CONTINENTAL AIRCRAFT ENGINE

MAINTENANCE MANUAL

STANDARD PRACTICE FOR SPARK IGNITED ENGINES

Technical Portions Accepted by the Federal Aviation Administration

Publication M-0

CHANGE 3

JAN 2017

Supersedure Notice

This manual incorporates maintenance and service information contained in Continental Motors Service Documents common to the horizontally opposed, spark ignition, AvGas aircraft engines conforming to Type Certificate held by Continental Motors. This document is supplemental to the Instructions for Continued Airworthiness provided in the manuals listed in Section 1-1.1. Instructions contained in the Service Documents listed in Section 1-2.4 are superseded by instructions in this manual upon release, except for those Mandatory Service Bulletins (MSBs) and Critical Service Bulletins (CSBs).

Effective Changes for this Manual

0 .....15 April 2016			
1 ..... 30 May 2016			
2 .....30 Sep 2016			
3 ..... 15 Jan 2017			

List of Effective Pages

Document Title: Standard Practice Maintenance Manual
Publication Number: M-0 Initial Publication Date: 15 April 2016

Page	Change	Page	Change	Page	Change	Page	Change
Cover	3	2-14 thru 2-24	0	6-8 thru 6-10	3	6-97	0
A	3	3-1 thru 3-2	0	6-11 thru 6-15	0	6-98 thru 6-100	3
B	3	3-3	3	6-16 thru 6-17	2	6-101	1
C (blank)	1	3-4	0	6-18	3	6-102	0
i thru ii	0	3-5	3	6-19 thru 6-22	0	6-103	1
iii thru xviii	1	3-6	0	6-23	2	6-104 thru 6-115	0
1-1 thru 1-10	0	3-7 thru 3-8	3	6-24 thru 6-29	0	6-116	1
1-11	2	3-9	1	6-30	2	6-117 thru 6-132	0
1-12	3	3-10 thru 3-24	0	6-31	0	6-133 thru 6-135	1
1-13 thru 1-16	0	4-1 thru 4-2	0	6-32	3	6-136	0
2-1	0	5-1 thru 5-8	0	6-33 thru 6-51	0	6-137 thru 6-138	1
2-2 thru 2-4	1	6-1 thru 6-2	0	6-52	3	6-139	0
2-5 thru 2-6	0	6-3	2	6-53 thru 6-66	0	6-140	1
2-7 thru 2-8	1	6-4 thru 6-5	3	6-67	1	6-141	0
2-9 thru 2-12	0	6-6	1	6-68 thru 6-95	0	6-142	3
2-13	3	6-7	0	6-96	1	6-143 thru 6-145	0

Published and printed in the U.S.A. by Continental Motors

Available exclusively from the publisher: P.O. Box 90, Mobile, AL 36601

List of Effective Pages, cont.

Page	Change	Page	Change	Page	Change	Page	Change
6-146	3	8-17 thru 8-26	0	12-2 thru 12-12	0		
6-146.1 added	3	9-1	1	A-1 thru A-6	0		
6-146.2 added	3	9-2 thru 9-6	0	B-1	1		
6-146.3 added	3	10-1 thru 10-2	0	B-2 thru B-7	0		
6-146.4 added	3	10-3	1	B-8	1		
6-146.5 added	3	10-4 thru 10-8	0	B-9 thru B-16	0		
6-146.6 added	3	10-9 thru 10-10	2	C-1 thru C-4	0		
6-147	3	10-11	1	C-5 thru C-7	3		
6-148	2	10-12	2	C-8 thru C-9	1		
6-149 thru 6-151	0	10-13	2	C-10 thru C-18	0		
6-152	2	10-14	3	C-19	1		
6-153 thru 6-154	1	10-15	1	C-20 thru C-26	0		
6-155	0	10-16 thru 10-18	2				
6-156	1	10-19 thru 10-21	0				
6-157	0	10-22	1				
6-158	3	10-23 thru 10-24	0				
6-159	1	10-25	1				
6-160 thru 6-164	0	10-26 thru 10-37	0				
6-165	3	10-38	3				
6-166 thru 6-171	0	10-39 thru 10-40	1				
6-172	1	10-41 thru 10-62	0				
6-173 thru 6-174	0	10-63	3				
7-1 thru 7-2	0	10-64 thru 10-69	0				
7-3	3	10-70	3				
7-4 thru 7-7	0	10-71 thru 10-93	0				
7-8	1	10-94 thru 10-95	3				
7-9	0	10-96 thru 10-99	0				
7-10	1	10-100 thru 10-101	3				
7-11 thru 7-17	0	10-102 thru 10-103	0				
7-18	3	10-104	1				
7-19 thru 7-23	0	10-105	0				
7-24	1	10-106	1				
7-25 thru 7-30	0	10-107 thru 10-108	0				
8-1 thru 8-15	0	11-1 thru 11-8	0				
8-16	2	12-1	1				

c. Acceleration ..... Smooth from IDLE to Wide Open
If acceleration is rough or the Idle RPM or Idle Mixture Rise are outside the normal operating parameters specified in the primary ICA (**Ref: Section 1-1.1**), perform an "Engine Operational Check" according to the instructions in Section 6-4.7.

3. Establish and oil analysis profile by collecting an oil sample according to the instructions in Section 6-4.8.4, "Oil Sample Collection" and Section 6-4.8.5, "Oil Trend Monitoring and Spectrographic Oil Analysis."
4. Change the engine oil and filter according to the Section 6-4.8.2, "Oil Change." Fill the oil sump to the proper capacity for the engine model (**Ref: Section 1-1.1**) with fresh, ashless dispersant aviation engine oil conforming to SAE J1899 (Section 3-1).
5. Perform an "Induction System Inspection" according to Section 6-4.14.
6. For applicable turbocharged engines, lubricate the wastegate butterfly valve and clean the oil supply check valve according to the instructions in Section 6-4.21 and Section 6-4.21.1, respectively.
7. Inspect the cylinder drains according to the instructions in Section 6-4.20.
8. If a battery serves as the FADEC secondary power source, perform the "FADEC Backup Battery Inspection" according to instructions in the primary ICA.
9. For any other optional engine accessories, refer to the accessory manufacturer's maintenance instructions for inspection criteria.

6-4.4. 100-Hour (Annual) Engine Inspection

Frequency

The 100-Hour Inspection is accomplished under two circumstances:

- After every 100 hours of accumulated engine operation
- Annually, if the engine did not accumulate 100 hours of operation during the calendar year since the last 100-Hour Engine Inspection.

WARNING

Turn the Ignition Switch OFF and disconnect engine electrical power before commencing maintenance or inspections. Confirm continuity between the magneto capacitor and aircraft ground to prevent accidental engine start during maintenance. Do not stand or place equipment within the arc of the propeller.

Procedure

WARNING

Correct all fuel or oil leaks. Flammable petroleum products may ignite if exposed to an ignition source.

NOTE: The fuel injector nozzles must be cleaned after the first 100-Hour Inspection after installation of a new, rebuilt or overhauled engine. Thereafter, clean the nozzles every 300 hours or annually.

1. Perform a "Visual Inspection" according to instructions in Section 6-4.6; correct any discrepancies.

NOTE: For FADEC engines, perform an "Engine Operational Check" according to instructions in the primary ICA rather than Section 6-4.7.

2. Perform an "Engine Operational Check" according to instructions in Section 6-4.7.
3. Collect an engine oil sample according to the instructions in Section 6-4.8.4, "Oil Sample Collection" and submit it for analysis according to Section 6-4.8.5, "Oil Trend Monitoring and Spectrographic Oil Analysis."
4. Perform the "Cylinder Inspections" according to instructions in Section 6-4.11. The cylinder inspections consist of multiple inspections and checks including Cylinder Power Stroke Area, Differential Pressure, Borescope, Baffle, Cowling, and Cylinder Mounting Deck Inspections.
5. Perform a "Crankcase Inspection" according to Section 6-4.12.
6. Perform an "Engine Mount Inspection" according to Section 6-4.13.
7. Perform an "Induction System Inspection" according to Section 6-4.14.
8. Perform an "Ignition System Inspection" according to Section 6-4.15.
9. **For the IOF-240-B engine only**, perform a "Throttle Position Switch Inspection" according to instructions in the primary ICA.
10. **For FADEC engines only**, perform a "Ground Strap Continuity Test" according to instructions in the primary ICA.
11. **For FADEC engines only**, perform a "FADEC Backup Battery Inspection" according to instructions in the primary ICA.
12. Perform an "Engine Gauge Inspection" according to Section 6-4.16.
13. Perform a "Fuel System Inspection" according to Section 6-4.17.
14. Perform an "Engine Control Linkage Inspection" according to Section 6-4.19.
15. Perform an "Induction System Drain Inspection" according to Section 6-4.20.
16. Inspect the Exhaust system according Section 6-4.21.
17. Change the engine oil and filter according to the Section 6-4.8.2, "Oil Change." Fill the oil sump to the proper capacity for the engine model (**Ref: Section 1-1.1**) with fresh, ashless dispersant aviation engine oil conforming to SAE J1899 (Section 3-1).
18. Inspect installed accessories for mounting security, condition, and proper operation according to the aircraft maintenance manual or accessory manufacturer's instructions. Inspect Hartzell alternator brush holders for soot accumulation. If large amount of soot is present, inspect brushes (Section 6-4.22) according to the alternator manufacturer's ICA.

    NOTE: For FADEC engines, perform an "Engine Operational Check" according to instructions in the primary ICA rather than Section 6-4.7.

19. Perform an "Engine Operational Check" according to instructions in Section 6-4.7.
20. For any other optional engine accessories, refer to the accessory manufacturer's maintenance instructions for inspection criteria.

6-4.6. Visual Inspection

Frequency

- Begin any service interval with a visual inspection

Procedure

1. Verify the engine nacelle is clean and free of fuel leaks, oil leaks, dirt and debris.
2. Inspect all fuel and oil lines for signs of chafing.
3. Inspect the oil cooler and oil filter (or screen) for signs of leaks and physical discrepancies.
4. Check the following on the engine for cracks, dents, pitting or physical damage:
   a. External cylinder barrels
   b. Cylinder barrel fins
   c. Areas between and adjacent to the cylinder barrel fins.
   d. External surfaces of the cylinder head, including areas around
      1) Cylinder head fins
      2) Top and bottom spark plug bosses
      3) Fuel nozzle bosses
      4) Crankcase external surfaces
      5) Accessories
      6) Support structures adjacent to accessories

   NOTE: If cylinder discrepancies are discovered during the visual inspection, perform the "Cylinder Inspections" in Section 6-4.11.
5. Check security of engine and accessory wiring harnesses, including ignition leads. Check for signs of thermal breakdown, chafing, deterioration or improper routing.
6. Replace broken or damaged cushion clamps and stressed or broken wire ties.
7. Check magnetos for external damage, cracks and mounting security. Ensure the ignition plate is securely fastened to the magneto and the harness is properly routed.
8. Inspect external drive belts for nicks, cracks and visible wear; replace belts exhibiting nicks, cracks, or visible wear. Check belt tension and adjust, as required according to instructions in Section 6-4.10.4.
9. Inspect the exposed area of the crankshaft between the crankshaft nose oil seal and the propeller flange for evidence of corrosion. If corrosion is detected, use a Scotch-Brite® pad and a no-corrosive soap solution to remove surface corrosion.
   a. If the cleaning process eliminated the corrosion and no evidence of pitting exists, apply a generous coat of silver or aluminum paint according to the paint manufacturer's instructions to the exposed portion of the crankshaft to prevent further corrosion.

b. If cleaning is unsuccessful (suspected corrosion has advanced to pitting), disassemble the engine and replace the crankshaft.

10. Check electrical connectors for signs of corrosion or contamination; if external corrosion or contamination is discovered, disconnect the connectors and inspect the internal pins for corrosion or contamination.

11. Inspect installed accessories for proper mounting and security. Inspect brush holders for soot accumulation. If large amount of soot is present, inspect brushes (Section 6-4.22).

    NOTE: For items 12 - 16, inspect for obvious signs of physical damage, wear or deterioration, loose or missing hardware, leaks or foreign material that may hinder normal operation. Correct any discrepancies.

12. Inspect the physical security of the fuel system.

13. Inspect the physical integrity of the induction system airbox, ducts, seals and gaskets.

14. Inspect the physical integrity of the lubrication system.

15. Inspect the physical integrity of the turbocharger and exhaust system.

    a. Inspect the stacks, risers, elbows and transitions for burns, cracks or leaks.

    b. Inspect turbocharger and exhaust system hardware and joints for stress.

    c. Inspect slip joints for leaks, bulges, cracks, deformation, or hot spots.

    d. Inspect multi-segment V-band clamp spot welds (or rivets) for cracks or physical damage.

        1) Inspect the corner radii of clamp inner segments for cracks with a flashlight and inspection mirror.

        2) Inspect the V-band clamp outer band for flatness, especially within two inches of spot-weld tabs that retain the T-bolt fastener variance must be less than 0.062 in.

    e. Inspect the heat exchanger, if installed, seams, joints and transition slip joints for evidence of leakage or cracks using a mirror or flexible borescope. Replace any heat exchanger assembly that exhibits cracks or is suspected of leaking.

16. Repair any observable damage or deficiency before the aircraft is returned to service. Refer to Chapter 10, Non-Overhaul Repair and Replacement Procedures.

6-4.21. Turbocharger and Exhaust System Inspection

Purpose

Verify the integrity of the turbocharger and exhaust system, including the heater muff (if installed). Isolate and correct cracks or leaks in the exhaust system.

Frequency

During 100-hour/Annual inspection

CAUTION: Ensure the turbocharger and exhaust system components are cool before inspection to prevent burns.

Procedure

1. Remove airframe items that hinder visual inspection of the exhaust and turbochargers.
2. Clean the exhaust system, removing oil and grease, by spraying the exhaust systems parts with Stoddard solvent. Allow the solvent to drain and wipe the parts with a clean cloth.

   CAUTION: Cracks in the exhaust system can release carbon monoxide in the nacelle or the cabin; correct exhaust leaks before further flight.

3. Inspect the exhaust system components according to the instructions in Table 6-24.

Table 6-24. Exhaust Inspection Criteria

Part	Inspection Action
Stacks Risers Elbows	Check parts for the following: • Burned areas • Cracks • Loose parts/hardware • Pay particular attention to welded areas and seams, checking for cracks. • Replace parts that are cracked, burned, or worn
Slip joints	Check for bulges, cracks, or hot spots (see Figure 6-96)
Multi-segment V-band clamps	Inspect spot-weld (or rivet) areas for cracks or physical damage. Inspect the corner radii of clamp inner segments for cracks with a flashlight and mirror. Inspect the inner segment spacing. Inspect the clamp outer band for flatness using a straight edge, especially within 2 inches of spot-weld tabs that retain the T-bolt fastener - clearance must be less than 0.062 inches. Verify 100% inner and outer band segment contact. To replace a multi-segment V-band clamp, refer to the primary ICA. Ref: Section 1-1.1
Heater muff	Inspect the heat exchanger seams, joints and transitions with a flashlight and mirror or a flexible borescope for physical damage, cracks, corrosion, and burn-through. Inspect connecting flanges for security and proper mating.

4. Connect a high volume, dust-free, air pressure source to the exhaust tailpipe outlet.
5. Apply five (5) psi of air pressure to the exhaust system.

6. Apply soapy water to the exhaust system and check for bubbling in areas of the exhaust other than the slip joints. If bubbling is found, replace the leaking exhaust components according to the instructions in primary ICA (**Ref: Section 1-1.1**) or aircraft maintenance manual.

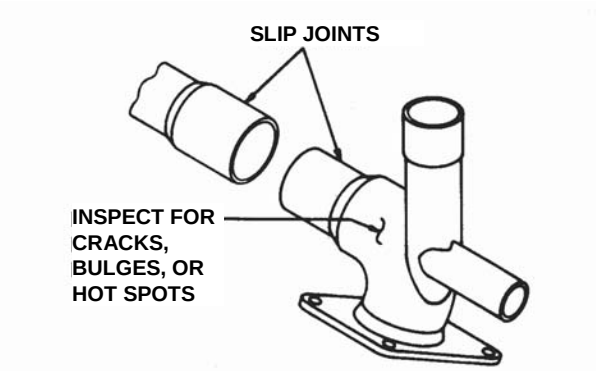

Figure 6-96. Exhaust Slip joint Inspection

WARNING

Exhaust system weld repairs may only be performed by an FAA Part 145 authorized repair station certified to perform the specific repairs.

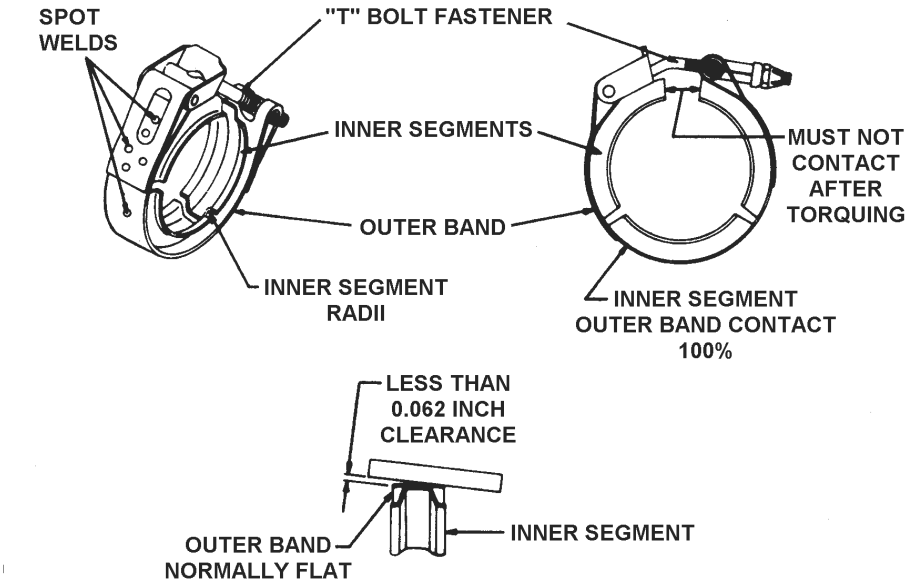

Figure 6-97. V-band Clamp Inspection

7. Visually inspect the exhaust stacks and transition unit for wear, leaks, cracks, or distortion. Replace worn, leaking, cracked, or distorted exhaust parts. Inspect the exhaust manifold connections at the cylinder to verify the physical security of the exhaust flange, gasket and exhaust manifold fasteners. Exhaust system removal and installation procedures may be found in the primary ICA (**Ref: Section 1-1.1**) or the aircraft maintenance manual, if disassembly is required.

8. Remove the multi-segment V-band clamps from the exhaust tailpipes according to instructions in the primary ICA (**Ref: Section 1-1.1**) or the aircraft maintenance manual. Clean the outer band of the multi-segment V-band clamps with crocus cloth. Inspect the V-band clamps according to the instructions in Table 6-24.
9. Inspect the turbocharger oil reservoirs, oil inlet and outlet fittings and surrounding area for signs of leakage. Torque fasteners or fittings to Appendix B specifications or replace leaking parts, as required to remedy leaking reservoirs or fittings.
10. Remove the induction air supply from the turbocharger compressor according to the aircraft manufacturer's instructions. Inspect the induction air supply duct for wear, deformation, cracks or other physical damage; replace, if necessary.
11. Remove the turbocharger compressor discharge duct from the induction system according to instructions in the primary ICA (**Ref: Section 1-1.1**) or the aircraft maintenance manual. Inspect the hardware for wear, deformation, cracks or other physical damage; replace, if necessary.
12. Inspect the turbine and compressor housings for cracks or physical damage, especially at the mounting flanges. If cracks or physical damage is discovered, replace the turbocharger with a new, rebuilt or serviceable unit.
13. Inspect the turbine and compressor wheel blades for damage. If turbine or compressor blades are damaged, replace the turbocharger with a new, rebuilt or serviceable unit.
14. Spin the turbine shaft to check for freedom of movement and end play. If the turbine or compressor blades touch the housing during rotation, if the shaft does not rotate freely, or if the shaft exhibits noticeable "wobble" during rotation, replace the turbocharger with a new, rebuilt or serviceable unit.
15. Inspect the interior of the turbine and compressor housings for oil, indicating oil seal damage or a faulty check valve. If oil is found inside the housing, troubleshoot to isolate cause of oil accumulation.
16. Inspect the wastegate for cracks or physical damage. If the wastegate is cracked or damaged, replace the wastegate with a new, rebuilt or serviceable unit. Inspect the security of the mounting flange fasteners, retorque if fasteners appear loose.
17. Inspect the wastegate actuator fittings for leaks and physical security; retorque loose fittings to Appendix B specifications. If leaks persist, replace O-rings, retorque fittings and repeat leak inspection after a ground engine run. Inspect the wastegate actuator hydraulic hoses for chafing, nicks, cuts or leaks; replace hoses exhibiting these conditions.
18. Inspect the wastegate actuator and butterfly valve for general condition and freedom of movement. Check the link rod pins and levers for wear. If the wastegate actuator, butterfly valve, link rod pins or levers are worn, binding, or damaged, replace the wastegate actuator.

19. Clean and lubricate the butterfly valve and associated linkages:

    a. Inspect fixed wastegate valves according to the instructions in the primary ICA (**Ref: Section 1-1.1**).

    b. For variable wastegate valves resembling the Figure 6-97.1, lubricate the butterfly shaft with Mouse Milk® (see Table 3-5) penetrating lubricant at initial installation and at each 100-hour maintenance interval.

    NOTE: The installed wastegate may be positioned in a manner that differs from the illustration. The fittings used to connect the hydraulic hoses may differ from those depicted in the illustration.

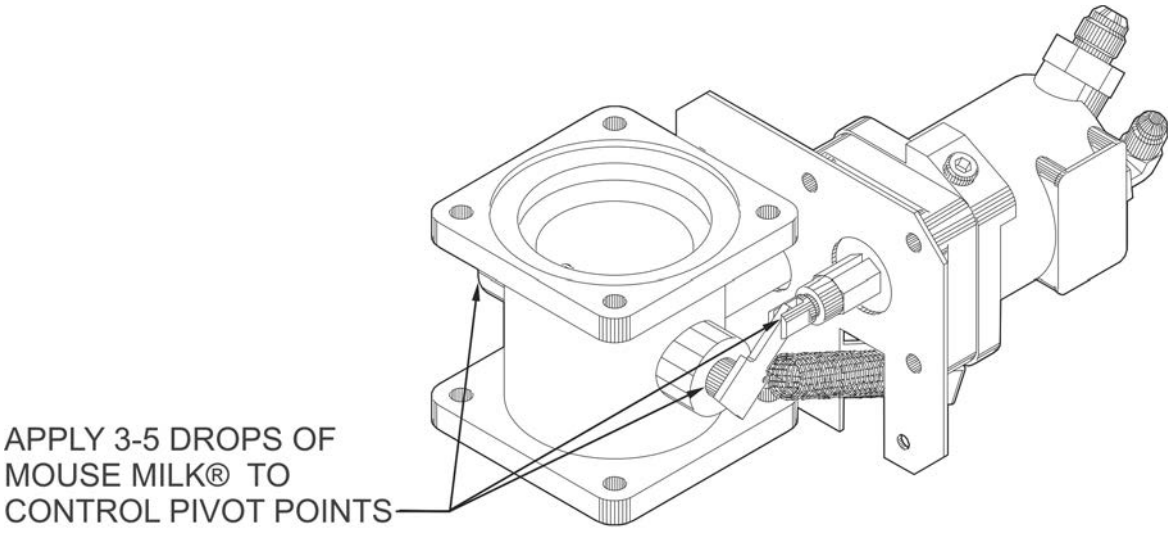

Figure 6-97.1. Typical Wastegate Lubrication Points

20. For applicable engine models: remove, disassemble, and inspect the turbocharger oil supply check valve according to the instructions in Section 6-4.21.1.

procedure continues on next page...

21. Inspect the wastegate controller and fittings for physical condition and security. If the wastegate controller exhibits physical damage, replace the wastegate controller with a new, rebuilt, or serviceable unit. Inspect the wastegate controller hoses, or tubes, for chafing, nicks, cuts or leaks; replace hoses exhibiting these conditions. Inspect the wastegate controller reference hoses or tubes for bends, dents, nicks or leaks; replace reference lines exhibiting these conditions.

22. Inspect the wastegate controller (Figure 6-56) housing for oil leaks around the diaphragm, deck pressure sensing port, oil inlet, oil outlet, or adjustment screw. If oil is leaking from a fitting, remove the fitting and replace O-rings, install and torque the fitting to Appendix B specifications. If oil is leaking from the housing, replace the wastegate controller with a new, rebuilt, or serviceable unit.

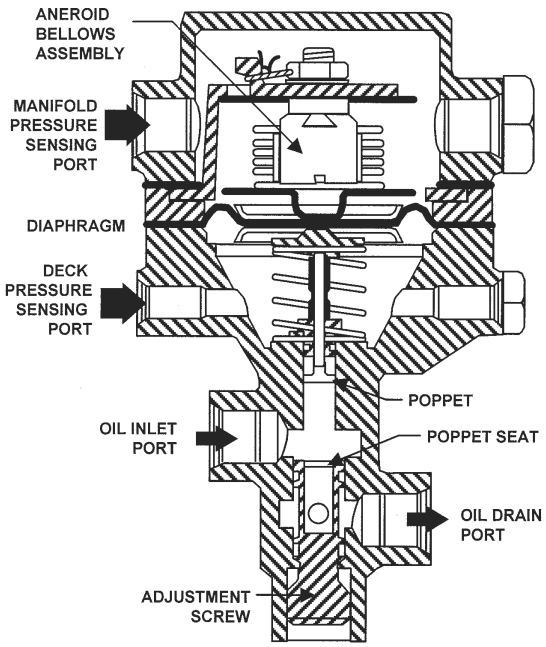

Figure 6-56 repeated for reference (typical sloped controller)

23. Inspect the overboost valve housing for cracks or physical damage; replace cracked or damaged overboost valve assembly with a new, rebuilt or serviceable unit. Remove accumulated debris from the overboost valve exposed bellows assembly shaft (behind the housing flange) and housing according to instructions in the primary ICA (**Ref: Section 1-1.1**). Inspect the mounting flange for fastener security; replace missing fasteners; re-torque loose overboost valve fasteners to Appendix B specifications.

24. Inspect the compressor housing V-band clamp, exhaust housing bolts and lock tabs for security. Torque loose hardware to Appendix B specifications.

25. Reassemble the turbocharger and exhaust system.

    a. Install the induction system air supply according to aircraft manufacturer's instructions.

    b. Install the turbocharger compressor discharge duct and exhaust pipe/heater muff according to the instructions in the primary ICA (**Ref: Section 1-1.1**) or the aircraft maintenance manual.

Table 12-1. Aircraft Engine Parts Cleaning Guidelines

Item to Clean	Instructions/References/Tips
Crankshaft counterweights[1]	Mineral spirits
Cylinders[3]	Refer to "Cylinder Cleaning" instructions in Section 12-1.4.
Cylinder intake valves	• Degrease intake valves with mineral spirits. • Remove all carbon, varnish and gum either using a carbon solvent or by dry blasting according to instructions in Section 12-2, "Dry Blasting." If dry blasting is performed, clean the valve with mineral spirits and air dry.
Cylinder baffles and cylinder hardware	Mineral spirits
Electrical connectors	• Electrical contact cleaner CR4 • Do not use water-base or petroleum-base solvent to clean connectors • If a cleaning fluid is suspected to have entered a connector, blow the excess away from the connector and place the effected component(s) in a warm dry environment; i.e. 90°F (32°C), overnight or until thoroughly dry. • As applicable, replace the sealant strip in the connector if any damage to the seal is evident.
WARNING **Except when removing carbon deposits and gum (oil varnish), do not use alkaline (caustic) cleaning solutions for external engine cleaning. Alkaline solutions remove the alodine finish of aluminum parts.**	
Engine and component exterior surfaces	Spray or brush cleaning solvent (mild detergent or mineral spirits) on the engine or engine component exterior.
Engine mount brackets	Mineral spirits
Exhaust system multi-segment V-band clamps	Clean clamps using crocus cloth on the outer band of the clamp assembly. Use Stoddard solvent to clean the rest of the clamp
CAUTION: Never insert any object (wire, pipe cleaner, brush, etc.) in the fuel injector nozzle. If stain or obstruction cannot be removed with solvent or air, replace the nozzle.	
Fuel injectors FADEC engines only	Cannot be cleaned; remove and replace fuel injectors
Fuel injectors CMI Continuous Flow Fuel Injection only Fuel distribution block FADEC engines only	Immerse in an ultrasonic cleaner bath, adhere to the ultrasonic cleaner manufacturer's instructions. If ultrasonic cleaner is not available: • Acetone • MEK • Lacquer thinner Soak in solvent (acetone, lacquer thinner or MEK) to remove gum and fuel varnish stains and deposits. Use clean, oil free air to remove residue and dry the inside of nozzle.
Fuel filters/screens	Immerse in an ultrasonic cleaner bath, adhere to the ultrasonic cleaner manufacturer's instructions. If ultrasonic cleaner is not available, flush with clean Stoddard solvent into white filter paper until no particulate residue is evident on the filter paper.

12-1.3. Cleaning Exhaust Parts

1. Clean the exhaust system parts (except for the multi-segment V-band clamps) with Stoddard solvent. Allow the solvent to drain and wipe the parts dry with a clean cloth.
2. Clean V-band clamps using crocus cloth on the outer band clamp assembly.

12-1.4. Cleaning Aluminum Alloy Parts

Degrease aluminum alloy parts with mineral spirits. Soak heavily soiled parts for 15 minutes in mineral spirits. To remove carbon and gum deposits, perform the following:

CAUTION: Do not use an alkaline etching solution.

1. Immerse the part in a hot bath of any of the following *long enough to remove the deposit*:
   a. Inhibited, mild alkaline cleaning solution.
   b. Hot, soapy water.
   c. Carbon solvent (only for hard, thick carbon deposits).
2. Remove the cleaned part from the solvent bath.

   CAUTION: Remove all solvent residue (especially if soap or mild alkaline cleaning solution is used), paying particular attention to crevices, recesses, and holes to prevent engine oil contamination on re-assembly. If not removed completely, the alkaline residue can corrode the part.
3. Rinse thoroughly to remove all traces of the cleaning solution.

   CAUTION: When utilizing compressed air, wear OSHA approved safety glasses, goggles or face shield. Never exceed 30 psi when using compressed gases for cleaning purposes. (OSHA 1910.242(b))
4. Dry the part with dry compressed air.
5. If carbon deposits remain on the part, refer to Section 12-2, “Dry Blasting.”
6. Remove protective seals and masking material.
7. If the Alodine finish was removed during cleaning, restore the alodine finish according to Section 12-4.1, “Alodine.”

Table B-2. Component Specific Torque Specifications

Size	Fastener	Torque Value		Models Affected (Non-standard, see General Torque Specification)
		In.-Lbs.	Ft.-Lbs.	
.25-28	Nut, Rocker Shaft Hold Down	110-120	9.2-10.0	IO-240, IOF-240 & All 360
.25-28	Nut, Exhaust (self locking)	120-130	10.0-10.8	All Models (AR)
.25-28	Nut, Exhaust Manifold Flange (spirotallic gasket)	100-110	8.3-9.2	All Models (AR)
.31-18	Bolt, Rocker Shaft Hold Down[11]	190-210	15.8-17.5	GTSIO-520, TSIO-520-BE, IO-550-G, N, P & R, IOF-550-N, P & R, TSIO-550 & TSIOF-550
.31-24	Bolt, Rocker Shaft Hold Down[12]	85-110	7.1-9.2	O-470, IO-470, TSIO-470, IO-520, TSIO-520 (EXCEPT BE), IO-550 (EXCEPT G, N, P & R), IOF-550 (EXCEPT N, P & R) & TSIOL-550
.31-24	Nut, Exhaust Manifold Flange (spirotallic gasket)	200-210	16.7-17.5	All Models (AR)
.31-24	Nut, Induction Tube Flange	50-70	4.2-5.8	IO-240, IOF-240 & All 360
.44-20	Plug, Cylinder Drain (w/O-ring)	50-70	4.2-5.8	TSIOL-550
Miscellaneous Fasteners				
.19-32	Nut, Carburetor Air Intake Box Control Lever	9-10	0.75-0.83	O-200-D
.25-62	Clamp, Hose, Oil Gauge Rod	12-16	0.3-1.3	IO-360 & L/TSIO-360 (AR)
.25-62	Clamp, Hose, Magneto Pressurization	10-14	0.8-1.17	All Models with Pressurized Magnetos
.25-28	Nut, Exhaust Coupling, "V" band clamp[13]	42	3.5	TSIO-520-L, LB & WB
.31-18	Bracket, Turbocharger	220-250	18.3-20.8	GTSIO-520-F, K
.31-18	Bolt, Alternator Mounting	150-180	12.5-15.0	IO-346, All 520 & All 550
.38-16	Bolt, Turbocharger to Bracket	310-350	25.8-29.2	TSIO-520-L1, LB, UB, WB
.38-24	Nut, Slick Mag Impulse Coupling to Magneto Shaft	120-180	10.0-15.0	All Model using Slick Impulse Coupled Magnetos
.38-24	Nut, Starter to Adapter	200-220	16.7-18.3	O-300 (AR), GO-300 (AR), IO-346, All 470, 520 & 550
.44-20	Nut, Alternator Sheave to Starter Shaft	600-720	50-60	TSIO-520-B
.56-18	Nut, Starter Shaft Gear[14]	450-500	37.5-41.6	IO-520, IO-550, IOF-550,TSIO-550, TSIOF-550
.56-18	Nut, Starter Jaw, Crankshaft	575-625	47.9-52.1	O-470-Numeral
.56-18	Nut, Generator Pulley Drive	450-500	37.5-41.7	IO-346, ALL 470, IO-520, TSIO-520, IO-550, IOF-550, TSIO-550, TSIOF-550 & TSIOL-550
.56-24	Screw, Shoulder, Air Conditioning Idler Sheave	800-850	66.6-70.8	TSIO-520-BE, TSIO-550, TSIOF-550
.62-32	Nut, Alternator Hub Assembly	300-450	25.0-37.5	IO-346, IO-520(AR), TSIO-520 (AR), GTSIO-520 (AR), IO-550, IOF-550, TSIO-550, TSIOF-550 & TSIOL-550

of the aircraft. To ensure continued safety in aircraft operation, it is essential that great care be used when inspecting, testing, and determining the acceptability of all parts and materials. Particular caution should be exercised when the identity of materials, parts, and appliances cannot be established or when their origin is in doubt.

C-2.3. 100% Parts Replacement Requirements

"100% Replacement" parts are items that require a "new" replacement if removed during any maintenance or preventive maintenance on the engine or it's components. You must always replace removed gaskets, seals, packings, hoses, "O" rings, cotter pins, retaining rings (snap rings), safety wires, self locking fasteners (including exhaust and connecting rod nuts) and lock washers with "new" serviceable parts.

> NOTE: Service documents published or revised subsequent to the issuance of this publication may mandate the replacement of components and parts not included in these instructions. At engine overhaul, the technician must review all service bulletins to ensure compliance with the manufacturer's requirements for continued airworthiness.

Do not re-use worn, damaged or deformed fasteners. Do not replate cadmium plated fasteners or washers. If the cadmium plating has been removed, discard the item and replace it with a new part.

Engine mounted accessories must be maintained in accordance with the manufacturer's instructions. Additionally, accessories must be overhauled during engine overhaul, or more frequently, in accordance with the manufacturer's instructions.

At engine overhaul the starter, starter adapter, alternator, magnetos, and engine fuel system must be replaced with New, Factory Rebuilt, or FAA approved overhauled units. On turbocharged engines, the turbocharger, wastegate, all controllers, bypass valve and exhaust system must be replaced with new, factory rebuilt or FAA approved overhauled units. All engine baffles must be repaired or replaced and all flexible baffle seals replaced.

Items such as spark plugs, alternator drive belts and air-conditioning drive belts are replaced on condition.

Continental Motors

www.continentalmotors.aero