

Service Letter: 451

Date: March 18, 2020

Title: Bolt Wear at Exhaust Slip Joints

Models: 8KCAB and 8GCBC (AEIO-390-A1B6 or IO-390-A1B6 engine)

Description: Bolt wear and bracket cracking at the exhaust slip joints has been reported. This service letter provides instructions for replacement of the slip joint brackets, revisions to the slip joint hardware, and modification to the shroud. This service letter provides a revised 100-hour exhaust inspection (the 500-hour inspection provided in the AMM remains applicable).

American Champion is also aware of modifications to the exhaust using bushings at the slip joint. While this modification improves bolt wear it does not address abrasion of the bushing. Aircraft modified with bushings should use the 100-hour inspection procedure for the original slip joint brackets.

The inspection procedures described herein are not intended to be a substitute for a properly performed 100-hour / annual inspection. Refer to Advisory Circular (AC) 43.13-1B: Acceptable Methods, Techniques, and Practices: Aircraft Inspection and Repair.

Inspection (original slip joint): Inspect at every 100-hour or annual inspection

1. Remove lower portion of shroud wraparound (10 screws).
2. Inspect interior of shroud and tubes for sooting that may indicate an exhaust leak. Any leak within the shroud requires repair or replacement of the exhaust tubes.
3. Inspect exhaust tubes and collector for cracks, holes, burned spots, chaffing, and excessive sooting. Replace or repair exhaust components if integrity is compromised in any manner.
4. Remove AN3-14A bolts at slip joints and inspect bolts for condition (6 bolts). Inspect for wear at the slip joint brackets, shroud interface, and along the length of the bolt. If bushings are installed at the slip joint brackets, remove and inspect the bushings.
5. Inspect slip joint brackets for distortion and cracks per figure 1. Replace bracket with improved 11-1078-1 or 11-1078-2 if cracked or distorted.

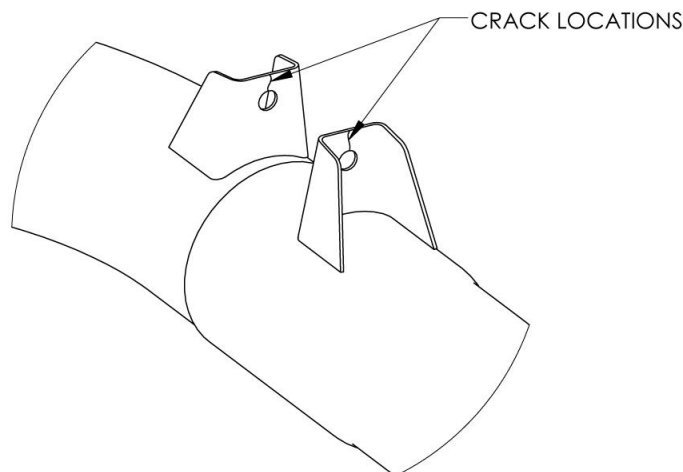


Figure 1, Crack Locations

6. Install AN3-14A bolts at slip joints per figure 2 (reuse or replace 6 bolts). If bushings were present, reinstall bushings (a longer AN3 bolt may be required). **DO NOT** over tighten bolt as cracking or distortion of bracket may occur. Bolt should be lightly tightened allowing for expansion and movement of the inner tube within the slip joint.

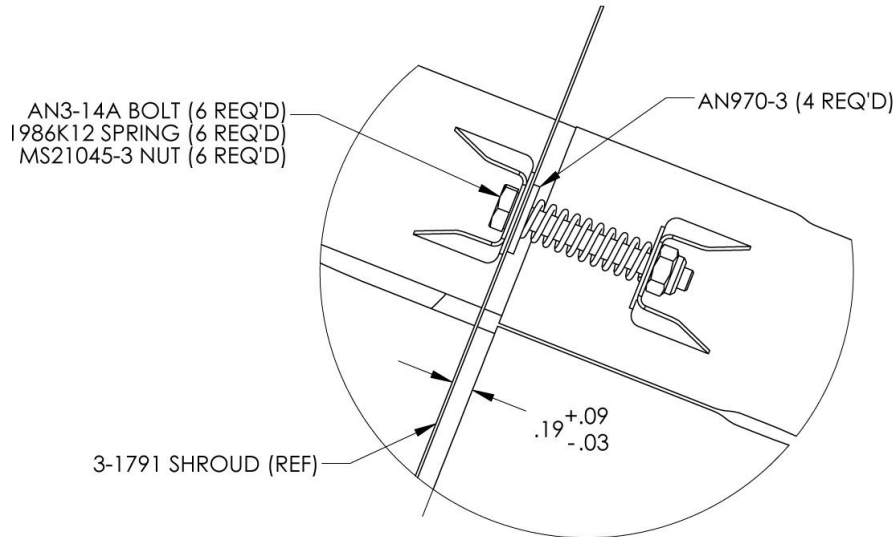


Figure 2, Original Slip Joint

7. Inspect condition of alternate air inlet flange and screen. Verify there is .060 inches or greater clearance between shroud and inlet flange. Verify the inlet flange is free of abrasion.
8. Inspect exhaust tube to shroud clearance; the minimum clearance is .094 inches. Remove material from shroud as required for clearance.
9. Reinstall lower portion of shroud wraparound (10 screws).
10. Inspect condition of exhaust hanger at collector.

Inspection (modified slip joint): Inspect at every 100-hour or annual inspection

1. Remove lower portion of shroud wraparound (10 screws).
2. Inspect interior of shroud and tubes for sooting that may indicate an exhaust leak. Any leak within the shroud requires repair or replacement of the exhaust tubes.
3. Inspect exhaust tubes and collector for cracks, holes, burned spots, chaffing, and excessive sooting. Replace or repair exhaust components if integrity is compromised in any manner.
4. Inspect slip joint brackets for distortion and cracks.
5. Inspect condition of alternate air inlet flange and screen. Verify there is .060 inches or greater clearance between shroud and inlet flange. Verify the inlet flange is free of abrasion.
6. Reinstall lower portion of shroud wraparound (10 screws).
7. Inspect condition of exhaust hanger at collector.

Modification of Slip Joint:

1. Remove and disassemble exhaust per the appropriate AMM.
2. Replace 11-1078 bracket with 11-1078-1 or 11-1078-2 bracket as shown in figure 3. Mark centerline and face of bracket before removal. Remove excess weld with 36688 (Superior Abrasives) or equivalent sanding disk. Position replacement bracket such that the attachment face is in the same location as the original (the base will shift .032 inches). Weld flanges of bracket per specification CW-1S or equivalent process. Remove weld penetration from inner surface of expanded tube.

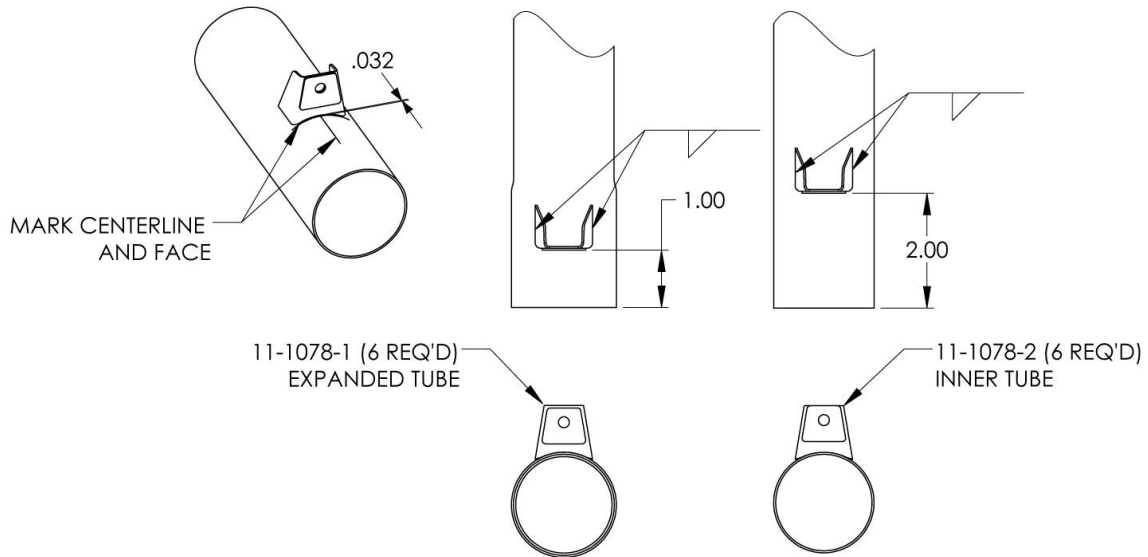


Figure 3, Bracket Installation

3. Position 92844A129 (McMaster-Carr) washer on outside face of shroud at $\text{Ø}.191$ attach holes (4 places). Weld washer to shroud per specification CW-1S or equivalent process, see figure 4.

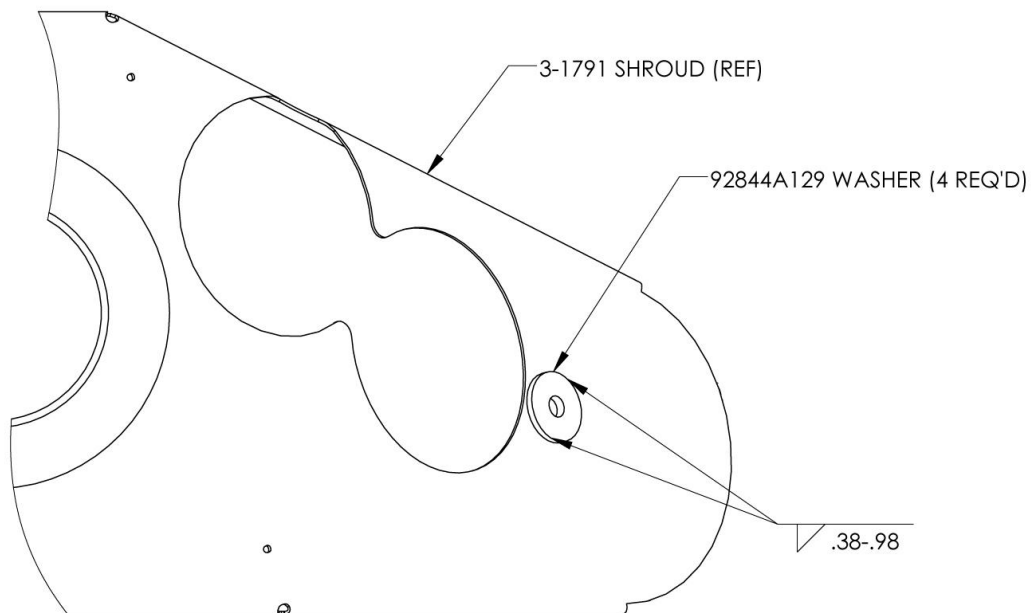


Figure 4, Washer Welded to Shroud (4 Places)

4. Lubricate all slip joints with nickel based anti-seize MIL-A-907 or equivalent.
5. Working from the collector forward, insert exhaust tubes into collector. Shroud panels should be installed concurrently with this step. The #3 and #4 cylinder tubes must be inserted through the shroud openings (from outside the shroud). The #1 and #2 cylinder tubes may be oriented later (positioned from inside the shroud).
6. Secure #1 and #2 exhaust tubes to the collector with AN3-15A bolts as shown in figure 5. **DO NOT** over tighten bolts as cracking or distortion of bracket may occur. Bolts should be tightened to the .19 inch dimension shown in figure 5 allowing for expansion and movement of the inner tube within the slip joint.

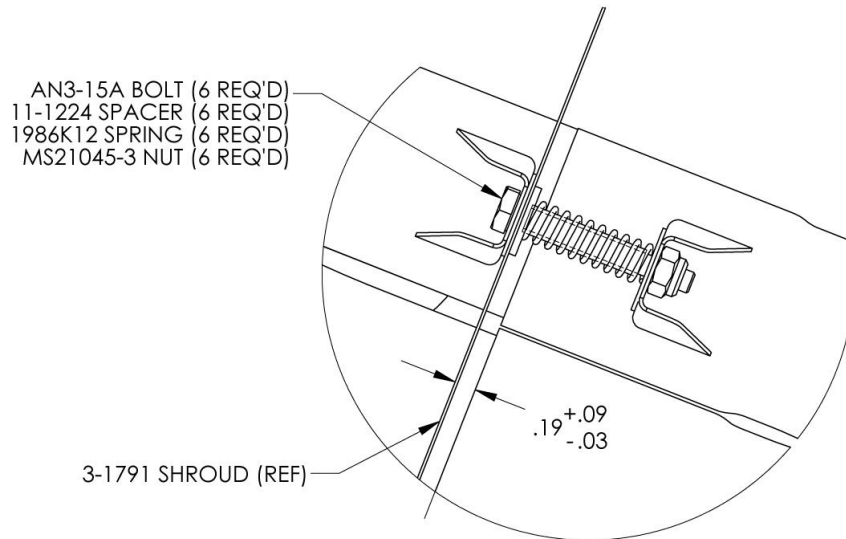


Figure 5, Modified Slip Joint

7. Insert exhaust risers into left and right side slip joints.
8. Secure #1, #2, #3, and #4 cylinder risers with AN3-15A bolts as shown in figure 5. **DO NOT** over tighten bolt as cracking or distortion of bracket may occur. Bolt should be tightened to the .19 inch dimension shown in figure 5 allowing for expansion and movement of the inner tube within the slip joint.
9. Install exhaust per the AMM.

Table I: Parts Required for Slip Joint Modification

Part Number	Description	Quantity
11-1078-1	Bracket	6
11-1078-2	Bracket	6
11-1224	Spacer	6
1986K12	Spring	0 (reuse 6)
92844A129	Washer	4
AN3-15A	Bolt	6
MS21045-3	Nut	6