LUFTFARTSVERKET
Luftfartsinspektionen

LUFTVÄRDIGHETSDIREKTIV (LVD)

A Motordrivna Luftfartyg
Cessna
LVD Nr 3030
Upphäver 1087B

Sektion 2. Utlandstillverkad flygmateriel

TITEL: **Kontroll, reparation/byte av avgassystem**

GÄLLER: Serierna 300 och 400 i enlighet med bifogad kopia av FAA AD 2000-01-06

ÅTGÄRD: Utför åtgärder angivna i FAA AD 2000-01-06

TID FÖR ÅTGÄRD: Inom tider och intervaller enligt FAA AD 2000-01-06

UNDERLAG: FAA AD 2000-01-16 och där angivet underlag

REFERENS: FAA AD 2000-01-16

BESLUTSDATUM: 2000-02-02

LFS 2000:16

Åtgärder enligt LVD utgör nödvändig förutsättning för ifrågavarande flygmateriels luftvärdighet. Referens BCL M 1.11.
Anteckning om åtgärd, som vidtagits i enlighet med LVD, skall införas i teknisk journal för berörd flygmateriel med hänvisning till ifrågavarande LVD-nummer. Angivet underlag refererar till senast gällande revision/utgåva. LVD utges i luftfartsverkets författningssamlingar LFS.

Postadress	Gatuadress	Telefonnummer	Faxnummer	Telegram	Telex
				Civilair	
601 79 NORRKÖPING	Vikobplan 11	011-19 20 00	011-19 25 75	Norrköping	62450

AIRWORTHINESS DIRECTIVE

REGULATORY SUPPORT DIVISION
P.O. BOX 26460
OKLAHOMA CITY, OKLAHOMA 73125-0460

U.S. Department
of Transportation
Federal Aviation
Administration

2000-01-16 CESSNA AIRCRAFT COMPANY: Amendment 39-11514; Docket No. 97-CE-67-AD. Supersedes AD 75-23-08 R5, Amendment 39-5451.

Applicability: Models T310P, T310Q, T310R, 320, 320A, 320B, 320C, 320D, 320E, 320F, 320-1, 335, 340, 340A, 321 (Navy OE-2), 401, 401A, 401B, 402, 402A, 402B, 402C, 404, 411, 411A, 414, 414A, 421, 421A, 421B, and 421C airplanes, all serial numbers, certificated in any category.

NOTE 1: This AD applies to each airplane identified in the preceding applicability provision, regardless of whether it has been modified, altered, or repaired in the area subject to the requirements of this AD. For airplanes that have been modified, altered, or repaired so that the performance of the requirements of this AD is affected, the owner/operator must request approval for an alternative method of compliance in accordance with paragraph (i) of this AD. The request should include an assessment of the effect of the modification, alteration, or repair on the unsafe condition addressed by this AD; and, if the unsafe condition has not been eliminated, the request should include specific proposed actions to address it.

Compliance: Required as indicated in the compliance table in Figure 1 of this AD, unless already accomplished. Compliance times of this AD may be extended 10-percent to work the actions in with already scheduled maintenance.

To detect and correct cracks and corrosion in the exhaust system, which could result in exhaust system failure and a possible uncontrollable in-flight fire with pilot and/or passenger injury, accomplish the following:

(a) The following paragraphs present the type of individuals who have the authority to accomplish the actions of this AD:

(1) Repairs: Required to be accomplished at an FAA-approved exhaust repair facility (or for non U.S.-registered airplanes: the state of registry's equivalent facility in accordance with their applicable procedure).

(2) Replacements: Required to be accomplished in accordance with the appropriate Cessna Service Manual and must be accomplished by a person holding a currently effective mechanic certificate with both an airframe and powerplant (A&P) rating or by an individual authorized to represent an FAA-approved repair station (or for non U.S.-registered airplanes: the state of registry's equivalent facility in accordance with their applicable procedure).

(3) Visual inspections except for paragraph (g) of this AD: Required to be accomplished by a person holding a currently effective mechanic certificate with both an airframe and powerplant (A&P) rating (or for non U.S.-registered airplanes: the state of registry's equivalent facility in accordance with their applicable procedure).

NOTE 2: Commercial certificate holders operating under part 121 or part 135 of the Federal Aviation Regulations (14 CFR part 121 or 14 CFR part 135) could have accomplished the actions of this AD if in compliance with an FAA-approved maintenance program. "Unless already accomplished" credit should be taken in these situations.

NOTE 3: Cessna service information and Maintenance Manual Revisions include assembly, disassembly, and general guidance information for the subject of this AD. These documents should not be utilized for repairs. This AD takes precedence over these documents.

Figure 1 of Docket No. 97-CE-67-AD
Compliance Table

Letters in ( ) correspond with AD paragraphs	(b)	(c)	(d)	(e)	(f)	(g)	Throughout the AD
Actions of Docket No. 97-CE-67-AD	*Visually inspect the exhaust system.*	*Remove the tailpipes and visually inspect for any crack, corrosion, holes, or distortion.*	*Visually inspect the outboard engine beams, firewalls, and canted bulkheads.*	*Inspect and pressure test the exhaust system.*	*Replace the multi-segment V-band clamps.*	*Remove the exhaust system from the slip joints aft to all turbo-charger components.*	*If any damage is found on any component or part, repair or replace the damaged component or part in accordance with this AD.*
Initial Compliance Time	Within the next 50 hours TIS after the effective date of this AD or within the next 30 calendar days, whichever occurs later.	Upon the accumulation of 5 years since installing a new or overhauled exhaust system or within the next 100 hours TIS after the effective date of this AD, whichever occurs later.	Within the next 100 hours TIS after the effective date of this AD.	Upon the accumulation of 5 years since installing a new or overhauled exhaust system or within the next 100 hours TIS after the effective date of this AD, whichever occurs later.	Within 500 hours TIS after the last replacement required by AD 75-23-08 R5 or within the next 500 hours TIS after the effective date of this AD, whichever occurs first.	At whichever occurs later: - At the next engine overhaul that occurs after the accumulation of 2,500 hours TIS since installing a new or overhauled exhaust system; or - Within the next 100 hours TIS after the effective date of this AD.	Prior to further flight after damage is found.
Repetitive Compliance Times	Thereafter at intervals not to exceed 50 hours TIS or 30 calendar days, whichever occurs later.	Thereafter at intervals not to exceed 12 calendar months.	Thereafter at intervals not to exceed 500 hours TIS.	Thereafter at intervals not to exceed 12 calendar months.	Thereafter at intervals not to exceed 500 hours TIS.	Thereafter at intervals not to exceed 2,500 hours TIS or 12 years, whichever occurs first. These inspection intervals are established to coincide with each regularly scheduled engine overhaul.	Prior to further flight after damage is found.

(b) At the Initial Compliance Time and Repetitive Compliance Times specified in Figure 1 of this AD, visually inspect the exhaust system for burned areas, cracks, or looseness. If any area of the exhaust system shows damage as defined in the Appendix of this AD, prior to further flight, repair or replace the damage part.

NOTE 4: Cessna Service Bulletin (SB) MEB99-6, Cessna SB MEB99-9, and Cessna SB MEB99-12, all dated August 2, 1999, specify and include procedures for installing access panels to help with the exhaust system inspections. Each service bulletin applies to various Cessna airplane models.

(c) At the Initial Compliance Time specified in Figure 1 of this AD, remove the tailpipes and visually inspect for cracks, corrosion, holes, or distortion.

(1) If no crack, corrosion, hole, or distortion is found, continue to visually inspect at intervals indicated in Repetitive Compliance Times in Figure 1 of this AD.

(2) If a crack, corrosion, hole, or distortion is found during any inspection, prior to further flight, repair or replace the tailpipe.

NOTE 5: Although not required by this AD, the FAA recommends removing and cleaning internally (every 12 calendar months) all tailpipes that are more than 5 years old from the date of manufacture or overhaul (yellow tag). This includes accomplishing the following:

- inspecting for cracks, pinholes, corrosion buildup, and general airworthiness;
- overhauling the tailpipe or replacing all parts considered suspect; and
- approving for return to service of all parts considered airworthy.

NOTE 6: The FAA recommends checking the turbocharger wheel for ease of rotation any time the tailpipe is removed. Excessive friction in the turbocharger wheel bearings can cause high exhaust back pressure, which can adversely affect the cylinder compression, the exhaust valve guide, and the exhaust valve and piston life. The turbine wheel should continue to rotate for at least three seconds after spinning induced by fingers or a wooden tool.

NOTE 7: The FAA recommends examining the system to assure that cables and torque tag values are intact on the single-piece V-band clamps.

(d) At the Initial Compliance Time and Repetitive Compliance Times specified in Figure 1 of this AD, visually inspect the outboard engine beam (adjacent to the tailpipe) and the canted bulkheads for signs of distress, chafing, corrosion, or cracking. Even though some airplanes may have stainless steel engine beams, carefully inspect the areas of contact between the engine beam and canted bulkhead for corrosion.

(1) If damage to the engine beams is found that exceeds 10-percent of the material thickness or there is evidence of overheating on the firewall beyond that which can be removed with "scotchbrite " or equivalent, prior to further flight, replace the firewall and the aluminum fuel lines behind the firewall. Stainless steel fuel lines are available from the Cessna Aircraft Company. Replacement of the fuel lines behind the firewall may require removing and replacing the firewall or accomplishing major repair of the firewall.

(2) Prior to further flight, accomplish one of the following:

(i) Repair any chafing, corrosion, or cracking on the engine beams or canted bulkheads or distress or damage beyond that which is described in paragraph (d)(1) of this AD, in accordance with data provided by any individual or facility that is authorized by the FAA to perform the necessary repairs or provide the FAA-approved data to authorized personnel for repair of these items; or

(ii) Replace any parts that have chafing, corrosion, or cracking on the engine beams or canted bulkheads, or distress or damage beyond that which is described in paragraph (d)(1) of this AD.

(e) At the Initial Compliance Time (which is based on the condition of the exhaust system at the slip joints and aft) and Repetitive Compliance Times specified in Figure 1 of this AD, inspect the exhaust system from the slip joints and aft and perform a pressure test in accordance with the Appendix of this AD. If any condition as specified in the Appendix of this AD is found, prior to further flight, send these parts to an FAA-approved exhaust repair facility for inspection and possible repair or replace the affected parts with serviceable parts approved for the affected airplanes.

(f) At the Initial Compliance Time and Repetitive Compliance Times specified in Figure 1 of this AD, replace all multi-segment V-band clamps per the appropriate Cessna Service Manual.

(g) At the Initial Compliance Time and Repetitive Compliance Times specified in Figure 1 of this AD, remove the exhaust system from the slip joints and aft to all turbo-charger attached components, and send to any FAA-approved exhaust repair facility. The FAA-approved exhaust repair facility will inspect this portion of the exhaust system for serviceable condition and make any necessary repairs to these items. No overlay patch-type or parallel multi-seam weld repairs are permitted. Inlay patch repairs and multi-seam welds at joints that are similar to the original construction are acceptable.

(h) Special flight permits may be issued in accordance with sections 21.197 and 21.199 of the Federal Aviation Regulations (14 CFR 21.197 and 21.199) to operate the airplane to a location where the requirements of this AD can be accomplished. Isolation of the fuel cross feed lines behind the firewall may be required.

(i) An alternative method of compliance or adjustment of the initial or repetitive compliance times that provides an equivalent level of safety may be approved by the Manager, Wichita Aircraft Certification Office, 1801 Airport Road, Room 100, Wichita, Kansas 67209.

(1) The request shall be forwarded through an appropriate FAA Maintenance Inspector, who may add comments and then send it to the Manager, Wichita Aircraft Certification Office.

(2) Alternative methods of compliance approved in accordance with AD 75-23-08 R5 are not considered approved as alternative methods of compliance for this AD.

NOTE 8: Information concerning the existence of approved alternative methods of compliance with this AD, if any, may be obtained from the Wichita Aircraft Certification Office.

(j) Information related to this AD may be examined at the FAA, Central Region, Office of the Regional Counsel, 901 Locust, Room 506, Kansas City, Missouri 64106.

(k) This amendment supersedes AD 75-23-08 R5, Amendment 39-5451.

Appendix to Docket No. 97-CE-67-AD

VISUAL INSPECTION

(a) CLEANING

In order to properly inspect the exhaust system, components must be clean and free of oil, grease, etc. If required, clean as follows:

(1) Clean engine exhaust components with a suitable solvent, allow to drain, and wipe dry with a clean cloth.

WARNING: NEVER USE HIGHLY FLAMMABLE SOLVENTS ON ENGINE EXHAUST SYSTEMS. NEVER USE A WIRE BRUSH OR ABRASIVES TO CLEAN EXHAUST SYSTEMS OR MARK ON THE SYSTEM WITH LEAD PENCILS.

(2) Remove the heat shields from the turbocharger in accordance with the heat shield removal procedures in the appropriate Cessna Aircraft Service Manual.

(3) Remove shields around the exhaust bellows or slip joints, multi-segment "V" band clamps at joints, and other items that might hinder the inspection of the system. Removal of the "V" band clamps may not be necessary.

(4) Using crocus cloth, polish any suspect surfaces to verify that no cracks or pinholes exist in the material. Replace or repair any part where cracks or pinholes exist.

(b) VISUAL INSPECTION OF COMPLETE SYSTEM

NOTE 1: Conduct this inspection when the engine is cool.

(1) Visually inspect exhaust stacks for burned areas, cracks, bulges, and looseness. Make sure the attach bolts are properly torqued, in accordance with the appropriate Cessna Aircraft Service Manual.

NOTE 2: During this inspection, pay special attention to the condition of the bellows, if installed, and welded areas along the seams; the welded areas around the bellows; and the welded seams around the exhaust system components.

(2) Visually inspect the flexible connection between the waste-gate and overboard duct (when applicable) for cracks and security.

(3) Visually inspect the exhaust joint springs for correct compression. If the joint is disturbed or if the springs are obviously loose or frozen, proceed with the following inspection (see Figure 1 of this Appendix).

(i) Before removal of the exhaust joint springs, measure the installed length of each spring, and replace the springs compressed to less than .45 inch.

(ii) Remove all the springs and measure the free length. Replace any spring having a free length of less than .57 inch.

NOTE 3: Add AN960-10 (or FAA-approved equivalent part number) washers under the head of the joint bolts as required to obtain the correct dimension. During installation, the joint bolts should be tightened gradually and spring length checked frequently to prevent over-compression of the springs.

(iii) Reinstall the springs and measure the installed length. The length must be .51 inch (+.00, -.03 inch).

(4) If installed, visually inspect the slip joint(s) for bulges beyond the normal manufacturing irregularities of .03 inches and/or cracks. If any bulges and/or cracks are present, replace the bulged or cracked slip joint(s). (Refer to the appropriate Cessna Aircraft Service Manual) (See Figure 2 of this Appendix).

(c) INSPECTION OF THE MULTI-SEGMENT "V" BAND CLAMP(S). (BETWEEN ENGINE AND TURBOCHARGER.)

1) Using crocus cloth, clean the outer band of the multi-segment "V" band clamp(s). Pay particular attention to the spot weld area on the clamp(s).

(2) With the clamp(s) properly torqued, progress to the following actions:

(i) Visually inspect the outer band in the area of the spot weld for cracks (see Figure 3 of this Appendix). If cracks are found, replace the clamp(s) with new multi-segment "V" band clamp(s).

(ii) Visually inspect the corner radii of the clamp inner segments for cracks (see Figure 3 of this Appendix). This inspection requires careful use of artificial light and inspection mirrors.

(iii) Visually inspect the flatness of the outer band, especially within 2 inches of the spot welded tabs that retain the T-bolt fastener. This can be done by placing a straight edge across the flat part of the outer band as shown in Figure 4 of this Appendix, then check the gap between the straight edge and the outer band. This gap should be less

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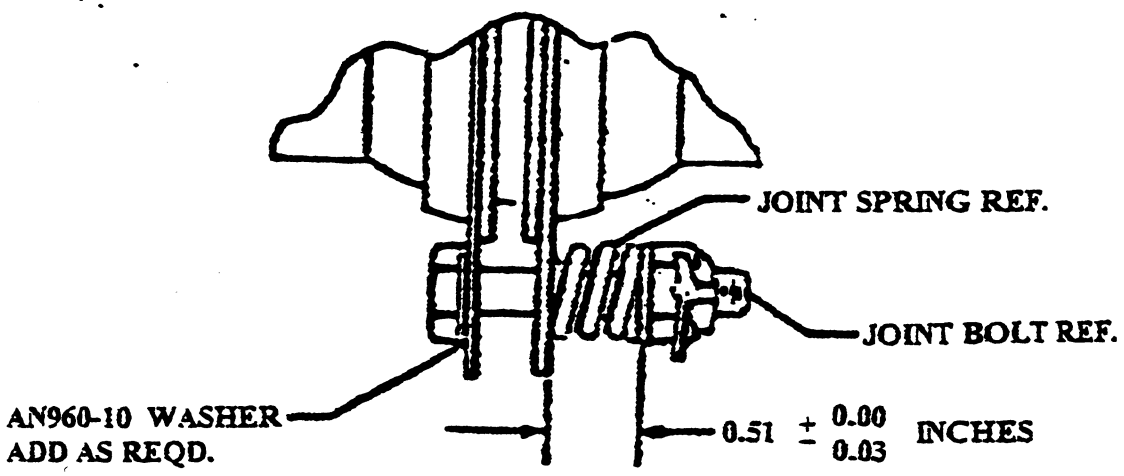
than 0.062 inch. If deformation exceeds the 0.062- inch limit, replace the clamp(s) with new multi-segment clamp(s). (See Figure 3 of this Appendix). See Cessna maintenance manual(s) and revisions for correct installation procedures.

(iv) Visually inspect the one-piece "V" band clamp (overboard exhaust to turbocharger) with a light and mirror, in the area of the clamp surfaces adjacent to the intersection of the "V" apex and bolt clips, and the entire length of the "V" apex of the clamp for signs of cracks or fractures. If cracks or fractures are visible, replace the clamp (see Figure 5 of this Appendix). See Cessna service manual(s) and revisions for correct installation procedures



Typical Exhaust Joint Spring Installation

FIGURE 1 to the Appendix

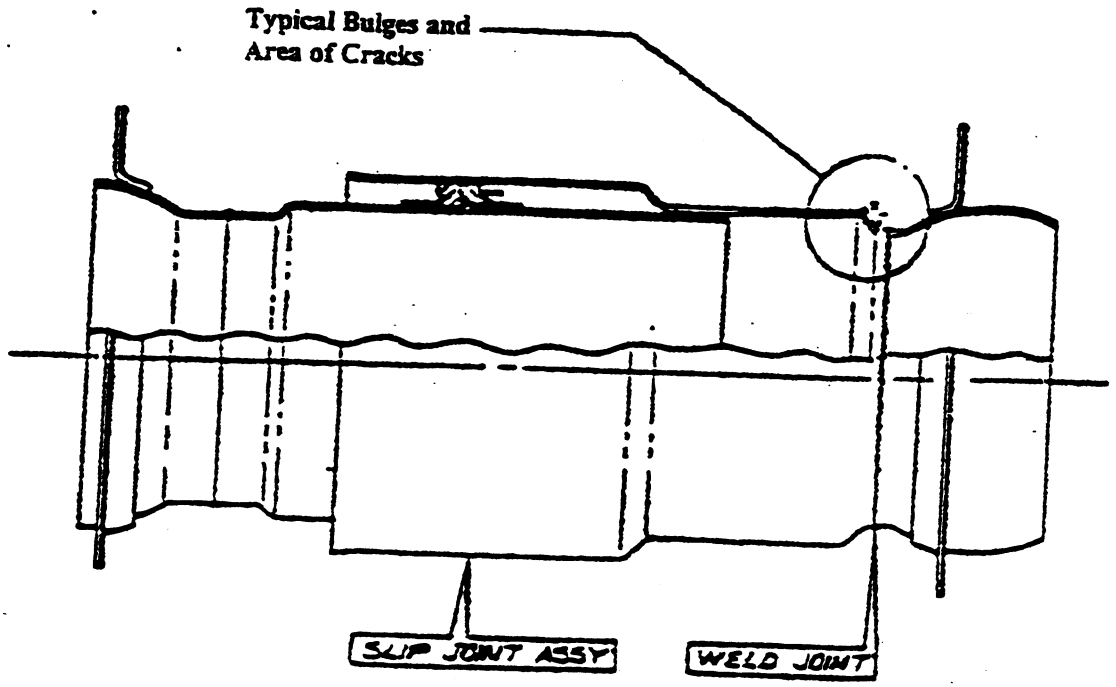


FIGURE 2 to the Appendix

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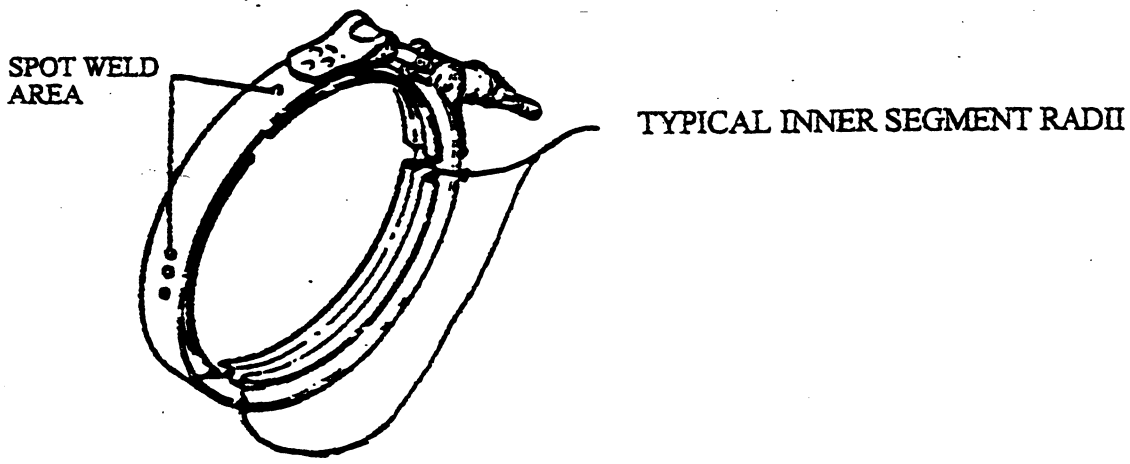
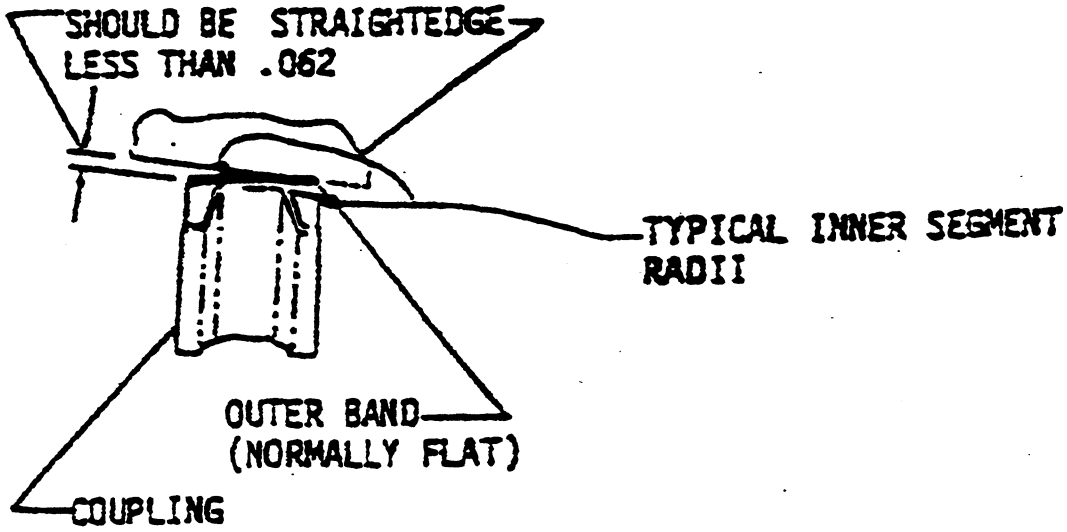


Multi-Segment "V" Band Clamp

FIGURE 3 to the Appendix



Multi-Segment "V" Band Clamp Outer Band Flatness Check

FIGURE 4 to the Appendix

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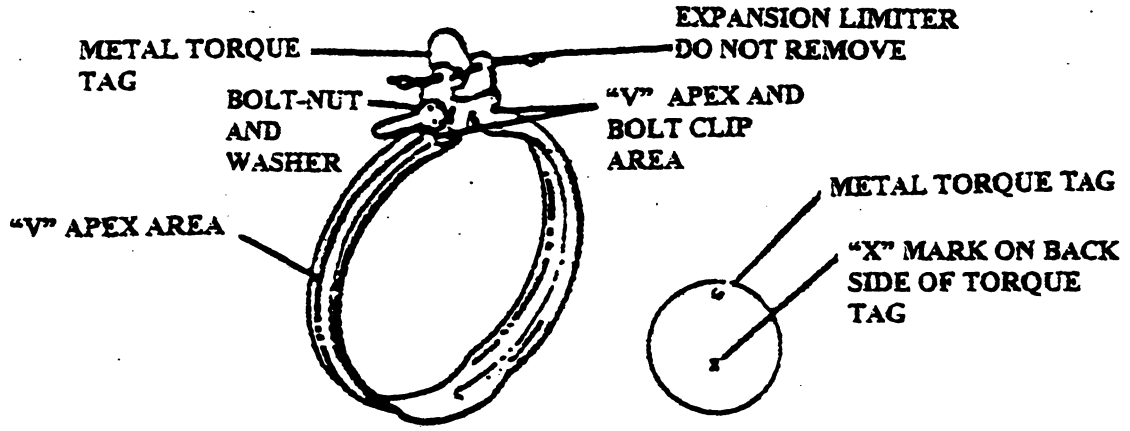

One-Piece "V" Band Type Clamp

FIGURE 5 to the Appendix

INSPECTION OF THE EXHAUST SYSTEM AFT OF THE SLIP JOINTS

(a) Remove all top and bottom engine cowlings, as well as the under-nacelle inspection panels (on aircraft so-equipped). Remove the nacelle-mounted induction air filter canister, slip-joint heat shields, turbocharger heat shields, and any other readily-removable components that facilitate a better view of the exhaust system aft of the slip joints.

(b) Visually inspect each elbow pipe that runs from the slip joint to the wye duct. Carefully inspect the hard-to-see areas where the manifold passes through the canted bulkhead, beneath the clamp-on heat shields, and around the flange and V-band clamp, where it joins the wye. Use a flashlight and mirror to inspect the areas that cannot be seen directly.

(1) Look for evidence of exhaust stains, bulges, cracks, or pinholes.

(2) Exhaust stains or evidence of heat-induced corrosion on any portion of the engine mount beams or canted bulkhead should be grounds for removing the elbow pipe for closer inspection.

(3) Inspect for cracks, bulges, pinholes, or corrosion on the elbow (manifold) pipe, and if any of this damage is found, replace the elbow pipe.

(c) Visually inspect each wye duct beneath the turbo charger for leakage, stains, cracks, or pinholes, and, if damaged, repair or replace. Carefully inspect the hard-to-see area between the duct and firewall.

(1) Carefully inspect the turbo-charger and waste-gate flanges and welded seams between the ducts and the firewall for evidence of exhaust stains on the wye or the firewall, bulges, cracks, or pinholes.

(2) If exhaust stains, bulges, cracks or pinholes are found, repair or replace the damaged part.

PRESSURE TEST

(a) Pressurize the exhaust system with air regulated to 20 PSI or below.

(b) Apply this air pressure to the tailpipe. Fabricate shop fixtures as required to accomplish this.

(c) Seal off the waste-gate pipe.

(d) Check the tailpipe, elbow pipes and the wye duct for leaks by spraying leak check fluid (bubbling) on these parts and looking for the appearance of bubbles. Some air leakage is normal at the joints and flanges, but none should be seen anywhere else.

(e) Pay special attention to any weld repairs, and various hard-to-see areas described previously.

(f) If the tailpipes, elbow pipes, or the wye ducts fail the pressure test, repair or replace the distressed component.

(l) This amendment becomes effective on February 15, 2000.

FOR FURTHER INFORMATION CONTACT: Paul O. Pendleton, Aerospace Engineer, FAA, Wichita Aircraft Certification Office, 1801 Airport Road, Room 100, Wichita, Kansas 67209; telephone: (316) 946-4143; facsimile: (316) 946-4407.

Issued in Kansas City, Missouri, on January 10, 2000.

Michael Gallagher, Manager, Small Airplane Directorate, Aircraft Certification Service.