

RECOMMENDED SERVICE BULLETIN**NUMBER:** SB14-11**REVISION:** 01**DATE:** 04/13/2016**SUBJECT:** POROUS PANELS FLOW – CAV ICE PROTECTION SYSTEM**EFFECTIVITY**

KODIAK® 100 airplanes certified prior to June 2013, or retrofitted with TKS ice protection system prior to June 2013.

SUMMARY

Quest has received two reports of wing porous panels that were not flowing correctly during operation and corrosion was found at the porous panel inlet. The cause of the corrosion is a set screw at the inlet that was installed with damaged plating. The attached document from CAV Aerospace provides instructions on inspecting and correcting flow rate issues at the panel caused by this corrosion. Airplanes outside of the effectivity described above have porous panels with stainless steel set screws installed, and corrosion is not a concern.

The airplane date of manufacture can be found on the data plate on the back of the airplane, on the left side.

COMPLIANCE

During the next 100 Hour or Annual Inspection, ensure the TKS porous panels operate as described in Chapter 5 of the *KODIAK 100® Airplane Maintenance Manual (AMM)*. If the flow rate is questionable on a particular panel, perform the attached inspection and procedure as needed.

ATTACHED DOCUMENTS

Document #:	Document Title:
CAV Aerospace Service Bulletin S.B.13002- XX-30-001	<i>Quest KODIAK® 100 Ice Protection System Porous Panels: Rework of Fluid Inlet Fitting with Corroded Set-Screw, Issue 2</i>

FAA APPROVAL STATUS

The resultant alteration (or repair) to the affected airplane described in the attached CAV service bulletin has been shown to comply with the applicable FAA regulations and is FAA approved.

SPECIAL INSTRUCTIONS

There can be multiple reasons for low flow or no flow at a particular porous panel. Follow all procedures in the AMM and contact Quest Aircraft Company Customer Service Department with any questions and concerns, or for further assistance.

CREDIT AND WARRANTY INFORMATION

Quest Aircraft Company will supply the set screw and CAP50 tool needed to comply with this Service Bulletin at no cost to owners of aircraft who have found corrosion at the inlet port. For aircraft under factory warranty, Quest® will reimburse for labor costs associated with this bulletin up to 3.5 man-hours for each set screw found corroded. Refer to Quest® warranty information regarding submitting invoices for reimbursement.

Quest Customer Service**Phone:** (208)263-1111 **Toll Free:** 1(866)263-1112**Email:** Customerservice@questaircraft.com

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S.B.13002-XX-30-001

QUEST KODIAK 100
ICE PROTECTION SYSTEM

POROUS PANELS

REWORK OF FLUID INLET FITTING
WITH CORRODED SET-SCREW

Issue	Date	Compiled	Checked	CAV Approved	Description
1	Dec 16/14	SJB	DRR	JLJ	New Document
2	Apr 16/15	SJB			Incorporate Quest Comments

CAV Ice Protection Ltd. Medomsley Road Consett Co Durham DH8 6SR U.K.	CAV Ice Protection Inc. 30 Leawood Drive New Century Kansas 66031 USA
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SERVICE BULLETIN

S.B.13002-XX-30-001

RECOMMENDED

QUEST KODIAK 100 ICE PROTECTION SYSTEM POROUS PANELS REWORK OF FLUID INLET FITTING WITH CORRODED SET-SCREW

1. PLANNING INFORMATION

A. Effectivity

(1) Applicable to Quest Kodiak 100 Aircraft.

(2) Components affected:

Description: Porous Panel

Part Number: 13002-61

Serial Numbers:

CAVI11F686	CAVI11G760	CAVI11H442	CAVI11K020
CAVI11K021	CAVI11K022	CAVI11K023	CAVI11K560
CAVI11K561	CAVI11K562	CAVI11K563	

Part Number: 13002-62

Serial Numbers:

CAVI11H426	CAVI11H427	CAVI11H732	CAVI11K024
CAVI11K025	CAVI11K026	CAVI11K027	CAVI11L421
CAVI11L422	CAVI11L423	CAVI11L424	

Part Number: 13002-63

Serial Numbers:

CAVI11F576	CAVI11F575	CAVI11G761	CAVI11G762
CAVI11J606	CAVI11J607	CAVI11J608	CAVI11J685
CAVI11K244	CAVI11K245	CAVI11K246	CAVI11K564

Part Number: 13002-64

Serial Numbers:

CAVI11F577	CAVI11F578	CAVI11H428	CAVI11H429
CAVI11J686	CAVI11J687	CAVI11J688	CAVI11J689
CAVI11K565	CAVI11K567	CAVI11K568	CAVI11M048
CAVI12F016			

Part Number: 13002-65

Serial Numbers:

CAVI11G764	CAVI11H733	CAVI11K058	CAVI11K059
CAVI11K060	CAVI11K061	CAVI11L124	CAVI11L125
CAVI11L126	CAVI11L137	CAVI12J031	

Part Number: 13002-66

Description: Porous Panel

Serial Numbers:

CAVI11F687	CAVI11F688	CAVI11G644	CAVI11G765
CAVI11K062	CAVI11K063	CAVI11K064	CAVI11K065
CAVI11L127	CAVI11L128	CAVI11L129	CAVI11L130

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Part Number: 13002-69

Serial Numbers:

CAVI11C160	CAVI11C162	CAVI11F583	CAVI11F584
CAVI11H635	CAVI11H636	CAVI11H677	CAVI11K303
CAVI11K304	CAVI11K305	CAVI11K540	CAVI11K569
CAVI11L425	CAVI11L426	CAVI11M192	

Part Number: 13002-70

Description: Porous Panel

Serial Numbers:

CAVI10H818	CAVI10H819	CAVI10H820	CAVI11F171
CAVI11H637	CAVI11H639	CAVI11K326	CAVI11K327
CAVI11K328	CAVI11K329	CAVI11L138	CAVI11L140
CAVI11L142	CAVI11L143	CAVI11M050	CAVI11M051
CAVI12E020	CAVI12H056		

Part Number: 13002-71

Serial Numbers:

CAVI11C163	CAVI11H472	CAVI11H473	CAVI11H474
CAVI11H678	CAVI11H679	CAVI11H734	CAVI11H735
CAVI11K416	CAVI11K571	CAVI11L428	CAVI11L429
CAVI11L430	CAVI11L601	CAVI12J167	

Part Number: 13002-72

Serial Numbers:

CAVI11C257	CAVI11D250	CAVI11F173	CAVI11F174
CAVI11F580	CAVI11G769	CAVI11G770	CAVI11H736
CAVI11H737	CAVI11K420	CAVI11K421	CAVI11K422
CAVI11K573	CAVI11K574	CAVI11L602	

Part Number: 13002-73

Description: Porous Panel

Serial Numbers:

CAVI11F581	CAVI11H431	CAVI11J690	CAVI11J691
CAVI11J692	CAVI11J693	CAVI11J694	CAVI11K247
CAVI11K248	CAVI11L300	CAVI11L431	

Part Number: 13002-74

Serial Numbers:

CAVI11F582	CAVI11H432	CAVI11H433	CAVI11J609
CAVI11J610	CAVI11J695	CAVI11K249	CAVI11K250
CAVI11K251	CAVI11K725	CAVI11L295	

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Part Number: 13002-75

Serial Numbers:

CAVI11C584	CAVI11B703	CAVI11C585	CAVI11D329
CAVI11D331	CAVI11D474	CAVI11H640	CAVI11K276
CAVI11K423	CAVI11K424	CAVI11K425	CAVI11K426
CAVI11L297	CAVI11L298	CAVI11L299	CAVI11M053.
CAVI12G466			

Part Number: 13002-87

Serial Numbers:

CAVI10G296	CAVI11D251	CAVI11D252	CAVI11D253
CAVI11D254	CAVI11E395	CAVI11G771	CAVI11G772
CAVI11K010	CAVI11K537	CAVI11K538	CAVI11K726
CAVI11L226	CAVI11L227	CAVI11L228	CAVI11M070

Part Number: 13002-88

Serial Numbers:

CAVI11D332	CAVI11C238	CAVI11C239	CAVI11D330
CAVI11E242	CAVI11E243	CAVI11G773	CAVI11G774
CAVI11J150	CAVI11J151	CAVI11K011	CAVI11K575
CAVI11K577	CAVI11L467	CAVI11L468	CAVI11L469

B. Concurrent Requirements

None

C. Reason

Some Porous Panel inlet fitting set-screws may have corroded as a result of damaged plating. This may cause a blockage of the inlet fitting rendering the Porous Panel inoperative.

D. Description

This Service Bulletin is accomplished by:

- (1) Inspection of Porous Panel inlet fitting to determine if the set-screw has corroded
- (2) Replacement of corroded set-screw if required.
- (3) Flow test of Porous Panel after replacement of set-screw.

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E. Compliance

- (1) The following information is classified as **RECOMMENDED**.
- (2) Service Bulletin shall be complied with within 100 flight hours or at annual inspection. Whichever occurs first.

F. Approval

Approval is under the authority of Quest Aircraft Company. This Service Bulletin must be accompanied by Quest Aircraft Company Service Advisory providing authorisation.

G. Manpower

Estimated time to accomplish this Service Bulletin:

Inspection of inlet fitting:	1.0 manhour per panel
Replacement of inlet and test of Panel:	2.5 manhours per panel

The cost of manpower may be redeemed via Quest Aircraft Company. The maximum amount reimbursed shall be at the Service Center's posted shop rates for manhours up to the estimated times given above.

H. Weight and Balance

No affect on weight and balance.

I. Electrical Load Data

No affect on electrical load data.

J. Software Accomplishment

Not applicable.

K. References

Quest Kodiak Aircraft Maintenance Manual (AMM)

L. Other Publications Affected

No other publications affected.

M. Interchangeability or Intermixability of Parts

Set-screws supplied as replacements are interchangeable/intermixable with unaffected items.

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2. MATERIAL INFORMATION
A. Material – Price and Availability

Replacement set-screws shall be provided at zero cost.

B. Industry Support Information

Warranty shall remain unaffected for any item modified in accordance with this Service Bulletin.

C. Material Necessary for Each Component

(1) Material to be Purchased (zero cost).

Part Number	Keyword	Qty per Panel	Applicable to Panel P/N
AN565-DC1032-H4	Set-Screw	1	13002-71, -72, -73, -74
AN565-DC1032-H5	Set-Screw	1	13002-61, -62, -63, 64, -65, -66, -69, -70, -75, -87, -88

(2) Material to be Supplied by Operator.

Part Number	Keyword	Qty
General Supply	Teflon Tape (Temporary Use)	As Reqd.
AMS-S-8802	Sealant	As Reqd.
Loctite 5772	Threadlocking Adhesive	As Reqd.
General Supply	Iso Propyl Alcohol	As Reqd.

D. Reidentified Parts

Not applicable.

E. Tooling

The following CAV P/N or equivalents will be required to carry-out Panel flow test following set screw replacement.

Part Number	Keyword	Qty
09305-01	Purge Cart	1
CAP50	Calibrated Restrictor	1
General Supply	Monopropylene Glycol	As Reqd.
General Supply	Clean (filtered) water	As Reqd.
General Supply	Trough	1
General Supply	Pressure Gauge	1
General Supply	Measuring Cylinders (0 to 25, 50, 100 & 250 ml/min)	1 each
General Supply	Viscosity Cup (#1 or #2 Zahn recommended)	1
General Supply	Hydrometer (0.990 to 1.160 recommended)	1

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CAUTION : Porous panels will be damaged by the use of certain solvents such as MEK and trichloroethane. Allow ONLY the following liquids to come into contact with porous panels: Isopropyl alcohol, water, soaps or detergents and water, monopropylene glycol, de-icing fluid.

A. Inspection

- (1) Gain access to the Porous Panel inlet connector by (Refer to AMM).
- (2) Inspect set screw through inlet connector using mirror and/or light source if required. Check for signs of corrosion/rust (ref. Figure 1).
- (3) If signs of corrosion exist carry out procedure according to Section 3.B. If no corrosion is evident, this Service Bulletin has been complied with, and no further action is required.
- (4) Refit pipeline. Restore aircraft in accordance with AMM.

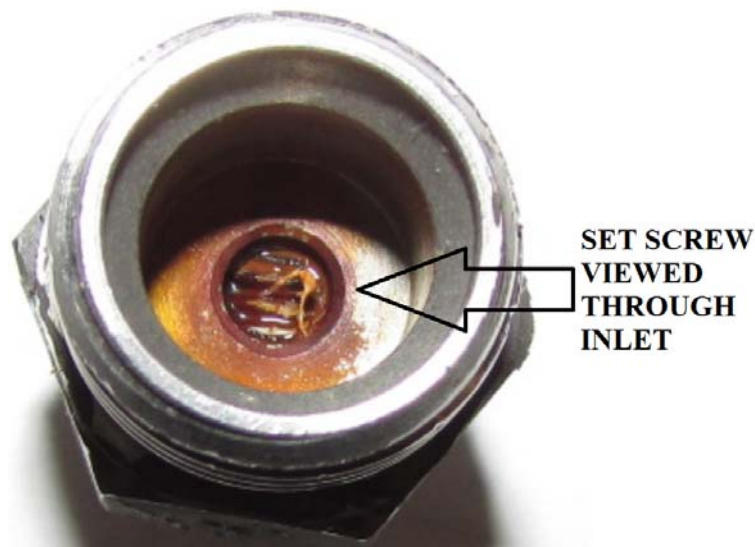


Figure 1. View of Inlet Connector Showing Corroded Set Screw

B. Procedure

- (1) If set screw shows signs of corrosion unscrew entire inlet connector from Porous Panel and remove from aircraft.
- (2) Inspect the inlet connector to establish whether the set screw has been set during factory calibration. If the set screw is not fully across the bore it

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has not been set, and can be replaced without the need to carry out a panel flow rate calibration check.

- (3) If the set screw has been set at the factory, carefully screw *into* the inlet fitting whilst counting the number of turns required to bottom it out.

NOTE : The set screw may require only 1 or 2 turns, so fractions of turns should be noted.

- (4) Fully remove and discard the corroded set screw.
- (5) Remove sealant from the inlet connector threads and remove any traces of corrosion and loose debris from the inlet fitting. Degrease with iso propyl alcohol.
- (6) Degrease the replacement set screw and apply threadlocking adhesive in accordance with manufacturer's instructions.
- (7) Fit set screw into inlet connector. If the set screw had *not* previously been set at the factory, screw in until the top is flush with the outside of the connector and 2 or 3 threads are visible in the bore. If the set screw had previously been factory set, screw fully in, and then unscrew the number of turns counted at 3.B.(3).
- (8) Where the screw had not been previously set at the factory, apply AMS-S-8802 sealant to the inlet connector threads and refit to Porous Panel. Allow sealant to cure and carry out Panel Pressure Test as given at Section 3.D.
- (9) Where the set screw had previously been factory set, it will be necessary to verify the setting of the replacement screw by carrying out a Panel Flow Rate Calibration Check as given at Section 3.C and, after allowing any sealants and adhesives to cure, a Panel Pressure Test as given at Section 3.D.
- (10) Perform TKS Ice Protection System Operational Check in accordance with AMM Chapter 30.
- (11) Restore aircraft in accordance with AMM and update aircraft records to indicate accomplishment of this Service Bulletin.

C. Panel Flow Rate Calibration Check

- (1) Apply Teflon tape to the inlet connector's threads and temporarily refit to Porous Panel.
- (2) Mix a quantity of monopropylene glycol with clean water (approximately 7:1 by volume) to obtain a Test Fluid that has a dynamic viscosity of 23.5

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+/-2.5 cP when measured at ambient temperature. Obtain kinematic viscosity with a viscosity cup and specific gravity (S.G.) with a hydrometer in accordance with the equipment manufacturer's instructions. Calculate dynamic viscosity by multiplying kinematic viscosity (cSt) by density, expressed in this case by specific gravity (S.G.) according to the following equation:

$$cP = (cSt)(S.G.)$$

Where: *cP* is dynamic viscosity measured in centiPoise
cSt is kinematic viscosity measured in centiStokes
S.G. is specific gravity ratio (density compared to water)

- (3) Fill Test Cart with Test Fluid.
- (4) Verify test set-up and fluid viscosity by connecting Test Cart outlet tube to the CAP50 calibrated restrictor with the pressure gauge teed in at a location upstream of and close to the restrictor (ref. Figure 1). Apply fluid to the restrictor at 3 +/- 0.1 psi. Using a measuring cylinder of an appropriate range collect fluid over a timed period of 1 minute to obtain the flow rate. Confirm this flow rate is 50ml/min +/- 5%. If this flow rate is not achieved, check fluid viscosity and test set-up. Revise fluid mixture and/or test set-up and re-check flow rate through restrictor until required flow rate is obtained.

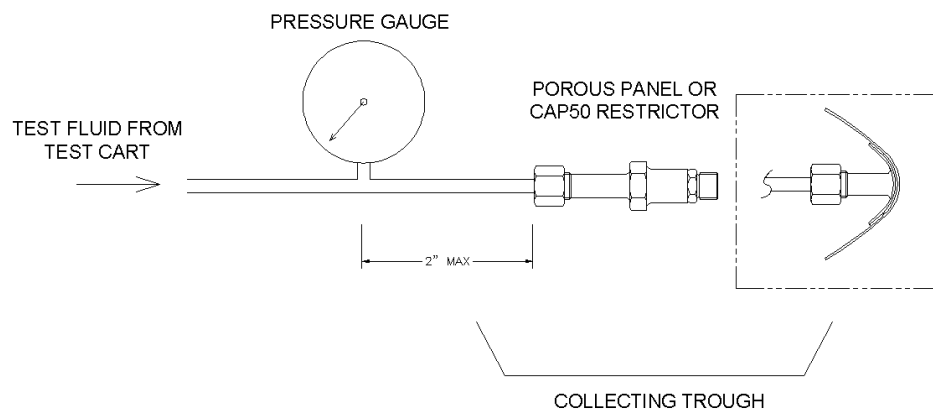


Figure 2. Test Set-Up

NOTE: The length of tube between pressure gauge inlet and Panel/restrictor inlet should be no more than 2". Ensure gauge is positioned level with the inlet.

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- (5) Connect Test Cart outlet tube to the Panel inlet with the pressure gauge teed in at a location upstream of and close to the inlet fitting (ref. Figure 1).
- (6) Position trough or similar beneath Porous Panel to collect fluid.
- (7) Apply pressure to Panel inlet. Gradually increase the pressure to 60 +/- 0.2 psi and maintain for 5 minutes to purge any air from the Panel membrane.
- (8) Reduce pressure so that the gauge reads 3 +/- 0.1 psi and collect fluid in a measuring cylinder of the appropriate range over a timed period of 1 minute to obtain the flow rate.
- (9) Recheck viscosity and density of collected fluid and correct value measured at 3.C.(8) to find the normalised flow rate according to the following calculation:

$$Q_i = \left(\frac{cP}{23.5} \right) Q_o$$

Where: Q_i is normalized flow rate measured in ml/min
 cP is the dynamic viscosity measured during the test
 23.5 is the normalized dynamic viscosity value
 Q_o is measured flow rate measured in ml/min

- (10) Compare the normalised volumetric flow rate to the acceptance limits given in the following Table.

Panel Part Number	Maximum Flow Rate (ml/min)	Minimum Flow Rate (ml/min)
13002-61/-62	17.6	11.8
13002-63/-64	37.8	25.2
13002-65	25.1	16.7
13002-66	28.1	18.7
13002-69/-70	118.9	79.3
13002-71/-72	73.1	48.7
13002-73/-74	22.2	14.8
13002-75	31.7	21.1
13002-87/-88	96.6	64.4

- (11) Remove connector. If measured flow rate value is within limits remove Teflon tape and refit to Porous Panel using AMS-S-8802 sealant on threads. If measured flow rate value is outside limits, adjust set screw by screwing-in to reduce flow rate or out to increase. Replace fitting using temporary Teflon tape and recheck flow rate according to Section 3.C.

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D. Panel Pressure Test

- (1) Use Test Cart filled with Test Fluid as per Section 3.C. Connect Test Cart outlet tube to the Panel inlet with the pressure gauge teed in at a location upstream of, and close to the fitting.
- (2) Position trough or similar beneath Porous Panel to collect fluid.
- (3) Apply pressure to the Panel inlet. Gradually increase the pressure to 60+/- 0.2 psi and maintain for 5 minutes whilst inspecting the inlet fitting and set screw for signs of leakage.
- (4) If leakage is observed at the inlet connector/panel interface remove the inlet connector, remove sealant and clean up threads with iso propyl alcohol. Inspect the panel inlet for debris and clean as required. Re-apply AMS-S-8802 sealant and refit entry connector.
- (5) If leakage is observed around the entry connector grub screw, remove the entry connector assembly and repeat Sections 3.B.(5) thru 3.B.(11), and Sections 3.C and 3.D.

E. Functional Test

- (1) Refer to AMM Chapter 30 TKS Ice Protection System Operational Check