

What if I told you those teardown reports have more meaning that you realize?



THE VALUE OF THOSE TEARDOWN REPORTS

DISCUSSION TOPICS:

- **What are Teardown Reports?**
- **How airlines use them to analyze Short Term Escalations in their Maintenance Program**
- **How airlines use them to evaluate Reliability issues**
- **How you can use them to review the validity of Warranty Claims**
- **How they can be used to evaluate candidates for DER Repairs**
- **Other uses and comments**



UP NEXT:

- **What are Teardown Reports?**



So....what's a Teardown Report?



- Tear-down reports may go by many names such as ‘Work-Shop Reports’, ‘Shop Findings’, and ‘Work Order’, among others. **Essentially, they are a summary of the work performed, parts replaced, the reason those parts were replaced, and other pertinent data.**
- Generally, the regulations of the respective country’s Civil Aviation Authority require such information be recorded when aircraft components are being repaired and overhauled.
- **The tear-down report accompanies the Airworthiness Release Certificate such as an EASA Form 1 or FAA 8130-3.**

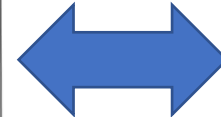


TYPICAL 8130-3 and its Teardown Report

1. Approving Civil Aviation Authority/Country: FAA/UNITED STATES		2. AUTHORIZED RELEASE CERTIFICATE FAA FORM 8130-3, AIRWORTHINESS APPROVAL TAG		3. Form Tracking Number: RE2135	
4. Organization Name and Address: 630 Aerospace, Inc. 13930 NW 60th Ave Miami Lakes, FL 33014 USA Ph: 754-208-3737, Fax: 305-503-6843 FAA Approval Holder: SYTR070K				5. Work Order/Contract/Invoice Number: COM13247	
6. Item	7. Description:	8. Part Number:	9. Quantity:	10. Serial Number:	11. Status/Work:
1	COMMON NOZZLE ASSY	745-1101-507	1.00	8639001	OVERHAULED
12. Remarks: Performed detailed visual inspection and Overhauled Common Nozzle Assembly as per ref. Goodrich CMM 78-11-11 (Revision No. 43/ Dated Feb 1, 2021), V2500 SPM 70-39-00 (Revision 109 Dated 04/01/2020), Goodrich SRM 54-40-00 (Revision No. 42 / Dated Feb 1, 2020) and 630 Aerospace Repair Specification No. 630-RS-0015 REV. IR Dated 01-14-2021 630 Aerospace, Inc. "Certifies that the work specified in block 11/12 was carried out in accordance with EASA Part-145 and in respect to that work the component is considered ready for release to service under EASA Part-145 Approval Number: "EASA 145.5217"					
13a. Certifies the items identified above were manufactured in conformity to: ☐ Approved design data and are in a condition for safe operation. ☐ Non-approved design data specified in Block 12		14a. ☒ 14 CFR 43.9 Return to Service ☒ Other regulation specified in Block 12 Certifies that unless otherwise specified in Block 12, the work identified in Block 11 and described in Block 12 was accomplished in accordance with Title 14, Code of Federal Regulations, part 43 and in respect to that work, the items are approved for return to service.			
13b. Authorized Signature:		13c. Approval Authorization No.:		14b. Authorized Signature: 	
13d. Name (Typed or Printed):		13e. Date (dd/mm/yyyy):		14c. Approval/Certificate No.: SYTR070K	
				14d. Name (Typed or Printed): Victor M. Castro	
				14e. Date (dd/mm/yyyy): 09-Mar-2021	
User/Installer Responsibilities It is important to understand that the existence of this document alone does not automatically constitute authority to install the aircraft engine/propeller/article. Where the user/installer performs work in accordance with the national regulations of an airworthiness authority different than the airworthiness authority of the country specified in Block 1. It is essential that the user/installer ensures that his/her airworthiness authority accepts aircraft engine(s)/propeller(s)/article(s) from the airworthiness authority of the country specified in Block 1. Statement in Blocks 13a and 14a do not constitute installation certification. In all cases aircraft maintenance records must contain an installation certification issued in accordance with the national regulations by the user/installer before the aircraft may be flown.					

FAA Form 8130-3 (02-14)

NSN:0052-00-012-9005

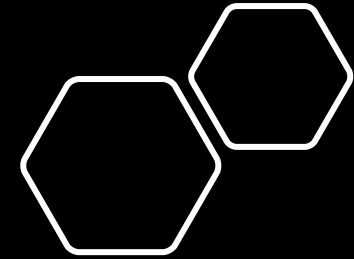


 630 Aerospace, Inc. 13930 NW 60th Ave Miami Lakes, FL 33014 USA Ph: 754-208-3737, Fax: 305-503-6843 630repair@630aerospace.com		Tear Down/Inspection Ref #: COM13247 Date Printed: 3/9/2021
TO: ALARIS AEROSPACE SYSTEMS LLC. 1721 BLOUNT ROAD SUITE 1 POMPANO BEACH, FL 33069 USA		Ship To: ALARIS AEROSPACE SYSTEMS LLC. 1721 BLOUNT ROAD Suite 1 POMPANO BEACH, FL 33069
Ref #: RE2135 Code: 106 Qty: 1 Make:	Phone: 954-596-8736 Site: Station: Model:	Fax#: 954-596-8737 PN: 745-1101-507 Descr: COMMON NOZZLE ASSY MFG:
TSN:	TSO:	TSR:
CSN:	CSO:	CSR:
S/N: 8639001 Replaced sealing plates as per ref IAE V2500 SPM 70-39-00.		
Discrepancy CNA 6 o'clock fitting shims need to be replaced for final installation/rigging. (IPL Fig. 2-460, 470)		
Corrective Action Replaced shims as per ref Goodrich CMM 78-11-11.		
Discrepancy CNA has all seals deteriorated/flat except for 12 o'clock fire seals. (IPL Fig. 2-550, 560, 570 / IPL Fig. 4-220, 420, 600, 610, 680, 690, 780)		
Corrective Action Replaced seals as per Goodrich CMM 78-11-11 Repair 005, 006, and 008.		
Discrepancy CNA Aerodynamic sealant found deteriorated. Replace as necessary.		
Corrective Action Replaced sealant as per ref Goodrich CMM 78-11-11.		
Discrepancy CNA has a previous blendout due to a lightning strike on the aft ring measuring 0.50" x 0.15" located between 4 and 5 o'clock.		
Corrective Action Blendout not accomplished with a correct blend to depth ratio, repaired as per Goodrich SRM 54-40-00 Repair 009.		
Discrepancy CNA exit nozzle assembly LH and RH skins have a previous repair. LH Skin has a repair at 12 o'clock leading 9.5" downwards. RH skin has a repair at 12 o'clock leading 11.25" downwards. Both repairs are corroded.		
Corrective Action Replaced Skin as per Goodrich SRM 54-40-00 Repair 004.		
Discrepancy CNA titanium outer barrel outer skin has a previous repair measuring 4.00" x 4.00" located at approx. 4 o'clock, on fwd edge of skin.		
Corrective Action No repairs found for damage on edge of skin. Repair as per an 630 aerospace ERO # 630-RS-0015.		
Discrepancy CNA titanium outer barrel outer skin has a previous repair measuring 4.50" x 6.50", located at approx. 9 o'clock, 13.00" from aft edge of skin.		
Corrective Action Repair found to have been accomplished as per Goodrich SRM 54-40-00 Repair 011. Inspected and found no discrepancies, no further action		
Form SRS003		Revision: 2
		26 SEP 2018



UP NEXT:

- **How airlines use them to analyze Short Term Escalations in their Maintenance Program**





How airlines use them to analyze Short Term Escalations in their Maintenance Program

OVERHAUL AND REPLACEMENT SCHEDULE (Cont'd)

ITEM

OVERHAUL OR REPLACE

FLIGHT CONTROLS (Cont'd)

Flap Actuators and 90° Drives

Every 10,000 cycles.

Flight Controls

On Condition (Any bulges, splits or damages in any push rod is cause for replacement unless otherwise specified. Any bent or cracked turnbuckle or end fitting is caused for replacement. Any crack in a casting or control system component is cause for replacement. Any broken cable strands or evidence of corrosion in any control system component is cause for replacement unless otherwise specified.

Flap Flexible Shaft

Every 10,000 cycles.

Rudder Tab Actuator

On Condition (Check end play per Chapter 27).

Elevator Tab Actuator

On Condition (Check end play per Chapter 27).

Horizontal Stabilizer Actuator

After the first 2,000 hours of actuator service and every 2,000 hours thereafter, the actuators must be load tested per Chapter 27-40-00. Overhaul at 20,000 hours.

Here's a typical aircraft Overhaul and Replacement Schedule excerpt.

It is these stated cycles or hours which may be desirable to escalate



How airlines use them to analyze Short Term Escalations in their Maintenance Program

U.S. Department
of Transportation
Federal Aviation
Administration

Operations Specifications

D076 . Short-Term Escalation Authorization

HQ Control: 03/17/2020

HQ Revision: 040

a. Subject to the following conditions, limitations, and prohibitions, the certificate holder is authorized to escalate scheduled maintenance intervals, on a short-term basis, for check packages, check package individual line items, or component time-change/task intervals.

b. The conditions, procedures, and standards for the technical evaluation and implementation of short-term escalation of scheduled maintenance intervals must be defined in the certificate holder's manual and must reflect the following policy:

(1) The basis for a short-term escalation is the emergence of some unforeseen situation; however, the use of short-term escalations must be supported solely on a technical analysis. It cannot be used to compensate for marketing requirements, flight scheduling requirements, poor maintenance practices, or poor maintenance program management.

In order to implement Short Term Escalations, the airline must be authorized to do so by D076 Operation Specification (Op-Spec) as noted here



How airlines use them to analyze Short Term Escalations in their Maintenance Program

5. The VP of Maintenance, Director of Maintenance, Chief Inspector, and the Chief Records Officer may authorize an escalation. They must perform the following technical evaluation prior to authorizing an escalation:
- a. Instructions and prohibitions are listed in D076 and the most current copy of D076 should be reviewed prior to authorization.
 - b. Review the history of the affected aircraft, aircraft system or component to ascertain that the proposed escalation does not compromise the airworthiness of any aircraft or create any safety of flight issues.
 - c. Determine that no collisions with the D076 “prohibitions” list exist or might be created during the proposed escalation period. Consider that items prohibited from escalation by D076 could be embedded in an escalated interval inspection/check package being analyzed.
 - d. Analyze previous inspection results and/or previous teardown reports if the escalation authorization applies to:
 - i. powerplants; powerplant accessories and components
 - ii. propellers and gearboxes
 - iii. airframe accessories and components

**Here is a
typical
airline
General
Maintenance
Manual
(GMM)
excerpt**



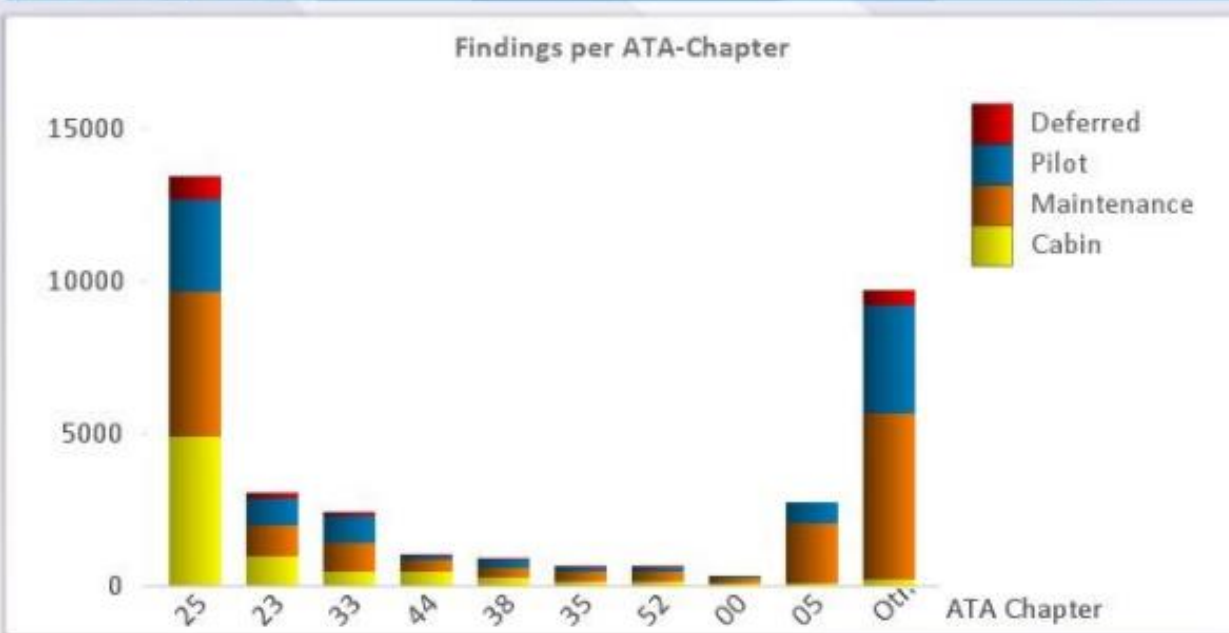
UP NEXT:

- **How airlines use them to evaluate Reliability issues**



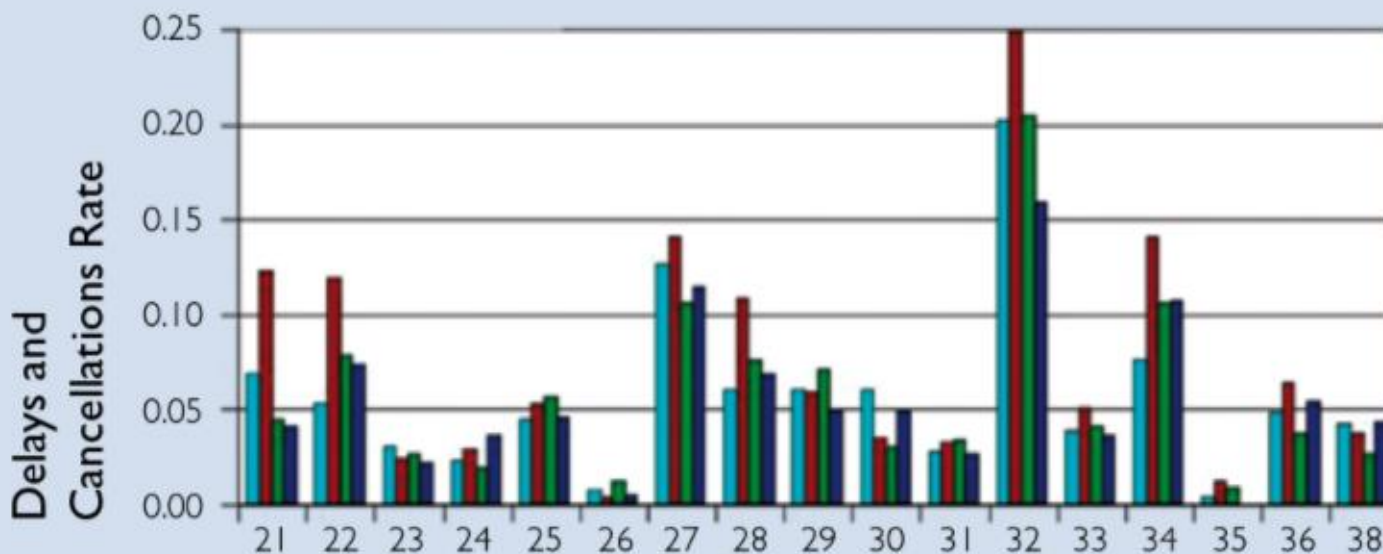
How airlines use them to evaluate Reliability issues

ATA-Chapter



Here are excerpts of the raw number of Writeups, PIREPs, and or Findings trending by ATA Chapter

“Alert Levels” are established, and when an ATA chapter is above the Alert Level, the airline’s resources are assembled to address the circumstances and mitigate the caused.





How airlines use them to evaluate Reliability issues

The Avionics Maintenance Conference under the auspices of the AMC brings together Airlines and OEMs to discuss reliability issues sorted by ATA chapters



The Aviation Maintenance Conference (AMC) **contributes to increased reliability** and maintainability which results in reduced operating costs for aircraft components and aircraft electronic systems. These contributions are achieved through the internationally acclaimed Aviation Maintenance Conference and the development of technical standards.

Attended by more than 750 avionics and mechanical maintenance experts from around the world, the annual conference identifies technical solutions to maintenance issues resulting in immediate and long-term maintenance improvements and cost savings.



How airlines use them to evaluate Reliability issues

So Royboy, lets look at a real-world issue

For a given airline, chapter 33 (Lighting) was exhibiting reliability issues and was over the alert level.

This is a redacted posting from one of the discussion items:

“An analysis of 124 landing light assemblies’ **teardown reports** was accomplished over the period xx/xx/xx to xx/xx/xx with the top issues reported as lens cracked/broken (77%), wire harness cracked/broken (77%), and lamp harness open (61%). (Airline) xxx and **(OEM) xxx reviewed a corrective action plan to improve the lamp harness with a service loop (bulletin).** (Airline) xxx has just implemented this so it’s too early see if this action will correct the harness issues.”





UP NEXT:

- **How you can use them to review the validity of Warranty Claims**



**This is covered under
the Warranty Period!**



**But only for the work that
was previously performed**





How you can use them to review the validity of Warranty Claims

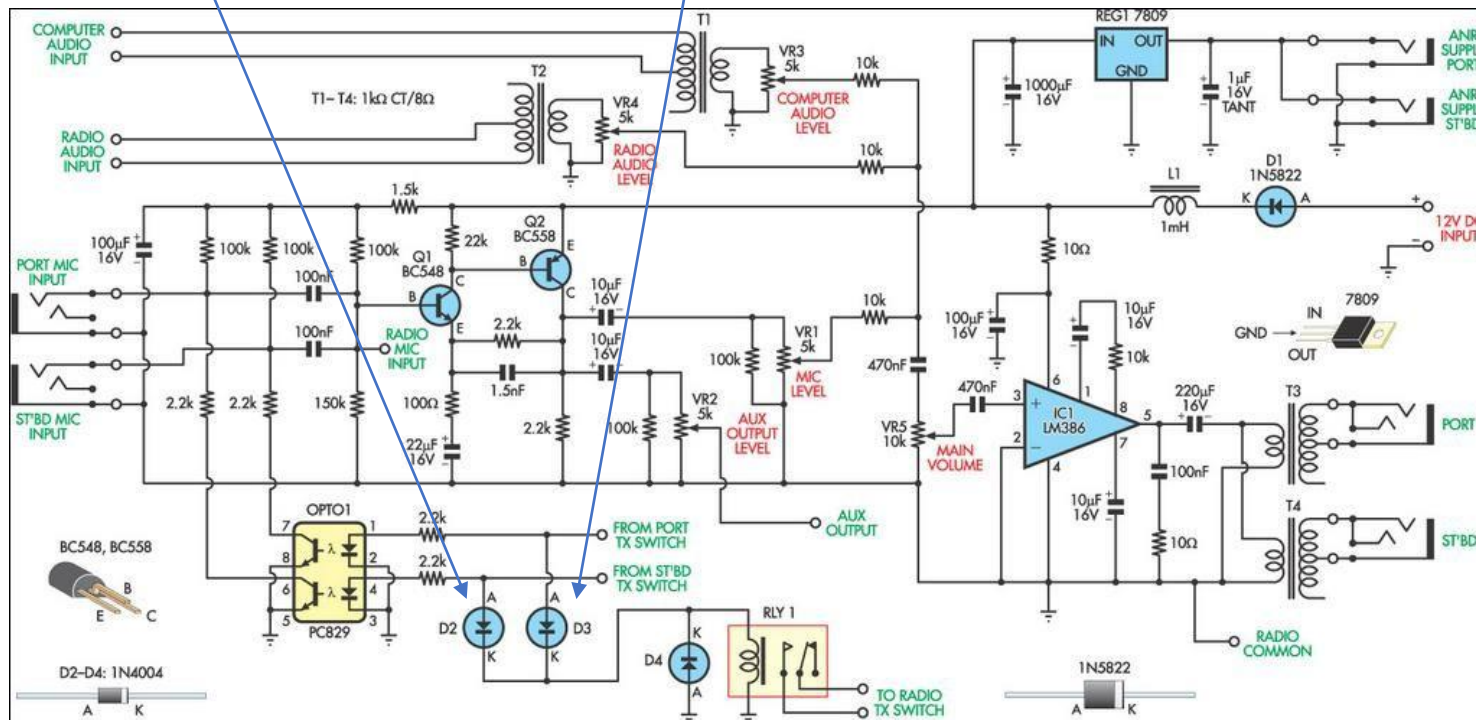
A tail of two repair scenarios: Scenario 1:

Audio Control **first shop visit:**

D2 failed and was replaced, but the **Teardown only stated “Repaired Amplifier”**

Audio Control **Second shop visit within the warranty period:**

D3 failed and was replaced, and the **Teardown only stated “Repaired Amplifier”**



Since both reports stated the same thing:

“Repaired Amplifier”

you can expect the owner of the part to demand a warranty repair, and the shop to contest it; this due to the lack of specificity in the shop statements

The shop likely will win its defense that the warranty does not apply.



UP NEXT:

- **How they can be used to evaluate candidates for DER Repairs**



How they can be used to evaluate candidates for DER Repairs

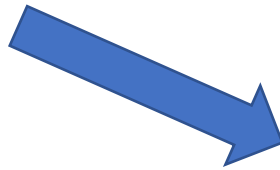
Actual Teardown Report excerpt:

Discrepancy

CNA titanium outer barrel outer skin has a previous repair measuring 4.00" x 4.00" located at approx. 4 o'clock, on fwd edge of skin.

Corrective Action

No repairs found for damage on edge of skin.



Typically, this is going to end up as scrap or placed indefinitely in Quarantine



How they can be used to evaluate candidates for DER Repairs

Careful analysis of these Teardown Reports for scrapped parts can reveal a pattern of common failures for which an OEM repair does not exist...

In which case a DER Repair Specification could be a solution.



U.S. DEPARTMENT OF TRANSPORTATION FEDERAL AVIATION ADMINISTRATION STATEMENT OF COMPLIANCE WITH AIRWORTHINESS STANDARDS				1. DATE February 24, 2021
AIRCRAFT OR AIRCRAFT COMPONENT IDENTIFICATION				
2. MAKE Airbus	3. MODEL NO. A320-231, A320-232, A320-233	4. TYPE (Aircraft, Engine, Propeller, etc.) Aircraft	5. NAME OF APPLICANT Systems Repair SVC Co. NOTE 6 (Repair Station SYTR070K)	
LIST OF DATA				
6. IDENTIFICATION 630-RS-0015, Revision IR, dated 01/14/2021, pages 1-7 FAA 630-RS-0015, Revision IR, dated February 23, 2021, pages 1-7 --END--		7. TITLE Authorize Patch Repair of External CNA Skin FAA Substantiation for Authorize Patch Repair of External CNA Skin Notes: 1) This approval is for the engineering design data only. It indicates the data listed above demonstrates compliance only with the regulations specified by paragraph and subparagraph listed below as "Applicable Requirements". 2) This form constitutes FAA approval of all the engineering data necessary for substantiation of compliance to necessary requirements for the entire repair. 3) Assessment of the Instructions for Continued Airworthiness (ICA) concludes that no new ICAs are necessary to provide for future maintenance of components incorporating this repair design data. 4) AC 43-13-1B, AC 120-77, and Order 8110.37F were utilized as guidance for evaluation and approval of this data package. 5) This approval requires additional review and approval 630-RS-0015 by RS-DER per order 8110.37F. 6) Dba 630 Aerospace 7) Michael Schwetz of the Boston ACO delegated authorization to approve this repair on February 24, 2021		
8. PURPOSE OF DATA: Multiple Use Major Repair data in support of a repair specification for Systems Repair SVC Co. (Repair Station SYTR070K) repair of Airbus A320 Series V2500 Common Nozzle Assembly.				
9. APPLICABLE REQUIREMENTS (List specific sections): 14 CFR 25.601 Amdt. 25-0 [General], 25.603 (all) Amdt. 25-46 [Materials], 25.939 (a) Amdt. 25-40 [Turbine Engine Operating Characteristics], 25.1123 (a)(b) Amdt 25-40 [Exhaust Piping]				
10. CERTIFICATION - Under authority vested by direction of the Administrator and in accordance with conditions and limitations of appointment under 14 CFR Part 183, data listed above and on attached sheets numbered <u>as listed above</u> have been examined in accordance with established procedures and found to comply with applicable requirements of the Airworthiness Standards listed. ☐ Recommend approval of these data ☒ Approve these data I (We) Therefore				
11. SIGNATURE(S) OF DESIGNATED ENGINEERING REPRESENTATIVE(S)		12. DESIGNATION NUMBERS(S)	13. CLASSIFICATION(S)	
			Chart E (Engines) Chart B (Powerplant) Major Repair/ Major Alteration	



How they can be used to evaluate candidates for DER Repairs

Now, the part which would otherwise be scrapped, is repaired and approved for return to service.

1. Approving Civil Aviation Authority/Country: FAA/UNITED STATES		2. AUTHORIZED RELEASE CERTIFICATE FAA FORM 8130-3, AIRWORTHINESS APPROVAL TAG			3. Form Tracking Number: RE2135
4. Organization Name and Address: 630 Aerospace, Inc. 13930 NW 60th Ave Miami Lakes, FL 33014 USA Ph: 754-208-3737, Fax: 305-503-6843 FAA Approval Holder: SYTR070K		5. Work Order/Contract/Invoice Number: COM13247			
6. Item	7. Description:	8. Part Number:	9. Quantity:	10. Serial Number:	11. Status/Work:
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12. Remarks: Performed detailed visual inspection and Overhauled Common Nozzle Assembly as per ref. Goodrich CMM 78-11-11 (Revision No. 43/ Dated Feb 1, 2021), V2500 SRM 70-39-00 (Revision 109 Dated 04/01/2020), Goodrich SRM 54-40-00 (Revision No. 42 / Dated Feb 1, 2020) and 630 Aerospace Repair Specification No. 630-RS-0015 REV. IR Dated 01-14-2021 630 Aerospace, Inc. "Certifies that the work specified in block 11/12 was carried out in accordance with EASA Part-145 and in respect to that work the component is considered ready for release to service under EASA Part-145 Approval Number: "EASA 145.5217"					

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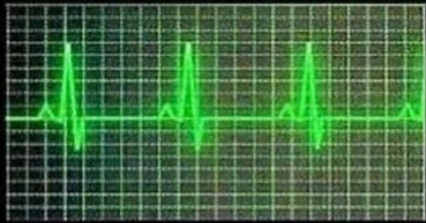
Corrective Action

No repairs found for damage on edge of skin. Repair as per an 630 aerospace ERO # 630-RS-0015.

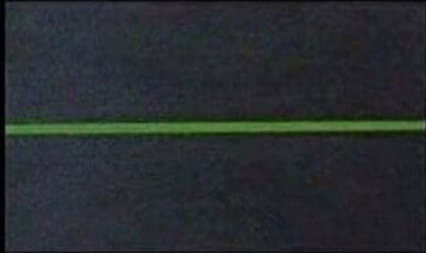


UP NEXT:

- **Other uses and comments**



Normal heartbeat



Deceased heartbeat



Missing tool



Other uses and comments

Can Also be used for: To verify AD Accomplishment Status

Discrepancy

LH fan cowl verified compliance with Easa AD 2016-0257, Goodrich SB RA32071-163

Corrective Action

Verified compliance with EASA AD 2016-0257 , Goodrich SB RA32071-163 found previously accomplished, need reidentify data plate with new PN 642-3001-513

Discrepancy

LH fan cowl verified compliance with EASA AD 2014-0276, Goodrich SB RA32071-151 and FAA AD 2016-02-02 SB A320-71-1062/SB RA32071-151.

Corrective Action

Verified compliance with EASA AD 2014-0276 , Goodrich SB RA32071-151 and FAA AD 2016-02-02 SB A320-71-1062/SB RA32071-151. found previously accomplished.



Other uses and comments

Can Also be used for:

From an airline auditor who performed repair station audits and reviewed the Teardowns:

“There were too many occasions where the teardown report listed the parts they replaced and during an audit we would discover that the parts used were PMA parts not approved by the airline. Not to get into the PMA issue but some airlines have to approve the use of the PMA part in their maintenance program and this can be a real problem if the repair supplier used one without permission. This could even be a problem later down the road if that rotatable were offered to an airline and the subject were to come up in the purchase discussions.”

“To make matters more complicated, it was a common practice during audits to ask the repair supplier to provide certification paperwork for the parts they listed in the teardown report or shop order only to find that the certs were missing or were not from a qualified source. Worst case scenario found that the installed parts were unapproved. The same can be said for the test equipment needed. The teardown report and shop order gave us a roadmap of what and where to look for “stuff”.”



Other uses and comments

Royboy's Closing Comments:

Be aware that most repair stations/AMOs don't give you all the maintenance data records which were created during the maintenance activity. *In many cases you only get a summary.* If, for whatever reason you are performing research and analysis on your parts, ask the repair station/AMO for the additional records.



Special mention and thanks to Mr. Andrew Somar (4th from right next to me) and 630 Aerospace for use of their documentation.





AVAILABLE FOR YOUR CONSULTING NEEDS:

Roy Resto: royresto@aol.com, 414-467-3063

WWW.AimSolutionsConsulting.com



Roy Resto is an experienced aviation industry professional having served in management positions with several firms, and is currently heading AIM Consulting Solutions. Most recently he was Vice President of Technical Operations for Tracer Corp. and Messier-Bugatti-Tracer, a family of aviation companies. Prior to this position, he was the COO of Quality Management Solutions LP, a consulting firm specializing in aircraft maintenance. In addition, Roy worked with American Airlines in their Maintenance and Engineering center where he retired as a level 5 Manager, and before that, with McDonnell Douglas. He was also a member of the US Air Force in the Reserves/ANG having served 32 years in Electronic Warfare and Avionics. Resto has served on the FAA's Suspected Unapproved Parts Steering Committee and the Aviation Suppliers Association Board of Directors.

Roy has an MBA in Finance from Oklahoma City University, a BS from Oklahoma State University, an AAS in Avionics from the Community College of the Air Force, and is an Aviation High School graduate. Complementing these, he has an FAA A&P license, an FCC Radiotelephone license with a RADAR endorsement, is an FAA DAR (Designated Airworthiness Representative), Instrument Rated Pilot, and speaks fluent Spanish. His website is: www.AimSolutionsConsulting.com





THANK YOU SO MUCH!

