[4910-13-U]

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39 [65 FR 2844 01/19/2000]

[Docket No. 97-CE-67-AD; Amendment 39-11514; AD 2000-01-16]

RIN 2120-AA64

Airworthiness Directives; Cessna Aircraft Company 300 and 400 Series Airplanes

AGENCY: Federal Aviation Administration, DOT.

ACTION: Final rule; request for comments.

SUMMARY: This amendment supersedes Airworthiness Directive (AD) 75-23-08 R5, which currently requires repetitively inspecting and replacing or repairing the exhaust system on certain Cessna Aircraft Company (Cessna) 300 and 400 series airplanes. The requirements of this AD replace the inspections and replacements that are required by AD 75-23-08 R5 with inspections and replacements containing new simplified procedures for all 300 and 400 series airplanes (models affected by the current AD plus additional models). This AD also revises the inspection intervals and requires replacing certain unserviceable parts and removing the exhaust system for a detailed inspection. This AD is the result of numerous incidents and accidents relating to the exhaust systems on Cessna 300 and 400 series airplanes dating from the middle 1970's to the present, including six incidents since issuance of AD 75-23-08 R5 where exhaust problems were cited. The actions specified by this AD are intended 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.

DATES: Effective February 15, 2000.

Comments for inclusion in the Rules Docket must be received on or before April 14, 2000.

ADDRESSES: Information that relates to this AD may be examined at the Federal Aviation Administration (FAA), Central Region, Office of the Regional Counsel, Attention: Rules Docket No. 97-CE-67-AD, 901 Locust, Room 506, Kansas City, Missouri 64106.

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.

SUPPLEMENTARY INFORMATION:

Events Leading to the Issuance of This AD

A proposal to amend part 39 of the Federal Aviation Regulations (14 CFR part 39) to include an AD that would apply to certain Cessna 300 and 400 series airplanes was published in the **Federal Register** as a notice of proposed rulemaking (NPRM) on July 6, 1999 (64 FR 36307). The NPRM proposed to supersede AD 75-23-08 R5, Amendment 39-5451, with a new AD. AD 75-23-08 R5 currently requires repetitively inspecting, using visual methods, the exhaust system on certain Cessna 300 and 400 series airplanes; and repairing or replacing any unserviceable parts. The actions specified in the NPRM proposed to replace the inspections and replacements that are required by AD 75-23-08 R5 with inspections and replacements containing new simplified procedures for all 300 and 400 series airplanes (models affected by the current AD plus additional models). The NPRM also proposed to revise the inspection intervals and proposed to require replacing certain unserviceable parts and removing the exhaust system for a detailed inspection. Other provisions included in the NPRM, as currently written, are:

- Prohibiting patch-type repairs; and

- Removing the exhaust system and sending it to a designated facility for metallic identification, airworthiness determinations, and repair or replacement of any unserviceable parts.

The NPRM was the result of numerous incidents and accidents relating to the exhaust systems on Cessna 300 and 400 series airplanes dating from the middle 1970's to the present, including six incidents since issuance of AD 75-23-08 R5 where exhaust problems were cited.

Interested persons have been afforded an opportunity to participate in the making of this amendment. Due consideration has been given to the comments received.

Introduction to the Comment Disposition

The FAA received over 350 comments on the NPRM. Many of the comments indicate that some kind of action needs to be taken regarding the ongoing problems with the exhaust systems on Cessna 300 and 400 series airplanes. Many commenters present detailed suggestions for alternatives to the proposed actions included in the NPRM. The FAA believes that, for the most part, these suggestions and alternatives have merit, and the final rule reflects many of these suggestions and alternatives.

The FAA will continue to make available information that relates to the exhaust system problems on the Cessna 300 and 400 series airplanes. However, the FAA does not believe that this advisory information alone will alleviate and eliminate the unsafe condition of the exhaust system problems on the Cessna 300 and 400 series airplanes. The FAA also does not believe that continuing to only mandate the actions of AD 75-23-08 R5 will provide the safety level that is necessary for the affected airplanes.

The NPRM proposed to require an inspection to determine the type of material (Inconel or stainless steel) and the condition of the exhaust system. Of note is that the minimum wall thickness criteria was established as an attempt to remove from service those systems that

were over 30 years old. However, the FAA did not account for those unused or recently installed exhaust systems that were manufactured over 30 years ago and either are currently held as or until recently were held as spares. The final rule accounts for this by requiring an inspection of the tailpipes 5 years after installation of an unused or overhauled exhaust system or within 100 hours time-in-service (TIS) after the effective date of the AD (the prevalent one being that which occurs later).

In addition, the FAA has found that Cessna has not manufactured any exhaust assemblies that are 100-percent Inconel material. Much of the confusion raised on and in opposition to the proposal stems from sending the exhaust system to a facility to get a determination on whether the system was a stainless steel or Inconel exhaust system. The different compliance times for the different systems adds to the confusion and opposition. The FAA has revised the proposal to include the same compliance times for all airplanes regardless of the exhaust system material and to remove the proposed requirement of sending the exhaust system to a specific facility for a material determination.

The final rule reflects other changes made based on the FAA's analysis of the comments received and all other information related to the exhaust systems on the Cessna 300 and 400 series airplanes. All changes, like the ones referenced above, will alleviate the burden upon the public as proposed in the NPRM while still providing the necessary safety level intended by this AD.

The following paragraphs present the comments received with the FAA's response and changes to the AD, as applicable:

Comment Issue No. 1: Include Alternative Proposals

Numerous commenters recommend that the FAA incorporate the provisions of proposals that the Cessna Pilot's Association and Twin Cessna Flyer submitted. The commenters state that there is a need for the AD, and that these proposals provide a viable safety alternative.

The FAA evaluated both of these proposals, determined that many of these comments have merit, and has made changes to the final rule. Among the items in the proposals that the FAA incorporated into the final rule include:

- eliminating the check of the system for wall thickness;

- having the same compliance schedule for all airplanes regardless of whether the exhaust systems are made of Inconel or stainless steel; and

- eliminating the proposed requirement of removing the exhaust system and sending it to a specific facility for a material determination.

Comment Issue No. 2: The Existing AD is Sufficient

Many commenters state that the current actions of AD 75-23-08 R5 are sufficient to meet the necessary safety level intended by this AD for the exhaust systems of the Cessna 300 and 400 series airplanes. Several commenters state that, if AD 75-23-08 R5 was complied with in a correct and timely matter, the incidents referenced in the NPRM may not have

happened. Some commenters believe that changing the inspection requirements from that already required by AD 75-23-08 R5 will cause confusion and add unnecessary costs to the inspections. One other commenter suggests that the FAA issue a Special Airworthiness Information Bulletin (SAIB) to address the requirements of the AD. The FAA does not concur that AD 75-23-08 R5 is sufficient. Analysis of the incidents and accidents pertaining to the exhaust systems on the Cessna 300 and 400 series airplanes that have occurred since the issuance of AD 75-23-08 R5 reveals the need to require different inspection requirements to meet the conditions known today. The FAA believes that the changes made to the final rule will also make the inspections easier to accomplish and will allow them to be accomplished to coincide with regularly scheduled maintenance.

The FAA does not concur that an SAIB should be issued instead of an AD. An SAIB is an "information only" document and has no regulatory requirement; therefore, it is not mandatory. The only vehicle the FAA has of assuring that certain actions are complied with is through the issuance of an AD. No changes have been made to this AD as a result of this comment.

Comment Issue No. 3: Cost Impact

Many commenters state that the FAA's estimate of the cost impact upon U.S. owners/operators of the affected airplanes is incorrect. Some also believe that the FAA should have completed the Regulatory Flexibility Analysis before issuing the NPRM. Among the specific cost issues that were identified is the FAA's failure to account for the revenue lost due to airplane downtime and the fact that the cost of the proposed AD would affect the airplanes' value and make them unaffordable.

The FAA does not concur that the estimate of the cost impact upon U.S. owners/operators of the affected airplanes is incorrect. The FAA has no way of determining the number or extent of repairs and replacements that would be necessary based on the inspections proposed in the NPRM. Therefore, the FAA can only account for the costs of the inspections. The FAA believes it is the owners'/operators' responsibility to repair or replace parts when found damaged, regardless of whether the action is required by AD.

The FAA does not concur that it was necessary to complete the Regulatory Flexibility Analysis before issuing the NPRM. Having this analysis completed prior to issuing the NPRM is preferred; however, the FAA did not believe it could wait to initiate rulemaking on this subject. The FAA has until 180 days after issuance of the final rule AD action to have the completed Regulatory Flexibility Analysis in the docket file.

The FAA concurs that airplane downtime is not accounted for in the estimate of the cost impact. The FAA has no way of determining the operational characteristics of each owner/operator of the affected airplanes. Therefore, estimating the lost expenses due to the affected airplanes being out of service is not possible. Even if this were possible, the safety aspects of the proposed rule would outweigh the potential lost revenue due to airplane downtime.

Comment Issue No. 4: V-Band Clamp Replacements

Several commenters state that the proposed V-band replacement requirements are inconsistent with what is currently required by AD 75-23-08 R5 and would be difficult to accomplish. The commenters request clarification on the FAA's intent.

The FAA's intent was to maintain the V-band replacements from AD 75-23-08 R5. Based on this and after evaluating all the comments and information on this subject, the FAA has revised the proposal to only require replacement of the multi-band V-clamps at 500-hour TIS intervals. Inspection of the other V-band clamps is part of the exhaust system inspections required by this AD.

Comment Issue No. 5: Concerns With the Slip Joint Requirement

Many commenters express concerns regarding the requirements of the slip joints, specifically either require (1) replacement of the old style joints; (2) lubrication of the slip joints; or (3) a change to the compliance time of the slip joint removal and inspection requirements. The majority of these commenters state that removing the slip joints would cause more damage than would be caused during normal usage.

The FAA concurs that removing the slip joints too frequently could cause damage. The FAA has determined that the necessary safety level intended by this AD will be reached by requiring the slip joints to be annually inspected for freedom of movement without removing the slip joints from the nacelle. The slip joints will be removed for inspection at each 2,500-hour TIS inspection. The FAA believes that the inspections will reveal deterioration of the older style joints and require replacement.

Comment Issue No. 6: Stainless Steel versus Inconel

Many commenters state that the different compliance times for stainless steel exhaust systems and Inconel exhaust systems need clarification. These commenters request that the FAA define an "all Inconel system" since all exhaust systems consist of some stainless steel parts. Several commenters state that having different compliance times for different exhaust systems is confusing, and request that all exhaust systems be treated equally.

The FAA concurs that no exhaust system is made exclusively of Inconel alloy and that the current compliance times could cause confusion among those airplane owners/operators and mechanics trying to accomplish the AD. The FAA has revised the AD to provide compliance times that are applicable to all exhaust systems. This eliminates the need to send the exhaust system to an authorized facility for material determination. The FAA has revised the compliance times to coincide with regularly scheduled maintenance.

Comment Issue No. 7: Facilities and Personnel

Numerous commenters express concern about the FAA's requirement of the qualifications of the personnel to accomplish the work and what facilities must be used to accomplish portions of this AD. These concerns include:

- The three approved facilities would not be able to accomplish the parts evaluations and inspections on all of the affected airplanes in a timely manner;

- Foreign airworthiness authorities that adopt an FAA AD verbatim for their countries would then require all airplanes certificated for operation in those countries to have the parts evaluations and inspections accomplished at one of the three U.S. facilities; and

- Maintenance personnel in foreign countries with equivalent ratings to those specified in the proposed AD would not be able to accomplish the work under the current wording of this AD.

The FAA has evaluated these concerns and has changed this AD to include:

- clarifying who can accomplish what actions in this AD, including a clause of "or for non U.S.-registered airplanes: the state of registry's equivalent facility in accordance with their applicable procedure";

- consolidating the actions of all airplanes into one compliance program so the need to send to one of the three facilities to determine the material used for the exhaust system and the condition is no longer necessary; and

- changing the facilities required to do the repair work to any FAA-approved exhaust repair facility.

Comment Issue No. 8: Compliance Times

Many commenters request changes to the proposed compliance times. The main reason for these proposed changes is to time the actions specified in the NPRM to coincide with regular maintenance intervals, i.e., engine overhaul and annual inspections. Several commenters also request a 10-percent adjustment on inspection compliance times.

The FAA has re-evaluated the compliance times and has changed the final rule to add provisions that would make the actions coincide with regularly scheduled maintenance activities. Having one compliance time for all airplanes, regardless of the exhaust system type (Inconel or stainless steel) allowed this to be accomplished. The FAA is also allowing the 10-percent adjustment allowance to allow the actions to be accomplished with other scheduled maintenance. All of these adjustments actually reflect a reduction in the burden upon U.S. operators over that proposed in the NPRM.

Comment Issue No. 9: Cessna Service Bulletins

A few commenters suggest that the FAA issue an AD that mandates the Cessna service bulletins that relate to this subject instead of what is proposed in the NPRM. These commenters state that the actions specified in the service bulletins are adequate to address the unsafe condition.

The FAA does not concur. The Cessna service bulletins were not available at the time of issuance of the NPRM. Cessna has issued the following service bulletins since the NPRM:

- Service Bulletin (SB) MEB99-8, SB MEB99-11, SB MEB99-14, and SB MEB99-15, all dated August 2, 1999. These service bulletins specify and include procedures for replacing

the crossfeed fuel lines with stainless steel cross feed lines. Each service bulletin applies to various Cessna airplane models.

- SB MEB99-6, SB MEB99-9, and SB MEB99-12, all dated August 2, 1999. These service bulletins specify and include procedures for installing access panels to help with exhaust system inspections. Each service bulletin applies to various Cessna airplane models.

- SB MEB99-7, SB MEB99-10, and SB MEB99-13, all dated August 2, 1999. These service bulletins specify and include procedures for installing stainless steel engine beam covers and inspecting the engine beams. Each service bulletin applies to various Cessna airplane models.

The FAA has determined that the best course of action is accomplishing that specified in the final rule (the actions of the NPRM as modified based on the comments received) instead of incorporating the Cessna service bulletins. Reasons include:

- The service bulletins focus more on the protection of the affected airplanes once the exhaust system has failed; and

- The service bulletins do not address the turbocharger installation on the firewall, including the engine exhaust pipes and the tail pipe. The leakage of exhaust gases in this area is considered the unsafe condition.

The FAA does believe that installing the access panels as specified in the Cessna service bulletins will aid in the repetitive exhaust system inspections. The FAA has added a note to the AD to include this access panel information. No other changes to the final rule have been made as a result of these comments.

Comment Issue No. 10: Supplemental Type Certificates and Parts Manufacturer Approvals

Two commenters suggest that airplanes that have been modified through the incorporation of Riley Aviation supplemental type certificates (STC's) not be subject to this AD, or that the FAA wait for the Riley Aviation solution to the unsafe condition for those affected airplanes. In addition, two commenters request explanation related to installation requirements of STC and parts manufacturer approval (PMA) parts as they relate to the exhaust systems on Cessna 300 and 400 series airplanes.

The FAA does not concur. The Riley Aviation modification through STC's utilizes design parts that are equivalent to the original type design. The FAA has determined that exhaust systems that have been modified through Riley Aviation STC's are subject to the unsafe condition addressed by this AD. Although Riley Aviation may indeed develop actions to address this unsafe condition, the FAA cannot delay AD action waiting for actions that have yet to be developed or approved. However, any owner/operator of the affected airplanes can present data to show that their exhaust systems utilize design parts that should not be subject to this AD by submitting an alternative method of compliance request in accordance with the procedures specified in this AD. The FAA will evaluate the merits of each request and either grant or deny the alternative method of compliance. No changes have been made to this AD as a result of these comments.

Comment Issue No. 11: Maintenance and Pilot Training

Numerous commenters state that part of the safety problem comes from inadequate maintenance and the need for pilot training. These commenters suggest that additional pilot training and mandated preflight checks could alleviate the unsafe condition. Many commenters feel that the FAA is arbitrarily punishing the majority of owners/operators of the affected airplanes because of the inadequate maintenance practices of a few operators. These commenters state that the existing maintenance requirements are adequate to provide the necessary safety level intended by this AD, and that if the FAA enforced the existing rules there would not be any problems.

The FAA concurs that pilot training and preflight checks could reduce the potential for the unsafe condition from occurring. However, the FAA has determined that the unsafe condition is in part the result of maintenance practices that are not adequate to provide the necessary safety level intended by this AD. The FAA has determined that the condition should be addressed through inspections and exhaust system repair and parts replacement. No changes to this AD have been made as a result of these comments.

Comment Issue No. 12: Part 135 Operations

Five commenters suggest that the FAA exempt those airplanes that are regulated by a maintenance program such as that required for airplanes operating in accordance with part 135 of the Federal Aviation Regulations (14 CFR part 135). The commenters state that such maintenance programs already require the actions specified in the NPRM.

The FAA partially concurs. The FAA agrees that certain actions may already be accomplished by maintenance programs required under 14 CFR part 135. A note has been added to this AD that specifies that the owners/operators of those airplanes operating under 14 CFR part 135 may have already had the actions of this AD incorporated, and appropriate "unless already accomplished" credit could be taken for the applicable portion of this AD. The FAA cannot exempt these airplanes from this AD because operators are not obligated to fly predominately in part 135 operations and could operate under part 91 of the Federal Aviation Regulations (14 CFR part 91).

Comment Issue No. 13: Leak Testing for Cracks

Several commenters suggest that the FAA allow a leak test to detect cracked exhaust system parts. The FAA presumes that these commenters would prefer the leak test over the currently proposed pressure tests.

The FAA has determined that the pressure checks required in this AD will detect cracks, pinholes, or other damage, and that leak testing is not required. Owners/operators of the affected airplanes can submit an alternative method of compliance to the FAA that contains appropriate data and information to show that an equivalent level of safety to this AD would be obtained through leak testing. No changes to this AD have been made as a result of these comments.

Comment Issue No. 14: Firewall, Bulkhead, Engine Beams, and Fuel Lines

Many commenters request modification or explanation concerning the need to inspect the firewall, bulkheads, engine beams, and fuel lines. The commenters suggest that the FAA only require inspection of the fuel lines and areas behind the firewall if damage has occurred or work has been done in the firewall area. These commenters also request the FAA define the acceptable limits of corrosion in the engine beams and associated structure.

The FAA maintains that the firewalls, canted bulkheads, and engine beams should be inspected and has written the compliance time of these inspections to allow them to be accomplished during the regular maintenance schedule that coincides with other inspections or repairs. The FAA concurs that the fuel lines should only be inspected upon condition, and this AD has been changed to only require the inspections if there is evidence of past damage to the firewalls, canted bulkheads, and engine beams. The fuel lines will be replaced if damage is found.

Comment No. 15: Wall Thickness

Numerous commenters state that the wall thickness inspection is unworkable due to the thickness limit of .025 inches. Some of these commenters are concerned that some new parts would not pass the thickness requirement. The commenters recommend specific thickness of .049 inches for the "wye" and .035 inches for the tailpipe.

After further analysis of the wall thickness inspection requirement, the FAA has determined that overly thin parts will be detected and corrected in the general airworthiness inspections required on the "wye" and tailpipe. Therefore, the FAA has deleted this requirement from this AD.

Comment Issue No. 16: Install an Insulation Blanket

Five commenters suggest installing an insulation blanket (such as Kevlar) as an alternative to the actions specified in the NPRM. Another commenter states that installing this insulation blanket would complicate inspections.

The FAA concurs that the addition of an insulation blanket could relieve some of the potential difficulties, although it would only alleviate the condition and would not provide the necessary safety level intended by this AD. Also, the FAA concurs that installing an insulation blanket could make already required inspections difficult to accomplish. Based on this, the FAA has determined that the installation of an insulation blanket will not meet the necessary safety level intended by this AD and the FAA has not incorporated this suggestion. No changes have been made to this AD as a result of these comments.

Comment Issue No. 17: Inadequate Maintenance Practices

Several commenters state that the NPRM lacks test and inspection procedures. These commenters suggest specific changes or additions to these inspection methods, including:

1. make a video tape of the inspection process;

2. require an inspection for exhaust stains;

3. specify wear rates and leakage rates on the pressure tests;

4. include information about the confusion concerning the various types of slip joints utilized on the affected airplanes;

5. clarify what is meant by an exhaust repair station;

6. require only visual inspections;

7. clarify the pressure check requirements because this check is too judgmental, and that an unacceptable leak is not identified;

8. add a "tap test" to check parts; and

9. clarify and mandate assembly and torquing sequence requirements.

The FAA concurs with some of the recommendations, as follows:

1. The FAA believes a video could be a great visual aid in illustrating the inspection, but the FAA has determined that it could only be an informational aid and cannot be mandated by AD action. No changes have been made to this AD as a result of this comment;

2. The FAA does not consider the exhaust stains to be a reliable indication of whether exhaust problems exist. Stains could be a sign to look further, but not a true indicator. No changes have been made to this AD as a result of this comment;

3. As specified in Comment Issue No. 13, the FAA has determined that the pressure checks required in this AD will detect cracks, pinholes, or other damage, and that leak testing is not required. Owners/operators of the affected airplanes can submit an alternative method of compliance to the FAA that contains appropriate data and information to show that an equivalent level of safety to this AD would be obtained with this method. No changes have been made to this AD as a result of this comment;

4. The FAA has revised this AD to only require removal of the slip joints during the 2,500-hour TIS engine overhaul inspection;

5. The FAA has revised the AD to specify an FAA-approved exhaust system repair facility. The means a facility that has FAA approval to work on exhaust systems;

6. Due to the extent and location of the damage found on the Cessna 300 and 400 series airplanes, the FAA has determined that visual inspections will not provide the necessary safety level intended by this AD. No changes have been made to this AD as a result of this comment;

7. The pressure check is intended to identify leakage that is considered to be excessive or in locations where it will help identify crack, pinholes, or damage. Any application of the pressure test will be judgmental; however, many owners/operators have already accomplished this test on the affected airplanes with success so the FAA has determined that

authorized or appropriate maintenance personnel can accomplish the procedure repeatedly with acceptable results. No changes have been made to this AD as a result of this comment;

8. The FAA concurs that a "tap test" may be helpful in identifying damaged parts, however, the FAA has determined that this procedure is not definitive and any suspect part should be further investigated. No changes have been made to this AD as a result of this comment; and

9. After re-examining the procedures and information in the maintenance manuals and service information for the affected airplanes, the FAA has determined that the assembly and torquing techniques are acceptable to meet the necessary safety level intended by this AD. No changes have been made to this AD as a result of this comment.

Comment Issue No. 18: Incorporate a Design Change

Many commenters recommend that the FAA incorporate a design change to the exhaust systems rather than requiring repetitive inspections and testing. One commenter states that various failure modes of the system should be analyzed and that various system changes should be implemented to prevent failure. Five commenters suggest that adding provisions to isolate the crossfeed lines or adding crossfeed valves could be a proposed solution to the problem. Each of the other commenters recommend at least one of the following:

- installing a fire detector system;

- incorporating a "tell tale" patch that changes color with heat exposure, or using paint that changes color when exposed to heat;

- incorporating heat shields to protect the fuel lines that are behind the firewall from the effects of the exhaust heat; and

- adding heat shields to the firewall.

The FAA concurs that adding a design change would be a more desirable solution to the exhaust system problems on the Cessna 300 and 400 series airplanes rather than relying on repetitive inspections and testing to detect any problems. The FAA reviewed many of the design ideas presented above, and found that they are designed to mitigate the effects of an exhaust system failure, but none prevent failure of the exhaust system. The FAA currently knows of no such design changes that would provide the same safety level as those actions in this AD. The FAA will look at any design changes on an individual basis if they are submitted as an alternative method of compliance in accordance with the procedures specified in this AD. No changes have been made to this AD as a result of this comment.

Comment Issue No. 19: V-Band Clamps

One commenter recommends that the FAA change the word V-band clamps in paragraph (g) of the NPRM to multi-segment V-band clamps. This commenter states that this was an oversight by the FAA.

The FAA concurs and has revised this AD accordingly.

Comment Issue No. 20: All Airplanes Should Not Be Affected

Five commenters suggest that there are design differences in the affected airplanes and believe that this AD should not apply to all airplanes. One commenter states that less demand is placed on the exhaust system of unpressurized airplanes and this AD should only apply to pressurized airplanes.

The FAA's analysis and interpretation of the service history on the exhaust systems of the Cessna 300 and 400 series airplanes does not indicate that certain designs are more/less susceptible to the exhaust system problems than others. No changes have been made to this AD as a result of this comment.

Comment Issue No. 21: Lesser Requirements for Newer Exhaust Systems

Several commenters believe that less stringent initial inspection requirements should exist for airplanes with newer exhaust systems installed. The commenters do not feel that the potential for damage exists for airplanes with exhaust systems that have not been in service for very long.

The FAA sees merit in this comment and has re-evaluated the compliance time of the initial inspection for cracks, corrosion, holes, or distortion, which is the inspection that requires removal of the tailpipes. The FAA has determined that the initial inspection compliance time should read "upon the accumulation of 5 years since installing a new or overhauled exhaust system or within the next 100 hours time-in-service (TIS) after the effective date of this AD, whichever occurs later."

The FAA has revised the AD accordingly.

Comment Issue No. 22: Certification Process of Exhaust Systems

One commenter believes that the FAA is changing the certification process of exhaust systems because the requirements of this AD were not required at the time the airplanes were type certificated.

The FAA does not concur. The exhaust systems that were certificated with the airplane met all design criteria at the time of certification. are not available to the field or the current maintenance procedures are AD's are the vehicle that the FAA uses to mandate modifications, inspections, etc. to correct an unsafe condition that is caused by airplane usage (fatigue), quality control, or maintenance problems (where the procedures to accomplish such maintenance not meeting the necessary safety level). The FAA has determined that the current maintenance procedures for the exhaust systems of the Cessna 300 and 400 series airplanes, including those required by AD 75-23-08 R5, are not adequate to eliminate the unsafe condition. No changes have been made to this AD as a result of this comment.

Comment Issue No. 23: Welds and Weld Repairs

Several commenters express opinions concerning welds and the use of weld repairs in the NPRM. The comments vary and include the following:

- patch welds should be banned;

- patch welds should be retained;

- inlay weld repairs should be allowed;

- multi-seam welds should be defined;

- butt welds are a better type of weld;

- no welds should be allowed; and

- patch or multi-seam weld repairs should not be left in service for 500 hours TIS and should be removed after 100 hours TIS.

The FAA has further examined the subject of welds on the exhaust systems as a method of repair and has incorporated the following into this AD:

- overlay patch-type and parallel multi-seam weld repairs will not be permitted;

- inlay patch repairs and multi-seam welds at the joints that are similar to the original construction are acceptable;

- inspection schedules have been adjusted; and

- removal of patch and multi-seam welds will not be required at 100 hours TIS, and will be inspected on condition until removed with the rest of the exhaust system.

Comment Issue No. 24: Exhaust System Removal Requirement

One commenter recommends that the FAA remove paragraph (i) from the NPRM. This paragraph specifies removal of the exhaust system from the slip joints and specifies the system be sent to an exhaust repair facility to be inspected for serviceable condition with accomplishment of necessary repairs. The FAA infers that the commenter believes that these requirements are not necessary.

The FAA does not concur. Based on its analysis of all information related to this subject, the FAA has determined that the removal, inspection, and possible repair requirements are necessary to reach the necessary safety level intended by this AD. The FAA has revised the compliance time to coincide with engine overhauls, when the system is removed for other reasons, thereby reducing the downtime of the airplane.

Comment Issue No. 25: No Compelling Safety Issues

Five commenters state that there are no compelling safety issues driving this AD action. These commenters further explain that this is evidenced through the AD process delays and the amount of time it took the FAA to issue the NPRM. The FAA infers that the commenters would like the NPRM withdrawn.

The FAA does not concur. The FAA has determined that an unsafe condition exists and this condition must be corrected. No changes have been made to this AD as a result of this comment.

Comment Issue No. 26: No Guarantee That the AD Will Work

One commenter states that there is no guarantee that the actions specified in the NPRM will eliminate the unsafe condition on the affected airplanes. The FAA infers that the commenter wants the NPRM withdrawn.

The FAA believes that, based on its analysis and evaluation of all available information related to this subject, the actions in this AD address items that have directly contributed to exhaust system incidents and accidents on the Cessna 300 and 400 series airplanes. The FAA also believes that the final rule AD (with the changes made to the NPRM) will be easier to comply with than AD 75-23-08 R5.

Comment Issue No. 27: Impossible to Comply With the AD

One commenter states that Environmental Protection Agency (EPA) requirements make it impossible to comply with the NPRM. The commenter expresses that this is due to the requirement to use certain solvents that the EPA has banned.

No banned substances are required to accomplish this AD. No changes have been made to this AD as a result of this comment.

Comment Issue No. 28: Extend the Comment Period

One commenter requests an extension to the comment period to allow persons to comment. The commenter states that this is necessary because the existence of the NPRM was not widely known.

The FAA does not concur. Based on the fact that over 350 comments were received, the FAA believes that it was widely known that the NPRM was issued and available. The FAA is aware that several owner associations sent their members individual letters advising them of the content and availability of the NPRM, and encouraging the owners to comment. In addition, the FAA is aware of several news articles that publicized the proposed action. The FAA has determined that there was adequate time to comment on the NPRM. No changes have been made to this AD as a result of this comment.

Comment Issue No. 29: More Information on the Accident Airplanes

One commenter requests more information on the accidents referenced in the NPRM. The FAA infers that the commenter does not believe the action is justified based on the information provided in the NPRM. The commenter is requesting information such as the age of the airplanes, the maintenance of the airplanes, the frequency in which the airplanes were flown, the States where the accidents occurred, any temperature swings that were involved, and the provider of the failed parts.

The FAA did a thorough investigation and examination of all the information available on the exhaust system failures of the Cessna 300 and 400 series airplanes, and has determined that the explanation presented in the NPRM adequately explained the situation. No changes have been made to this AD as a result of this comment.

Comment Issue No. 30: Exhaust System Time Is Not Always Recorded

One commenter states that, although required by FAA regulations, exhaust system component time is not always recorded or recorded correctly. The commenter states that improper maintenance and recordkeeping can negate any mandated action. The commenter makes no suggestion as to modifying or eliminating this AD action.

No changes have been made to this AD as a result of this comment.

Comment Issue No. 31: Exhaust Systems Have a Limited Life

One commenter states that exhaust system components have a limited life. This commenter believes that the FAA should require replacement of the exhaust system at a certain time of hours TIS.

The FAA concurs that exhaust systems have a limited life. However, the utilization differences between operators and the environment where the airplanes are operated contribute to the condition. For these reasons, a definite life limit on the exhaust systems could not be established and the FAA is requiring repetitive inspections and tests to assure that the condition of the systems is adequate. No changes have been made to this AD as a result of this comment.

Comment Issue No. 32: Apply a Corrosion Standard

Several commenters suggest that the FAA should incorporate a 10-percent corrosion standard for the corrosion inspection of the engine beams and bulkhead. These commenters state that the proposed AD will require structural repair if any corrosion is found on the engine beams, canted bulkhead, or firewalls.

The FAA concurs that a reasonable standard should be applied. Revisions have been incorporated that require further investigation if corrosion or damage is found during the inspections. This includes holes or defects in the structural components. A 10-percent material thickness requirement for engine beam damage has been included in the AD.

Comment Issue No. 33: Visual Examination and Pressure Tests Are Adequate

Many commenters believe that visual examination and pressure tests of the exhaust systems are adequate to meet the necessary safety level intended by this AD. These commenters state that they have found defects by visual and pressure checking.

The FAA does not concur. Although visual examination and pressure tests will reveal defects, many defects may go undetected if only these tests are utilized. No changes have been made to this AD as a result of this comment.

The FAA's Determination

After careful review of all available information related to the subject presented above, the FAA has determined that air safety and the public interest require the adoption of the rule as proposed except for the changes discussed above in the comment disposition and minor editorial corrections. The FAA has determined that these changes and minor corrections will not change the meaning of this AD and will not add any additional burden upon the public than was already proposed. In fact, the changes made based on the comments received will actually reduce the burden that was originally proposed in the NPRM.

Comments Invited

Although this action is in the form of a final rule that was preceded by notice and opportunity for comment, public comments are again invited on this rule. The FAA has determined that because of the large number of comments received on the proposed rule and the controversial nature of the situation, the public should be provided an opportunity to comment on the changes being made in this final rule. In addition, the FAA is in the process of completing a regulatory flexibility analysis for this action. The FAA anticipates completion of the analysis well within 180 days after issuance of this AD and will accept comments on the analysis at any time, even after the comment closing date for comments on this final rule. The FAA is particularly interested in receiving factual information on alternative means of compliance with the AD as well as the regulatory flexibility analysis.

Interested persons are invited to comment on this rule by submitting such written data, views, or arguments as they may desire. Communications should identify the Rules Docket number and be submitted in triplicate to the address specified above. All communications received on or before the closing date for comments will be considered, and this rule may be amended in light of the comments received. Factual information that supports the commenter's ideas and suggestions is extremely helpful in evaluating the effectiveness of the AD action and determining whether additional rulemaking action would be needed.

Comments are specifically invited on the overall regulatory, economic, environmental, and energy aspects of the rule that might suggest a need to modify the rule. All comments submitted will be available, both before and after the closing date for comments, in the Rules Docket for examination by interested persons. A report that summarizes each FAA-public contact concerned with the substance of this AD will be filed in the Rules Docket.

Commenters wishing the FAA to acknowledge receipt of their comments submitted in response to this rule must submit a self-addressed, stamped postcard on which the following statement is made: "Comments to Docket No. 97-CE-67-AD." The postcard will be date stamped and returned to the commenter.

Cost Impact

The FAA estimates that 6,500 airplanes in the U.S. registry will be affected by this AD. The cost of the inspections will be as follows at an average labor rate of approximately $60 per hour. The cost of any necessary repair depends on the extent of the rework and replacement needed based on the results of the inspections.

- The repetitive visual inspections of the exhaust system will take approximately 3 workhours to accomplish, with a labor cost of $180 per airplane for each inspection;

- The repetitive visual inspections of the removed tailpipes will take approximately 1 workhour per tailpipe to accomplish, with a labor cost of $120 per airplane for each inspection;

- The inspection of the engine beams and canted bulkheads, as a result of damage to the tailpipes, will take approximately 3 workhours to accomplish, with a labor cost of $180 per airplane;

- The inspection of the fuel tubing behind the firewall, as a result of damage to the tailpipes, engine beams, and canted bulkheads, will take approximately 16 workhours to accomplish, with a labor cost of $960 per airplane;

- The replacement of the fuel tubing, if necessary, will take approximately 30 workhours to accomplish, with a labor cost of $1,800 per airplane;

- The requirement of removing exhaust system prior to shipping to an approved facility will take approximately 8 workhours, with a labor cost of $480 per airplane. The cost of shipping the exhaust system to the facility and the inspections by the facility is estimated at $500 per airplane;

- The repetitive pressure test is estimated to take 1 workhour, with a labor cost of $60 per airplane; and

- The multi-band V-clamp replacement is estimated to take 1 workhour, with a labor cost of $60 per airplane.

The total cost impact on the U.S. operators for the initial inspections is estimated to be $28,210,000, or $4,340 per airplane. The maximum expense for full exhaust parts replacement is estimated to be approximately $60,000 per airplane. These figures do not take into account the costs of any repetitive inspections or repairs or replacements that may be necessary. The FAA has no way of determining the number of repetitive inspections an owner/operator will incur over the life of the airplane, or the extent of the repairs and replacements that may be necessary for any affected airplane.

Compliance Time of This AD

Certain repetitive inspections of this AD are presented in both calendar time and hours time-in-service (TIS). The unsafe condition specified in this AD is a result of the stress cracking and/or corrosion that results over time. Stress corrosion starts as a result of high local stress incurred through operation of the affected part (the exhaust systems). Corrosion can then develop regardless of whether the airplane is in operation. The cracks may not be noticed initially as a result of the stress loads, but could then progress as a result of corrosion. The stress incurred during flight operations (while in-flight) or temperature changes (either while in-flight or on the ground) could then cause rapid crack growth. In order to assure that these stress corrosion cracks do not go undetected, a compliance time of specific hours TIS and calendar time (whichever occurs first) is utilized.

Regulatory Flexibility Analysis

The FAA believes that this regulation may have a significant economic impact on a substantial number of small businesses. Due to the urgent nature of the safety issues addressed, the FAA was not able to complete a regulatory flexibility analysis prior to issuing the NPRM. As stated in the NPRM, the FAA will complete the final regulatory flexibility analysis within 180 days after issuance of this AD. Copies of this analysis may be obtained at that time at the Central Region, Office of the Regional Counsel, Attention: Rules Docket No. 97-CE-67-AD, 901 Locust, Room 506, Kansas City, Missouri 64106.

Regulatory Impact

The regulations adopted herein will not have substantial direct effects on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government. Therefore, in accordance with Executive Order 12612, it is determined that this final rule does not have sufficient federalism implications to warrant the preparation of a Federalism Assessment.

For the reasons discussed above, I certify that this action (1) is not a "significant regulatory action" under Executive Order 12866; (2) is not a "significant rule" under DOT Regulatory Policies and Procedures (44 FR 11034, February 26, 1979); and (3) may have a significant economic impact, positive or negative, on a substantial number of small entities under the criteria of the Regulatory Flexibility Act.

List of Subjects in 14 CFR Part 39

Air transportation, Aircraft, Aviation safety, Safety.

Adoption of the Amendment

Accordingly, pursuant to the authority delegated to me by the Administrator, the Federal Aviation Administration amends part 39 of the Federal Aviation Regulations (14 CFR part 39) as follows:

PART 39 - AIRWORTHINESS DIRECTIVES

1. The authority citation for part 39 continues to read as follows:

Authority: 49 U.S.C. 106(g), 40113, 44701.

§ 39.13 [Amended]

2. Section 39.13 is amended by removing Airworthiness Directive (AD) 75-23-08 R5, Amendment 39-5451, and by adding a new AD to read as follows:

AIRWORTHINESS DIRECTIVE

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

U.S. Department
of Transportation
Federal Aviation Administration

The following Airworthiness Directive issued by the Federal Aviation Administration in accordance with the provisions of Federal Aviation Regulations, Part 39, applies to an aircraft model of which our records indicate you may be the registered owner. Airworthiness Directives affect aviation safety and are regulations which require immediate attention. You are cautioned that no person may operate an aircraft to which an Airworthiness Directive applies, except in accordance with the requirements of the Airworthiness Directive (reference 14 CFR part 39, subpart 39.3).

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	**Actions of Docket No. 97-CE-67-AD**	**Initial Compliance Time**	**Repetitive Compliance Times**
(b)	*Visually inspect the exhaust system.*	Within the next 50 hours TIS after the effective date of this AD or within the next 30 calendar days, whichever occurs later.	Thereafter at intervals not to exceed 50 hours TIS or 30 calendar days, whichever occurs later.
(c)	*Remove the tailpipes and visually inspect for any crack, corrosion, holes, or distortion.*	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.	Thereafter at intervals not to exceed 12 calendar months.
(d)	*Visually inspect the outboard engine beams, firewalls, and canted bulkheads.*	Within the next 100 hours TIS after the effective date of this AD.	Thereafter at intervals not to exceed 500 hours TIS.

Letters in ( ) correspond with AD paragraphs	Actions of Docket No. 97-CE-67-AD	Initial Compliance Time	Repetitive Compliance Times
(e)	*Inspect and pressure test the exhaust system.*	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.	Thereafter at intervals not to exceed 12 calendar months.
(f)	*Replace the multi- segment V-band clamps.*	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.	Thereafter at intervals not to exceed 500 hours TIS
(g)	*Remove the exhaust system from the slip joints aft to all turbo-charger components.*	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.	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.
Throughout the AD	*If any damage is found on any component or part, repair or replace the damaged component or part in accordance with this AD.*	Prior to further flight after damage is found.	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.

(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.

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

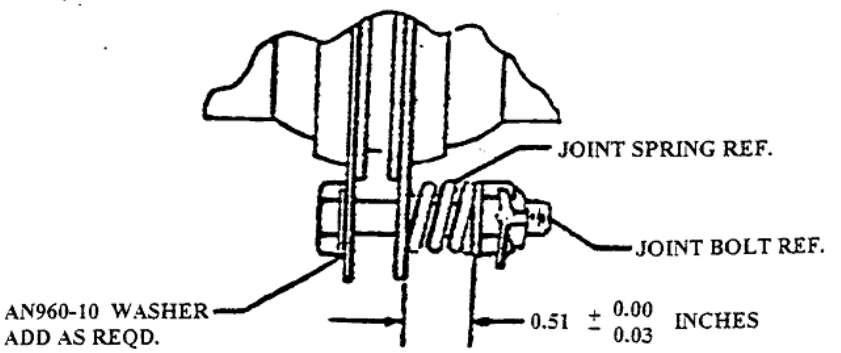
NOTE 1: Conduct this inspection when the engine is cool.

(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).



Typical Exhaust Joint Spring Installation

Figure 1 to the 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).

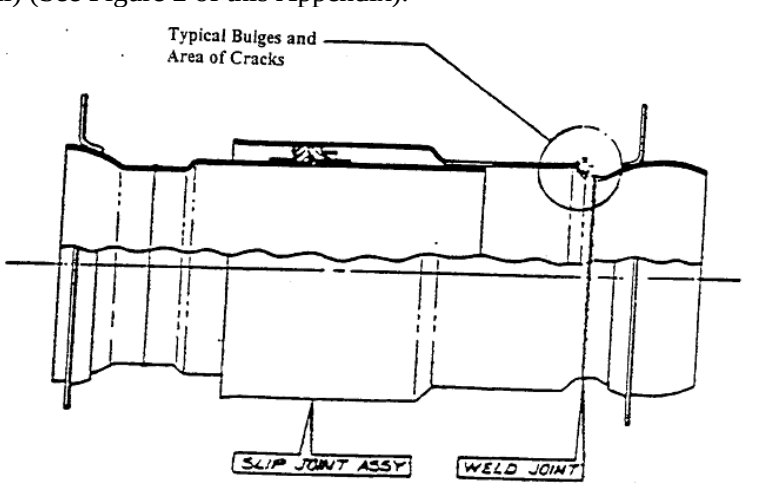


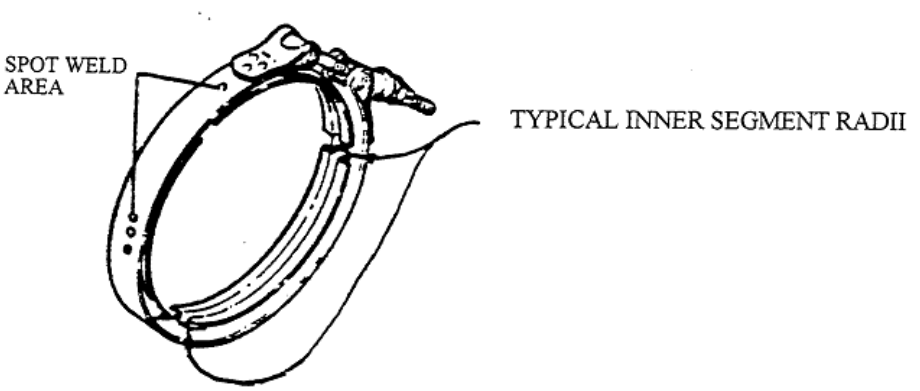
Figure 2 to the Appendix

(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:

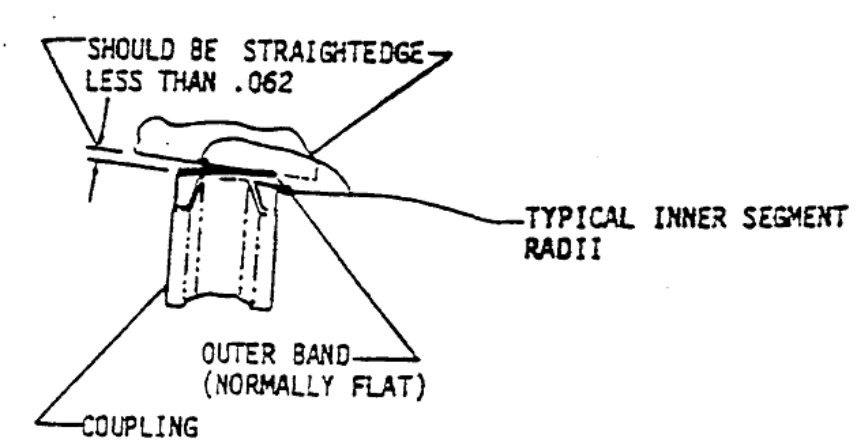
(i) Visually inspect the outer band in the area of the spot weld for cracks (see Figure 3 of this Appendix). If cracks are found, replace the clamp(s) with new multi-segment "V" band clamp(s).



Multi-Segment "V" Band Clamp

Figure 3 to the Appendix

(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.

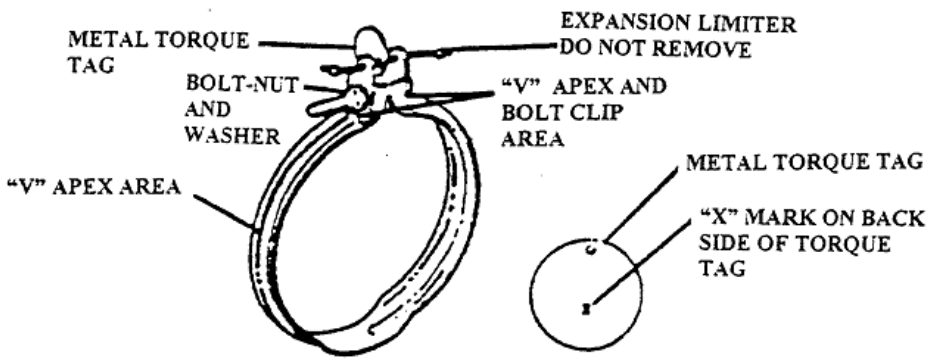


Multi-Segment "V" Band Clamp Outer Band Flatness Check

Figure 4 to the Appendix

(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 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.



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.