b>		

**3. For FAA Use Only**

4. Type		5. Unit Identification		
Repair	Alteration	Unit	Make	Model
<input type="checkbox"/>	<input type="checkbox"/>	AIRFRAME	<u>piiper</u>	(As described in Item 1 above)
<input type="checkbox"/>	<input type="checkbox"/>	POWERPLANT		
<input type="checkbox"/>	<input checked="" type="checkbox"/>	PROPELLER	<b>Hartzell</b>	<b>-C2YK-1BF/F8477D-</b>
<input type="checkbox"/>	<input type="checkbox"/>	APPLIANCE	Type	
			Manufacturer <b>X</b>	

**6. Conformity Statement**

<b>A. Agency's Name and Address</b>		<b>B. Kind of Agency</b>	
Name <b>Richard A. Mier</b>		<input checked="" type="checkbox"/> U. S. Certificated Mechanic <input type="checkbox"/> Foreign Certificated Mechanic <input type="checkbox"/> Certificated Repair Station <input type="checkbox"/> Certificated Maintenance Organization	
Address <b>3863 DELLING CT</b>		C. Certificate No.	
City <b>LV</b> State <b>NV</b>		<b>525680249 IA</b>	
Zip <b>89164</b> Country <b>USA</b>			

D. I certify that the repair and/or alteration made to the unit(s) identified in item 5 above and described on the reverse or attachments hereto have been made in accordance with the requirements of Part 43 of the U.S. Federal Aviation Regulations and that the information furnished herein is true and correct to the best of my knowledge.

Extended range fuel per 14 CFR Part 43 App. B <input type="checkbox"/>	Signature/Date of Authorized Individual <div style="text-align: center;"><i>Richard A. Mier</i>      8-10-2019</div>
--	---

**7. Approval for Return to Service**

Pursuant to the authority given persons specified below, the unit identified in item 5 was inspected in the manner prescribed by the Administrator of the Federal Aviation Administration and is  Approved  Rejected

BY	FAA Fit. Standards Inspector	<input checked="" type="checkbox"/>	Manufacturer	Maintenance Organization	Persons Approved by Canadian Department of Transport
	FAA Designee		Repair Station	<input checked="" type="checkbox"/> Inspection Authorization	Other (Specify)

Certificate or Designation No. <b>A&amp;P 525680249 IA</b>	Signature/Date of Authorized Individual <div style="text-align: center;"><i>Richard A. Mier</i>      8.10.2019</div>
--	---



NOTICE

Weight and balance or operating limitation changes shall be entered in the appropriate aircraft record. An alteration must be compatible with all previous alterations to assure continued conformity with the applicable airworthiness requirements.

8. Description of Work Accomplished

(If more space is required, attach additional sheets. Identify with aircraft nationality and registration mark and date work completed.)

N7905P

August 10, 2019

Nationality and Registration Mark

Date

TTAF 7364.3 Removed Hartzell propeller HC A2VK-1, prop governor model Hartzell B-4-2 and spinner dome and bulkhead adapter. Hartzell prop HC-C2YK-1BF/F8477D-5R. Prop, Hartzell governor F-4-4A, spinner dome and bulkhead adapter model 82-A3519 was installed in accordance with STC# SA3550NM. In accordance with FAA sealed Johnson Aircraft Service Inc. Installation Instructions No CPI-2 "NC" dated Dec.10,1986,or later FAA approved revision. and airplane flight manual supplement for 250. This propeller was installed in accordance with STC 3550NM installation manual. Weight and balance recalculated and added to equipment list.

NOTHING FOLLOWS

Additional Sheets Are Attached



## MAJOR REPAIR AND ALTERATION (Airframe, Powerplant, Propeller, or Appliance)

OMB No. 2120-0020    Electronic Tracking Number  
Exp: 5/31/2018

For FAA Use Only

**INSTRUCTIONS:** Print or type all entries. See Title 14 CFR §43.9, Part 43 Appendix B, and AC 43.9-1 (or subsequent revision thereof) for instructions and disposition of this form. This report is required by law (49 U.S.C. §44701). Failure to report can result in a civil penalty for each such violation. (49 U.S.C. §46301(a))

<b>1. Aircraft</b>	Nationality and Registration Mark <b>N7905P</b>	Serial No. <b>PA24-3136</b>	Series
	Make <b>Piper</b>	Model <b>Pa24-250</b>	
<b>2. Owner</b>	Name (As shown on registration certificate) <b>N7905P LLC</b>		
	Address (As shown on registration certificate) <b>PO Box 128</b>		
	City <b>Logandale</b>	State <b>NV</b>	
	Zip <b>89021</b>	Country <b>USA</b>	

**3. For FAA Use Only**

4. Type		5. Unit Identification			Serial No.
Repair	Alteration	Unit	Make	Model	
<input type="checkbox"/>	<input checked="" type="checkbox"/>	AIRFRAME	Piper	(As described in Item 1 above)	PA24-3136
<input type="checkbox"/>	<input type="checkbox"/>	POWERPLANT			
<input type="checkbox"/>	<input type="checkbox"/>	PROPELLER			
<input type="checkbox"/>	<input type="checkbox"/>	APPLIANCE	Type		
			Manufacturer		

**6. Conformity Statement**

<b>A. Agency's Name and Address</b>		<b>B. Kind of Agency</b>		<b>Manufacturer</b>
Name <b>Richard A. Mier</b>		<input type="checkbox"/> U. S. Certificated Mechanic		<b>525680249IA</b>
Address <b>3863 Dellinger Ct</b>		<input type="checkbox"/> Foreign Certificated Mechanic		
City <b>LV</b> State <b>NV</b>		<input type="checkbox"/> Certificated Repair Station		
Zip <b>89104</b> Country <b>USA</b>		<input type="checkbox"/> Certificated Maintenance Organization		

**D.** I certify that the repair and/or alteration made to the unit(s) identified in item 5 above and described on the reverse or attachments hereto have been made in accordance with the requirements of Part 43 of the U.S. Federal Aviation Regulations and that the information furnished herein is true and correct to the best of my knowledge.

Extended range fuel per 14 CFR Part 43 App. B <input type="checkbox"/>	Signature/Date of Authorized Individual <b>Richard A. Mier</b> <b>8-10-2019</b>
--	--

**7. Approval for Return to Service**

Pursuant to the authority given persons specified below, the unit identified in item 5 was inspected in the manner prescribed by the Administrator of the Federal Aviation Administration and is  Approved  Rejected

BY	FAA Fit. Standards Inspector	Manufacturer	Maintenance Organization	Persons Approved by Canadian Department of Transport Other (Specify)
	FAA Designee	Repair Station	Inspection Authorization	

Certificate or Designation No. <b>A&amp;P525680249IA</b>	Signature/Date of Authorized Individual <b>Richard A. Mier</b> <b>8-12-2019</b>
--	--

/  
 N  
 A  
 C  
 Z  
 E  
 pe  
 A  
 I  
 BY  
 Cert  
 Des

NOTICE

Weight and balance or operating limitation changes shall be entered in the appropriate aircraft record. An alteration must be compatible with all previous alterations to assure continued conformity with the applicable airworthiness requirements.

8. Description of Work Accomplished

(If more space is required, attach additional sheets. Identify with aircraft nationality and registration mark and date work completed.)

N7905P

8/10/2019

Nationality and Registration Mark

Date

Removed door holder (slide) #27072-03. Installed door steward STC SA01120SE In accordance with install instruction MVA-B40C10M&O. Mtn. View Aviation. Approved Model list SA01120SE sept.9,2002 FAA approved. Installed with approved methods and practices in AC43.13-1B.capter 4-57 Figure 4-8. ....nothing follows.....

Additional Sheets Are Attached



US Department of Transportation  
Federal Aviation Administration

### MAJOR REPAIR AND ALTERATION (Airframe, Powerplant, Propeller, or Appliance)

OMB No. 2120-0020  
Exp: 6/31/2018

Electronic Tracking Number

For FAA Use Only

INSTRUCTIONS: Print or type all entries. See Title 14 CFR §43.9, Part 43 Appendix B, and AC 43.9-1 (or subsequent revision thereof) for instructions and disposition of this form. This report is required by law (49 U.S.C. §44701). Failure to report can result in a civil penalty for each such violation. (49 U.S.C. §46301(a))

1. Aircraft	Nationality and Registration Mark N7905P	Serial No. PA24-3136
	Make Piper	Model Pa24-250
2. Owner	Name (As shown on registration certificate) N7905P LLC	Address (As shown on registration certificate) Address PO Box 128
		City Logandale State NV Zip 89021 Country USA

3. For FAA Use Only

4. Type		5. Unit Identification			
Repair	Alteration	Unit	Make	Model	Serial No.
<input type="checkbox"/>	<input checked="" type="checkbox"/>	AIRFRAME	Piper	(As described in Item 1 above)	PA24-3136
<input type="checkbox"/>	<input type="checkbox"/>	POWERPLANT			
<input type="checkbox"/>	<input type="checkbox"/>	PROPELLER			
<input type="checkbox"/>	<input type="checkbox"/>	APPLIANCE	Type		
			Manufacturer		

6. Conformity Statement

A. Agency's Name and Address		B. Kind of Agency		C. Certificate No. <b>525680249IA</b>
Name Richard A. Mier	Address <u>3863 Delling Ct</u> City <u>LV</u> State <u>NV</u> Zip <u>89104</u> Country <u>USA</u>	<input type="checkbox"/> U. S. Certificated Mechanic	<input type="checkbox"/> Manufacturer	
		<input type="checkbox"/> Foreign Certificated Mechanic		
		<input type="checkbox"/> Certificated Repair Station		
		<input type="checkbox"/> Certificated Maintenance Organization		

D. I certify that the repair and/or alteration made to the unit(s) identified in item 5 above and described on the reverse or attachments hereto have been made in accordance with the requirements of Part 43 of the U.S. Federal Aviation Regulations and that the information furnished herein is true and correct to the best of my knowledge.

Extended range fuel per 14 CFR Part 43 App. B <input type="checkbox"/>	Signature/Date of Authorized Individual <i>Richard A. Mier</i> 8-10-2019
--	---

7. Approval for Return to Service

Pursuant to the authority given persons specified below, the unit identified in item 5 was inspected in the manner prescribed by the Administrator of the Federal Aviation Administration and is  Approved  Rejected

BY	FAA Fit. Standards Inspector	Manufacturer	Maintenance Organization	Persons Approved by Canadian Department of Transport
	FAA Designee	Repair Station	Inspection Authorization	Other (Specify)

Certificate or Designation No. <b>A&amp;P525680249IA</b>	Signature/Date of Authorized Individual <i>Richard A. Mier</i> 8-10-2019
--	---

NOTICE

Weight and balance or operating limitation changes shall be entered in the appropriate aircraft record. An alteration must be compatible with all previous alterations to assure continued conformity with the applicable airworthiness requirements.

8. Description of Work Accomplished

(If more space is required, attach additional sheets. Identify with aircraft nationality and registration mark and date work completed.)

N7905P

8/10/2019

Nationality and Registration Mark

Date

Removed sections of damaged skins from belly of aircraft . and removed channel assembly part #20954-00 and replaced with a new one. Purchased center skins part #20600-13 and 22232-02 and used sections of them to repair damaged skins. These parts were installed by using acceptable methods and practices in FAR 43.13-1B figure 4-5,4-6,4-16, and 4-18. also page 4-36. It was then cleaned prepped ,by alodine, washing ,Zink chromatin and painted. In according to FAR 43.13-1B page 6-12 section 6-38 and 6-40...  
... Nothing Follows.....

Additional Sheets Are Attached



US Department of Transportation  
Federal Aviation Administration

## MAJOR REPAIR AND ALTERATION (Airframe, Powerplant, Propeller, or Appliance)

OMB No. 2120-0020  
Exp: 6/31/2018

Electronic Tracking Number

For FAA Use Only

INSTRUCTIONS: Print or type all entries. See Title 14 CFR §43.9, Part 43 Appendix B, and AC 43.9-1 (or subsequent revision thereof) for instructions and disposition of this form. This report is required by law (49 U.S.C. §44701). Failure to report can result in a civil penalty for each such violation. (49 U.S.C. §46301(a))

<b>1. Aircraft</b>	Nationality and Registration Mark	Serial No. <u>24-3136</u>	
	Make <u>piper</u>	Model <u>pa24-250</u>	Series
<b>2. Owner</b>	Name (As shown on registration certificate) <u>N7905P LLC</u>		Address (As shown on registration certificate)
			Address <u>PO Box 128</u>
			City <u>Logandale</u> State <u>NV</u>
			Zip _____ Country <u>USA</u>

**3. For FAA Use Only**

4. Type		5. Unit Identification			
Repair	Alteration	Unit	Make	Model	Serial No.
<input type="checkbox"/>	<input checked="" type="checkbox"/>	AIRFRAME	<u>piper</u>	(As described in Item 1 above)	<u>24-3136</u>
<input type="checkbox"/>	<input type="checkbox"/>	POWERPLANT			
<input type="checkbox"/>	<input type="checkbox"/>	PROPELLER			
<input type="checkbox"/>	<input type="checkbox"/>	APPLIANCE	Type		
			Manufacturer <u>X</u>		

**6. Conformity Statement**

A. Agency's Name and Address		B. Kind of Agency	
Name <u>Richard A. Mier</u>		U. S. Certificated Mechanic	<input checked="" type="checkbox"/> Manufacturer
Address <u>3863 DELLING CT</u>		Foreign Certificated Mechanic	C. Certificate No.
City <u>LV</u> State <u>NV</u>		Certificated Repair Station	<b>525680249 IA</b>
Zip <u>89104</u> Country <u>USA</u>		Certificated Maintenance Organization	

D. I certify that the repair and/or alteration made to the unit(s) identified in item 5 above and described on the reverse or attachments hereto have been made in accordance with the requirements of Part 43 of the U.S. Federal Aviation Regulations and that the information furnished herein is true and correct to the best of my knowledge.

Extended range fuel per 14 CFR Part 43 App. B <input type="checkbox"/>	Signature/Date of Authorized Individual <u>Richard A. Mier</u> <u>8-10-2019</u>
--	--

**7. Approval for Return to Service**

Pursuant to the authority given persons specified below, the unit identified in item 5 was inspected in the manner prescribed by the Administrator of the Federal Aviation Administration and is  Approved  Rejected

<b>BY</b>	FAA Fit. Standards Inspector	<input checked="" type="checkbox"/>	Manufacturer	Maintenance Organization	Persons Approved by Canadian Department of Transport
	FAA Designee		Repair Station	<input checked="" type="checkbox"/>	
Certificate or Designation No. <u>A&amp;P 525680249 IA</u>		Signature/Date of Authorized Individual <u>Richard A. Mier</u> <u>8-12-2019</u>			

NOTICE

Weight and balance or operating limitation changes shall be entered in the appropriate aircraft record. An alteration must be compatible with all previous alterations to assure continued conformity with the applicable airworthiness requirements.

8. Description of Work Accomplished

(If more space is required, attach additional sheets. Identify with aircraft nationality and registration mark and date work completed.)

N 1905P 8/10/19

Nationality and Registration Mark

Date

Removed ELT EBC 102a from station 130. Installed Artex ELT 345A#-06-2880 serial #381572-039 at station 171. Installed new antenna at station 205. Artex ELT345 was installed on the factory installed avionics shelf immediately aft of station 171 using factory supplied mounting tray, and factory supplied installation instructions. The installation was accomplished in accordance with the following references: AC 43.13.13.2A . Chapter 2 paragraph 28, fig 2.8 and 3.1 . Aircraft weight and balance was recalculated, and Aircraft equipment list updated. END.....

Additional Sheets Are Attached

*J.*

*cor*

*the*

*Reg*

*Orig*

*De  
acc  
Dec*

*Lim.  
the  
appr  
othe  
that  
appr  
that*

*This*

*rend*

*Fedor*

*Date.*

*Date.*

*Any al*

The Aviation DataBase -- AD Resource System  
**Aviation DataSource, Inc.**  
 DataBases updated Oct. 11, 2012: As of Biweekly 2012-20/-21

**Airworthiness Directives: Compliance Report - Airframe**

Airframe		Engine(s)		Propeller(s)	
Make: Piper Aircraft Inc. Model: PA-24-250 N-No.: 7505P Serial: 24-3136 Hours:		Make: <i>Lycoming 0540-A1D5</i> Model: L-S/N: R-S/N: L-Hrs:                      R-Hrs:		Make: Model: L-S/N: R-S/N: L-Hrs:                      R-Hrs:	
59-06-05	Amdt.	Issued:	Effective: 01/01/59	Recurring: No	Hrs:
Subject: Nose gear bungee			Supersedes:	Due:	
Method:					SB#:
Terminated by:					SB#:
Name:		Sig.		Cert.	Date:
59-12-09	Amdt.	Issued:	Effective: 01/01/59	Recurring: No	Hrs:
Subject: Control wheel sprocket stud			Supersedes:	Due:	
Method:					SB#:
Terminated by:					SB#:
Name:		Sig.		Cert.	Date:
59-13-02	Amdt.	Issued:	Effective: 01/01/59	Recurring: No	Hrs:
Subject: Aileron balance weight			Supersedes:	Due:	
Method:					SB#:
Terminated by:					SB#:
Name:		Sig.		Cert.	Date:
59-26-02	Amdt.	Issued:	Effective: 01/01/59	Recurring: No	Hrs:
Subject: Fuel cell vent tubes			Supersedes:	Due:	
Method:					SB#:
Terminated by:					SB#:
Name:		Sig.		Cert.	Date:
60-24-03	Amdt.	Issued:	Effective: 12/19/60	Recurring: No	Hrs:
Subject: Fuel vent tubes			Supersedes:	Due:	
Method:					SB#:
Terminated by:					SB#:
Name:		Sig.		Cert.	Date:



61-16-06	Amdt.	Issued:	Effective: 08/31/61	Recurring: No	Hrs:
Subject: Fuel selector valve handles			Supersedes:	Due:	
Method:					SB#:
Terminated by:					SB#:
Name:		Sig.	Cert.	Date:	
61-20-02	Amdt.	Issued:	Effective: 10/20/61	Recurring: Yes	Hrs: 0
Subject: Exhaust stack reinforcement			Supersedes:	Due:	
Method: Mfg 3-2-1962					SB#:
Terminated by:					SB#:
Name:		Sig.	Cert.	Date:	
62-10-03	Amdt.	Issued:	Effective: 04/26/62	Recurring: No	Hrs: 77.12
Subject: Aileron counterweight bay rework			Supersedes:	Due:	
Method: NA by SN					SB#:
Terminated by:					SB#:
Name: <i>AB</i>		Sig. <i>AB</i>	Cert. 1459849	Date: 6-13-2013	
62-26-05	Amdt.	Issued:	Effective: 12/05/62	Recurring: <input checked="" type="checkbox"/>	Hrs:
Subject: Exhaust system			Supersedes:	Due:	
Method: Found Muffler hollow, with Brace					SB#:
Terminated by: <i>Abv.</i>					SB#:
Name: <i>Brown</i>		Sig. <i>AB</i>	Cert. 1459849	Date: 6-13-2013	
63-27-03	Amdt.	Issued:	Effective: 01/23/64	Recurring: No	Hrs:
Subject: Landing gear retraction motor circuit			Supersedes:	Due:	
Method: Changed 25 Amp Breaker to 30 Amp, Book 1					SB#:
Terminated by:					SB#:
Name: <i>Unknown</i>		Sig.	Cert.	Date: <i>Book 1</i>	
64-10-04	Amdt.	Issued:	Effective: 05/12/64	Recurring: No	Hrs: ?
Subject: Carburetor air box deflector vanes			Supersedes:	Due:	
Method: <i>Somebody Removed Vanes per this AD</i>					SB#:
Terminated by:					SB#:
Name:		Sig. <i>AB</i>	Cert. 1459849	Date: 6-13-2013	
64-22-03	Amdt.	Issued:	Effective: 09/28/64	Recurring: No	Hrs: 300
Subject: Landing gear safety switch			Supersedes:	Due:	

64-22-03

Method:					SB#:
Terminated by: Kit 754-475 installed					SB#:
Name:		Sig.		Cert. 1498006 1068050	Date: 10-3-67
65-11-04	Amdt.	Issued:	Effective: 05/15/65	Recurring: No	Hrs:
Subject: Stabilator control system			Supersedes:		Due:
Method: NA Mitchell autopilot					SB#:
Terminated by:					SB#:
Name:		Sig.		Cert.	Date:
65-25-03	Amdt.	Issued:	Effective: 12/10/65	Recurring: Yes	Hrs: 1615
Subject: Nose landing gear drag link clevis			Supersedes:		Due:
Method: PCW by Kit # 756-911 SB 445					SB#:
Terminated by:					SB#:
Name:		Sig.		Cert. 1068050	Date: 8-20-65 3-24-66
68-05-01	Amdt.	Issued:	Effective: 03/05/69	Recurring: <input checked="" type="checkbox"/>	Hrs: 6462.16
Subject: Exhaust mufflers			Supersedes:		Due:
Method: By Finding the muffler hollow and Breece stops					SB#:
Terminated by: The reoccurring feature.					SB#:
Name: Brown		Sig. [Signature]		Cert. 1459849	Date: 6-13-2013
68-13-03	Amdt.	Issued:	Effective: 03/05/69	Recurring: Yes P2 1000 Hrs.	Hrs: 6453.0 6462.16
Subject: Fuel cell collapse			Supersedes:		Due: 7462.16
Method: CW 3-29-64, 7-23-83 Tech 4-774 9-25-09 <sup>4530</sup>					SB#:
Terminated by:					SB#:
Name: Brown		Sig. [Signature]		Cert. 1459849	Date: 6-13-2013
72-22-05	Amdt.	Issued:	Effective: 12/26/74	Recurring: No	Hrs: 6462.16
Subject: Operation limitation placard			Supersedes:		Due:
Method: Marked on Air speed indicator					SB#:
Terminated by: " " " " "					SB#:
Name: Brown		Sig. [Signature]		Cert. 1459849	Date: 6-13-2013
74-10-03 R	Amdt.	Issued:	Effective: 01/01/74	Recurring: No	Hrs:
Subject: Superseded by 79-20-10			Supersedes:		Due:
Method: NA					SB#:
Terminated by:					SB#:
Name:		Sig.		Cert.	Date:

74-13-01	Amdt.	Issued:	Effective: 06/18/74	Recurring: No	Hrs:
Subject: Superseded by 94-13-10			Supersedes:	Due:	
Method: <i>NA</i>			SB#:		
Terminated by:			SB#:		
Name:		Sig.	Cert.	Date:	
74-13-03	Amdt.	Issued:	Effective: 04/30/76	Recurring: Yes	Hrs:
Subject: Stabilator attach bolts			Supersedes:	Due:	
Method:			SB#:		
Terminated by:			SB#:		
Name:		Sig.	Cert.	Date:	
75-05-02	Amdt.	Issued:	Effective: 02/21/75	Recurring: Yes	Hrs:
Subject: Engine oil - Beryl Aviation filtrator assembly - STC SA2653WE			Supersedes:	Due:	
Method:			SB#:		
Terminated by: <i>NA</i>			SB#:		
Name:		Sig.	Cert.	Date:	
75-12-06	Amdt.	Issued:	Effective: 06/05/75	Recurring: Yes	Hrs: <i>6462.16</i>
Subject: Fin forward spar			Supersedes:	Due:	
Method: <i>CW by Inspection before painting</i>			SB#:		
Terminated by:			SB#:		
Name: <i>Brown</i>		Sig. <i>[Signature]</i>	Cert. <i>1459849</i>	Date: <i>6-13-2013</i>	
75-27-08	Amdt.	Issued:	Effective: 06/03/76	Recurring: No	Hrs: <i>3812.46</i>
Subject: Torque tube bearing fittings			Supersedes:	Due:	
Method:			SB#:		
Terminated by:			SB#:		
Name: <i>Niles</i>		Sig.	Cert. <i>2198115</i>	Date: <i>1-7-76</i>	
76-19-07	Amdt.	Issued:	Effective: 09/29/76	Recurring: No	Hrs:
Subject: Stabilator weight assy			Supersedes:	Due:	
Method:			SB#:		
Terminated by: <i>NA Book 1 + 2</i>			SB#:		
Name:		Sig.	Cert.	Date:	
77-08-01	Amdt.	Issued:	Effective: 04/18/77	Recurring: Yes <i>pa. 100 hrs</i>	Hrs:
Subject: Aileron spar cracks			Supersedes:	Due:	

2708-01

Method: <i>Insp. 7-23-83 et al</i>					SB#:
Terminated by:					SB#:
Name: <i>Brown</i>		Sig. <i>[Signature]</i>		Cert. <i>1459849</i>	Date: <i>6-13-2013</i>
77-13-21	Amdt.	Issued:	Effective: <i>12/16/77</i>	Recurring: Yes <i>3424.00 500 hrs</i>	Hrs: <i>6462.16</i>
Subject: <i>Prevent landing gear collapse</i>			Supersedes:		Due:
Method: <i>Bungies Replaced Lube + Insp.</i>					SB#:
Terminated by:					SB#:
Name: <i>Brown</i>		Sig. <i>[Signature]</i>		Cert. <i>1459849</i>	Date: <i>6-13-2013</i>
79-20-10	Amdt.	Issued:	Effective: <i>10/04/79</i>	Recurring: Yes <i>100 hrs</i>	Hrs:
Subject: <i>Incorporation of Piper Kit 763893</i>			Supersedes: <i>74-10-03</i>		Due:
Method: <i>CW 9-3-84 et al</i>					SB#:
Terminated by:					SB#:
Name:		Sig.		Cert.	Date:
82-23-01 R1	Amdt.	Issued:	Effective: <i>04/07/83</i>	Recurring: No	Hrs:
Subject: <i>Placard near flap actuator</i>			Supersedes:		Due:
Method: <i>NA Robertson STC</i>					SB#:
Terminated by:					SB#:
Name:		Sig.		Cert.	Date:
83-19-03	Amdt.	Issued:	Effective: <i>09/30/83</i>	Recurring: No	Hrs: <i>4905</i>
Subject: <i>Lower spar cap inspection</i>			Supersedes:		Due:
Method: <i>CW Book 1</i>					SB#:
Terminated by:					SB#:
Name:		Sig.		Cert.	Date: <i>9-3-84</i>
85-02-05 R1	Amdt.	Issued:	Effective: <i>11/21/97</i>	Recurring: No	Hrs:
Subject: <i>Brake operation placard P/N 81090-02</i>			Supersedes:		Due:
Method:					SB#:
Terminated by:					SB#:
Name:		Sig.		Cert.	Date:
94-13-10	Amdt.	Issued:	Effective: <i>08/12/94</i>	Recurring: Yes <i>ca 100 hrs</i>	Hrs: <i>6462.16</i>
Subject: <i>Stabilator torque tube</i>			Supersedes: <i>74-13-01</i>		Due:
Method: <i>BK 2 2-5-08 at 6443.9, 9-75-09 @ 6453.0</i>					SB#:
Terminated by:					SB#:
Name: <i>Brown</i>		Sig. <i>[Signature]</i>		Cert. <i>1459849</i>	Date: <i>6-13-2013</i>

Book 2  
↓

**Aviation DataSource, Inc. -**  
 The Aviation DataBase  
 DataBases updated November 21, 2017: As of Biweekly 2017-231-24

*Brake Fluid - good  
 Gear Swing - good  
 Compression Good  
 Aux Fuel Cells to be replaced*

5-Line HTML Report

Display Reports in MS-Word

Return to Search Selections

Search within the listed ADs for: **N7905P**

*Annual 12-1-2017*

Number of ADs: 36

Manufacturer: Piper Aircraft Inc. TC No.: 1A15  
 Airworthiness Directives for Model: Comanche -250  
 Rec (Yes); Indicates a Recurring AD.

AD Number	PDF	Rec	Subject	Effective
59-06-05	PDF	No	Nose gear bungee	07/30/59
59-12-09	PDF	No	Control wheel sprocket stud	10/01/59
59-13-02	PDF	No	Aileron balance weight	01/15/60
59-26-02	PDF	No	Fuel cell vent tubes	12/19/60
60-24-03	PDF	No	Fuel vent tubes	08/31/61
61-16-06	PDF	No	Fuel selector valve handles	10/20/61
61-20-02	PDF	Yes	Exhaust stack reinforcement	04/26/62
62-10-03	PDF	No	Aileron counterweight bay rework	12/05/62
62-26-05	PDF	No	Exhaust system	01/23/64
63-27-03	PDF	No	Landing gear retraction motor circuit	05/12/64
64-10-04	PDF	No	Carburetor air box deflector vanes	09/28/64
64-22-03	PDF	No	Landing gear safety switch	05/15/65
65-11-04	PDF	No	Stabilator control system	12/10/65
65-25-03	PDF	Yes	Nose landing gear drag link clevis <i>in 100 hrs CW by Insp. JLB</i>	03/05/69
68-05-01	PDF	Yes	Exhaust mufflers <i>NA - (no guts) JLB</i>	03/05/69
68-13-03	PDF	Yes	Fuel cell collapse <i>Mains OK OX to be replaced</i>	12/26/74
72-22-05	PDF	No	Operation limitation placard	01/01/74
74-10-03 R	PDF	No	Superseded by 79-20-10	06/18/74
74-13-01	PDF	No	Superseded by 94-13-10	04/30/76
74-13-03	PDF	Yes	Stabilator attach bolts <i>All 4 good JLB</i>	02/21/75
75-05-02	PDF	Yes	Engine oil - Beryl Aviation filtrator assembly - STC SA2653WE	06/05/75
75-12-06	PDF	Yes	Fin forward spar <i>CW by Insp. 10 per Glass JLB</i>	06/03/76
75-27-08	PDF	No	Torque tube bearing fittings	09/29/76
76-19-07	PDF	No	Stabilator weight assy	04/18/77
77-08-01	PDF	Yes	Aileron spar cracks <i>Has Kit</i>	12/16/77
77-13-21	PDF	Yes	Prevent landing gear collapse <i>Bungee Due at 2018 Annual</i>	10/04/79
79-20-10	PDF	Yes	Incorporation of Piper Kit 763893 <i>PCW</i>	04/07/83
82-23-01 R1	PDF	No	Placard near flap actuator	09/30/83
83-19-03	PDF	No	Lower spar cap inspection	11/21/97
85-02-05 R1	PDF	No	Brake operation placard P/N 81090-02	08/12/94
94-13-10	PDF	Yes	Stabilator torque tube <i>PMA Mod (No Longer req'd)</i>	11/17/95
95-20-07 C1	PDF	Yes	Superseded by 97-01-01	12/08/98
97-01-01 R1	PDF	Yes	Cracks - main gear sidebrace studs <i>ca 1000 hrs. 301 hrs left before Due</i>	03/19/99
99-05-09	PDF	No	Facet Purolator induction air filters	10/22/12
2012-17-06	PDF	Yes	Cracks - stabilator horn assembly <i>PCW Has Austriale Horn installed</i>	01/12/16
15-24-05	PDF	No	POH/AFM change - fuel system management placard	

Following ADs apply to Accessories that could be installed on the Comanche -250 (See Explanation) No. of ADs: 4

**Aviation DataSource, Inc. —**  
 The Aviation DataBase  
 DataBases updated November 21, 2016: As of Biweekly 2016-23/-24

5-Line HTML Report

Display Reports in MS-Word

[Return to Search Selections](#)

Search within the listed ADs for: **N7905P** search

Manufacturer: **Piper Aircraft Inc.** TC No.: **1A15**  
 Airworthiness Directives for Model: **Commanche -250**  
 Rec (Yes): Indicates a Recurring AD.

Number of ADs: 36

AD Number	PDF	Rec	Subject	Effective
<a href="#">59-06-05</a>	<a href="#">PDF</a>	No	Nose gear bungee	06/01/59
<a href="#">59-12-09</a>	<a href="#">PDF</a>	No	Control wheel sprocket stud	07/30/59
<a href="#">59-13-02</a>	<a href="#">PDF</a>	No	Aileron balance weight	10/01/59
<a href="#">59-26-02</a>	<a href="#">PDF</a>	No	Fuel cell vent tubes	01/15/60
<a href="#">60-24-03</a>	<a href="#">PDF</a>	No	Fuel vent tubes	12/19/60
<a href="#">61-16-06</a>	<a href="#">PDF</a>	No	Fuel selector valve handles	08/31/61
<a href="#">61-20-02</a>	<a href="#">PDF</a>	Yes	Exhaust stack reinforcement <i>PCW</i>	10/20/61
<a href="#">62-10-03</a>	<a href="#">PDF</a>	No	Aileron counterweight bay rework	04/26/62
<a href="#">62-26-05</a>	<a href="#">PDF</a>	No	Exhaust system	12/05/62
<a href="#">63-27-03</a>	<a href="#">PDF</a>	No	Landing gear retraction motor circuit	01/23/64
<a href="#">64-10-04</a>	<a href="#">PDF</a>	No	Carburetor air box deflector vanes	05/12/64
<a href="#">64-22-03</a>	<a href="#">PDF</a>	No	Landing gear safety switch	09/28/64
<a href="#">65-11-04</a>	<a href="#">PDF</a>	No	Stabilator control system	05/15/65
<a href="#">65-25-03</a>	<a href="#">PDF</a>	Yes	Nose landing gear drag link clevis <i>CW by Insp</i>	12/10/65
<a href="#">68-05-01</a>	<a href="#">PDF</a>	Yes	Exhaust mufflers <i>Hollow NA</i>	03/05/69
<a href="#">68-13-03</a>	<a href="#">PDF</a>	Yes	Fuel cell collapse <i>CW by Insp</i>	03/05/69
<a href="#">72-22-05</a>	<a href="#">PDF</a>	No	Operation limitation placard	12/26/74
<a href="#">74-10-03 R</a>	<a href="#">PDF</a>	No	Superseded by 79-20-10	01/01/74
<a href="#">74-13-01</a>	<a href="#">PDF</a>	No	Superseded by 94-13-10	06/18/74
<a href="#">74-13-03</a>	<a href="#">PDF</a>	Yes	Stabilator attach bolts <i>CW by Insp</i>	04/30/76
<a href="#">75-05-02</a>	<a href="#">PDF</a>	Yes	Engine oil - Beryl Aviation filtrator assembly - STC SA2653WE <i>NA</i>	02/21/75
<a href="#">75-12-06</a>	<a href="#">PDF</a>	Yes	Fin forward spar <i>CW by Insp</i>	06/05/75
<a href="#">75-27-08</a>	<a href="#">PDF</a>	No	Torque tube bearing fittings	06/03/76
<a href="#">76-19-07</a>	<a href="#">PDF</a>	No	Stabilator weight assy	09/29/76
<a href="#">77-08-01</a>	<a href="#">PDF</a>	Yes	Aileron spar cracks <i>Has Kit</i>	04/18/77
<a href="#">77-13-21</a>	<a href="#">PDF</a>	Yes	Prevent landing gear collapse <i>PCW (Bungee)</i>	12/16/77
<a href="#">79-20-10</a>	<a href="#">PDF</a>	Yes	Incorporation of Piper Kit 763893 <i>PCW w Kit</i>	10/04/79
<a href="#">82-23-01 R1</a>	<a href="#">PDF</a>	No	Placard near flap actuator	04/07/83
<a href="#">83-19-03</a>	<a href="#">PDF</a>	No	Lower spar cap inspection	09/30/83
<a href="#">85-02-05 R1</a>	<a href="#">PDF</a>	No	Brake operation placard P/N 81090-02	11/21/97
<a href="#">94-13-10</a>	<a href="#">PDF</a>	Yes	Stabilator torque tube <i>CW by Insp</i>	08/12/94
<a href="#">95-20-07 C1</a>	<a href="#">PDF</a>	Yes	Superseded by 97-01-01	11/17/95
<a href="#">97-01-01 R1</a>	<a href="#">PDF</a>	Yes	Cracks - main gear sidebrace studs <i>ca 500 line</i>	12/08/98
<a href="#">99-05-09</a>	<a href="#">PDF</a>	No	Facet Purolator induction air filters	03/19/99
<a href="#">2012-17-06</a>	<a href="#">PDF</a>	Yes	Cracks - stabilator horn assembly <i>Installed Australia Horn</i>	10/22/12
<a href="#">2015-24-05</a>	<a href="#">PDF</a>	No	POH/AFM change - fuel system management placard	01/12/16

The Following ADs apply to Accessories that *could be* installed on the **Comanche -250** (See [Explanation](#)) **No. of ADs: 4**

<u>AD Number</u>	<u>PDF</u>	<u>No</u>	<u>Description</u>	<u>Date</u>	<u>Count</u>
<u>98-21-21 R1</u>	<u>PDF</u>	No	Overheating: electric door seal inflation systems	05/01/00	---
<u>2001-23-17</u>	<u>PDF</u>	No	GNS 430 Circuitry changes - deviation & flag outputs	12/28/01	---
<u>2005-01-19</u>	<u>PDF</u>	No	Garmin GTX 33, GTX 33D, GTX 330, GTX 330D Mode S Transponders	02/23/05	---
<u>2006-03-08</u>	<u>PDF</u>	No	Aero Advantage ADV211CC & ADV212CW Vacuum Pumps; pump chamber failure	03/10/06	---

ADs that address non-Type Certificate holders (Garmin, Bendix, etc.) can be found in the **Appliance/Accessory Index**.  
Use your Browser's "Print Page" function to print this Summary,  
and/or use "Save As" to save it to disk. Change the file name before clicking on "Save".

**Aviation DataSource, Inc. --**  
**The Aviation DataBase**  
 DataBases updated November 2, 2015: As of Biweekly 2015-22/-23

5-Line HTML Report

Display Reports in MS-Word

Return to Search Selections

Search within the listed ADs for:

search

Manufacturer: **Lycoming Engines** TC No.: **E-295**  
 Airworthiness Directives for Model: **O-540-A1B5**  
 Rec (Yes); Indicates a Recurring AD.

Number of ADs: 30

AD Number	Rec	Subject	Effective
<u>59-10-07</u>	No	Cylinder baffle clamps	07/01/59
<u>63-14-03</u>	Yes	Drive shaft <i>P CW by Changing No longer Repetative</i>	07/06/63
<u>64-16-05</u>	No	Oil seal failure	07/10/64
<u>66-20-04</u>	No	Oil filter adapter gasket	08/27/66
<u>75-08-09</u>	No	Oil pump failure	08/18/77
<u>81-18-04 R2</u>	No	Superseded by 96-09-10	06/07/82
<u>87-10-06 R1</u>	No	Rocker arm assemblies	09/01/89
<u>91-14-22</u>	Yes	Superseded by 2004-10-14	08/19/91
<u>92-12-05</u>	No	Piston pins	07/10/92
<u>95-07-01</u>	No	Connecting rod bolt failure	04/12/95
<u>96-09-10</u>	No	Iron and aluminum impellers in oil pumps	07/15/96
<u>97-01-03</u>	No	Superseded by 97-15-11	01/21/97
<u>97-15-11</u>	No	Defective piston pins	08/12/97
<u>98-17-11</u>	No	Crankshafts serviced by Nelson Balancing	10/19/98
<u>98-17-11 C1</u>	No	Crankshafts serviced by Nelson Balancing	10/19/98
<u>2002-20-51 E</u>	No	Superseded by 2002-23-06	10/01/02
<u>2002-23-06</u>	No	Superseded by 2004-05-24	11/19/02
<u>2004-05-24</u>	No	Crankshaft gear retaining bolts	03/30/04
<u>2004-10-14</u>	Yes	Prop Strike - crankshaft gear installation	06/25/04
<u>2005-19-11</u>	No	Crankshaft replacement	10/21/05
<u>2005-26-10</u>	No	Superseded by 2006-12-07	01/31/06
<u>2006-10-21</u>	No	Non-TC Holder - ECi connecting rods	06/22/06
<u>2006-12-07</u>	No	Non-TC Holder - ECi cylinder assemblies	07/11/06
<u>2006-20-09</u>	No	Superseded by 2012-19-01	11/03/06
<u>2007-04-19 R1</u>	No	Non-TC Holder - Superior Air Parts - Cylinder Assemblies	06/01/07
<u>2008-19-05</u>	Yes	Superseded by 2009-26-12; ECi cylinders	10/20/08
<u>2009-26-12</u>	Yes	Non-TC Holder - ECi cylinder assemblies; P/N AEL65102 Series	02/04/10
<u>2012-03-07</u>	No	Volare - Marvel-Schebler (BorgWarner) HA-6 carburetors <i>NA</i>	03/27/12



**Aviation DataSource, Inc. --**  
**The Aviation DataBase**

DataBases updated November 21, 2016: As of Biweekly 2016 --

[https://airresearch.com/PHPScripts/Sel\\_LAC.php3](https://airresearch.com/PHPScripts/Sel_LAC.php3)

5-Line HTML Report

Display Remarks

S...

10/24/12

**2-19-01**   **No**   **Crankshafts**  
**Use your Browser's "Print Page" function to print this Summary,**  
**or use "Save As" to save it to disk. Change the file name before clicking on "Save".**  
**Items that address non-Type Certificate holders (Garmin, Bendix, etc.) can be found in the Appliance/Accessory**  
**Index.**

**Aviation DataSource, Inc. --**  
**The Aviation DataBase**  
 DataBases updated November 21, 2016: As of Biweekly 2016-23/-24

5-Line HTML Report

Display Reports in MS-Word

[Return to Search Selections](#)

Search within the listed ADs for: N7905P

Manufacturer: **Lycoming Engines** TC No.: **E-295**  
 Airworthiness Directives for Model: **O-540-A1B5**

Number of ADs: 30

Rec (Yes): Indicates a Recurring AD.

AD Number	PDF	Rec	Subject	Effective
<a href="#">59-10-07</a>	<a href="#">PDF</a>	No	Cylinder baffle clamps	07/01/59
<a href="#">63-14-03</a>	<a href="#">PDF</a>	Yes	Drive shaft <i>was Replaced with new style</i>	07/06/63
<a href="#">64-16-05</a>	<a href="#">PDF</a>	No	Oil seal failure	07/10/64
<a href="#">66-20-04</a>	<a href="#">PDF</a>	No	Oil filter adapter gasket	08/27/66
<a href="#">75-08-09</a>	<a href="#">PDF</a>	No	Oil pump failure	08/18/77
<a href="#">81-18-04 R2</a>	<a href="#">PDF</a>	No	Superseded by 96-09-10	06/07/82
<a href="#">87-10-06 R1</a>	<a href="#">PDF</a>	No	Rocker arm assemblies	09/01/89
<a href="#">91-14-22</a>	<a href="#">PDF</a>	Yes	Superseded by 2004-10-14	08/19/91
<a href="#">92-12-05</a>	<a href="#">PDF</a>	No	Piston pins	07/10/92
<a href="#">95-07-01</a>	<a href="#">PDF</a>	No	Connecting rod bolt failure	04/12/95
<a href="#">96-09-10</a>	<a href="#">PDF</a>	No	Iron and aluminum impellers in oil pumps	07/15/96
<a href="#">97-01-03</a>	<a href="#">PDF</a>	No	Superseded by 97-15-11	01/21/97
<a href="#">97-15-11</a>	<a href="#">PDF</a>	No	Defective piston pins	08/12/97
<a href="#">98-17-11</a>	<a href="#">PDF</a>	No	Crankshafts serviced by Nelson Balancing	10/19/98
<a href="#">98-17-11 C1</a>	<a href="#">PDF</a>	No	Crankshafts serviced by Nelson Balancing	10/19/98
<a href="#">2002-20-51 E</a>	<a href="#">PDF</a>	No	Superseded by 2002-23-06	10/01/02
<a href="#">2002-23-06</a>	<a href="#">PDF</a>	No	Superseded by 2004-05-24	11/19/02
<a href="#">2004-05-24</a>	<a href="#">PDF</a>	No	Crankshaft gear retaining bolts	03/30/04
<a href="#">2004-10-14</a>	<a href="#">PDF</a>	Yes	Prop Strike - crankshaft gear installation	06/25/04
<a href="#">2005-19-11</a>	<a href="#">PDF</a>	No	Crankshaft replacement	10/21/05
<a href="#">2005-26-10</a>	<a href="#">PDF</a>	No	Superseded by 2006-12-07	01/31/06
<a href="#">2006-10-21</a>	<a href="#">PDF</a>	No	Non-TC Holder - ECi connecting rods	06/22/06
<a href="#">2006-12-07</a>	<a href="#">PDF</a>	No	Non-TC Holder - ECi cylinder assemblies	07/11/06
<a href="#">2006-20-09</a>	<a href="#">PDF</a>	No	Superseded by 2012-19-01	11/03/06
<a href="#">2007-04-19 R1</a>	<a href="#">PDF</a>	No	Non-TC Holder - Superior Air Parts - Cylinder Assemblies	06/01/07
<a href="#">2008-19-05</a>	<a href="#">PDF</a>	Yes	Superseded by 2009-26-12; ECi cylinders	10/20/08
<a href="#">2009-26-12</a>	<a href="#">PDF</a>	Yes	Non-TC Holder - ECi cylinder assemblies; P/N AEL65102 Series	02/04/10
<a href="#">2012-03-07</a>	<a href="#">PDF</a>	No	Non-TC Holder - Volare - Marvel-Schebler (BorgWarner) HA-6 carburetors	03/27/12
<a href="#">2012-19-01</a>	<a href="#">PDF</a>	No	Crankshafts	10/24/12

The Following ADs apply to Accessories that *could be* installed on the O-540-A1B5 (See [Explanation](#)) No. of ADs: 8

<a href="#">63-22-03</a>	<a href="#">PDF</a>	No	Marvel-Schebler MA-4 Series Carburetors - venturi replacement	12/02/63	---
<a href="#">69-24-03</a>	<a href="#">PDF</a>	No	Marvel-Schebler MA-3 Series Carburetors - modification	11/29/69	---
<a href="#">89-04-02</a>	<a href="#">PDF</a>	No	Carburetor throttle jamming; air metering stop pin replacement (P/N 62-226)	03/08/89	---
<a href="#">2005-12-06</a>	<a href="#">PDF</a>	Yes	Teledyne Cont. S-20, S-1200, D-2000 & D-3000 Series Magnetos	07/19/05	---
<a href="#">2006-10-21</a>	<a href="#">PDF</a>	No	Replacement: ECi connecting rods, P/N AEL11750	06/22/06	---

# Aviation DataSource, Inc. -- The Aviation DataBase

2015 22/ 23

<u>2006-12-07</u>	<b>PDF</b>	No	ECi cylinder assemblies, P/N AEL65102 series "Classic Cast"	07/11/06	--
<u>2007-04-19 R1</u>	<b>PDF</b>	No	Superior Air Parts Cylinder Assembly removal	06/01/07	--
<u>2009-26-12</u>	<b>PDF</b>	Yes	Cracks: head-to-barrel interface; cylinder assemblies replacement	02/04/10	--

ADs that address non-Type Certificate holders (Garmin, Bendix, etc.) can be found in the Appliance/Accessory Index.  
Use your Browser's "Print Page" function to print this Summary,  
and/or use "Save As" to save it to disk. Change the file name before clicking on "Save".

# Aviation DataSource, Inc. --

The Aviation DataBase

DataBases updated November 2, 2015: As of Biweekly 2015-22/-23

5-Line HTML Report

Display Reports In MS-Word

[Return to Search Selections](#)

Search within the listed ADs for: **N7905 P**

search **PA 24-250**  
**SN 24-3136**

Manufacturer: **Piper Aircraft Inc.** TC No.: **1A15**  
Airworthiness Directives for Model: **Comanche -250**

Number of ADs: **35**

Rec (Yes); Indicates a Recurring AD.

AD Number	Rec	Subject	Effective
59-06-05	No	Nose gear bungee	06/01/59
59-12-09	No	Control wheel sprocket stud	07/30/59
59-13-02	No	Aileron balance weight	10/01/59
59-26-02	No	Fuel cell vent tubes	01/15/60
60-24-03	No	Fuel vent tubes	12/19/60
61-16-06	No	Fuel selector valve handles	08/31/61
61-20-02	Yes	Exhaust stack reinforcement <i>NAMFy 3-2-1962</i>	10/20/61
62-10-03	No	Aileron counterweight bay rework	04/26/62
62-26-05	No	Exhaust system	12/05/62
63-27-03	No	Landing gear retraction motor circuit	01/23/64
64-10-04	No	Carburetor air box deflector vanes	05/12/64
64-22-03	No	Landing gear safety switch	09/28/64
65-11-04	No	Stabilator control system	05/15/65
65-25-03	Yes	Nose landing gear drag link clevis <i>PCW CRIF #756-911</i>	12/10/65
68-05-01	Yes	Exhaust mufflers <i>Hollowed out PCW</i>	03/05/69
68-13-03	Yes	Fuel cell collapse <i>CW by insp.</i>	03/05/69
72-22-05	No	Operation limitation placard	12/26/74
74-10-03 R	No	Superseded by 79-20-10	01/01/74
74-13-01	No	Superseded by 94-13-10	06/18/74
74-13-03	Yes	Stabilator attach bolts <i>PCW</i>	04/30/76
75-05-02	Yes	Engine oil - Beryl Aviation filtrator assembly - STC SA2653WE	02/21/75
75-12-06	Yes	Fin forward spar <i>CW by Insp</i>	06/05/75
75-27-08	No	Torque tube bearing fittings	06/03/76
76-19-07	No	Stabilator weight assy	09/29/76
77-08-01	Yes	Aileron spar cracks <i>PCW Kit installed</i>	04/18/77
77-13-21	Yes	Prevent landing gear collapse <i>CW - Replaced Bungees</i>	12/16/77
79-20-10	Yes	Incorporation of Piper Kit 763893 <i>PCW Kit installed</i>	10/04/79
82-23-01 R1	No	Placard near flap actuator	04/07/83

C/W 8-25-05 6427.9 Kit Installed \*77-08-01

[https://airresearch.com/PHPScripts/Sel\\_LAC.php3](https://airresearch.com/PHPScripts/Sel_LAC.php3)

83-19-03	No	Lower spar cap inspection	
85-02-05 R1	No	Brake operation placard P/N 81090-02	09/30/83
94-13-10	Yes	Stabilator torque tube <i>CW by Insp</i>	11/21/97
95-20-07 C1	Yes	Superseded by 97-01-01	08/12/94
97-01-01 R1	Yes	Cracks - main gear sidebrace studs <i>CW by Insp.</i>	11/17/95
99-05-09	No	Facet Purolator induction air filters	12/08/98
2012-17-06	Yes	Cracks - stabilator horn assembly <i>ea 500 not done yet</i>	03/19/99
			10/22/12

Use your Browser's "Print Page" function to print this Summary,  
 and/or use "Save As" to save it to disk. Change the file name before clicking on "Save".  
 ADs that address non-Type Certificate holders (Garmin, Bendix, etc.) can be found in the Appliance/Accessory  
 Index.

*J. R. Brown IA 1457849*

c/w 8-25-05 6427.9 Kit Installed

\*77-08-01

77-08-01

PIPER:

Amendment 39-2871. Applies to Models PA-24, PA-24-250 and PA-24-260, Serial Nos. 24-1 through 24-5047; Model PA-24-400, Serial Nos. 26-2 through 26-148; Model PA-30, Serial Nos. 30-2 through 30-2000; Model PA-39, Serial Nos. 39-1 through 39-155; certificated in all categories except aircraft incorporating Piper Kit number 760 914.

To prevent possible hazards in flight associated with aileron spar cracks, accomplish the following:

- (a) within the next 100 hours in service from the effective date of this AD or upon the attainment of 1000 total hours in service, whichever is later, and at intervals not to exceed 100 hours in service from the last inspection, inspect and alter as necessary in accordance with the instructions sections of Piper Service Letter No. 787 dated December 1, 1976, or equivalent.
- (b) Upon the incorporation of Aileron Outboard Hinge Bracket Replacement, Piper Kit No. 760 914 or equivalent, compliance with the requirements of this AD may be dispensed with.
- (c) Equivalent inspections and alterations must be approved by the Chief, Engineering and Manufacturing Branch, FAA, Eastern Region.
- (d) Upon submission of substantiating data by an owner or operator through an FAA Maintenance Inspector, the Chief, Engineering and Manufacturing Branch, FAA, Eastern Region may adjust the inspection intervals specified in this AD.

This amendment becomes effective April 18, 1977.

C/W 3-24-46

~~Kit 2059-03~~ 2059-03

\*65-25-03

65-25-03

PIPER:

Amdt. 39-155 Part 39 Federal Register November 10, 1965.  
Applies to Models PA-24 and PA-24-250 Airplanes, Serial  
Numbers 24-1 through 24-3225 except 24-923.

Compliance required as indicated.

To prevent further failures of the nose landing gear drag link clevis, accomplish the following:

- (a) Inspect nose landing gear drag link clevis, P/N's 20859-03(HT), 20859-02, or 20859-00, as applicable, for cracks in the thread roots and the shank-to-clevis fillet radius using water-washable or water-emulsifiable dye penetrant methods or an FAA-approved equivalent within the next 25 hours' time in service after the effective date of this AD, unless already accomplished within the last 75 hours' time in service and thereafter at intervals not to exceed 100 hours' time in service from the last inspection until modified in accordance with (b)(2) or (3).
- (b) If a crack is found, before further flight -
  - (1) Replace the clevis with an uncracked clevis in accordance with Piper Service Letter No. 366, dated January 3, 1962, or later FAA-approved revision;
  - (2) Replace the clevis with an uncracked drag link clevis, P/N 20859-03 (HT), reinforced with drag link clevis reinforcement bracket, Piper P/N 25257, in accordance with the sketch on the back of Piper Service Letter No. 445, dated April 21, 1965, or later FAA-approved revision, or an equivalent approved by the Chief, Engineering and Manufacturing Branch, FAA Eastern Region; or
  - (3) Install Piper Kit Number 754429, or an equivalent approved by the Chief, Engineering and Manufacturing Branch, FAA Eastern Region.

This directive effective December 10, 1965.

Kit

756-911

C/W 9-3-84

4905

83-19-03

PIPER:

Amendment 39-4730. Applies to Models PA-24-180/250/260 (S/N 24-1 and up); PA-24-400, (S/N 26-2 and up); PA-30 (S/N 30-2 thru 30-2000); and PA-39 (S/N 39-1 thru 39-155) airplanes certificated in any category.

COMPLIANCE: Required as indicated, unless already accomplished.

To prevent wing lower main spar cap damage and possible cracks in this component where it enters the fuselage at the lower wing root fairing, accomplish the following:

- a) Within the next 100 hours time-in-service after the effective date of this AD, inspect the lower spar cap for chafing damage and cracks in accordance with the Instructions Section of Piper Service Bulletin 751 dated May 24, 1983.
- b) Prior to further flight, polish out any chafing damage or replace parts which are cracked or that have chafing damage which cannot be polished out within the depth limits specified in the Instructions Section of Piper Service Bulletin 751 dated May 24, 1983, with a serviceable part.
- c) Prior to reinstallation, trim the lower portion of the seal plates in accordance with the Instructions Section of Piper Service Bulletin 751 dated May 24, 1983.
- d) Aircraft may be flown in accordance with Federal Aviation Regulation 21.197 to a location where this AD can be accomplished.
- e) An equivalent method of compliance with this AD may be used, if approved, by the Manager, New York Aircraft Certification Office, FAA, Room 202, 181 South Franklin Avenue, Valley Stream, New York 11581.

This amendment becomes effective on September 30, 1983.



C/W ~~2-14-62~~  
10-3-62

Kit installed

64-22-0

64-22-03

PIPER:

Amdt. 802 Part 507 Federal Register August 28, 1964.  
Applies to Models PA-24 and PA-24-250 Aircraft Serial  
Numbers 24-1 through 24-3284.

Compliance required within the next 50 hours' time in service after the effective date of this AD, unless already accomplished.

To eliminate possible breakage or loosening of the wires leading to the landing gear safety switch with resultant malfunction of the landing gear safety switch accomplish the following:

- (a) On the left main landing gear, inspect for broken and loose wires and terminals at the connections to the landing gear safety switch. Repair any broken or loose wires and terminals before further flight.
- (b) Install Piper Kit No. 754475, or FAA approved equivalent, leaving sufficient slack in the wires between the new clamp and the safety switch to prevent pulling of the wires.

(Piper Service Letter No. 379, dated July 12, 1962, pertains to this subject.)

This directive effective September 28, 1964.

1-19-65

20 AND 101

**PIPER**  
**Customer Services**

**Piper Aircraft Corporation**  
**Lock Haven, Pennsylvania, U.S.A.**

**SERVICE LETTER No. 379**

**August 10, 1962**

**Page 1 of 2**

**TO:** Distributors, Dealers, Certified Service Centers and Owners

**SUBJECT:** Landing Gear Safety Switch Harness

**MODELS AFFECTED:**

PA-24 and PA-24 "250" Comanches  
Serial Numbers 24-1 to 24-3284 incl.

We have been advised that over extended periods of operation, there is a possibility of a wire or wires in the landing gear safety switch harness becoming broken at the switch. This condition would cause malfunction of the safety switch.

A kit, consisting of a bracket, clamp, plastic sleeve and necessary hardware, is available for use in the subject aircraft. It is recommended that this kit be installed in the referenced aircraft as it will support the wire harness of the safety switch. See sketch on the reverse side of this Service Letter.

Until such time as this kit is installed, an inspection of the safety switch and related wire harness should be performed at each 100 hours of operation to ascertain this condition does not exist.

The part number of this kit is 754 475, unit price \$1.08, and is available through your Piper distributor or dealer.

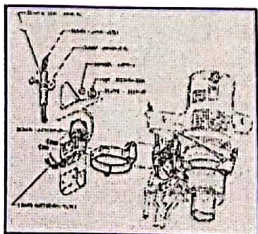
Very truly yours,

PIPER AIRCRAFT CORPORATION  
/s/  
Wes Holmes  
Service Manager

WH:dlt

(over)

Page 2 of 2



Sketch

2-19-65

30 Amp CB/

63-27-03

63-27-03

PIPER:

Amdt. 661 Part 507 Federal Register December 24, 1963.  
Applies to All Models PA-24 and PA-24-250 Aircraft, which  
Have 25 Ampere Circuit Breakers in the Landing Gear  
Retraction Motor Circuit.

Compliance required within the next 100 hours' time in service after the effective date of this AD.

Inadvertent tripping of the 25 ampere landing gear retraction circuit breaker has resulted in stoppage of the landing gear retraction mechanism in other than the fully extended position. Therefore, in order to eliminate this condition, with its associated hazard of partial-gear-down landing accidents, the 25 ampere circuit breaker in the landing gear retraction motor circuit must be replaced with a 30 ampere circuit breaker, Piper P/N 454661, or FAA approved equivalent.

(Piper Service Letter No. 356, dated March 31, 1961, pertains to this same subject.)

This directive effective January 23, 1964.

c/w 1-5-63

62-26-05

PIPER:

Amdt. 511 Part 507 Federal Register December 5, 1962.  
Applies to All Models PA-24 and PA-24 "250" Aircraft.

Compliance required within the next 50 hours' time in service after the effective date of this AD, unless already accomplished.

To preclude hazardous carbon monoxide contamination in the cockpit and engine power loss, caused by cracked muffler heater shrouds, accomplish the following:

- (a) For aircraft Serial Numbers 24-1 to 24-2298 inclusive, equipped with channel reinforced muffler P/N's 22594-00, 22594-02 on PA-24, and P/N's 22593-00, 23159-00 on PA-24 "250" installed as service replacements:
- (1) Remove the tail pipe, the right-hand exhaust stack, and carburetor heat shroud and inspect for cracks and hot spots. Pay particular attention to the junction of rear cylinder exhaust tube with the stack assembly.
  - (2) Remove the muffler and muffler heater shroud. Carefully inspect the muffler for visible cracks, particularly in the area near the tail pipe opening and examine the internal baffle and perforated tube. Submerge the muffler in water and pressure test at 10 p.s.i.
  - (3) Replace the muffler prior to further flight if cracks, heat deterioration, defects, or wrinkles formed in the perforated tube are observed or if leaks are detected during the pressure test.
  - (4) Rework the muffler heater shroud by:
    - (i) enlarging the opening in the shroud in accordance with the Piper template;
    - (ii) installing the muffler reinforcement tube, P/N 23482-00 using 20 rivets PDR 134A-6, or FAA approved equivalent; and
    - (iii) installing cover plate P/N 23498-00 using 11 rivets AN 426A3-4, or FAA approved equivalent, in accordance with Piper Immediate Action Service Bulletin No. 210 (Kit P/N 754 484).
  - (5) Reinstall the muffler exhaust stacks, tailpipe, and air ducts on the airplane.
- (b) For aircraft Serial Numbers 24-2299 to 24-3284 inclusive, equipped with channel reinforced muffler P/N's 22594-00, 22594-02 on PA-24, and P/N's 22593-00, 23159-00 on PA-24 "250", except aircraft Serial Numbers 24-2876, 24-2929, 24-2949, 24-2967, 24-2990, 24-3033, 24-3095, 24-3114, 24-3130, 24-3150, 24-3155, 24-3173, 24-3191, 24-3193, 24-3194, 24-3196, 24-3198, 24-3203, 24-3204, 24-3222, 24-3233, 24-3234, 24-3241, 24-3244, 24-3248, 24-3254, 24-3257, 24-3258, 24-3265, 24-3268, 24-3270, 24-3273, 24-3274, 24-3276, 24-3277, 24-3278, 24-3279, 24-3280, 24-3282, 24-3283, which have been modified:
- (1) Perform inspections required by (a)(1) and (a)(2), and the replacement required by (a)(3), if necessary.
  - (2) Install new cabin heater shroud, P/N 23507-00 on PA-24, and P/N 23489-00 on PA-24 "250". Center the tailpipe in the shroud tailpipe opening.
  - (3) Reinstall the muffler exhaust stacks, tailpipe, and air ducts on airplane.

NOTE: PA-24 and PA-24 "250" mufflers have been manufactured incorporating two different styles of tailpipe reinforcement brackets. This AD requires

modification of one style only - those with channel style reinforcement. See sketch A of Piper Service Bulletin No. 210 for further identification. Both types of mufflers have been sold as service replacements. It will therefore be necessary to examine aircraft Serial Numbers 24-1 to 24-2587 inclusive, if the original muffler has been replaced, to determine if the modification is required. Aircraft Serial Numbers 24-2588 through 24-3284, were manufactured with the channel shaped reinforcement and will require modification except those already modified as indicated.

(Use Piper Service Letter No. 324B as a guide for inspections in addition to Service Bulletin No. 210.)

This directive effective December 5, 1962.

# PIPER AIRCRAFT CORPORATION

SERVICE BULLETIN NO. 210

F.A.A. Approved

OCTOBER 3, 1962

**SUBJECT: Replacement or Modification of Muffler Shrouds**

**MODELS AFFECTED:** PA-24 and PA-24 "250" Comanches - Serial Numbers 24-2588 to 24-2875 incl., 24-2877 to 24-2928 incl., 24-2930 to 24-2948 incl., 24-2950 to 24-2966 incl., 24-2968 to 24-2989 incl., 24-2991 to 24-3032 incl., 24-3034 to 24-3094 incl., 24-3096 to 24-3113 incl., 24-3115 to 24-3129 incl., 24-3131 to 24-3149 incl., 24-3151 to 24-3154 incl., 24-3156 to 24-3172 incl., 24-3174 to 24-3190 incl., 24-3192, 24-3195, 24-3197, 24-3199 to 24-3202 incl., 24-3205 to 24-3221 incl., 24-3223 to 24-3232 incl., 24-3235 to 24-3240 incl., 24-3242, 24-3243, 24-3245, 24-3246, 24-3247, 24-3249 to 24-3253 incl., 24-3255, 24-3256, 24-3259 to 24-3264 incl., 24-3266, 24-3267, 24-3269, 24-3271, 24-3272, 24-3275, 24-3281, 24-3284 and all of the referenced aircraft prior to Serial No. 24-2588 in which mufflers, part number 22594-00 and part number 22594-02 PA-24, and part number 22593-00 and part number 23159-00 PA-24 "250", have been installed as service replacements.

**DATE OF COMPLIANCE:** Prior to but not later than next 50 hours of operation

Service reports have been received advising of cracks located in the muffler housing near the tailpipe reinforcement strap. The muffler heater shroud has therefore been redesigned to remove the affected area from the heater system. This has been accomplished by increasing the shroud opening around the tailpipe, making the area more accessible for inspection.

Comanche mufflers have been manufactured incorporating two different styles of tailpipe reinforcement brackets. However, this Service Bulletin requires modification of one style only; those with the channel-shaped reinforcement. See Sketch "A" for further identification. Both styles of muffler have been sold as service replacements. It will therefore be necessary to inspect aircraft, Serial Nos. 24-1 to 24-2587 inclusive if the original muffler has been replaced, to determine if compliance with this Bulletin is required.

Aircraft, Serial Nos. 24-2588 through 24-3284 inclusive, were manufactured with the channel shaped reinforcement and will require modification, except those already modified as indicated by serial numbers omitted under models affected.

---

PAGE 2 OF 3

**RECOMMENDED AIRCRAFT INSPECTION PROCEDURE**

Aircraft Serial Nos. 24-1 to 24-2298 inclusive (Mufflers with channel reinforcement only)

1. Remove the tailpipe.
2. Remove the right hand exhaust stack and inspect for cracks, etc., paying particular attention to the junction of rear cylinder exhaust tube with the stack assembly.
3. Remove the muffler. This can be accomplished by taking the muffler out the right side, without removing the left exhaust stack.
4. Remove muffler heater shroud.
5. Carefully inspect the muffler for visible cracks, particularly the area near the tailpipe opening. Inspect the internal baffle and perforated tube. Submerge the muffler in water and pressure test at 10 p.s.i.  
  
If cracks or other defects are observed, leaks detected during pressure test, or wrinkles found in the perforated tube, the muffler must be replaced.
6. Remove the cold air inlet take-off assembly located on the aluminum heater shroud.
7. Cut out the enclosed template and place on the aluminum shroud over the present tailpipe opening.
8. Cut the new opening in the aluminum shroud, taking care not to cut past the splice. (See Note Figure 2.)
9. Install the muffler housing reinforcement tube, part number 23482-00, on the inside of the aluminum heater shroud. (See Figure 2.)
10. Relocate the cold air inlet take-off assembly as shown on the take-off relocation table and install cover plate, part number 23498-00, over old hole. Trim cover plate as required. (See Figure 2.)
11. Reinstall the aluminum shroud on the muffler. The tailpipe should be centered in the shroud tailpipe opening.
12. Reinstall the muffler, exhaust stack, tailpipe, etc., on the aircraft.
13. The referenced material required for the heater shroud modification is contained in Kit, part number 754 484.

**RECOMMENDED AIRCRAFT INSPECTION PROCEDURE (Cont.)**

Aircraft Serial Nos. 24-2299 to 24-3284 inclusive (Mufflers with channel reinforcement only)

Steps numbers 1 through 5 – Same as for Serial Numbers 24-1 to 24-2298 inclusive.

6. Install new cabin heater shroud, part number 23507-00 on PA-24, and part number 23489-00 on PA-24 "250." The tailpipe should be centered in shroud tailpipe opening.

7. Install the muffler, exhaust stack, tailpipe, etc. on the aircraft.

We have been aware that in some instances, inspection of the exhaust systems has not been as thorough as it should have been and are, therefore, attaching to this Bulletin a copy of our Service Letter No. 324B covering that subject.

**NOTE FOR DISTRIBUTORS**

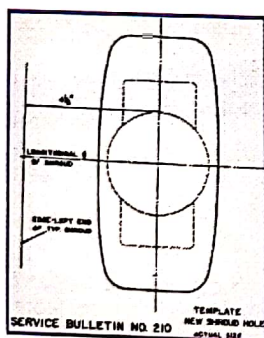
Distributors should order muffler shrouds, part number 23507-00 PA-24, and part number 23489-00 PA-24 "250", in sufficient quantities to comply with this Bulletin.

Credit will be issued for these shrouds and three (3) hours warranty labor will be approved upon receipt of a Warranty and Credit Claim.

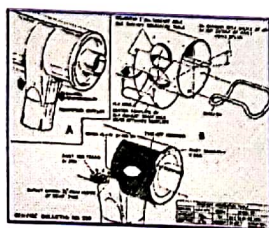
Distributors should order kit number 754 484 in sufficient quantities for muffler shroud modification.

PA-24 "250" Comanches, Serial Nos. 24-103 to 24-2298 inclusive, using muffler shroud, part number 21577-00, will require a longer flex tube. An order for this tube, part number 22502-25, should accompany the order for the kit.

Credit will be issued for kit number 754 484 and five (5) hours warranty labor upon receipt of a Warranty and Credit Claim.



**Figure 1**



**Figure 2**



FAA APPROVED MODEL LIST (AML) NO. SA3531NM

DOGERT AVIATION

FOR

INSTALLING COPPER ELECTRICAL CABLES

Issue Date: July 15, 1986

ITEM	AIRCRAFT MAKE	AIRCRAFT MODEL	ORIGINAL TYPE CERTIFICATE NUMBER	CERTIFICATION BASIS FOR ALTERATION	INSTALLATION INSTRUCTIONS		AFM SUPPLEMENT NUMBER/DATE	AML AMENDMENT DATE
					NUMBER	REVISION NO. AND DATE		
1	Piper	PA34-200/-200T/ & PA34-220T	A7SO	FAR 23 and Amendments listed in TCDS A7SO	2-1	6/25/86	N/A	
2	Piper	PA28-140/-150/-160/-180/-235/-151/-161/-181/-236/-201T, and PA28R-180/-200/-201/-201T, and PA28RT-201/-201T	2A13	CAR 3 and Amendments listed in TCDS 2A13	2-2	6/25/86	N/A	9/9/86
3	Piper	PA-18 Series	1A2	CAR 3	2-3	7/23/86	N/A	9/9/86
4	Piper	PA-20 Series	1A4	CAR 3	2-3	7/23/86	N/A	9/9/86

Issue Date: July 15, 1986

ITEM	AIRCRAFT MAKE	AIRCRAFT MODEL	ORIGINAL TYPE CERTIFICATE NUMBER	CERTIFICATION BASIS FOR ALTERATION	INSTALLATION INSTRUCTIONS		AFM SUPPLEMENT NUMBER/DATE	AML AMENDMENT DATE
					NUMBER	REVISION NO. AND DATE		
5	Piper	PA-22 Series	1A6	CAR 3 dated 11/1/49 & amendments 3-1 thru 3-6.	2-3	7/23/86	N/A	9/9/86
6	Piper	PA-24, PA-24-250/-260/-400	1A15	CAR 3 dated 11/1/49 & amendments 3-1 thru 3-12.	2-4	7/31/86	N/A	7/16/87
7	Piper	PA-32-300/-301/-301T, PA-32R-300/-301/-301T/ and PA-32RT-300/-300T	A3SO	CAR 3 dated 5/15/56 thru Amendment 3-8 & TCDS A3SO	2-10	9/20/86	N/A	7/16/87
8	Piper	PA-30	A1EA	CAR 3 dated 5/15/56 thru Amendment 3-6 dated 9/31/61, & Para. 3.705(a) of Amendment 3-7 dated 5/3/62. Also FAR 23.1557(a)(1) of Amendment 23-7 dated 9/14/69.	2-9	9/20/86	N/A	9/29/86



**PACKING SLIP**  
This is not an invoice.

### Grummanparts

4,136 lifetime feedback  
100% positive feedback

★ Top Rated

**Ship to**

blake brooksby  
4333 N Torrey Pines Dr  
Las Vegas, NV  
89108-5510, USA  
+1 702-588-9460

**Ship from**

David Fletcher  
P O Box 308  
Comfort, TX  
78013-0308, USA

**ORDER ID: 26-07290-27044**

Order date: Jul 3, 2021

ITEM	QTY	PRICE
Lot of 8 Lycoming Push rod tube O-360, 540, LW11485 W Warrant Airworthy (Item ID: 254931096536)	1	\$115.00
	Subtotal	\$115.00
	Shipping	\$14.82
	Sales tax (eBay collected)	\$9.63
	Discount	\$0.00
	<b>Total**</b>	<b>\$139.45</b>

\*\*Total includes eBay collected tax. eBay collects and remits the tax to the tax authorities in accordance with applicable state law.

## Aircraft Weight and Balance Revision

Tail Number: <b>N7905P</b>		Date: 5/15/2013	
Prepared by: LONE MOUNTAIN AVIATION 2830 N. RANCHO DR. STE A LAS VEGAS, NV 89130		Work Order No: 7627-05-2013	
		Type Certificate Data No: 1A15	
Aircraft Make: PIPER	Model: PA24-250	Serial No: 24-3136	Time: 6461.80
Registered Owner: EAGLE VIEW LLC		Address:	
Maximum Weight 2900	CG Range FWD		AFT
As Received; Date of Previous Weight and Balance:	Useful Load:	EW:	EWCG: Moment:
Notes: WEIGHED USING ARLYN SCALES MODEL 5-2205, SN 18098A LAST CALIBRATED 5/1/2013			
	<b>Weight</b>	<b>Arm</b>	<b>Moment</b>
LEFT MAIN	636.0	108.5	69006.00
RIGHT MAIN	624	108.5	67704.00
NOSE	616	30.7	18911.20
UNUSABLE FUEL	24	90	2160.00
	0.00	0.00	0.00
	0.00	0.00	0.00
	0.00	0.00	0.00
	0.00	0.00	0.00
	0.00	0.00	0.00
	0.00	0.00	0.00
	0.00	0.00	0.00
<input type="checkbox"/> As Calculated <input checked="" type="checkbox"/> As Weighed		Moment 157781.20 <hr/> Weight 1900.00	<b>New Empty Weight CG</b>  <b>83.04</b>
			<b>New Useful Load</b>  <b>1000.00</b>
Signature JAMES J. JAKUS			
Repair Agency or License No: L9OR473Y			