Enhanced FLIGHT GROUP LLC™
Perfecting the Flight Experience through Innovation
2048 Mercer Road, Lexington, Kentucky 40511 TEL / FAX: 859-255-4511 WEB: www.enhancedflight.com

Drawing No: 12003-1004

Date: November 2, 2004

Title: Inspection & Test Procedure
Pressure Test Engine Induction & Exhaust System for Leakage

Eligibility: Lycoming TIO-540-AE2A or Continental TSIO-520-BE

REVISION	CHANGE DESCRIPTION	APPROVED BY	DATE
-	INITIAL RELEASE	J. SISK	7/1/2003
A	UPDATED KIT PICTURE ON PAGE 3 FOR NEW CONFIGURATION.	J. SARTOR	11/2/2004
B	ADDED REFERENCES FOR TCM ENGINE IN MALIBU	J.SISK	11/28/2006

Abstract:

This procedure is recommended by Enhanced Flight Group (EFG) as a precautionary inspection for early detection of induction and exhaust leaks on the Lycoming TIO-540-AE2A engine used in the Piper Mirage aircraft, PA46-350P and the TCM TSIO-520/550 engines used in the PA46-310P Malibu. These engines utilize a system of dual turbochargers, intercoolers, and a complex network of induction and exhaust plumbing to maintain manifold pressure and full power up to an altitude of 20,000 feet. Maintaining the integrity of this system is critical to realize full engine performance and safe operation of the aircraft. Service experience over many years has shown that pressure testing detects leaks in this system that are not easily found by a visual inspection only. Inspection and repair of induction leaks will help maintain proper engine performance. Regular inspection and early detection of exhaust leaks provides a significant improvement to safety by preventing more progressed exhaust leaks which can result in loss of power and engine fires.

EFG recommends that this procedure be accomplished at 50 hour service intervals.

CAUTION:

This procedure uses a pressurized air source. If seals and plugs temporarily installed for testing are not properly secured they could become projectiles, possibly causing injury or property damage. Insure that all testing devices are properly installed and secure before applying pressure to the engine. Never work in the path of the propeller or where test devices would travel if they came loose during testing.

Instructions:

1) Move fuel selector lever to the OFF position.
2) Verify both magnetos switches are in the OFF position.
3) Remove upper and lower cowling.
4) Disconnect induction hose from each turbocharger compressor inlet. Inspect compressors for ease of rotation, bearing free play, and blade condition.
5) Install turbocharger inlet seal with brass air nipple (Item 1 from tool kit) onto the left turbo and tighten band clamp to 60 inch/lbs. Similarly, install the other turbo seal (Item 2) onto the right compressor inlet. See Figure 1 below.
6) Remove each bleed air hose from the induction tube connecting the turbocharger and the intercooler. Install bleed air seals (Item 3 from tool kit) and tighten band clamps to seal. Figure 1.

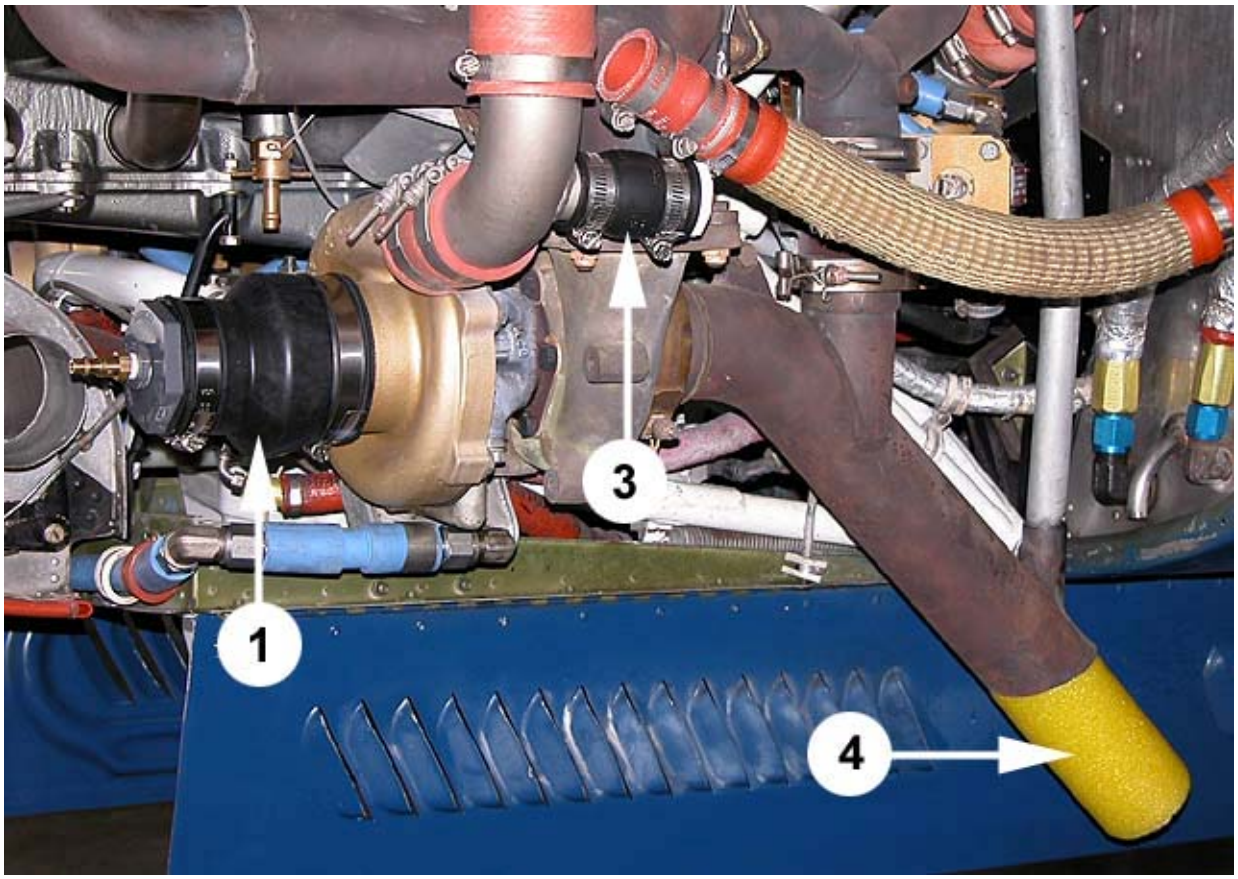

FIGURE 1 – Seal turbocharger inlet, bleed air and tailpipe prior to pressure testing. For TCM engines, the bleed air connection (item 3) is installed aft of the intercooler.

7) Insert foam tailpipe plugs (Item 4 from EFG tool kit) with a twisting motion well up into each exhaust. Note that on the left side, the tail pipe plug must be inserted far enough to seal off the air/oil separator drain tube.

8) Connect shop air and a regulator to the brass fitting on the left turbocharger seal. Gradually supply air to the engine while monitoring the ship's manifold pressure gauge until manifold pressure limit is reached.

9) Detect leaks by spraying a solution of water and mild, neutral pH soap (such as Ivory liquid) onto all of the induction and exhaust system components. Test should include all upper deck and magneto pressurization hoses.

    a. There should be no leakage in the induction/intercooler system.

    b. In the exhaust system, some minor leakage at slip joints and flanges is normal, but none should be seen elsewhere. If leakage at slip joints or flanges is sufficient to blow away the soapy solution instead of form bubbles, the part should be repaired or replaced in accordance with the engine manufacturer's service procedures or Standard Practices and Procedures, AC-43.13 before returning to service.

10) Retest system after repairs are made.

11) When testing is complete, remove all test plugs and seals and reconnect aircraft induction system hoses.

12) Re-install cowling. Ground test engine for proper operation.

13) Make entry in Engine Logbook.

P/N 1220-1000 Tool Kit Contents:

Item No.	Part Number	Description	Quantity
1	1220-1001	Turbocharger inlet seal with compressed air fitting	1
2	1220-1002	Turbocharger inlet seal	1
3	1220-1003	Bleed air seal	2
4	1220-1004	Tailpipe plug	2