



NATIONAL TRANSPORTATION SAFETY BOARD

Office of Aviation Safety
Washington, D.C. 20594

March 29, 2018

Maintenance Records – Factual

NTSB No: DCA18MA142

A. ACCIDENT

Operator: Southwest Airlines
Location: Philadelphia, Pennsylvania
Date: April 17, 2018
Time: 11:03 Eastern Daylight Time¹
Airplane: Boeing 737-7H4, Registration Number: N772SW, Serial No: 27880

B. MAINTENANCE RECORDS GROUP

Group Chairman: Gregory Borsari
National Transportation Safety Board
Washington, DC

Member: Angie Miller
Southwest Airlines
Dallas, Texas

Member: Gary Watson
Federal Aviation Administration
Dallas, Texas

Member: Scott McNabb
Aircraft Mechanics Fraternal Association
Dallas, Texas

¹ All times are Eastern Daylight Time (EDT) based on a 24-hour clock, unless otherwise noted. Actual time of accident is approximate.

C. SUMMARY

On April 17, 2018, at 1103 eastern daylight time, Southwest Airlines flight 1380, a Boeing 737-700, N772SW, experienced a left engine failure and loss of engine inlet and cowling during climb at about flight level 320. Fragments from the engine inlet and cowling struck the wing, fuselage, and one cabin window, resulting in a depressurization. The flight crew conducted an emergency descent and diverted into Philadelphia International Airport (KPHL), Philadelphia, PA. Of the 144 passengers and five crewmembers onboard, one passenger received fatal injuries and eight passengers received minor injuries. The airplane sustained substantial damage. The regularly scheduled domestic passenger flight was operating under 14 Code of Federal Regulations Part 121 from LaGuardia Airport (KLGA), Queens, New York, to Dallas Love Field (KDAL), Dallas, Texas.

On April 19, 2018 the maintenance record group convened at Southwest Airlines Technical Operations Center in Dallas Texas to conduct the initial maintenance record review on N772SW.

TABLE OF CONTENTS

A. ACCIDENT	1
B. MAINTENANCE RECORDS GROUP	1
C. SUMMARY	3
D. DEATAILS OF THE INVESTIGATION	4
1.0 AIR CARRIER CERTIFICATES	4
2.0 OPERATIONS SPECIFICATIONS	4
3.0 TYPE CERTIFICATE DATA SHEET	5
4.0 AIRCRAFT INFORMATION	5
5.0 MAINTENANCE AND INSPECTION PROGRAM.....	6
6.0 CONTINUING ANALYSIS AND SURVELLIANCE PROGRAM	11
7.0 MINIMUM EQUIPMENT LIST	12
8.0 SUPPLEMENTAL TYPE CERTICATES	12
9.0 AIRWORTHINESS DIRECTIVES & SERVICE BULLETINS	12
10.0 AIRCRAFT FLIGHT LOGS	12
11.0 WEIGHT & BALANCE SUMMARY	13
12.0 SERVICE DIFFICULTY REPROTS & MECHANICAL INTERRUPTION SUMMARY REPORTS	13
13.0 MAJOR REPAIRS AND ALTERATIONS	13
14.0 TIME LIMIT COMPONENTS	14
15.0 VENDORS	14
16.0 N772SW NUMBER ONE ENGINE	15
17.0 FAN BLADE CLEANING, INSPECTION & RELUBRICATION	16
18.0 ENGINE CONDITION MONITORING	18
19.0 ENGINE NOSE INLET COWL	18

20.0	ENGINE FAN COWLS	19
21.0	FLIGHT RECORDER PARAMETER REVIEW	19
22.0	METHOD OF RECORD KEEPING	19
23.0	MANUALS	20

LIST OF ACRONYMS

AD	AIRWORTHINESS DIRECTIVE
APU	AUXILIARY POWER UNIT
AWL	AIRWORTHINESS LIMITATION
BSTA	BODY STATION
CAMP	CONTINUOUS AIRWORTHINESS MAINTENANCE PROGRAM
CASE	COORDINATING AGENCY FOR SUPPLIER EVALUATION
CASS	CONTINUING ANALYSIS AND SURVEILLANCE SYSTEM
CFR	CODE OF FEDERAL REGULATIONS
CSN	CYCLES SINCE NEW
CV	CABIN VISIT
EDT	EASTERN DAYLIGHT TIME
EWIS	ELECTRICAL WIRING INTERCONNECTION SYSTEM
FAA	FEDERAL AVIATION ADMINISTRATION
FC	FLIGHT CYCLES
FH	FLIGHT HOURS
FSDO	FLIGHT STANDARDS DISTRICT OFFICE
GVI	GENERAL VISUAL INSPECTION
HC	HALF CHECK
HFEC	HIGH FREQUENCY EDDY CURRENT
IDG	INTEGRATED DRIVE GENERATOR
MEL	MINIMUM EQUIPMENT LIST
MISR	MECHANICAL INTERRUPTION SUMMARY REPORT
MPD	MAINTENANCE PLANNING DOCUMENT
MPM	MAINTENANCE PROCEDURE MANUAL
MRBR	MAINTENANCE REVIEW BOARD REPORT
MT	MAINTENANCE TASK
MV	MAINTENANCE VISIT
MX	MAINTENANCE
NDT	NON-DESTRUCTIVE TEST
OpSpecs	OPERATIONS SPECIFICATIONS
PSEW	PRINCIPAL STRUCTURAL ELEMENT WING
PN	PART NUMBER
RCB	RELIABILITY CONTROL BOARD
SB	SERVICE BULLETIN
SDR	SERVICE DIFFICULTY REPORT
SN	SERIAL NUMBER
SRM	STRUCTURAL REPAIR MANUAL

LIST OF ACRONYMS – Continued

STC	SUPPLEMENTAL TYPE CERTIFICATE
SWA	SOUTHWEST AIRLINES
TLI	TIME LIMIT INDEX
TSN	TIME SINCE NEW

D. DETAILS OF THE INVESTIGATION**1.0 Air Carrier Certificates**

On January 23, 1979, Amended February 17, 2016 Federal Aviation Administration (FAA) Flight Standards District Office (FSDO), Southwest Region issued Southwest Airlines Co., 2702 Love Field Dr., Dallas, Texas 75235, Certificate Number SWAA304A.

2.0 Operations Specifications (OpSpecs)²

Southwest Airlines has a Part 121 Certificate, which includes the standards, terms, conditions, and limitations contained in the FAA approved Operations Specifications (Parts D and E).

- (a) Air carrier was authorized as a 14CFR Part 121 operation.
- (b) Per section D072 of the OpSpecs, the Continuous Airworthiness Maintenance Program (CAMP), authorized Southwest Airlines to use the Southwest Airlines Maintenance Procedures Manual (MPM), B737NG MSG-3 Maintenance Specification (S7100) and B737NG Time Limit Index to maintain the B737 fleet.
- (c) Per section D074 of the OpSpecs, Southwest Airlines was authorized to use a maintenance reliability program for its fleet of aircraft per the Southwest Airlines Maintenance Procedures Manual Chapter 15, dated 5/25/2017.
- (d) Per section D085 of the OpSpecs, Southwest Airlines have 26 737-300, 510 737-700, 192 737-800 and 14 737-8MAX aircraft in its fleet. Fleet total of 741 aircraft.
- (e) Per section D090 of the OpSpecs, Southwest Airlines was authorized to utilize CASE³ as a means of qualifying a vendor for services, parts, and materials to satisfy the requirements of 14 CFR Section 121.373.

² Operations Specifications contains the authorizations, limitations, and certain procedures under which each kind of operation, if applicable, is to be conducted by the certificate holder.

³ The Air Carriers section of the Nonprofit Coordinating Agency for Supplier Evaluations (C.A.S.E.) was organized as a means of sharing non-prejudicial supplier quality approval data among the membership airlines. This increases surveillance coverage of suppliers and thereby upgrades their quality programs. It also has an economic impact on each C.A.S.E. member by decreasing the cost of supplier surveillance and making their surveillance programs more effective.

- (f) Per section D091 of the OpSpecs, Southwest Airlines was authorized to make arrangements with other organizations to perform substantial maintenance on its fleet of aircraft.
- (g) According to Section D095 of the OpSpecs, Southwest Airlines was authorized to use an approved Minimum Equipment List (MEL).
- (h) According to Section D097 of the OpSpecs, the FAA has approved sections of Southwest Airlines maintenance program for the compliance of Repairs Assessment for Pressurized Fuselages (121.1107), Supplemental Inspections (121.1109), Fuel Tank Systems Maintenance Program (121.1113), Flammability Reduction Means (121.1117) and Electrical Wiring Interconnection Systems (EWIS) Maintenance Program (121.1111).
- (i) Per section D485 of the OpSpecs, Southwest Airlines had an Aging Aircraft Inspection and Records Review. N772SW is below the threshold for the record reporting.
- (j) Per section E096 of the OpSpecs, Southwest Airlines was authorized for a Weight and Balance Program.

3.0 Type Certificate Data Sheet

The Type Certificate Data Sheet A16WE prescribes conditions and limitations under which the product for which the Type Certificate (TC) was issued meets the airworthiness requirements of the Federal Aviation Regulations. According to the document, The Boeing Company is the holder of the TC.

4.0 Aircraft Information

The Boeing Airplane Company manufactured the airplane on July 6, 2000. It was then delivered to Southwest Airlines on July 7, 2000. Southwest Airlines was the original owner of the airplane. The airplane had accumulated 63,521 total hours with 37,021 total cycles at the time of the accident.

The airplane was equipped with two CFM56 engines and a Honeywell Auxiliary Power Unit (APU). The engines and APU had accumulated the following operating times at the time of the accident, see table 1 (next page).

Table 1 - Engine and APU Information

	No.1 Engine	No.2 Engine	APU
Manufacturer	CFMI	CFMI	Honeywell
Model Number	CFM56-7B24	CFM56-7B24	131-9B (Series 28)
Manufacture Date	12/31/1997	6/22/2005	3/29/2006
Date Installed	11/29/2012	9/24/2009	7/27/2016
Serial Number	875134	889632	P-7118
Location of Engine/APU Installation	Houston	Dallas	Orlando
Total Time (Engine /APU hours)	67,040.0	56,448.0	63,509.5
Total Cycles (Engine/APU cycles)	40,569	33,020	6,498
Date of Last Overhaul	11/14/2012	9/4/2009	3/30/2016
Time Since Overhaul (hours)	18,088.0	28,954.0	2,333.0
Cycles Since Overhaul	10,712	17,201	6,498

5.0 Maintenance and Inspection Programs

The SWA B737-NG Maintenance Program is task based and encompasses the maintenance requirements deemed necessary by the Reliability Control Board (RCB) for tracking and controlling routine maintenance tasks. Continual updates and publication of the Maintenance Specification Reports are required to ensure a correct reflection of the Maintenance Program.

The Maintenance Program outlines the minimum scheduled maintenance requirements to maintain an approved CAMP for the airframe, engines, systems, and components of the aircraft.

The following sources were used to develop the minimum scheduled maintenance/inspection requirements:

- (a) B737-600/-700/-800/-900 MRB Report (Document No. D626A001-MRBR)
- (b) B737-600/-700/-800/-900 MPD Report (Document No. D626A001)

- (c) B737-600/-700/-700C/-800/-900/-900ER Airworthiness Limitations (AWLs) (Document No. D626A001-9-01)
- (d) B737-600/-700/-700C/-800/-900/-900ER Airworthiness Limitations - Line Number Specific (Document No. D626A001-9-02)
- (e) B737-600/-700/-700C/-800/-900/-900ER Certification Maintenance Requirements (Document No. D626A001-9-03)
- (f) B737-600/-700/-700C/-800/-900/-900ER Special Compliance Items/Airworthiness Limitations (Document No. D626A001-9-04)

For B737NG fleet Life Limited Parts

- (a) Components are maintained per the Time Limit Index (TLI), which contains the controls, intervals, and limitations for controlled components.
- (b) The TLI for B737NG fleet is maintained through a controlled revision process.

The Southwest Airlines Maintenance Program check package intervals are as follows:

- (a) Time Controlled Maintenance Task (MT): Maintenance requirements that are not packaged within a routine maintenance check are tracked individually.
- (b) Maintenance Visit 1 (MV1): Performed on aircraft that overnight with a minimum of four hours ground time at SWA maintenance bases or stations where scheduled overnight maintenance is performed.
- (c) Maintenance Visit 2 (MV2): Walk-Around Check for safety and security - assuring integrity for flight. MV2 visits were accomplished every 8 days / 150 hours whichever came first.
- (d) Maintenance Visit 3 (MV3): Inspection accomplished primarily on a walk-around basis to ensure condition, safety, security and servicing prior to flight. It is accomplished at SWA Maintenance Bases. MV3 visits were accomplished every 600 hours / 450 cycles / 60 days whichever came first.
- (e) Cabin Visit (CV) Checks: Contains a set group of interior tasks such as passenger accommodations, cabin safety items, doors, etc., but also contained exterior items such as lubrications and servicing. The "CV" may be scheduled as a standalone check or in conjunction with any phase of the "HC" Check or Heavy Maintenance Visits. CV visits were accomplished every 125 days.

Half C ("HC") Checks

- (a) The HC scheme divides a traditional block C Check concept into two distinct halves. The individual HC (HC1 & HC2) packages are then staggered to load level the check package content. This staggering allows for SWA to phase the check

contents so that each package remains within a predefined check span to minimize operational impact.

- (b) The "HC" Checks may include various tasks from the SWA Maintenance program including, Structural, Systems, Powerplant, and Zonal Program, STC, and SWA Tasks. The check will be conducted in a hangar and may be scheduled in conjunction with other Checks or Special Visits.

NOTE: The "HC1", "HC2" or combination of does not zero out any lesser check.

- (c) HC Checks were accomplished every 250 days. Both 1HC1 and 1HC2 Checks were accomplished every 500 days. Both 2HC1 and 2HC2 Checks were accomplished every 1000 Days. Both 3HC1 and 3HC2 Checks were accomplished every 1500 Days. (See table 2 below).

Table 2 – Maintenance Check Type and Days

Check Type	125	250	375	500	625	750	900	1000	1125	1250	1375	1500
CV	X	X	X	X	X	X	X	X	X	X	X	X
HC		X		X		X		X		X		X
1HC1		X				X				X		
1HC2				X				X				X
2HC1						X						
2HC2								X				
3HC1										X		
3HC2												X

- (d) The Heavy Maintenance Check program consists of "Y" Checks every two years starting at 6 years: 6Y, 8Y, 10Y, etc. The "Y" Checks may include various tasks from the SWA Maintenance program including, Structural, Systems, Powerplant, and Zonal Program, STC, and SWA Tasks.

Table 3 - Heavy Maintenance Check Intervals

CHECK TYPE	INTERVAL
2YA	Initial 2920 days repeat 730 days
4YA	Initial 2920 days repeats 1460 days
4YB	Initial 3,650 days Repeat 1,460 days
4YC	Initial 2,190 repeats 1,460 days
6Y	2,190 days / 15,000 cycles / 25,000 hours

Table 3 - Heavy Maintenance Check Intervals - continued

6YA	Initial 2,920 days / 24,000 cycles 1 st Repeat 1,460 days 2 nd and Subsequent Repeat – 2,190 days/25,000 hours/ 18,000 cycles
8Y	2,920 days / 24,000 cycles
8YA	Initial 4,380 days /36,000 cycles Repeat 2,920 days /24,000 cycles
8YB	Initial 7,300 days Repeat 2,920 days
10Y	Initial and repeat 3,652 days / 36,000 cycles
10YA	Initial 4,380 days / 36,000 cycles Repeat 3,650 days / 36,000 cycles
12Y	Initial and repeat 4,380 days / 36,000 cycles
14Y	5,110 days
16Y	5,840 days
18Y	6,570 days
20Y	7,300 days
22Y	8,030 days
24Y	8,760 days
26Y	9,490 days
28Y	10,220 days
30Y	10,950 days

Cabin Window Maintenance Program

Boeing MPD has no window change program. Inspection covered by zonal program tasks.

SWA Specification

- (a) 56-SWA-01 GVI - Passenger Cabin Window inspection - Initial and repeat 6Y.
- (b) SWA Cabin Window replacement program was initially at an eight-year interval. The replacement task was retired per SWA MX Program interval adjustment policy.
- (c) Replacement task was closed February 22, 2018. The cabin window general visual inspection requirement remained in place at the 6Y interval.
- (d) Task number 756-105-01-01 GVI - Passenger Cabin Windows Inspection.
 - 1) Last accomplished July 18, 2012 at the 12Y visit.
 - 2) Next due at 18Y visit.
- (e) Cabin window replacement task number 756-21-01 retired. Last accomplished at the 16Y visit, July 14, 2016.

Table 4 is a listing of the previous checks accomplished on airplane N772SW. This information was retrieved from the airplane maintenance records:

Table 4 - Maintenance Checks

Check	Last Check Date	Location	Total Time	Total Cycles
MV1	4/15/2018	LAS	63509	37012
MV2	4/15/2018	LAS	63509	37012
MV3	3/30/2018	DEN	63335	36917
CV	2/6/2018	DAL	62865	36620
HC	2/6/2018	PHX	62863	36620
1HC1	6/21/2017	PHX	60818	35307
1HC2	2/6/2018	DAL	62865	36620
2HC1	6/21/2017	PHX	60818	35307
2HC2	2/6/2018	DAL	62865	36620
3HC1	11/12/2014	MDW	52150	30221
3HC2	8/17/2015	HOU	54834	31731
PSEW	7/14/2016	PAE	57680	33439
2YA	7/14/2016	PAE	57680	33439
4YA	7/14/2016	PAE	57680	33439
4YB	7/18/2014	IND	51017	29590
4YC	7/18/2014	IND	51017	29590
6Y	7/18/2012	PAE	44183	25498
6YA	7/18/2012	PAE	44183	25498
8Y	7/14/2016	PAE	57680	33439
8YA	7/18/2012	PAE	44183	25498
8YB	Not accomplished 20Y initial			
10Y	6/15/2010	PAE	36962	21254
10YA	7/18/2012	PAE	44183	25498
12Y	7/18/2012	PAE	44183	25498
14Y	7/18/2014	IND	51017	29590
16Y	7/14/2016	PAE	57680	33439
18Y	Next Check Due			
20Y	Not accomplished due to age of aircraft			
22Y	Not accomplished due to age of aircraft			
24Y	Not accomplished due to age of aircraft			
26Y	Not accomplished due to age of aircraft			
28Y	Not accomplished due to age of aircraft			
30Y	Not accomplished due to age of aircraft			

Based on aircraft utilization, N772SW has entered the Southwest Airlines Aging Aircraft Maintenance Program

- (a) Initial inspections related to the Aging Aircraft Program were accomplished on July 14, 2016.

6.0 Continuing Analysis and Surveillance System (CASS)⁴ and Reliability Program.

The CASS program was in place to provide surveillance and analysis of the Southwest Airlines Continuous Airworthiness Maintenance Program (CAMP) for performance and effectiveness of the Inspection and Maintenance Programs, to include maintenance, preventative maintenance and alterations. Southwest Airlines conducted monthly CASS meetings, which according to Southwest representative, the FAA Principal Maintenance Inspectors or representatives attend. The CASS meetings covered the preceding month's activity. The CASS report showed statistical analysis of maintenance data collected from several sources i.e. Quality Assurance audits, Minimum Equipment List, Maintenance Station Performance, Hazmat Audits, etc.

Southwest Airlines has an FAA approved Reliability Program. The Program monitors the reliability of the aircraft, its systems, components, structures and powerplants. The Reliability Program defines the standards for determining time limitations or intervals between restoration, inspections, and checks of airframes, powerplants, appliances and emergency equipment and serves to satisfy the requirements of 14 CFR Part 121.373. The two primary outputs produced by the Reliability Program each month are the Mechanical Reliability Report (MRR) and the Reliability Control Board (RCB) Report. The MRR is a data display that contains aircraft utilization data, mechanical interruption summary, mechanical dispatch reliability, pilot report data, engine reliability data, Airplane Reliability Index, and Component Alert data. The RCB Report is a document that serves as the matter of record for work done to satisfy the requirements of the Reliability Program. The RCB Report includes analysis of aircraft systems and components that have exceeded established performance standards with related proposals, explanation of changes planned or made to the Maintenance Program, status of ongoing corrective actions and analysis for previously approved items, and other items required by the Reliability Program.

CASS reports (March 2, 2018 & March 29, 2018) and Reliability reports (January 2018 and February 2018) were reviewed. There were no systemic issues with the engine systems in the fleet. There were no findings in the CASS reports for the number one engine.

⁴ As established by 14 CFR Part 121.373, each certificate holder shall establish and maintain a system for the continuing analysis and surveillance of the performance and effectiveness of its inspection program and the program covering other maintenance, preventative maintenance and alterations and for the correction of any deficiency in those programs, regardless of whether those programs are carried out by the certificate holder or by another person.

7.0 Minimum Equipment List (MEL)⁵

Southwest Airlines was authorized to use an approved MEL on its airplanes per its OpSpecs. At the time of the accident, there were no open MEL items. No MEL items were found on the number one engine for the previous 12 months.

8.0 Supplemental Type Certificates (STC)⁶

Supplemental Type Certificates (STCs), supplied by air carrier, were reviewed. A total of 19 STCs were documented and installed by the operator. There was one STC (ST01556LA) for the engines that installed a Meggitt engine core fire detection loop “A” harness. No other STC’s affected either the engines, the passenger cabin windows, or window surround structures.

9.0 Airworthiness Directives (AD)⁷ and Service Bulletins (SB)

Southwest Airlines provided an AD summary for review. The AD summary contained the applicable Service Bulletins. A review of Airworthiness Directive status lists for the airplane, powerplants and appliances were conducted. All ADs applicable to the airplane and engines were either implemented or being tracked for completion. No discrepancies were found during the review of the listing. The review concentrated on the windows, engines and overall AD compliance.

AD 2016-20-14 (SB 737-53A1351) Inspection of the window corners. Areas affected are the upper forward and lower aft corners of the windows between BSTA 360 and 540. Lower forward and upper aft corners of the windows between BSTA 727 and 887. Perform an external HFEC inspection of the skin at twelve fastener locations in the window corners for cracking prior to 64,000 total aircraft cycles for the 737-700 aircraft. N772SW was being tracked for scheduling prior to the compliance date. Estimated compliance due date of November 2028 for N772SW.

10.0 Aircraft Flight Logs

Aircraft Flight Logs were reviewed from December 15, 2017 thru April 17, 2018. The review focused on the number one engine and passenger cabin window discrepancies on the accident airplane.

There were no systemic issues related to the number one engine or the passenger cabin windows prior to the accident.

⁵ The FAA approved Minimum Equipment List contains a list of equipment and instruments that may be inoperative on a specific aircraft for continuing flight beyond a terminal point.

⁶ The FAA issues Supplement Type Certificates, which authorize a major change or alteration to an aircraft, engine or component that has been built under an approved Type Certificate.

⁷ Airworthiness Directive (AD) is a regulatory notice sent out by the FAA informing the operator of an action that must be taken for the aircraft to maintain its airworthiness status.

11.0 Weight and Balance Summary

Per the Southwest Airlines OpSpecs, each airplane is weighed every 36 calendar months unless they fall within a fleet operating empty weight group which are weighed at least every ten years. In addition, Southwest is authorized a fleet average weight program where a percentage of airplanes must be weighed each 36 calendar months. There are nine weight groups for the 737-700 fleet. N772SW is in the T2 fleet group assignment. The last actual weight and balance on the airplane was accomplished on June 14, 2010 by Aviation Technical Services in Seattle, WA. The aircraft was maintained in compliance with the Fleet Average Weight program defined in the Weight and Balance Manual. The figures for the last weight and balance are shown below:

Basic Operating Weight:	84,806 pounds
Arm:	659.65 inches
Moment:	55,942,277.90 lb-inches

12.0 Service Difficulty Reports (SDR)⁸ and Mechanical Interruption Summary Report (MISR)⁹

A review of the FAA SDR database from April 16, 2015 to April 17, 2018, found 40 Service Difficulty Reports on file for aircraft N772SW. There were no SDRs associated with the number one engine or the passenger windows on the airplane.

From April 16, 2016 to April 17, 2018, Southwest Airlines reported seven Mechanical Interruption Summary Reports to the FAA for aircraft N772SW. The Southwest Airlines MISR listings dealt with aircraft system issues. There were no MISR reports for the number one engine.

13.0 Major Repairs and Alterations

A review of the Major Repairs on file for N772SW was conducted. There are 94 major repairs that were accomplished. None of the major repairs affected the passenger window surround structure, the number one engine or the number one engine inlet nose cowl.

The major alteration listing revealed 34 major alterations on the accident airplane. There were no major alterations accomplished to the number one engine or inlet cowl of the accident airplane.

⁸ As required under 14 CFR 121.703, each scheduled operator is to report the occurrence or detection of each failure, malfunction or defect concerning (a) fires during flight, (b) false fire warning during flight, (c) engine exhaust system that causes damage during flight, (e) an aircraft component that causes accumulation or circulation of smoke, vapor, or toxic or noxious fumes during flight, (f) engine shutdown during flight, (g) a propeller feathering, (h) aircraft structure requiring major repairs, (i) cracks, corrosion, (j) other safety critical issues as stated in the FAR part. These occurrences must be reported within 72 hours of the event.

⁹ Each scheduled operator is required under 14 CFR Part 121.705 to submit a summary of any (a) interruption to flight, (b) unscheduled change of aircraft en route, or unscheduled stop or diversion from a route caused by known or suspected mechanical difficulties or malfunctions that are not required to be reported as service difficulty reports.

14.0 Time Limit Components

Southwest Airlines produced a time limit component report dated April 18, 2018 for review. The component status report for time limit components for the airplane, the two installed powerplants and the APU were reviewed. No discrepancies were found during the review.

15.0 Vendors

The Maintenance Records Group reviewed the Approved Vendor List provided by the Manager of Quality Assurance for Southwest Airlines. Southwest Airlines accomplished 191 component/AEMP audits which includes CASE organization audits. All engine facilities are on an annual audit basis unless escalated by the CASS program. The group reviewed the GE Celma Brazil audit conducted January 15 – 19, 2018 as it was the vendor that accomplished the last overhaul of the number one engine. There were no findings during the audit.

16.0 N772SW Number One Engine

The Maintenance Record Group reviewed the most recent number one Engine (Serial No. 875134) Fan Blade, Disk and Disk Dovetail Slot Cleaning, Inspection and Relubrication task accomplished June 21, 2017 at Phoenix. The interval for this task was every 3,000 Flight Cycles (FC) or 5,000 Flight Hours (FH), whichever came first. See table 5 for blade position records and blade weight moment.

Table 5 – Number One Engine Fan Blades

Blade Position	Blade PN	Blade SN	Blade Weight (Moment)
1	340-001-038-0	DB631611-W	212918
2	340-001-038-0	DB632068-R	207492
3	340-001-038-0	DB632060-H	210753
4	340-001-038-0	DB631982-6	208051
5	340-001-038-0	DB631808-5	209779
6	340-001-038-0	DB632380-W	208762
7	340-001-038-0	DB631662-C	211256
8	340-001-038-0	DB632113-O	208015
9	340-001-038-0	DB632025-Y	210266
10	340-001-038-0	DB631680-B	208640
11	340-001-038-0	DB632098-8	209407
12	340-001-038-0	DB632595-6	209072
13	340-001-038-0	DB632507-P	212882
14	340-001-038-0	DB631739-J	207650
15	340-001-038-0	DB632306-U	210738
16	340-001-038-0	DB631941-9	208244
17	340-001-038-0	DB631704-A	209580
18	340-001-038-0	DB632101-J	208960

Table 5 – Number One Engine Fan Blades continued

19	340-001-038-0	DB632357-8	211058
20	340-001-038-0	DB632381-V	208020
21	340-001-038-0	DB632300-H	210103
22	340-001-038-0	DB631959-F	208706
23	340-001-038-0	DB632130-3	209397
24	340-001-038-0	DB632332-E	209072

A post vibration survey using flight deck instruments is accomplished for the fan blade, disk/disk dovetail slot cleaning, inspection and relubrication task. The procedure is to slowly increase power from idle to takeoff power (approximately 2 minutes) and then decelerate to idle (approximately two minutes). If the vibration is greater than 1.5 units, balance the engine. Vibration level was recorded as 0.6 on work instruction card No. 772-21-20 completed June 21, 2017.

The fan blade disk and disk dovetail slot cleaning, inspection and relubrication was completed seven times since the engine was installed on the aircraft, see table 6.

Table 6 – Fan Blade Cleaning, Inspection and Relubrication

Date	Engine Total Time	Engine Total Cycles	Location
June 21, 2017	64,354	38,865	Phoenix
April 19, 2016	60,648	36,664	Midway
August 17, 2015	58,353	35,279	Houston
July 30, 2015	58,183	35,181	Atlanta
November 12, 2014	55,669	33,769	Midway
March 17, 2014	53,404	32,504	Phoenix
July 23, 2013	51,272	31,249	Houston

One platform was replaced during the July 30, 2015 task due to a torn seal. At the August 18, 2015 inspection two elastomer seals were replaced due to delamination.

CFM published service bulletin CFM56-7B SB 72-1033 Revision 2, dated July 27, 2018 that reduced the repetitive inspection interval from 3,000 FC to 1,600 FC. Due to the revised service bulletin, on August 2, 2018 SWA revised the maintenance program and reduced the interval for the fan blade Ultrasonic Inspection and relubrication task to 1,600 flight cycles for engines at or above the 20,000 CSN threshold.

The FAA issued AD 2018-18-01 with an effective date of October 16, 2018 that reduces the reinspection requirement for fan blades to 1,600 flight cycles for engines that have reached 20,000 CSN.

The most recent number one engine compressor wash occurred October 5, 2017 at Oakland, California.

17.0 Fan Blade Cleaning, Inspection and Relubrication

On August 29, 2018 the Maintenance Record group along with NTSB power plant and material laboratory engineering witnessed the Fan Blade, Disk and Disk Dovetail Slot Cleaning, Inspection and Relubrication tasks at the Southwest maintenance facility in Dallas, TX. The fan blade removal, cleaning and inspection demonstration was performed on aircraft N260WN, number one engine, serial number 888304. This was the first inspection and relubrication of the fan blades on this engine since engine shop visit in December 2017.

A protective mat was put in place for the nose cowl inlet. The number one fan blade was identified, and the blades were numbered 1 through 24 counterclockwise forward looking aft. The platforms were numbered in the same manner ensuring that number one was properly identified.

The front and rear cones were removed followed by removing the fan retaining flange from the rear cone. The eight elastomer spacers were removed utilizing a nonmetallic tool. The retaining ring was then removed. A retaining ring wrench was first installed to assist in rotating the retaining ring until the disk scallops were properly aligned for removal.

The fan was rotated by hand to position each blade at 12 o'clock position to apply a bead of lubricant on each fan blade side at the platform seal for all 24 blades. The fan was rotated, and spacers removed when the blades were at about the 6 o'clock position.

Platforms were removed. The first platform required the use of a puller. The remaining platforms were removed by hand.

The fan blades were removed along with the shims. The blades, shims, spacers and platforms were placed on a portable rack numbered 1 – 24 in their corresponding positions during the removal.

Fan blade dovetail, spacers, platforms, and shims were cleaned for inspection. Prior to performing the ultrasonic inspection, a visual inspection was performed on the blade root looking for scratches, dents, wear marks or missing/damaged coatings. There are some allowable limitations for missing coatings, rub and/or wear marks on the convex side of the dovetail. No wear marks permitted in other areas. All 24 blades had a rub mark on the concave side where the shim contacted the blade dovetail.

Although the blades would now have to be routed to the shop for rework the ultra-sonic inspection was performed for this demonstration.

The inspector performed the initial equipment set up and then prepared to perform the concave side by first performing a test on the calibration standard to ensure the equipment was adjusted correctly. A liberal amount of couplant gel was applied to the dovetail from the leading edge to the trailing edge. With the transducer seated properly the inspector scanned from the leading edge towards the trailing edge. He then reversed the scan from trailing edge to leading edge. The inspector monitors the screen for any indication equal to or greater than 30% full screen height

(crack indication). The inspector repeated the inspection several times for each blade. The highest level of deflection from across the scans was recorded. None exceeded 6% which was attributed to noise as it is difficult to get a tight seal from the transducer to the dovetail with the couplant gel applied. The inspection was completed on the remaining 23 blades with similar results (no crack indication).

The inspector then switched the transducer to perform the same inspection on the convex side. The instrument was tested on the calibration standard for the convex side. Again, a liberal amount of liquid couplant gel was applied to the dovetail and with the transducer seated properly the inspector performed several scans of the convex side. No crack indications were found on any of the 24 blades inspected. The highest level of indicator deflection was recorded for each blade and again it was about 6% of full scale.

The group then moved over to aircraft N7856A where this same task was being performed on the number one engine to witness the inspection and re-installation of the fan blades. This engine also required shims to be installed. The blades, shims, spacers and platforms had already been cleaned and inspected. Three blades had failed the initial inspection and as a result six were being replaced. The blades were replaced due to wear marks and missing coating that exceeded allowable limits. Blades are replaced in pairs 180 degrees apart. This required a new plot from engineering based on the weight of the 24 blades. The blades were repositioned in the stand (1 thru 24) in accordance with the serial number positions recorded on the new plot.

SWA performs the ultrasonic inspection on all blades prior to installation regardless if they are overhauled, new or removed for inspection and relubrication. The group witnessed the ultrasonic inspection on the concave and convex sides of the dovetails for all 24 blades including the initial equipment calibration performed by the inspector prior to inspection. Each blade was scanned several times for both the concave and convex inspections. No crack indication was seen, and the average full screen deflection was recorded as 8% or less during the inspections which was attributed to noise.

The inspector also performed a post calibration check of the ultra-sonic test equipment prior to the blades being prepared for installation.

Each fan blade trim weight, location, part number, serial number, and blade weight was recorded in the respective tables on the installation card.

A thin coat of Molykote paste was applied to the retaining ring locating pins, fan disk pins, booster spool pins, spacers, shims, fan blade root pressure face and lugs, and the fan disk slot pressure faces. The fan blades with shims were installed starting with number one placed at the six o'clock position and slowly rotating the fan as each blade is installed. The spacers were then installed in the same manner, followed by the platforms which had the elastomer seals coated with a thin coat of petrolatum. All excess lubricant was wiped clean. The last platform installed is the most difficult.

The fan retaining ring was installed and seated utilizing an installation fixture. The retainer was turned to the lock position and the fixture was then removed. The elastomer seals were lubricated and installed.

The rear cone and the front cone were installed. The engine was restored to the normal configuration and the aircraft was prepped to perform a vibration survey using the flight deck instruments during engine run-up. The procedure is to slowly accelerate at a constant rate (approximately two minutes) to take off power and then decelerate at a constant rate (approximately two minutes) to idle. If the vibration is greater than 1.5 units then the engine would need to be rebalanced. During the run the highest level of vibration recorded was 1.4 units. No further action was required.

18.0 Engine Condition Monitoring

Engine condition monitoring reports were reviewed for the fan forward and aft vibration levels. Prior to fan blade lubrication task number one engine vibration at takeoff power was averaging about 0.75 units for the forward pick up and 1.20 units for the aft. After the clean and relubrication task the vibration reduced to 0.45 units for the forward pick up and 0.65 on average for the rear pickup.

At cruise power prior to fan blade lubrication task for number one engine, vibration was averaging about 0.75 units for the forward pick up and 1.35 units for the aft pick up.

After the clean and lubrication task at cruise power the vibration reduced to 0.25 units for the forward pick up and 0.40 on average for the rear pickup.

19.0 Engine Nose Inlet Cowl

According to the records reviewed, engine inlet cowl PN 314-2100-2, SN 1255001 was installed on aircraft N772SW number one position on February 2, 2018. The cowl had 61,876 hours TSN / 36,340 CSN at the time of installation. No discrepancies or maintenance action on the fan blades were completed during the removal installation of the inlet cowl.

History of the inlet nose cowl SN 1255001 prior to installation on N772SW

- (a) January 1, 2018: Removed from N777QC number two position, TSN 61,843 / CSN 36,340 (first time removal). Repaired in accordance with EA No. 1-771-1102 (SR) at SWA maintenance shops under repair order 0710037-J1R. A review of the repair order found 12 dents in the acoustic panel repaired per the SRM. Two nicks were blended on the attach ring inner face. Loose fasteners were found along the lip skin that were removed and replaced. Upper and lower chords removed and replaced due to wear. 20 fasteners found loose at 6 o'clock position removed, high frequency eddy current inspected for cracks, none found and new fasteners installed. Previous acoustic panel repair filler material was found to be deteriorating. Repaired in accordance with SRM 54-10-01, see attachment one.
- (b) January 28, 2018: Installed on aircraft N704SW number two position.

- (c) February 1, 2018: Removed from N704SW in a serviceable condition. Temporary installation due to paint scheme mis-match. Time on aircraft N704SW was 33 flight hours and 23 flight cycles.
- (d) February 2, 2018: Installed on aircraft N772SW number one position.
- (e) The inlet cowl had 62,656 TSN and 36,741 CSN at the time of the accident.

20.0 Engine Fan Cowls

The Fan Cowls installed on aircraft N772SW number one position were the original cowlings for the aircraft. A review of the maintenance records for the last ten years was conducted. The SWA maintenance program included a general visual zonal inspection (GVI) at an interval of every 560 flight cycles or 90 days, whichever comes first and was last completed on the fan cowls March 30, 2018. The task was a GVI of both engines for such items as bird strikes, dents, loose or missing fasteners, fluid leaks, or any obvious defects paying particular attention to the engine inlet (Inner and Outer Skin), Fan Blades, Acoustical Panels and Fasteners, Cowlings, Pylons and Surrounding Panels, Upper Pylon Panels and Thrust Reversers.

The maintenance program also included a GVI of the aircraft exterior, including the engine inlets, pylons, and cowlings every eight days and was last completed April 15, 2018.

A record review for non-routine items for the fan cowls was also conducted, going back ten years. Items such as hold open rods needing adjustment, chafe strips being worn, IDG access door latches being worn, and an item for a possible bird strike with no damage found were reviewed. No non-routine items were found for the fan cowl latches or the latch keepers.

21.0 Flight Recorder Parameter Review

Flight recorder data down load and parameter review was last accomplished June 22, 2017 for aircraft N772SW. SWA engineering provided an overview of the review process to the maintenance record group using the most recent down load. None of the 34 mandatory parameters were faulted. All parameters are validated and follow up action taken if needed. The parameter review is an 18-month regulatory requirement which is accomplished at SWA every 12 months on average.

22.0 Method of Record Keeping

Southwest Airlines used several different maintenance electronic systems to manage the various aspects of the maintenance program and configuration of their aircraft. Data for components installed, MEL/carry over/deferred item records, Engineering documents, logbooks, engine records, etc. were entered into the aircraft computer records on a daily basis. Configuration management systems are maintained that track all maintenance activities, inspections, tracked part installation, time controlled components and checks performed. The computer files are backed up real time as data is entered to prevent total loss of historical files. All hard copies of the documents are verified, scanned and then shredded or disposed of in accordance with Southwest policy.

23.0 Manuals

Southwest Airlines used the following manuals to maintain the airworthiness of its fleet and management of the airline maintenance program.

Maintenance Procedures Manual (MPM) – The manual provided policies and procedures to be followed by all persons in Tech Ops.

MSG-3 Maintenance Specification (S7100) – Defined the maintenance program for the B737-700 type aircraft operated by Southwest Airlines and was maintained in accordance with its CAMP, Reliability Program and the Southwest Engine Reliability Program as required by OpSpecs D072.

Time Limit Index – Provides the definition of requirements for components that have specific time limitations tracked for life limited parts.

Minimum Equipment List (MEL) – List of equipment and instruments that may be inoperative on a specific aircraft.

SWA Weight and Balance Manual – Weight and balance procedures to be followed by maintenance and flight operations personnel on all aircraft operated by Southwest Airlines.

Manufacture Supplied Manuals - Aircraft/Engine Maintenance Manuals, Structural Repair Manuals, Overhaul Manuals, Wiring Manuals, Fault Isolation Manuals, Illustrated Parts Catalog, Corrosion Program Manual, NDT Manual, Significant Structure Items Manual, Service Bulletins and Engine Manuals.

Submitted by: Gregory Borsari
Aviation Accident Investigator
Maintenance

Attachment 1

Inlet Fan Cowl Repair

D TAG#: 353440 SERVICEABLE



DATE: 17 JAN 18

INSP: 41384



007516649 ORD: 0710037-J1R

DESC: COWL

CFM56-7 ENGINE INLET

R SI#: 0710037

T S/N: 1255001

MPN: 314-2100-2

S ATA: 7110

TL: 3

TSOCSNEXPIRES

61843:18

36340

BATT DATE	HT C/W
MFG. DATE	FT/BT C/W

EFFECTIVITY:

OVERHAUL/REPAIR DATA

☐ OVERHAULED ☒ REPAIRED ☐ FUNC. TEST ☐ WT.CK
☐ CONF. ☐ NOT CONF. FAILURE ☐ BENCH TEST ☐ SWARTS

FINDINGS

FOUND SEVERAL DENTS IN

INNER Acoustic PNL

WORK ACCOMPLISHED

REPAIRED IN

EA# 1-771-1101

DATE 17 JAN 2018

AMT [REDACTED]

INSP [REDACTED]

REPAIR
AGENCY SHOP

JOB NO. 8710037-21R

The component identified on the face of this tag was repaired and/or inspected in accordance with current FAA regulations and was found airworthy for return to service. Pertinent details of the work accomplished are on file at this agency.

ATTACH TO UNIT

PART RECORDS &
CONTROL TAG

A TAG#: 346957

UNSERVICEABLE REMOVAL

4
0710037-JIRSOUTHWEST AIRLINES SA-M 857 REV 04/10/2012
PART RECORDS & CONTROL TAG - ATTACH TO UNIT

MLP: _____

DESC: COWL

CFM56-7 ENGINE INLET

DATE: 01 JAN 18 A/C: 777
DD MMM YYPOS: # 2 STA: KDALSI#: 0710037

21422

REPAIR AGENCY or SHOPRecord overhaul / repair data
on the back of this tag.S/N: 1255001MPN: 314-2100-2

PLEASE RETURN THIS TAG WITH THE UNIT

REMOVED DUE TO: Dents in Acoustic Panel

REMOVED BY

AMT: _____

SUPR or LEAD: _____

Southwest®

Check Type:	Shop	A/C, Eng S/N, or Shop:	SHOP	Sta:	DAL	Date:	2 JAN 2018
-------------	------	------------------------	------	------	-----	-------	------------

Quantity: 1	Repair Order Number (RO): 0710037-J1R ✓
Stock Item Number (S/N): 0710037 ✓	Manufacturer Part Number (MPN): 314-2100-2 ✓
Component Serial Number (S/N): 1255001 ✓	

[illegible]

SA-M 122 Master Inspection/Check Tally Sheet**Southwest®**

Rev 17-02 08/24/2017

Check Type: A/C, Eng S/N, or Shop: Sta: Date:

Carryover items are circled in Red.

Note: Priorities column indicates the planning priority code from Wizard. Margins will be used to annotate C/O authorization.**Note:** Maintenance Production Supervisors/Leads must verify and annotate the date/time carryover and the person who authorized the carryover on the tally sheet in accordance with work priorities in *MPM 51 General Maintenance Policies and Procedures*.

Authorization requirements for MELs, CDLs, and MX Notes differ from other deferred maintenance items.

Authorization to carryover resolution on these items must come directly from Maintenance Control. It is not necessary to contact the Maintenance Router.

Authorization to carryover tasks must come from the following:

Priority Code:

First priority "A" must be done before further flight unless carryover approved by:

1. Senior Director Maintenance Operations Center
2. Manager Maintenance Operations/Control
3. Senior Manager Aircraft Maintenance Planning
4. Manager Operations Team Leader
5. Maintenance Router
6. Director Maintenance Eastern Region, Director Maintenance Western Region, Director Maintenance Central Region, or Director Maintenance Dallas

Second priority "B" planning priority will have an adverse effect on scheduling when not complied with. Must be done before lesser priorities. Will be carried over by:

1. Senior Director Maintenance Operations Center
2. Manager Maintenance Operations/Control
3. Senior Manager Aircraft Maintenance Planning
4. Manager Operations Team Leader
5. Maintenance Router
6. Director Maintenance Eastern Region, Director Maintenance Western Region, Director Maintenance Central Region, or Director Maintenance Dallas

When using MCTALLY, non-check priority "B" items are carried over with discretion of Supervisor/Lead or designee.

Third priority "C" must be done before non-priority items and are carried over with discretion of Supervisor/Lead or designee.

Items listed are accounted for and carryover items have been date reviewed for dispatchability.

Lead AMT and/or Supervisor: ☒ Date:

To locate the policies, procedures, and controls for carryover/deferred items, refer to:

*MPM 51 Work Order Policy**MPM 51 Work Order (WO)/MCTALLY Procedures for Supervisors/Leads**MPM 24 Deferred Scheduled Maintenance Management*

SOUTHWEST AIRLINES
INTERNAL SHOP REPAIR ORDER
(ORIGINAL)

@@
0710037-J1R
@@

Date: 02JAN18

Vendor: R0579 SWA METL

Date Req: 01FEB18

Buyer: [REDACTED] N

=====
Tag Disp Qty Mfg Part Number Serial Description

346957 REPR 1 314-2100-2 255001 CFM56-7 ENGINE INLET
=====

Reason for Removal | DENTS IN ACCOUSTIC PANEL
=====

=====
Install DT ACN Pos Remove DT TSN TSO TSR AC Type

31JUL00 777 2 01JAN18 61843 61843 61843 737-700
=====

END OF REPAIR ORDER 0710037-J1R

SA-M 549 Teardown/Repair Record

Rev 16-02 12/15/2016

Southwest[®]

Parts Tag Number: 346957	Repair Order Number: 0710037-J1R
Date In: 2 JAN 2018	Date Completed: 17 JAN 2018
Final Inspection:	
Component Name: 700 ENG INLET	Mfg P/N: 314-2100-2
SI/N: 0710037	S/N: 1255001
Malfunction Component Removed For: DENTS IN ACCOUSTIC PANEL	From: 777

The component identified above was repaired and/or inspected in accordance with current FAA regulations and was found airworthy for return to service. Pertinent details of the work accomplished are on file at this agency

Discrepancy: ☒ Confirm ☐ Non-Confirm	Corrective Action: ☐ Test ☐ Repair ☐ O/H ☐ Service
Dents in Acoustic panel	REPAIRED JAW EAT# 1-771-1101
AMT:	AMT: Insp: Date: 17 JAN 2018

Additional Findings During IRAN

Discrepancy: #1 Dent in barrel skin Acoustic panel at 5:00 position 4.2" from aft edge.	Corrective Action: Repaired per SRM 54-10-01-ZR-7 Repair 7
AMT:	AMT: Insp: Date: 3 Jun 18

Discrepancy: #2 Dent in barrel skin Acoustic panel at 6:00 position 5.25" from aft edge.	Corrective Action: Repaired per SRM 54-10-01-ZR-7 Repair 7
AMT:	AMT: Insp: Date: 3 Jun 18

Discrepancy: #3 Dent in barrel skin Acoustic panel at 6:30 position 9.6" from Fwd edge.	Corrective Action: Repaired per SRM 54-10-01-ZR-7 Repair 7
AMT:	AMT: Insp: Date: 3 Jun 18

SA-M 549 Teardown/Repair Record

Rev 16-02 12/15/2016

Southwest[®]

Parts Tag Number: 346957	Repair Order Number: 0710037-J1R
Date In: 2 JAN 2018	Date Completed: 17 JAN 2018
Final Inspection:	
Component Name: 700 ENG INLET	Mfg P/N: 314-2100-2
SI/N: 0710037	S/N: 1255001
Malfunction Component Removed For: DENTS IN ACCOUSTIC PANEL	From: 777

Additional Findings During IRAN

Discrepancy: #4 Dent in barrel skin Acoustic panel at/or between 6:30 and 7:00 position 8.1" from aft edge	Corrective Action: Repaired per SRM 54-10-01-2R-7 Repair 7
AMT:	AMT: Insp: Date: 3 Jun 18

Discrepancy: #5 Dent in barrel skin Acoustic panel between 6:30 and 7:00 position 4.7" from aft edge.	Corrective Action: Repaired per SRM 54-10-01-2R-7
AMT:	AMT: Insp: Date: 3 Jun 18

Discrepancy: #6 Dent in barrel skin Acoustic panel between 6:30 and 7:00 position 4.7" from aft edge	Corrective Action: Repaired per SRM 54-10-01-2R-7
AMT:	AMT: Insp: Date: 3 Jun 18

Discrepancy: #7 Dent in barrel skin Acoustic panel at 7:00 position 4.9" from aft edge.	Corrective Action: Repaired per SRM 54-10-01-2R-7 Repair 7
AMT:	AMT: Insp: Date: 3 Jun 18

SA-M 549 Teardown/Repair Record

Rev 16-02 12/15/2016

Southwest®

Parts Tag Number: 346957	Repair Order Number: 0710037-J1R
Date In: 2 JAN 2018	Date Completed: 17 JAN 2018
Component Name: 700 ENG INLET	Mfg P/N: 314-2100-2
SI/N: 0710037	S/N: 1255001
Malfunction Component Removed For: DENTS IN ACCOUSTIC PANEL	From: 777

Additional Findings During IRAN

Discrepancy: #8 Dent in barrel Skin acoustic panel at 7:00 position 11.8" from aft edge	Corrective Action: Repaired per SRM 54-10-01-2R-7 Repair 7
AMT: [REDACTED]	AMT: [REDACTED] Insp: [REDACTED] Date: 3 Jun 2018
Discrepancy: #9 Dent in barrel Skin acoustic panel at 7:30 position 10.9" from aft edge	Corrective Action: Repaired per SRM 54-10-01-2R-7 Repair 7
AMT: [REDACTED]	AMT: [REDACTED] Insp: [REDACTED] Date: 3 Jun 2018
Discrepancy: #10 Dent in barrel Skin acoustic panel at 8:30 position 4.3" from FWD edge	Corrective Action: Repaired Acoustic panel per SRM 54-10-01-2R-7 Repair 7
AMT: [REDACTED]	AMT: [REDACTED] Insp: [REDACTED] Date: 11 JAN 18
Discrepancy: #11 Dent in acoustic panel barrel Skin at 11:30 position 4" from aft edge	Corrective Action: Repaired Acoustic panel per SRM 54-10-01-2R-7 Repair 7
AMT: [REDACTED]	AMT: [REDACTED] Insp: [REDACTED] Date: 11 JAN 18

SA-M 549 Teardown/Repair Record

Rev 16-02 12/15/2016

Southwest

Parts Tag Number: 346957	Repair Order Number: 0710037-J1R
Date In: 2 JAN 2018	Date Completed: 17 JAN 2018
Component Name: 700 ENG INLET	Mfg P/N: 314-2100-2
SI/N: 0710037	S/N: 1255001
Malfunction Component Removed For: DENTS IN ACCOUSTIC PANEL	From: 777

Additional Findings During IRAN

Discrepancy: #12 Dent in barrel Skin Acoustic panel at 11:30 position 5.5" from aft edge	Corrective Action: Repaired Acoustic panel per SRM 54-10-01-2R-7 Repair 7
AMT: [REDACTED]	AMT: [REDACTED] Insp: [REDACTED] Date: 11 JAN 18

Discrepancy: #13 Previous Acoustic panel Repair filler material deteriorating and dent/gouge still in skin. 9:00 position and 2" from skin splice TSR# 201800230	Corrective Action: Repaired per E.A. 1-771-1101
AMT: [REDACTED]	AMT: [REDACTED] Insp: [REDACTED] Date: 1-16-18

Discrepancy: Attach Ring has a nick on inner face at 7:45 position Near aft edge.	Corrective Action: Removed damage IAW SRM 51-10-02. Reworked area is within limits Per SRM 54-10-02 Fig 103. (Original material thickness 1.0800. reworked material 1.0784)
AMT: [REDACTED]	AMT: [REDACTED] Insp: [REDACTED] Date: 1-4-2018

Discrepancy: Attach Ring has a nick on inner face at 12:00 position near aft edge	Corrective Action: Removed damage IAW SRM 51-10-02. Reworked area is within serviceable limits IAW SRM 54-10-02 Fig 103. (Original material .0800 reworked material .0785)
AMT: [REDACTED]	AMT: [REDACTED] Insp: [REDACTED] Date: 1-4-2018

SA-M 549 Teardown/Repair Record

Rev 16-02 12/15/2016

Southwest[®]

Parts Tag Number: 346957	Repair Order Number: 0710037-J1R
Date In: 2 JAN 2018	Date Completed: 17 JAN 2018
Final Inspection: [REDACTED]	
Component Name: 700 ENG INLET	Mfg P/N: 314-2100-2
S/N: 0710037	S/N: 1255001
Malfunction Component Removed For: DENTS IN ACCOUSTIC PANEL	From: 777

Additional Findings During IRAN

Discrepancy: Attach Ring has several nicks along attach Lug from 8:00 to 8:30 positions	Corrective Action: Repaired per EA-1-771-1098
AMT: [REDACTED]	AMT: [REDACTED] Insp: [REDACTED] Date: 1-16-18

Discrepancy: Barrel Skin Acoustic panel Requires Aluminized primer.	Corrective Action: applied primer per AMM 51-21-99
AMT: [REDACTED]	AMT: [REDACTED] Insp: [REDACTED] Date: 1-16-18

Discrepancy: Lipskin has loose fastener in outer edge at 2:00 splice	Corrective Action: Removed and Replaced Fastener Per Cmm 71-11-22 And SRM 54-10-01-1A-2. HFEC HOLE PROB indicates no further damage Per 737 NDT PART 6 51-21-00, Procedure 16
AMT: [REDACTED]	AMT: [REDACTED] Insp: [REDACTED] Date: 09 JAN 18

Discrepancy: Lipskin has loose fastener in outer edge at 10:00 splice	Corrective Action: Removed and Replaced Fastener Per Cmm 71-11-22 and SRM 54-10-01-1A-2. HFEC HOLE PROB indicates no further damage Per 737 NDT PART 6 51-21-00, Procedure 16
AMT: [REDACTED]	AMT: [REDACTED] Insp: [REDACTED] Date: 09 JAN 18

#4

SA-M 549 Teardown/Repair Record

Rev 16-02 12/15/2016

Southwest

Parts Tag Number: 346957	Repair Order Number: 0710037-J1R
Date In: 2 JAN 2018	Date Completed: 17 JAN 2018
Final Inspection: [REDACTED]	
Component Name: 700 ENG INLET	Mfg P/N: 314-2100-2
SI/N: 0710037	S/N: 1255001
Malfunction Component Removed For: DENTS IN ACCOUSTIC PANEL	From: 777

The component identified above was repaired and/or inspected in accordance with current FAA regulations and was found airworthy for return to service. Pertinent details of the work accomplished are on file at this agency.

Discrepancy: ☐ Confirm ☐ Non-Confirm	Corrective Action: ☐ Test ☐ Repair ☐ O/H ☐ Service
Removed Upper Barrell SKIN	OK TO INSTALL [REDACTED] INSTALLED Upper Barrell SKIN per CMM 71-11-22
AMT: [REDACTED]	AMT: [REDACTED] Insp: [REDACTED] Date: 09 JAN 18

Additional Findings During IRAN

Discrepancy:	Corrective Action:
Removed Lower Barrell SKIN	OK TO INSTALL [REDACTED] INSTALLED Lower Barrell SKIN per CMM 71-11-22
AMT: [REDACTED]	AMT: [REDACTED] Insp: [REDACTED] Date: 09 JAN 18

Discrepancy: TAI Duct Fwd Attach plate has loose bolt	Corrective Action: INSTALLED BOLT Per CMM 71-11-22
AMT: [REDACTED]	AMT: 61113 Insp: [REDACTED] Date: 09 JAN 18

Discrepancy: TAI Duct Loose at Fwd and aft Seals	Corrective Action: INSTALLED NEW TAI Duct and Seals per CMM 71-11-22
AMT: [REDACTED]	AMT: [REDACTED] Insp: [REDACTED] Date: 09 JAN 18

SA-M 549 Teardown/Repair Record

Rev 16-02 12/15/2016

Southwest

Parts Tag Number: 346957	Repair Order Number: 0710037-J1R
Date In: 2 JAN 2018	Date Completed: 17 JAN 2018
Final Inspection:	
Component Name: 700 ENG INLET	Mfg P/N: 314-2100-2
SI/N: 0710037	S/N: 1255001
Malfunction Component Removed For: DENTS IN ACCOUSTIC PANEL	From: 777

Additional Findings During IRAN

Discrepancy: UPPER Chord is worn.	Corrective Action: Installed upper Chord JAW CMM 71-11-22 & SKM 51-40-02
AMT:	AMT: Insp: Date: 1-8-2018

Discrepancy: Lower Chord is worn	Corrective Action: removed and Replaced lower Chord JAW CMM 71-11-22
AMT:	AMT: Insp: Date: 05 JAN 2018

Discrepancy: Seal Barrel Skin And AFT chords	Corrective Action: Sealed upper and lower Barrel skins per AMM 51-31-00.
AMT:	AMT: Insp: Date: 11 JAN 18

Discrepancy: Removed LOWER BARREL SKIN.	Corrective Action: OK TO INSTALL Installed Lower Barrel skin per CMM 71-11-22
AMT:	AMT: Insp: Date: 11 JAN 18

SA-M 549 Teardown/Repair Record

Rev 16-02 12/15/2016

Southwest[®]

Parts Tag Number: 346957	Repair Order Number: 0710037-J1R
Date In: 2 JAN 2018	Date Completed: 17 JAN 2018
Component Name: 700 ENG INLET	Mfg P/N: 314-2100-2
S/N: 0710037	S/N: 1255001
Malfunction Component Removed For: DENTS IN ACCOUSTIC PANEL	From: 777

Additional Findings During IRAN

Discrepancy: 20 ea loose fasteners at 6 o'clock position REQUIRE hole probe Insp.	Corrective Action: Removed Fasteners H/FEC open holes RcFex 737 NDT PART 6 51-00-00 Proce chure 16 NO DEFECTS NOTED
AMT: [REDACTED]	AMT: [REDACTED] Insp: [REDACTED] Date: 1/10/18
Discrepancy: UPPER BARREL ACCESS DOOR (T-12) pushing WORN	Corrective Action: Removed and Replaced Bushings IAW CMM 71-11-22
AMT: [REDACTED]	AMT: [REDACTED] Insp: [REDACTED] Date: 10 JAN 18
Discrepancy: Removed 20 EA loose Fasteners @ 6 o'clock position	Corrective Action: INSTALLED 20 E.A. Fasteners Per SRM 54-10-01-1A-2
AMT: [REDACTED]	AMT: [REDACTED] Insp: [REDACTED] Date: 10 JAN 18
Discrepancy: Apply Teflon paint to Upper and Lower Chords.	Corrective Action: Applied Teflon paint to upper and lower Chords per AMM 51-21-81
AMT: [REDACTED]	AMT: [REDACTED] Insp: [REDACTED] Date: 11 JAN 18

	ENGINEERING AUTHORIZATION INSTRUCTION & APPROVAL PAGE		SOUTHWEST AIRLINES SA-M 456A DATE: 01/23/2012	
	EA No:	1-771-1101	REV	IR
			PAGE: 1 OF 2 ORIGINAL ISSUE DATE: 1/17/2018	

SUBJECT: SWA - Component - Power-Plant – Repair Engine Inlet Cowl Inner Barrel Upper Acoustic Panel Damage at 9:00 O'clock Position							
ORG ID	SWA	CLASSIFICATION				SSID	A/C TAIL NO
ISSUED BY	m@wnco.com 2018.01.17 08:09:22 -06'00'	ALTER.		MAJOR		RAP	Component
		REPAIR	X	MINOR	X	AD	CYC: 36,340
*APPROVED BY & DATE		OTHER				RVSM	HRS: 61,843
		WT & BAL	N/A		SFAR 36	COMPONENT ID	
***SWA REP		EA CLASSIF.	PERMANENT	INTERIM	TIME-LIMITED	P/N	314-2100-2
**FAA APPROVED			X			S/N	255001

* EA RELEASE SHALL CONFORM TO MPM Chapter 17 REQUIREMENTS.

** MAJOR REPAIRS OR ALTERATIONS MUST BE FAA APPROVED PRIOR TO AIRCRAFT RELEASE.

*** SWA REPRESENTATIVE APPROVAL REQUIRED IF ISSUED BY ORGANIZATION OTHER THAN SWA.

REV	DATE	DESCRIPTION OF REVISION

REASON: As reported by Dallas Sheet Metal Back Shop, Shop finding One (1.0) Previous Acoustical Panel Repair Filler Material is deteriorating and Dent/Gouge still exists in the Inlet Cowl Inner Barrel Upper Acoustic Panel. The Damaged Area is located at the 9:00 O'clock Position, approximately 2.0 inches from the Skin Splice.	
Notes: The SRM, 54-10-01, Repair #7 - Applicability calls for a minimum of 3.3 inches from a Doubler or Edge of the Acoustic Panel. MPN: 314-2100-2/SN: 255001 (Ref: Goodrich Aero-Structures Inlet Cowl Assembly Decal SN: 1255001). The Inlet Cowl Assembly was removed from AP: N777QC/LN: 621/Variable #YA075.	
REFERENCES: RO #0710037-J1R/Clipboard #4 Goodrich Aero-Structures CMM/IPL 71-11-22, Figure 1/Item #-1 and Figure 3/Item #280 737-700 SRM, 54-10-01, Identification #1 – Skin Location, Figure 1/Table #1 and Figure 4 – Table 4	
The Repair was based on -700 SRM, 54-10-01, Repair #7 – Inlet Cowl Inner Barrel Acoustic Panel Damage that is 3.0 inches or Less in Diameter Except Deviated from a Minimum 3.3 inches from The Edge of the Acoustic Panel	
Ref. TSR No: 201800230	

TASK ACTION INSTRUCTIONS		AMT	INSP	DATE
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	ENGINEERING AUTHORIZATION INSTRUCTION & APPROVAL PAGE		SOUTHWEST AIRLINES SA-M 456A DATE: 01/23/2012	
	EA No:	1-771-1101	REV	IR
			PAGE: 2 OF 2 ORIGINAL ISSUE DATE: 1/17/2018	

	TASK ACTION INSTRUCTIONS	AMT	INSP	DATE
	WHEN ELECTRICAL WIRING IS EXPOSED DUE TO WORK INSTRUCTIONS WITHIN THIS DOCUMENT OR CONCURRENT MAINTENANCE AND THERE IS POTENTIAL FOR CONTAMINATION OR DAMAGE, GENERATE A NON ROUTINE CARD TO PROTECT THE ELECTRICAL WIRING INTERCONNECTION SYSTEM (EWIS) PER AMM 20-60-07.			
1.	Part 1 of this Engineering Authorization provides Repair based on -700 SRM, 54-10-01, Repair #7 – Inlet Cowl inner Barrel Acoustic Panel Damage that is 3.0 inches or Less in Diameter. Engineer: [REDACTED]			JAN 15 2018
2.	Ensure E.A. – Part 1 complete and is properly signed-off.	[REDACTED]		17 JAN 2018

Southwest	ENGINEERING AUTHORIZATION		SOUTHWEST AIRLINES SA-M 456B DATE: 05/28/2015	
	INSTRUCTION PAGE			
EA No:	1-771-1101	PART	1	PAGE: 1 OF 9
				ISSUE DATE: 1/15/2018

SUBJECT: SWA - Component - Power-Plant – Repair Engine Inlet Cowl Inner Barrel Upper Acoustic Panel Damage at 9:00 O'clock Position

REFERENCES: RO # 0710037-J1R/Clipboard #4 Goodrich Aero-Structures CMM/IPL 71-11-22, Figure 1/Item #-1 and Figure 3/Item #280 737-700 SRM, 54-10-01, Identification #1 – Skin Location, Figure 1/Table #1 and Figure 4 – Table 4	ISSUED BY [REDACTED] p.com 2018.01.15 09:46:39 -06'00'	A/C TAIL NO Component
* Approved BY & DATE	Digitally signed by [REDACTED] Date: 2018.01.15 13:21:35 -06'00'	COMPONENT ID P/N 314-2100-2 S/N 255001
TSR No: 201800230		

REASON:

As reported by Dallas Sheet Metal Back Shop, Shop finding One (1.0) Previous Acoustical Panel Repair Filler Material is deteriorating and Dent/Gouge still exists in the Inlet Cowl Inner Barrel Upper Acoustic Panel. It is located at the 9:00 O'clock Location and is approximately 2.0 inches from the Skin Splice.
See Figure 1 – 1 (Sheet 1 of 4) for the Damage and its Location.

Note:

The SRM, 54-10-01, Repair #7 - Applicability calls for a minimum of 3.3 inches from a Doubler or Edge of the Acoustic Panel.

Part 1 of this Engineering Authorization provides repair based on 737-700 SRM, 54-10-01, Repair #7 – Inlet Cowl Inner Barrel Acoustic Panel Damage that is 3.0 inches or Less in Diameter.

*ONLY AN "ISSUED BY" SIGNATURE IS REQUIRED TO RELEASE EA PART TO PRODUCTION

TASK ACTION INSTRUCTIONS		AMT	INSP	DATE
Please review the General Notes attached. The requirements of the General Notes and Standard Industry Practices related to Structural Repairs apply to this repair unless otherwise noted in the individual step.				
WHEN ELECTRICAL WIRING IS EXPOSED DUE TO WORK INSTRUCTIONS WITHIN THIS DOCUMENT OR CONCURRENT MAINTENANCE AND THERE IS POTENTIAL FOR CONTAMINATION OR DAMAGE, GENERATE A NON ROUTINE CARD TO PROTECT THE ELECTRICAL WIRING INTERCONNECTION SYSTEM (EWIS) PER AMM 20-60-07.				
1.	Gain Access to facilitate the following Repair. Retain the Removed Parts for Re-Installation.	[REDACTED]		1-15-18
2.	Accomplish a General Visual Inspection and Examine for Signs of Physical Damage and Crack to the Structural Condition. Defects noted: Yes _____ No _____ If the defect is noted. Generate and Record a NRC # _____	[REDACTED]		1-15-18

Southwest	ENGINEERING AUTHORIZATION		SOUTHWEST AIRLINES	
	INSTRUCTION PAGE		SA-M 456B DATE: 05/28/2015	
	EA No:	1-771-1101	PART	1
			PAGE: 2 OF 9	
			ISSUE DATE: 1/15/2018	

	TASK ACTION INSTRUCTIONS	AMT	INSP	DATE
3.	Accomplish a Tap Test at least 2.0 inches beyond the Damage to ensure No Delamination exists at the Upper and FWD/Aft Surfaces. Defects noted: Yes _____ No <u>✓</u> If the defect is noted. Generate and Record a NRC # _____			1-15-18
4.	Clean the Damaged Area with a Soft Cloth moist with Cleaning Solvent per Boeing Standard Overhaul Practices Manual 20-30-03 for the Applicable Cleaning Solvent and General Cleaning Procedures.			1-15-18
5.	Cut and Remove the Damaged Perforated Skin to a Circular Shape as required. See Figure 1 – 1 (Sheet 3 of 4) as shown. Break sharp edges to 0.020"/0.030" radius typical.			1-15-18
6.	Cut and Remove the Damaged Honeycomb Core and Septum Material below the Perforated Skin a Minimum of 0.40 inch larger all around than the Skin Cutout to a Circular Shape as required. Cut Core to a sufficient depth to make sure that all the Damaged Core is removed. See Figure 1 – 1 (Sheet 3 of 4) as shown. Break sharp edges to 0.020"/0.030" radius typical.			1-15-18
7.	Remove/Dispose all the Unwanted Material from the Repair Location. Break sharp edges to 0.020"/0.030" radius typical. Vacuum Clean to remove the Minute Loose Particles.			1-15-18
8.	Fill the Space in the Honeycomb Core Area Below the Skin Cutout with BMS 5-28, Type 3 Honeycomb Edge Filling and Potting Compound and flush with the Surface of the Perforated Skin Panel. Put a 0.016 inch thick 2024-T3 Aluminum Bare Sheet Caul Plate over the Repair Area and use the Masking Tape to hold it in place. Cure Time for the BMS 5-28, Type 3 as call out in Figure 1 – 1 (Sheets 3 and 4). Note: During the Repair keep the mating surfaces of the Repair Part and the Repair Area clean with METHYL ISOOBUTYL KETONE (MIBK) or ACETONE during the Progress of the Repair.			1-16-18

Southwest	ENGINEERING AUTHORIZATION		SOUTHWEST AIRLINES	
	INSTRUCTION PAGE		SA-M 456B DATE: 05/28/2015	
	EA No:	1-771-1101	PART	1
			PAGE: 3 OF 9	
			ISSUE DATE: 1/15/2018	

	TASK ACTION INSTRUCTIONS	AMT	INSP	DATE
9.	Remove the Caul Plate as required.	[REDACTED]	[REDACTED]	1-16-18
10.	Remove the Unwanted Potting Compound with Abrasive Paper so that the Repair is flush with Surfaces of the Perforated Skin panel. Vacuum clean to remove the Minute Loose Particles.	[REDACTED]	[REDACTED]	1-16-18
11.	Clean the Repaired Area with a Soft Cloth moist with Cleaning Solvent per Boeing Standard Overhaul Practices Manual 20-30-03 for the Applicable Cleaning Solvent and General Cleaning Procedures. Keep the mating surfaces of the Repair Part and the Repair Area clean with METHYL ISOOBUTYL KETONE (MIBK) or ACETONE during the Progress of the Repair	[REDACTED]	[REDACTED]	1-16-18
12.	Apply a Layer of Aluminized Epoxy Primer (Base 463-6-4, Catalyst X-306 and Thinner TL-52) to the Surfaces of the Repair Part and the Initial Perforated Skin Around the Repair. See Figure 1 – 1 (Sheet 3 of 4) as shown.	[REDACTED]	[REDACTED]	1-16-18
13.	Permanent identify the repair with "EA-1-771-1101", using the Non-Corrosive Indelible Ink and with Clear Epoxy Topcoat.	[REDACTED]	[REDACTED]	1-16-18
14.	Notify Engineering upon completion of this EA Part by submitting an additional entry into the Technical Service Request (TSR) related to this repair (see reference block). Enter TSR Number: <u>201800230</u>	[REDACTED]	[REDACTED]	16 Jan 18
15.	Verify that EA SA-M 456A "Instruction & Approval" page (coversheet) has been issued by Engineering.	[REDACTED]	[REDACTED]	17 JAN 2018

Southwest	ENGINEERING AUTHORIZATION			SOUTHWEST AIRLINES	
	INSTRUCTION PAGE			SA-M 4568 DATE: 05/28/2015	
	EA No:	1-771-1101	PART	1	PAGE: 4 OF 9
					ISSUE DATE: 1/15/2018

General Notes for Structural Repairs**General:**

1. All abbreviations per industry standards (i.e. SRM, SB, IPC, AMM, MPM, OHM, CMM, MIL-STD-12D etc.) are acceptable.
2. Part Nomenclature used may not necessarily correspond to IPC/SRM/AMM/Drawing reference nomenclature.
3. Typographical errors that do not inhibit the individual work step are acceptable.
4. The precise aircraft physical configuration may or may not be depicted exactly in the EA (unless specified). The actual location of fasteners depends entirely upon the hand layout techniques used when the airplane was built. When accomplishing this repair, count the existing fasteners from known features, such as doublers edges, skin lap joints, fittings, frames, etc. to determine the required shape and size of the repair.
5. The steps indicated are a recommended work flow. Steps may be accomplished in different order provided the final outcome and the work intent is unchanged.
6. Mark NRC "Major" as required per MPM 38-10/38-11. EAs marked as "Other" may affect Major Repairs.
7. Mark NRC "RII" as required per MPM 10-03-05.
8. See SRM 51-30-05 for Equipment and Tools For Repairs.
9. Repair classification indicated in SRM are different than classifications used in the SWA RAP Program.
10. If any step within the EA has been previously accomplished by either another Engineering or Maintenance Document, then it is acceptable to PCW per MPM Chapter 5 any steps that have been previously accomplished. Record the Engineering or Maintenance Document that the action was previously accomplished adjacent to the sign-off block that is being PCWed.

Inspections:

1. Use a 0.03 inch notch standard for HFEC Fastener Hole Inspections per NDT Part 6, 51-00-00, Fig 16, unless indicated differently.
2. HFEC Surface Inspection of Aluminum Parts per NDT 51-00-00, Fig. 4 or 23.
3. HFEC Fastener Hole Countersink Inspection per NDT Part 6, 53-30-00, Fig 4.
4. Eddy Current Inspection for fuselage skin crack inspection along subsurface edges per NDT Part 6, 53-30-09.
5. Eddy Current Inspection for fuselage crown skin – crack inspection of outer skin at subsurface edges (chem-mill steps) per NDT Part 6, 53-30-18.
6. Dye-Penetrant or Fluorescent-Penetrant inspections per SOPM 20-20-02.
7. Generate additional NRCs for any damage found during inspections.
8. Critical Row definition. The critical row is the outermost fastener row of the repair.
9. Heat treat verification per SRM 51-20-02.

For All Repairs:

1. All dimensions are in inches, unless shown differently.
2. Access the repair area as required. Document all items removed on separate Non-Routine Cards for later installation and documentation of functional/operational checks as required by the individual AMM references. Document individual RII requirements for those systems on the individual NRCs. (Ref MPM 05-03-02).
3. Fastener removal and installation, hole sizes and edge margins per SRM 51-40.
4. Cleanup of holes, prior to inspection per SRM 51-40-05.
5. Inspection and removal of damage per SRM 51-10-02.
6. Removal of corrosion and surface finish requirements per SRM 51-20-01.
7. Machined surfaces and all cutout edges must have a finish of 125 microinches Ra or better, unless a different finish is specified (ref SRM 51-20-13).
8. D = Fastener Diameter
9. Sheet Metal Materials and substitutions per SRM 51-30-01.
10. Fastener substitution per SRM 51-40-03 or BAC5004 or BAC 5009. Blind fasteners are not considered similar to other fasteners which are not blind.
11. Screws retaining other components do not count as repair fasteners.
12. Use a minimum of 2D Edge Margin on the repair parts, unless shown differently.
13. Use 4D-6D fastener spacing between newly installed repair fasteners, unless shown differently. Fastener spacing of production fasteners common to the repair are acceptable as installed at production.
14. The installed number of rows and columns of fasteners on each side of the damaged area are to be the same or larger than shown.
15. Application of protective treatment of metal (Chemical Conversion Coating and CIC) per SRM 51-20-01.
16. Cadmium plate and prime all steel repair parts per SRM 51-20-01. (Refer to SOPM 20-42-01 and 20-42-05 for plating and SOPM 20-41-02 for priming the surface).
17. Repair Sealing per SRM 51-20-05.
18. All rivets are to be overdriven to a minimum of 1.4 times the fastener diameter as per SRM 51-40-02, Fig 3, Table II.
19. Install Hi-Loks in Transition Fit holes through aluminum parts. Install Hi-Loks in Close Ream holes through steel parts.
20. Installation of 1/64 or 1/32 O/S fasteners acceptable provided all other requirements are maintained (i.e. 4-6D spacing, 2D EM, etc).
21. Application of Urethane Compatible Primer per SOPM 20-44-04, unless shown differently.
22. Interior and Exterior finishes to be accomplished per AMM 51-21 procedures, unless indicated differently.

	ENGINEERING AUTHORIZATION INSTRUCTION PAGE			SOUTHWEST AIRLINES SA-M 456B DATE: 05/28/2015	
	EA No:	1-771-1101	PART	1	PAGE: 5 OF 9
					ISSUE DATE: 1/15/2018

General Notes for Structural Repairs (Continued)

For Skin Repairs:

1. Repairs of minor dents or edge deformation per SRM 51-70-01. Document additional rework and NDT as a separate entry on the NRC.
2. The final repair shape and size to be determined at installation. Allowances need to be made for existing skin fastener configuration and repair edge margins.
3. Pre-form or roll the repair parts to match the fuselage skin contour before they are installed.
4. Keep a minimum of 0.5 inch external radius and 2.0 inches internal radius on repair part corners, unless shown differently.
5. Chamfer all visible edges of external repair parts that are 0.050 inch or thicker.
6. Aerodynamic smoothness requirements per SRM 51-10-01.
7. Countersinking of holes and the use of countersink repair washers per SRM 51-40-08.
8. The ratio of the countersink depth in the outer layer divided by the thickness of the outer layer may not exceed 80%.
9. For repairs that define tapers in width or length (not fillers or shims), must be matched within one fastener row.
10. Use of fillers/shims (structural or non-structural) per SRM 51-30-01, Figure 10.

For Structure Repairs:

1. Minimum Inner Bend Radii per SRM 51-30-01.
2. If repair parts are to be fabricated from -O material, Heat treat to correct temper per BAC5602 for aluminum and BAC5617/BAC5619 for steel.
3. If repair parts are fabricated from pre-formed and heat tempered material, it is acceptable to N/A the NDT step and the Heat Treat step provided the material used, after trimming, meets all the original geometrical requirements of the required part. Add additional notation at the bottom of the page indicating the part number and material type used.
4. Installation of radius blocks is acceptable, provided they are individual blocks for each affected fastener. See BACF3H or BACF33C.
5. Shot Peening/Flap Peening procedures per SRM 51-20-06 and SOPM 20-10-03.
6. Cold Working fastener holes per SRM 51-40-09.
7. Use of shims (structural or non-structural) per SRM 51-30-01, Figure 10.

Southwest	ENGINEERING AUTHORIZATION			SOUTHWEST AIRLINES	
	INSTRUCTION PAGE			SA-M 4568 DATE 05/28/2015	
	EA No:	1-771-1101	PART	1	PAGE: 6 OF 9
					ISSUE DATE: 1/15/2018



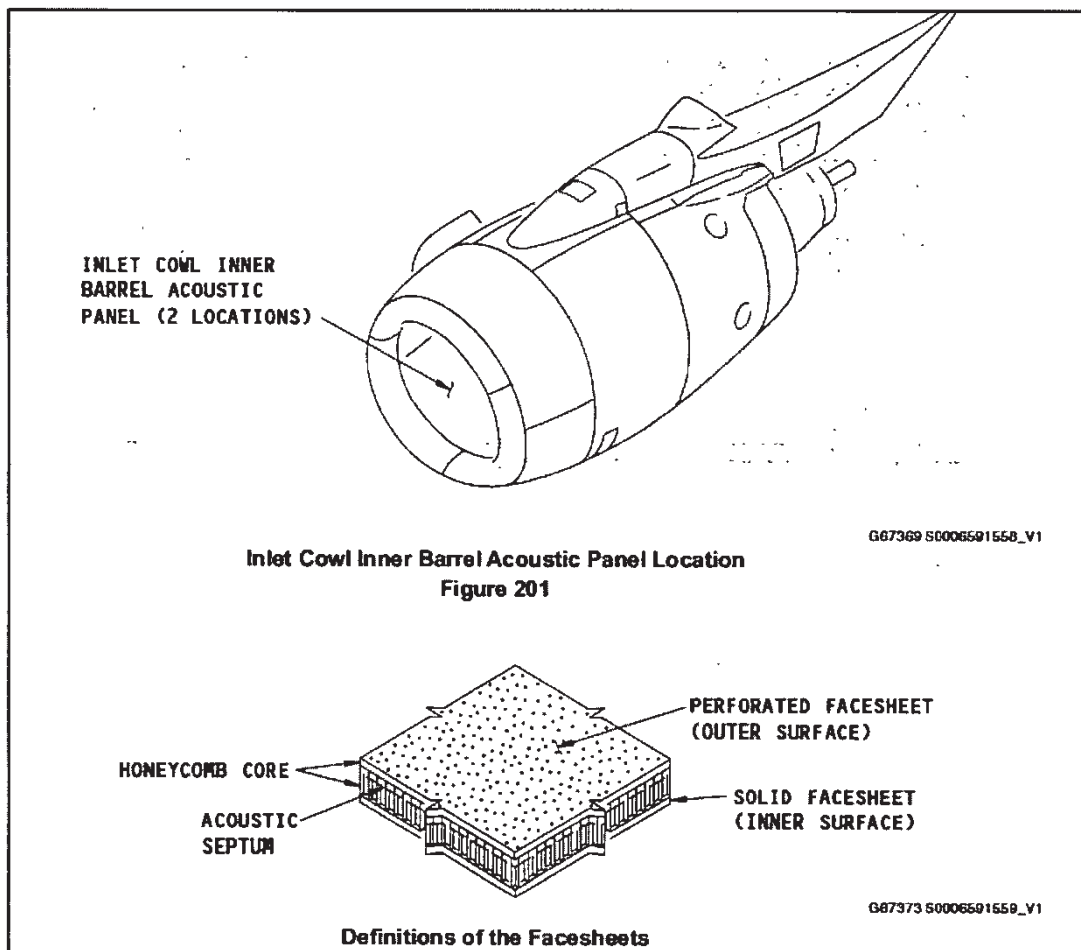
Damage View Looking Outboard from Inner Barrel

Upper Acoustic Panel

(9:00 O'clock Position)

Figure 1 – 1 (Sheet 1 of 4)

Southwest	ENGINEERING AUTHORIZATION			SOUTHWEST AIRLINES	
	INSTRUCTION PAGE			SA-M 456B DATE: 05/28/2015	
	EA No:	1-771-1101	PART	1	PAGE: 7 OF 9
					ISSUE DATE: 1/15/2018

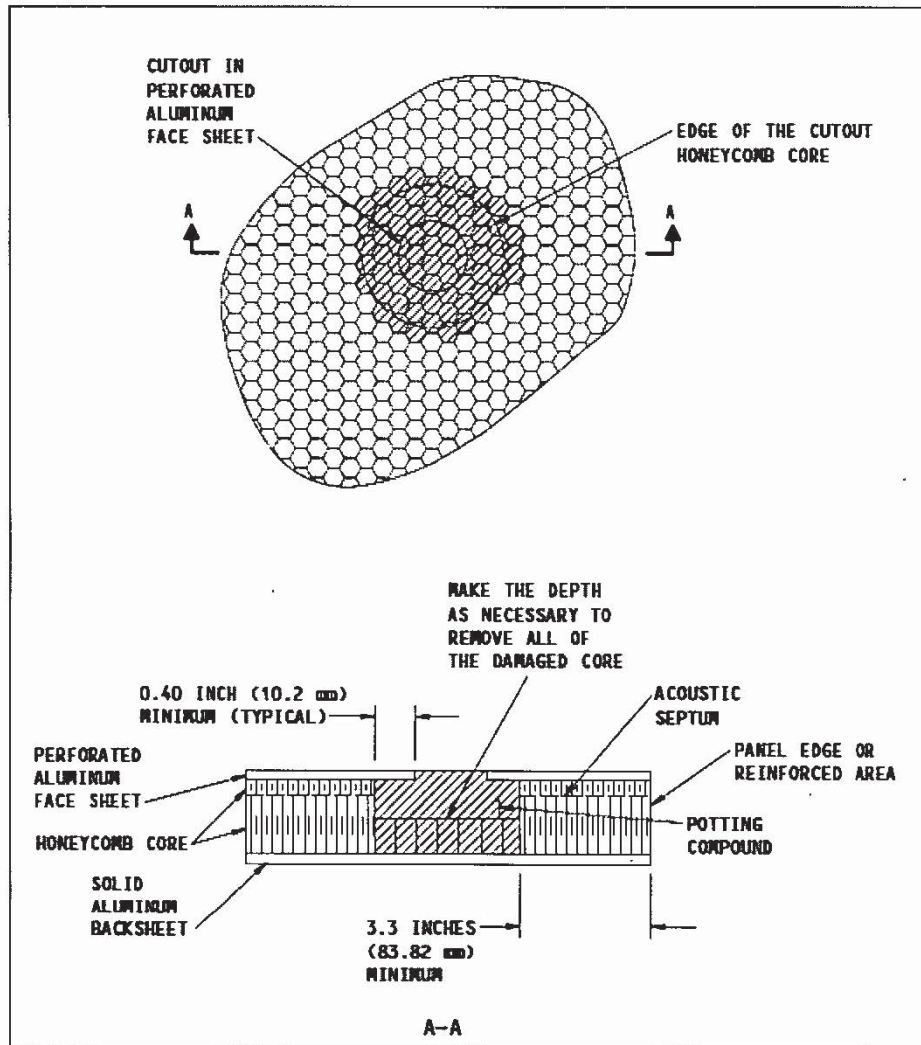


Inlet Cowl Assembly
Inner Acoustic Panel shown
Figure 1 –1 (Sheet 2 of 4)

Reference:

737-700 SRM, 54-10-01, Repair #7 – Inlet Cowl Inner Barrel Acoustic Upper Panel Damage that is 3.0 inches or Less Diameter.

Southwest	ENGINEERING AUTHORIZATION		SOUTHWEST AIRLINES	
	INSTRUCTION PAGE		SA-M 456B DATE 05/28/2015	
	EA No:	1-771-1101	PART	1
				PAGE: 8 OF 9
				ISSUE DATE: 1/15/2018



Layout of the Repair

Figure 1 – 1 (Sheet 3 of 4)

Reference:

737-700 SRM, 54-10-01, Repair #7 – Inlet Cowl Inner Barrel Acoustic Upper Panel Damage that is 3.0 inches or Less Diameter.

Southwest	ENGINEERING AUTHORIZATION			SOUTHWEST AIRLINES	
	INSTRUCTION PAGE			SA-M 456B DATE: 05/28/2015	
	EA No:	1-771-1101	PART	1	PAGE: 9 OF 9
				ISSUE DATE: 1/15/2018	

POTTING COMPOUND	COMPONENTS	PARTS BY WEIGHT	WORK TIME	CURING TIME ①
BMS 5-28, TYPE 3 POTTING COMPOUND ② ③	EPOCAST 1511A/B	④	20 MINUTES	7 DAYS AT 77° ±10°F 5 HOURS AT 125° ±10°F
BMS 5-28, TYPE 14, CLASS 2 POTTING COMPOUND ⑤	EPOCAST 1614-A1	④	8 HOURS	90 MINUTES AT 260°F ±10°F

TABLE A

NOTES

- ① APPLY HEAT TO THE MATERIAL AT A MAXIMUM RATE OF 5°F TO 7°F PER MINUTE, THEN KEEP AT THE CURE TEMPERATURE FOR THE GIVEN TIME.
- ② THE PASTE IS A TWO PART ROOM TEMPERATURE CURE, IF THE COMPOUND CAN BE USED BEFORE 1 YEAR AFTER STORAGE AT 40°F TO 80°F (5°C TO 27°C).
- ③ BMS 5-28, TYPE 14, CLASS 2 IS AN ALTERNATIVE TO BMS 5-28, TYPE 3.
- ④ MIX AS GIVEN IN THE MANUFACTURER'S INSTRUCTIONS. VISCOSITY CAN BE INCREASED IF YOU ADD MILLED GLASS FIBERS UP TO 20% OF THE TOTAL WEIGHT OF THE COMPOUND.
- ⑤ THE PUTTY IS A ONE PART HEAT CURE, IF THE COMPOUND CAN BE USED BEFORE 3 MONTHS AFTER STORAGE AT 0°F (-18°C) OR LOWER TEMPERATURE.

Potting Compound Cure Times

Figure 1 – 1 (Sheet 4 of 4)

Reference:

737-700 SRM, 54-10-01, Repair #7 – Inlet Cowl Inner Barrel Acoustic Upper Panel Damage that is 3.0 inches or Less Diameter.

	ENGINEERING AUTHORIZATION INSTRUCTION & APPROVAL PAGE		SOUTHWEST AIRLINES SA-M 456A DATE: 01/23/2012	
	EA No:	1-771-1098	REV	IR
				PAGE: 1 OF 2 ORIGINAL ISSUE DATE: 1/16/2018

SUBJECT: SWA - Component – Power-Plant - Engine Inlet Cowl Aft Bulkhead Aft Attach Ring Aft Flange Surface Nicks/Scratches Rework							
ORG ID	SWA	CLASSIFICATION				SSID	A/CTAIL NO
ISSUED BY	2018.01.16 08:20:04 -06'00'	ALTER.		MAJOR		RAP	Component
		REPAIR	X	MINOR	X	AD	CYC: 36,340
*APPROVED BY & DATE	2018.01.16 09:54:21 -06'00'	OTHER				RVSM	HRS: 61,843
		WT & BAL	N/A		SFAR 36	COMPONENT ID	
***SWA REP		EA CLASSIF.	PERMANENT	INTERIM	TIME-LIMITED	P/N	314-2100-2
**FAA APPROVED			X			S/N	255001

* EA RELEASE SHALL CONFORM TO MPM Chapter 17 REQUIREMENTS.

** MAJOR REPAIRS OR ALTERATIONS MUST BE FAA APPROVED PRIOR TO AIRCRAFT RELEASE.

*** SWA REPRESENTATIVE APPROVAL REQUIRED IF ISSUED BY ORGANIZATION OTHER THAN SWA.

REV	DATE	DESCRIPTION OF REVISION
-	-	-

REASON:

As reported by Dallas Sheet Metal Shop, Shop received a -700 Series Engine Inlet Cowl Assembly MPN: 314-2100-2/SN: 255001 (Ref: Goodrich Aero-Structures Assembly Decal SN: 1255001) has Several Scratches/Nicks and the Damage are in Three (3.0) Places located at Inlet Cowl Assembly Aft Attach Mounting Ring, Aft Flange Interface Surfaces as follows: -

- 1/ First Damage reported to be 0.0456 inch in depth and damage locates approximately at 8:30 O'clock Position.
- 2/ Second Damage reported to be Nick/Scratch and damage locates approximately at 8:15 O'clock Position.
- 3/ Third Damage reported to be 0.0458 inch in depth and damage locates approximately at 3:15 O'clock Position

Note:

THIS Inlet Cowl Assembly was removed from AP: N777QC/LN: 621/Propulsion Variable #YA075

REFERENCES:

RO #0710037-JIR/Clipboard #4
 -700 SRM, 54-10-02, Identification #1,
 Figure 1/Table 1 and Figure 6/Table 5
 -700 SRM, 54-10-02, Allowable Damage #1 – Table
 101, Paragraph 4. D. b. 1) – Attach Ring
 Goodrich Aero-Structures CMM/IPL 71-11-22, Figure 3 –
 Item #70 Attach Ring MPN: 314-2134-3

The Remaining Material Thickness after Blending is within UTAS Blueprint #314-2134 Dimensions and No Repair Documentation is required since there is No Deviation in Design Thickness at these Locations

Ref. TSR No: 201800067

TASK ACTION INSTRUCTIONS	AMT	INSP	DATE
WHEN ELECTRICAL WIRING IS EXPOSED DUE TO WORK INSTRUCTIONS WITHIN THIS DOCUMENT OR CONCURRENT MAINTENANCE AND THERE IS POTENTIAL FOR CONTAMINATION OR DAMAGE, GENERATE A NON ROUTINE CARD TO PROTECT THE ELECTRICAL WIRING INTERCONNECTION SYSTEM (EWIS) PER AMM 20-60-07.			

	ENGINEERING AUTHORIZATION INSTRUCTION & APPROVAL PAGE		SOUTHWEST AIRLINES SA-M 456A DATE 01/23/2012	
	EA No:	1-771-1098	REV	IR
			PAGE: 2 OF 2 ORIGINAL ISSUE DATE: 1/16/2018	

	TASK ACTION INSTRUCTIONS	AMT	INSP	DATE
1.	Clean the Reworked Surface Areas with a Soft Cloth moist with Cleaning Solvent per Boeing Standard Overhaul Practices Manual 20-30-03 for the Applicable Cleaning Solvent and General Cleaning Procedures.			1-16-18
2.	Apply a Chemical Conversion Coating to All Reworked Bare Surface Areas Excluding Inside of the Bolt Hole Locations in accordance with Boeing Standard Overhaul Practices Manual 20-43-03.			1-16-18
3.	Permanent identify the Rework with " E.A. 1-771-1098 ", using Non-Corrosive Indelible Ink and with Clear Epoxy Topcoat.			1-16-18
4.	Part 1 of this Engineering Authorization provides inspections, damage removals and rework instructions. Engineer: [REDACTED]			Jan. 12 2018
5.	Ensure E.A. – Part 1 complete and is properly signed-off.			1-16-18

Southwest	ENGINEERING AUTHORIZATION INSTRUCTION PAGE			SOUTHWEST AIRLINES SA-M 456B DATE: 05/28/2015	
	EA No:	1-771-1098	PART	1	PAGE: 1 OF 18 ISSUE DATE: 1/11/2018

SUBJECT: SWA - Component – Power-Plant - Engine Inlet Cowl Aft Bulkhead Aft Attach Ring Aft Flange Surface Nicks/Scratches Rework					
REFERENCES: RO #0710037-JIR/Clipboard #4 -700 Series SRM, 54-10-02, Identification #1, Figure 1/Table 1 and Figure 6/Table 5 -700 Series SRM, 54-10-02, Allowable Damage #1 – Table 101, Paragraph 4. D. – Attach Ring Goodrich AERO-Structures CMM/IPL 71-11-22, Figure 3 – Item #70 Attach Ring MPN: 314-2134-3 TSR No: 201800067		ISSUED BY [Redacted] 2018.01.12 12:11:41 -06'00'	[Redacted] b.co m	A/C TAIL NO Component	
	* Approved BY & DATE	Digitally signed by [Redacted] Date: 2018.01.12 13:01:39 -06'00'		COMPONENT ID	
				P/N	314-2100-2
				S/N	255001
REASON: As reported by Dallas Sheet Metal Back Shop, Shop received a -700 Series Engine Inlet Cowl Assembly MPN: 314-2100-2 and SN: 255001 (Ref: Goodrich AERO-Structures SN: 1255001) has several Scratches and Nicks and the Damage are located on Inlet cowl Assembly Aft Bulkhead Aft Attach Ring, Ring Aft Flange Surface. The Damage are located at Three (3.0) Locations: - 1/ The First Damage reported to be 0.0456" in depth and the damage locates approximately at 8:30 O'clock Position. 2/ The Second Damage reported to be Nick/Scratch and damage locates approximately at 8:15 O'clock Position. 3/ Third Damage reported to be 0.0458" in depth and the Damage locates approximately at 3:15 O'clock Position. Note: The Damage Areas are located at Inlet Aft Attach Mounting Ring, Aft Flange Interface Surfaces. Per -700 Series SRM, 54-10-02, Allowable Damage #1, Paragraph 4. D. b. 1) – Damage Rework is not permitted. The Inlet Cowl Assembly was removed from AP: N777QC/LN: 621 /Propulsion Variable #YA075. Part 1 of this Engineering Authorization provides inspection, damage removal, and rework instructions.					

*ONLY AN "ISSUED BY" SIGNATURE IS REQUIRED TO RELEASE EA PART TO PRODUCTION

TASK ACTION INSTRUCTIONS		AMT	INSP	DATE
Please review the General Notes attached. The requirements of the General Notes and Standard Industry Practices related to Structural Repairs apply to this repair unless otherwise noted in the individual step.				
WHEN ELECTRICAL WIRING IS EXPOSED DUE TO WORK INSTRUCTIONS WITHIN THIS DOCUMENT OR CONCURRENT MAINTENANCE AND THERE IS POTENTIAL FOR CONTAMINATION OR DAMAGE, GENERATE A NON ROUTINE CARD TO PROTECT THE ELECTRICAL WIRING INTERCONNECTION SYSTEM (EWIS) PER AMM 20-60-07.				
1.	Gain Access to facilitate the Rework. Remove and Retain Parts for Re-Installation.			13 JAN 2018

Southwest	ENGINEERING AUTHORIZATION INSTRUCTION PAGE		SOUTHWEST AIRLINES SA-M 456B DATE: 05/28/2015	
	EA No:	1-771-1098	PART	1
			PAGE: 2 OF 18	
			ISSUE DATE: 1/11/2018	

TASK ACTION INSTRUCTIONS		AMT	INSP	DATE
<u>Rework Aft Attach Mounting Ring</u> <u>Aft Flange Surface</u> <u>at 8:30 O'clock Position</u>				
2.	Accomplish a General Visual Inspection of the Damaged Area for an Additional Wear, Corrosion and Structural Condition using 10X Lens. Defects noted: Yes _____ No ☒ If Defects are noted. Record and Generate a NRC # _____			13 JAN 2018
3.	Accomplish a High Frequency Eddy Current (HFEC) Inspection along the Inlet Aft Attach Mounting Ring (Ref. MPN: 314-2134-3) Aft Flange Forward and Aft Faying Surfaces common to the Nicks/Scratches Areas as shown in Figure 1 – 1 in accordance with 737 NDT, D6-37239 Document, Part 6, 51-00-00, Procedure 4 or 23. Defects noted: Yes _____ No ☒ If Defects are noted. Record and Generate a NRC # _____ Note: The Inlet Attach Mounting Ring is made from 7075-T7351 Aluminum Alloy Forging in accordance with AMS4311 Material Specification.			13 JAN 2018
4.	Use a 60 Grit or Finer Aluminum Oxide Abrasive Paper, lightly Sand Nicks and Scratches on Reworked Aluminum Alloy Forged Metal Surface and blend out the Damaged Area in accordance with -700 Series SRM, 51-10-02 – "General – Inspection and Removal of Damage". Follow up with 400 Grit Aluminum Oxide Abrasive Paper as Finishing Process. See Figure 1 – 1 as shown.			13 JAN 2018
5.	Vacuum Clean to remove the Minute Loose Particles.			13 JAN 2018
6.	Break sharp edges to 0.020"/0.030" radius typical. Polish the Reworked Aft Bulkhead Aft Attach Mounting Ring Fay Surfaces to 63 micro-inches finish or better.			3 JAN 2018

Southwest	ENGINEERING AUTHORIZATION		SOUTHWEST AIRLINES	
	INSTRUCTION PAGE		SA-M 456B DATE 05/28/2015	
	EA No:	1-771-1098	PART	1
				PAGE: 3 OF 18
				ISSUE DATE: 1/11/2018

	TASK ACTION INSTRUCTIONS	AMT	INSP	DATE
7.	Clean Reworked Surface with a Soft Cloth moist with Cleaning Solvent in accordance with Boeing Standard Overhaul Practices Manual 20-30-03 for the Applicable Cleaning Solvent and General Cleaning Procedures.			13 JAN 2018
8.	Accomplish a High Frequency Eddy Current (HFEC) Inspection at the Reworked Aft Attach Mounting Ring (Ref. MPN: 314-2134-3) Aft Flange Forward and Aft Surfaces in Figure 1 – 1 as shown in accordance with 737 NDT, D6-37239 Document, Part 6, 51-00-00, Procedure #4 or 23. Defects noted: Yes _____ No ☒ If Defects are noted. Record and Generate a NRC # _____			13 JAN 2018
9.	Clean Reworked Surface with a Soft Cloth moist with Cleaning Solvent in accordance with Boeing Standard Overhaul Practices Manual 20-30-03 for Applicable Cleaning Solvent and General Cleaning Procedures.			13 JAN 2018
10.	Properly lay out the Grids at the Reworked Locations in 0.60 inch Square Grids as shown. Accomplish the Remaining Thickness Measurement at Blended Area either use 0 to 0.75 inch measuring range Point Micrometer (SWA Tooling #T001406) or 0 to 1.75 inches measuring range Point Micrometer (SWA Tooling #T1414) to determine the Material Remaining after the Blending in 0.60 inch Square Grids. Record the Material Remaining Thickness on Figure 1 – 1, Table "A".			13 JAN 2018
	<u>Rework Aft Attach Mounting Ring</u> <u>Aft Flange Surface</u> <u>at 8:15 O'clock Position</u>			
11.	Accomplish a General Visual Inspection of the Damaged Area for an Additional Wear, Corrosion and Structural Condition using 10X Lens. Defects noted: Yes _____ No ☒ If Defects are noted. Record and Generate a NRC # _____			13 JAN 2018

Southwest	ENGINEERING AUTHORIZATION		SOUTHWEST AIRLINES	
	INSTRUCTION PAGE		SA-M 456B DATE: 05/28/2015	
	EA No:	1-771-1098	PART	1
				PAGE: 4 OF 18
				ISSUE DATE: 1/11/2018

	TASK ACTION INSTRUCTIONS	AMT	INSP	DATE
12.	Accomplish a High Frequency Eddy Current (HFEC) Inspection along the Damaged Inlet Aft Attach Mounting Ring (Ref. MPN: 314-2134-3) Aft Flange Forward and Aft Faying Surfaces common to Nicks/Scratches as shown in Figures 1 – 1 in accordance with 737 NDT, D6-37239 Document, Part 6, 51-00-00, Procedure 4 or 23. Defects noted: Yes _____ No ☒ If Defects are noted. Record and Generate a NRC # _____ Note: The Inlet Attach Ring is made from 7075-T7351 Aluminum Alloy Forging in accordance with AMS4311 Material Specification.			13 JAN 2018
13.	Use a 60 Grit or Finer Aluminum Oxide Abrasive Paper, lightly Sand the Nicks and Scratches on Reworked Aluminum Alloy Forged Metal Surface and blend out the Damaged Area in accordance with -700 Series SRM, 51-10-02 – "General – Inspection and Removal of Damage". Follow up with 400 Grit Aluminum Oxide Abrasive Paper as Finishing Process. See Figure 1 – 1 as shown.			13 JAN 2018
14.	Break sharp edges to 0.020"/0.030" radius typical. Polish Reworked Aft Bulkhead Aft Attach Mounting Ring Fay Surfaces to 63 micro-inches finish or better.			13 JAN 2018
15.	Clean Reworked Surface with a Soft Cloth moist with Cleaning Solvent in accordance with Boeing Standard Overhaul Practices Manual 20-30-03 for the Applicable Cleaning Solvent and General Cleaning Procedures.			13 JAN 2018
16.	Accomplish a High Frequency Eddy Current (HFEC) Inspection along the Reworked Aft Attach Mounting Ring (Ref. MPN: 314-2134-3) Aft Flange Forward and Aft Surfaces in Figure 1 – 1 as shown in accordance with 737 NDT, D6-37239 Document, Part 6, 51-00-00, Procedure #4 or 23. Defects noted: Yes _____ No ☒ If Defects are noted. Record and Generate a NRC # _____			13 JAN 2018
17.	Clean Reworked Surface with a Soft Cloth moist with Cleaning Solvent in accordance with Boeing Standard Overhaul Practices Manual 20-30-03 for the Applicable Cleaning Solvent and General Cleaning Procedures.			3 JAN 2018

Southwest	ENGINEERING AUTHORIZATION		SOUTHWEST AIRLINES	
	INSTRUCTION PAGE		SA-M 456B DATE: 05/28/2015	
EA No:	1-771-1098	PART	1	PAGE: 5 OF 18
				ISSUE DATE: 1/11/2018

	TASK ACTION INSTRUCTIONS	AMT	INSP	DATE
18.	Properly lay out the Grids at Reworked Locations in 0.60 inch Square Grids as shown. Perform Remaining Thickness Measurement at Blended Area either use 0 to 0.75 inch measuring range Point Micrometer (SWA Tooling #T001406) or 0 to 1.75 inches measuring range Point Micrometer (SWA Tooling #T1414) to determine the Material Remaining after the Blending in 0.60 inch Square Grids. Record the Remaining Material Thickness on Figure 1 – 1, Table "A".			13 JAN 2018
<u>Rework Aft Attach Mounting Ring</u> <u>Aft Flange Surface</u> <u>at 3:15 O'clock Position</u>				
19.	Accomplish a General Visual Inspection of the Damaged Area for an Additional Wear, Corrosion and Structural Condition using 10X Lens. Defects noted: Yes _____ No _____ If Defects are noted. Record and Generate a NRC # _____			13 JAN 2018
20.	Accomplish a High Frequency Eddy Current (HFEC) Inspection along the Damaged Inlet Aft Attach Mounting Ring (Ref. MPN: 314-2134-3) Aft Flange Forward and Aft Face Surfaces common to the Nicks/Scratches as shown in Figure 1 – 2 in accordance with 737 NDT, D6-37239 Document, Part 6, 51-00-00, Procedure 4 or 23. Defects noted: Yes _____ No _____ If Defects are noted. Record and Generate a NRC # _____ Note: The Inlet Attach Ring is made from 7075-T7351 Aluminum Alloy Forging in accordance with AMS4311 Material Specification.			13 JAN 2018
21.	Use a 60 Grit or Finer Aluminum Oxide Abrasive Paper, lightly Sand the Nicks and Scratches on the Aluminum Alloy Forged Metal Surface and blend out the Damaged Area in accordance with -700 Series SRM, 51-10-02 – "General – Inspection and Removal of Damage". Follow up with 400 Grit Aluminum Oxide Abrasive Paper as Finishing Process. See Figure 1 – 2 as shown.			13 JAN 2018

Southwest	ENGINEERING AUTHORIZATION		SOUTHWEST AIRLINES	
	INSTRUCTION PAGE		SA-M 456B DATE: 05/28/2015	
EA No:	1-771-1098	PART	1	PAGE: 6 OF 18
				ISSUE DATE: 1/11/2018

	TASK ACTION INSTRUCTIONS	AMT	INSP	DATE
22.	Break sharp edges to 0.020"/0.030" radius typical. Polish Reworked Aft Bulkhead Aft Attach Mounting Ring Faying Surfaces to 63 micro-inches finish or better.			3 JAN 2018
23.	Clean the Reworked Surface with a Soft Cloth moist with Cleaning Solvent in accordance with Boeing Standard Overhaul Practices Manual 20-30-03 for the Applicable Cleaning Solvent and General Cleaning Procedures.			3 JAN 2018
24.	Accomplish a High Frequency Eddy Current (HFEC) Inspection along Reworked Aft Attach Mounting Ring (Ref. MPN: 314-2134-3) Aft Flange Forward and Aft Surfaces in Figure 1 – 2 as shown in accordance with 737 NDT, D6-37239 Document, Part 6, 51-00-00, Procedure #4 or 23. Defects noted: Yes _____ No ☒ If Defects are noted. Record and Generate a NRC # _____			13 JAN 2018
25.	Clean the Reworked Surface with a Soft Cloth moist with Cleaning Solvent in accordance with Boeing Standard Overhaul Practices Manual 20-30-03 for the Applicable Cleaning Solvent and General Cleaning Procedures.			13 JAN 2018
26.	Properly lay out the Grids at the Reworked Locations in 0.60 inch Square Grids as shown. Perform Remaining Thickness Measurement at Blended Area either use 0 to 0.75 inch measuring range Point Micrometer (SWA Tooling #T001406) or 0 to 1.75 inches measuring range Point Micrometer (SWA Tooling #T1414) to determine the remaining thickness of the Blended Flange Surfaces in 0.60 inch Square Grids. Record the Remaining Thickness on Figure 1 – 2, Table "B".			13 JAN 2018
27.	Resubmit the E.A. 1-771-1098, Part 1 to Service Engineering for further Engineering Evaluation.			13 JAN 2018
28.	Notify Engineering upon completion of this EA Part by submitting an additional entry into the Technical Service Request (TSR) related to this repair (see reference block). Enter TSR Number: <u>201800067</u>			13 JAN 2018
29.	Verify that EA SA-M 456A "Instruction & Approval" page (coversheet) has been issued by Engineering.			1-16-18

Southwest	ENGINEERING AUTHORIZATION			SOUTHWEST AIRLINES	
	INSTRUCTION PAGE			SA-M 456B DATE: 05/28/2015	
	EA No:	1-771-1098	PART	1	PAGE: 7 OF 18
				ISSUE DATE: 1/11/2018	

General Notes for Structural Repairs**General:**

1. All abbreviations per industry standards (i.e. SRM, SB, IPC, AMM, MPM, OHM, CMM, MIL-STD-12D etc.) are acceptable.
2. Part Nomenclature used may not necessarily correspond to IPC/SRM/AMM/Drawing reference nomenclature.
3. Typographical errors that do not inhibit the individual work step are acceptable.
4. The precise aircraft physical configuration may or may not be depicted exactly in the EA (unless specified). The actual location of fasteners depends entirely upon the hand layout techniques used when the airplane was built. When accomplishing this repair, count the existing fasteners from known features, such as doublers edges, skin lap joints, fittings, frames, etc. to determine the required shape and size of the repair.
5. The steps indicated are a recommended work flow. Steps may be accomplished in different order provided the final outcome and the work intent is unchanged.
6. Mark NRC "Major" as required per MPM 38-10/38-11. EAs marked as "Other" may affect Major Repairs.
7. Mark NRC "RII" as required per MPM 10-03-05.
8. See SRM 51-30-05 for Equipment and Tools For Repairs.
9. Repair classification indicated in SRM are different than classifications used in the SWA RAP Program.
10. If any step within the EA has been previously accomplished by either another Engineering or Maintenance Document, then it is acceptable to PCW per MPM Chapter 5 any steps that have been previously accomplished. Record the Engineering or Maintenance Document that the action was previously accomplished adjacent to the sign-off block that is being PCWed.

Inspections:

1. Use a 0.03 inch notch standard for HFEC Fastener Hole Inspections per NDT Part 6, 51-00-00, Fig. 16, unless indicated differently.
2. HFEC Surface Inspection of Aluminum Parts per NDT 51-00-00, Fig. 4, or 23.
3. HFEC Fastener Hole Countersink Inspection per NDT Part 6, 53-30-00, Fig. 4.
4. Eddy Current inspection for fuselage skin crack inspection along subsurface edges per NDT Part 6, 53-30-09.
5. Eddy Current Inspection for fuselage crown skin – crack inspection of outer skin at subsurface edges (chem-mill steps) per NDT Part 6, 53-30-18.
6. Dye-Penetrant or Fluorescent-Penetrant inspections per SOPM 20-20-02.
7. Generate additional NRCs for any damage found during inspections.
8. Critical Row definition: The critical row is the outermost fastener row of the repair.
9. Heat treat verification per SRM 51-20-02.

For All Repairs:

1. All dimensions are in inches, unless shown differently.
2. Access the repair area as required. Document all items removed on separate Non-Routine Cards for later installation and documentation of functional/operational checks as required by the individual AMM references. Document individual RII requirements for those systems on the individual NRCs. (Ref MPM 05-03-02).
3. Fastener removal and installation, hole sizes and edge margins per SRM 51-40.
4. Cleanup of holes, prior to inspection per SRM 51-40-05.
5. Inspection and removal of damage per SRM 51-10-02.
6. Removal of corrosion and surface finish requirements per SRM 51-20-01.
7. Machined surfaces and all cutout edges must have a finish of 125 microinches Ra or better, unless a different finish is specified (ref SRM 51-20-13).
8. D = Fastener Diameter
9. Sheet Metal Materials and substitutions per SRM 51-30-01.
10. Fastener substitution per SRM 51-40-03 or BAC5004 or BAC 5009. Blind fasteners are not considered similar to other fasteners which are not blind.
11. Screws retaining other components do not count as repair fasteners.
12. Use a minimum of 2D Edge Margin on the repair parts, unless shown differently.
13. Use 4D-6D fastener spacing between newly installed repair fasteners, unless shown differently. Fastener spacing of production fasteners common to the repair are acceptable as installed at production.
14. The installed number of rows and columns of fasteners on each side of the damaged area are to be the same or larger than shown.
15. Application of protective treatment of metal (Chemical Conversion Coating and CIC) per SRM 51-20-01.
16. Cadmium plate and prime all steel repair parts per SRM 51-20-01. (Refer to SOPM 20-42-01 and 20-42-05 for plating and SOPM 20-41-02 for priming the surface).
17. Repair Sealing per SRM 51-20-05.
18. All rivets are to be overdriven to a minimum of 1.4 times the fastener diameter as per SRM 51-40-02, Fig 3, Table II.
19. Install Hi-Loks in Transition Fit holes through aluminum parts. Install Hi-Loks in Close Ream holes through steel parts.
20. Installation of 1/64 or 1/32 O/S fasteners acceptable provided all other requirements are maintained (i.e. 4-6D spacing, 2D EM, etc).
21. Application of Urethane Compatible Primer per SOPM 20-44-04, unless shown differently.
22. Interior and Exterior finishes to be accomplished per AMM 51-21 procedures, unless indicated differently.

Southwest	ENGINEERING AUTHORIZATION			SOUTHWEST AIRLINES	
	INSTRUCTION PAGE			SA-M 4568 DATE: 05/28/2015	
	EA No:	1-771-1098	PART	1	PAGE: 8 OF 18
					ISSUE DATE: 1/11/2018

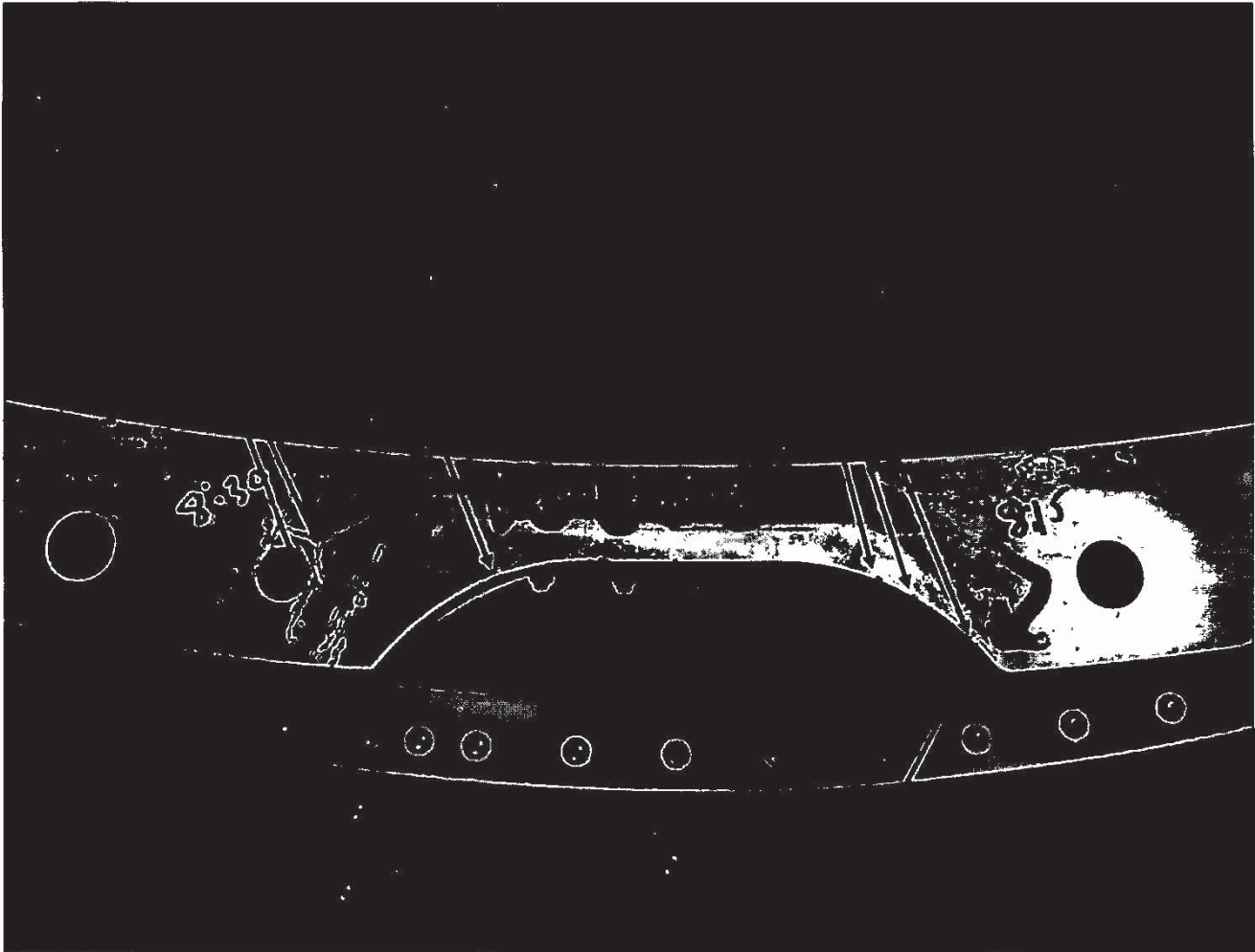
General Notes for Structural Repairs (Continued)**For Skin Repairs:**

- Repairs of minor dents or edge deformation per SRM 51-70-01. Document additional rework and NDT as a separate entry on the NRC.
- The final repair shape and size to be determined at installation. Allowances need to be made for existing skin fastener configuration and repair edge margins.
- Pre-form or roll the repair parts to match the fuselage skin contour before they are installed.
- Keep a minimum of 0.5 inch external radius and 2.0 inches internal radius on repair part corners, unless shown differently.
- Chamfer all visible edges of external repair parts that are 0.050 inch or thicker.
- Aerodynamic smoothness requirements per SRM 51-10-01.
- Countersinking of holes and the use of countersink repair washers per SRM 51-40-08.
- The ratio of the countersink depth in the outer layer divided by the thickness of the outer layer may not exceed 80%.
- For repairs that define tapers in width or length (not fillers or shims), must be matched within one fastener row.
- Use of fillers/shims (structural or non-structural) per SRM 51-30-01, Figure 10.

For Structure Repairs:

- Minimum Inner Bend Radii per SRM 51-30-01.
- If repair parts are to be fabricated from -O material, Heat treat to correct temper per BAC5602 for aluminum and BAC5617/BAC5619 for steel.
- If repair parts are fabricated from pre-formed and heat tempered material, it is acceptable to N/A the NDT step and the Heat Treat step provided the material used, after trimming, meets all the original geometrical requirements of the required part. Add additional notation at the bottom of the page indicating the part number and material type used.
- Installation of radius blocks is acceptable, provided they are individual blocks for each affected fastener. See BACF3H or BACF33C.
- Shot Peening/Flap Peening procedures per SRM 51-20-06 and SOPM 20-10-03.
- Cold Working fastener holes per SRM 51-40-09.
- Use of shims (structural or non-structural) per SRM 51-30-01, Figure 10.

Southwest	ENGINEERING AUTHORIZATION			SOUTHWEST AIRLINES	
	INSTRUCTION PAGE			SA-M 456B DATE 05/28/2015	
	EA No:	1-771-1098	PART	1	PAGE: 9 OF 18
					ISSUE DATE: 1/11/2018

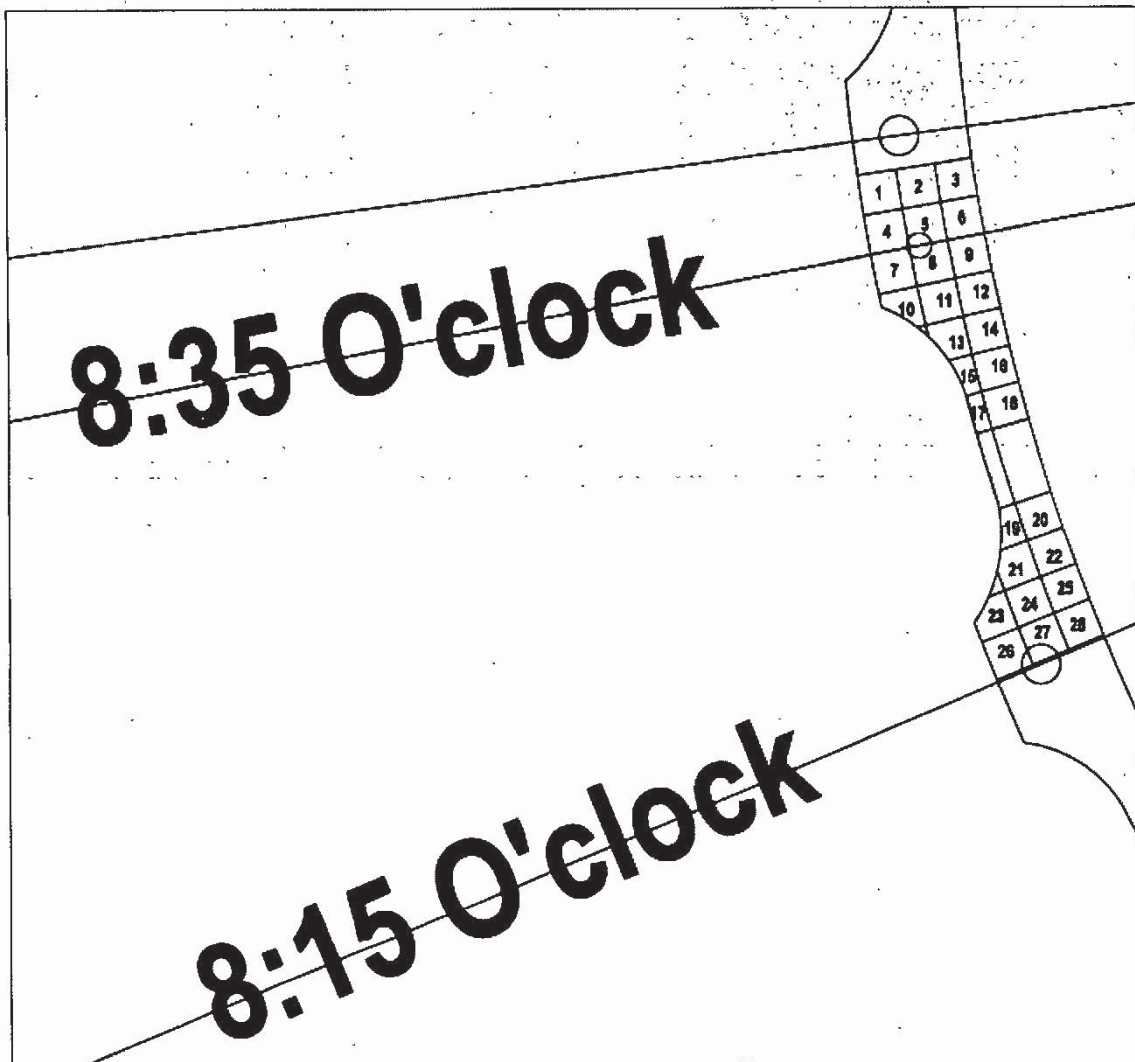


View Looking Forward from Aft Attach Mounting Ring
Aft Flange Surface

Nicks and Scratches shown at 8:15/8:30 O'clock Positions

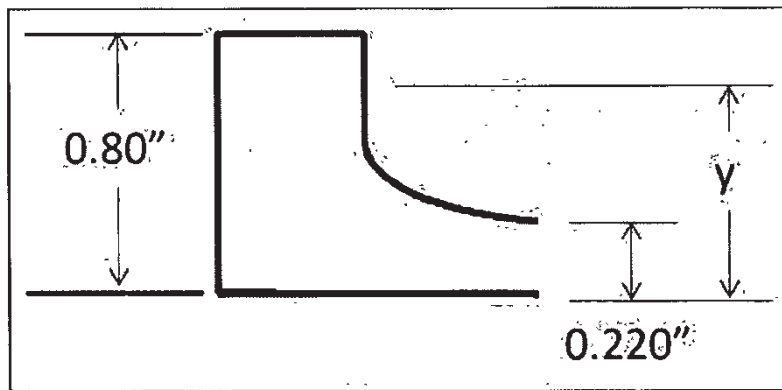
Figure 1 – 1 (Sheet 1 of 6)

Southwest	ENGINEERING AUTHORIZATION INSTRUCTION PAGE			SOUTHWEST AIRLINES SA-M 456B DATE: 05/28/2015	
	EA No:	1-771-1098	PART	1	PAGE: 10 OF 18 ISSUE DATE: 1/11/2018



View Looking Down
(After Blending at 8:35/8:15 O'clock)
Figure 1 – 1 (Sheet 2 of 6)

Southwest	ENGINEERING AUTHORIZATION			SOUTHWEST AIRLINES	
	INSTRUCTION PAGE			SA-M 456B DATE: 05/28/2015	
	EA No:	1-771-1098	PART	1	PAGE: 11 OF 18 ISSUE DATE: 1/11/2018



Section Cut across the Flange Blended Out

Figure 1 – 1 (Sheet 3 of 6)

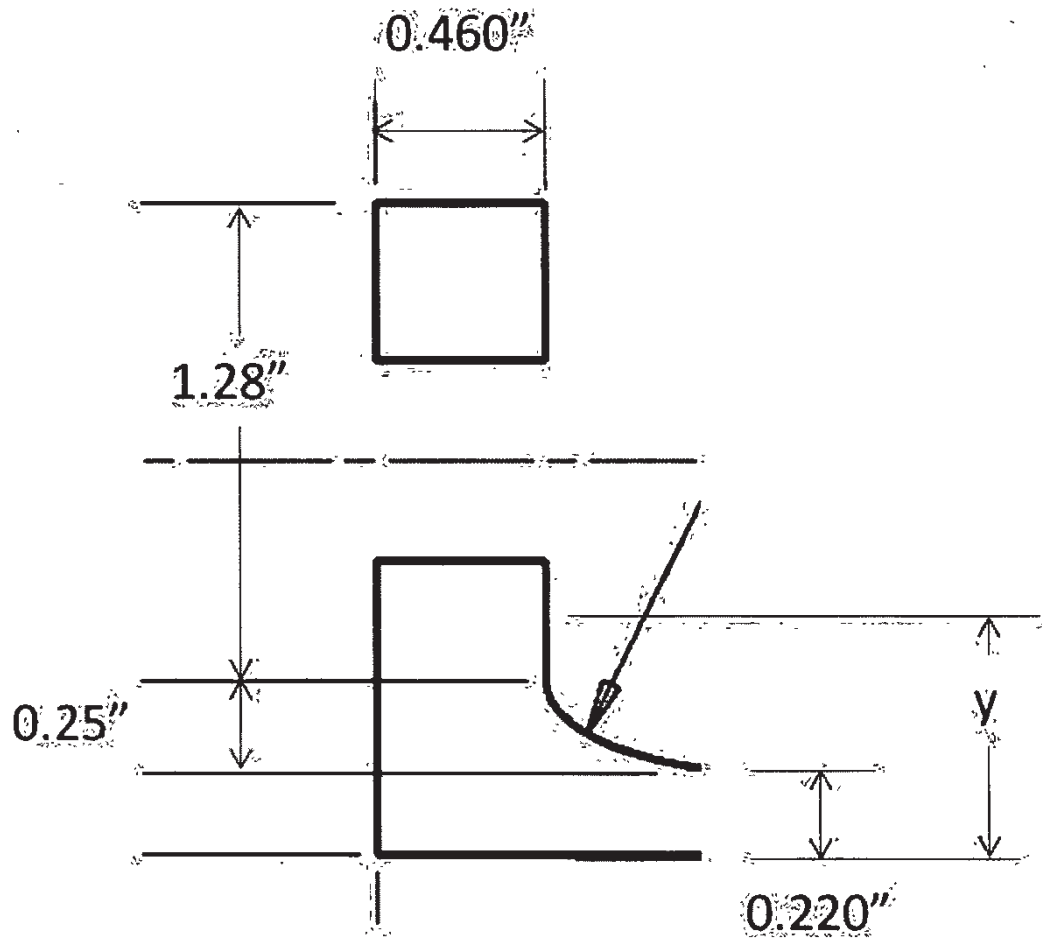
Southwest	ENGINEERING AUTHORIZATION			SOUTHWEST AIRLINES	
	INSTRUCTION PAGE			SA-M 456B DATE 05/28/2015	
	EA No:	1-771-1098	PART	1	PAGE: 12 OF 18
					ISSUE DATE: 1/11/2018

Table "A"

Number	Flange Original Thickness	Y (inches)	Flange Material Remaining Thickness After Blending (inches)
#13	.460		.458
#14	.460		.457
#15	.459 nick	.8	.458
#16	.460		.458
#17	.460		.457
#18	.460		.458
#19	.460		.460
#20	.460		.460

Figure 1 – 1 (Sheet 4 of 6)

Southwest	ENGINEERING AUTHORIZATION INSTRUCTION PAGE			SOUTHWEST AIRLINES SA-M 456B DATE: 05/28/2015	
	EA No:	1-771-1098	PART	1	PAGE: 13 OF 18
					ISSUE DATE: 1/11/2018



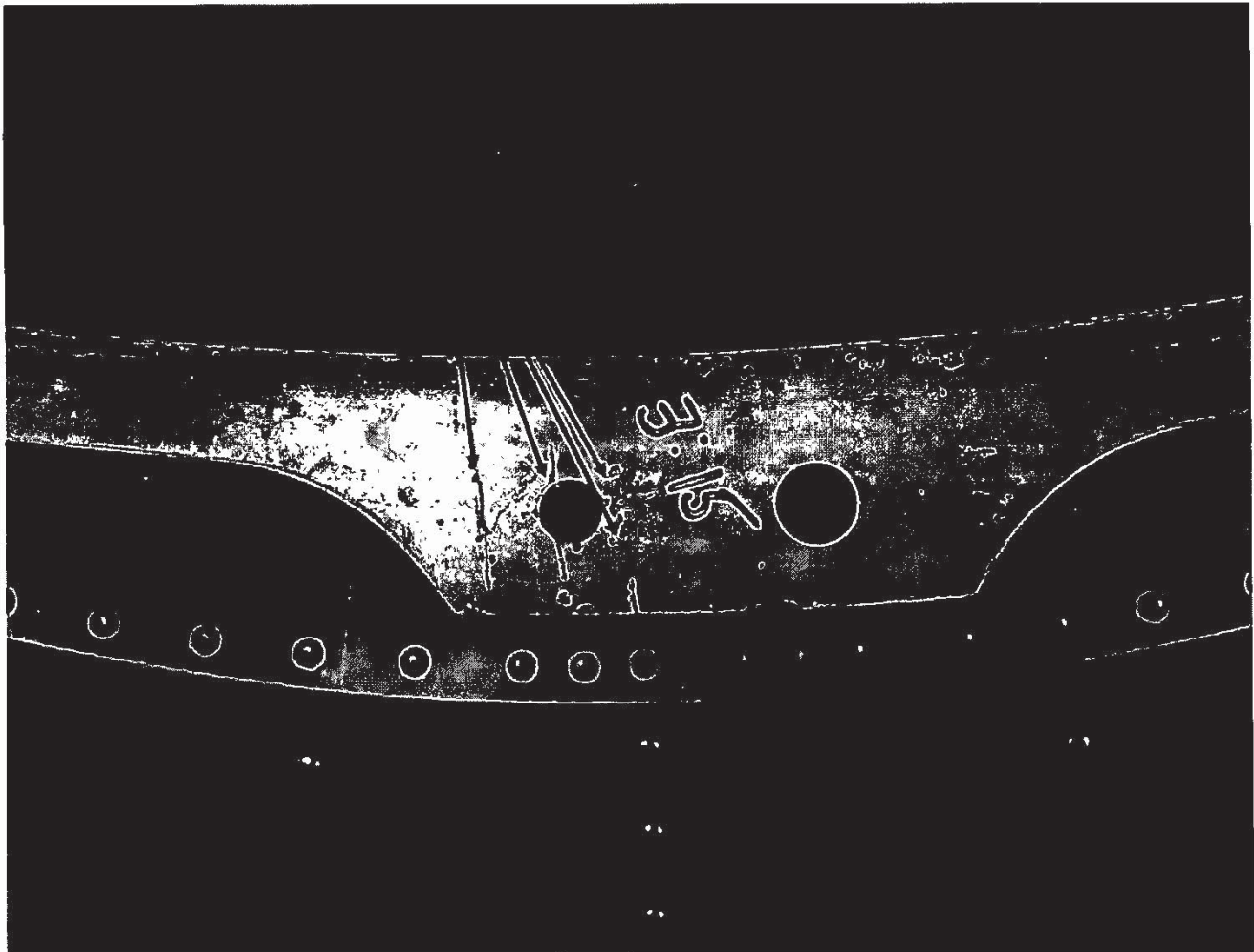
Section Cut across the Flange Blended Out
Figure 1 – 1 (Sheet 5 of 6)

Southwest	ENGINEERING AUTHORIZATION		SOUTHWEST AIRLINES	
	INSTRUCTION PAGE		SA-M 456B DATE: 05/28/2015	
	EA No:	1-771-1098	PART	1
			PAGE: 14 OF 18	
			ISSUE DATE: 1/11/2018	

Number	Flange Original Thickness	Y (inches)	Flange Material Remaining THK After Blending (inches)
#1	.460		.456
#2	.460		.457
#3	.460		.458
#4	.460		.458
#5	.460		.458
#6	.460		.456
#7	Nick .459	1.7	.458
#8	scratch .456	1.1	.456
#9	.460		.457
#10	.460		.457
#11	.460		.458
#12	.460		.460
#21	2 nicks .459	1.0	.458
#22	.460		.460
#23	scratch .458 nick	1.6	.458
#24	.460		.458
#25	.460		.460
#26	.460		.457
#27	.460		.457
#28	.460		.460

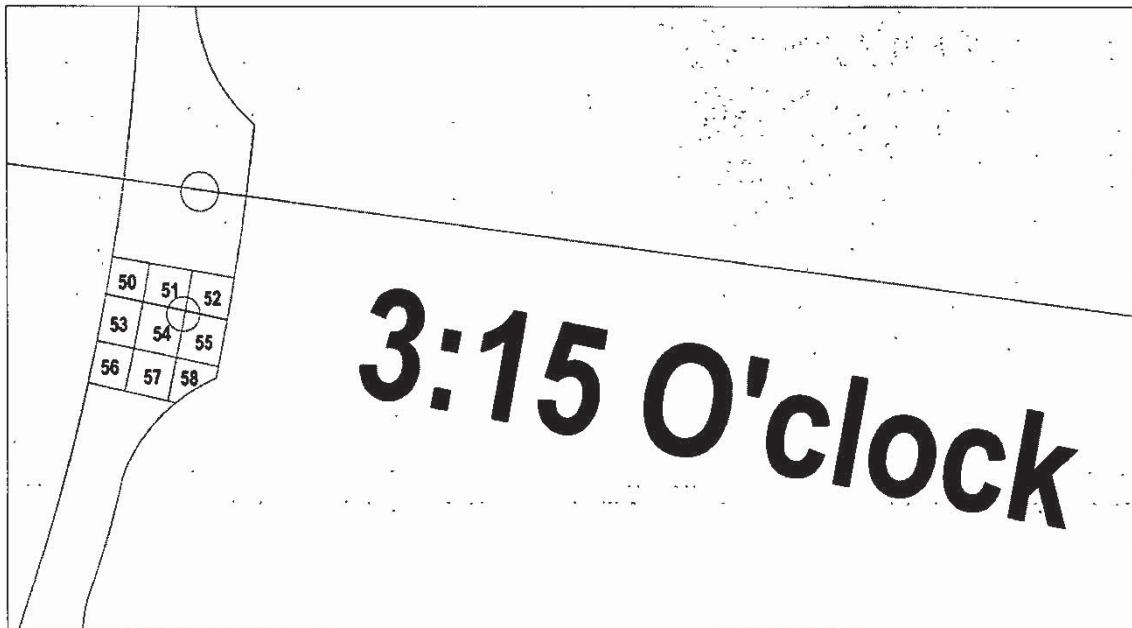
Table "A" Continues
Figure 1 - 1 (Sheet 6 of 6)

Southwest	ENGINEERING AUTHORIZATION			SOUTHWEST AIRLINES	
	INSTRUCTION PAGE			SA-M 456B DATE 05/28/2015	
	EA No:	1-771-1098	PART	1	PAGE: 15 OF 18
					ISSUE DATE: 1/11/2018



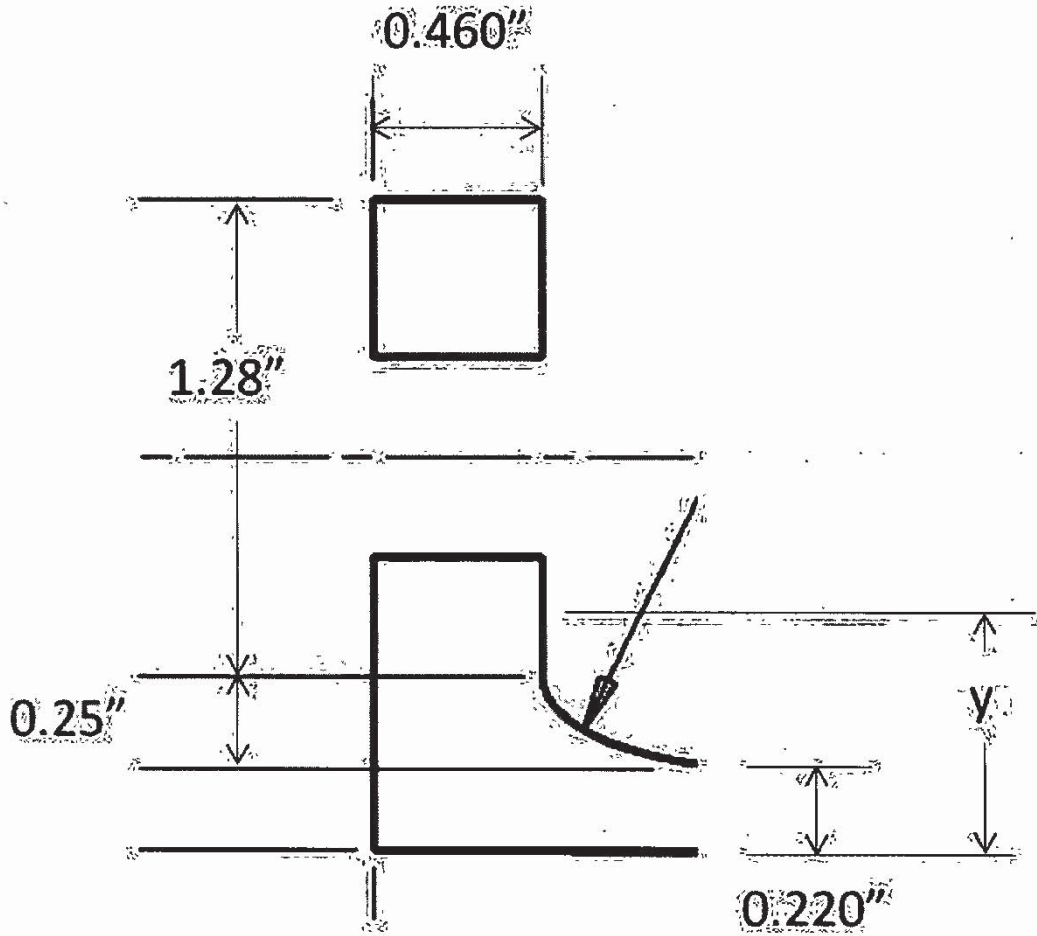
View Looking Down
(After Blending at 3:15 O'clock)
Figure 1 – 2 (Sheet 1 of 4)

Southwest	ENGINEERING AUTHORIZATION			SOUTHWEST AIRLINES	
	INSTRUCTION PAGE			SA-M 4568 DATE: 05/28/2015	
	EA No:	1-771-1098	PART	1	PAGE: 16 OF 18
					ISSUE DATE: 1/11/2018



View Looking Down
(After Blending at 3:15 O'clock)
Figure 1 – 2 (Sheet 2 of 4)

Southwest	ENGINEERING AUTHORIZATION INSTRUCTION PAGE			SOUTHWEST AIRLINES SA-M 4568 DATE 05/28/2015	
	EA No:	1-771-1098	PART	1	PAGE: 17 OF 18
					ISSUE DATE: 1/11/2018



Section Cut across the Flange Blended Out
Figure 1 – 2 (Sheet 3 of 4)

Southwest	ENGINEERING AUTHORIZATION		SOUTHWEST AIRLINES	
	INSTRUCTION PAGE		SA-M 456B DATE: 05/28/2015	
	EA No:	1-771-1098	PART	1
			PAGE: 18 OF 18	
			ISSUE DATE: 1/11/2018	

Number	Flange Original Thickness	Y (inches)	Flange Material Remaining THK After Blending
#50	.463		.463
#51	.463		.463
#52	.463		.463
#53	.463		.463
#54	.463		.463
#55	nick .462	1.2	.462
#56	.463		.463
#57	.463		.463
#58	.463		.463

Table "B"
Figure 1 – 2 (Sheet 4 of 4)

D TAG#: 356652

SERVICEABLE



DATE: 24 JAN 18

INSP: 55419



015927761

ORD: 0710037-JGR

DESC: COWL

CFM56-7 ENGINE INLET

R

SI#: 0710037

T

S/N: 4009001

S

MPN: 314-2100-3

ATA: 7110

TL: 3

TSOCSNEXPIRES

34484:59

16403



BATT DATE	HT C/W
MFG. DATE	FT/BT C/W

EFFECTIVITY:

OVERHAUL/REPAIR DATA

☐ OVERHAULED ☒ REPAIRED ☐ FUNC. TEST ☐ WT.CK
☐ CONF. ☐ NOT CONF. FAILURE ☐ BENCH TEST ☐ SWARTS

FINDINGS

Pulled Rivets

WORK ACCOMPLISHED

See SAM 549DATE 24 JAN 18

AMT

INSP

REPAIR

AGENCY SWA Shops

JOB NO.

0710037-568

The component identified on the face of this tag was repaired and/or inspected in accordance with current FAA regulations and was found airworthy for return to service. Pertinent details of the work accomplished are on file at this agency.

ATTACH TO UNIT

PART RECORDS &
CONTROL TAG

A TAG#: 347991 UNSERVICEABLE REMOVAL

SOUTHWEST AIRLINES SA-M 857 REV 04/10/2012
PART RECORDS & CONTROL TAG - ATTACH TO UNIT

MLP: _____
DATE: 07 JUL 10 A/C: 7718
DD MMM YY
POS: 2 STA: HOU
SI#: 0710037
S/N: 40090911
MPN: 21142100-3

DESC: COWL
CFM56-7 ENGINE INLET

REPAIR AGENCY or SHOP
Record overhaul / repair data
on the back of this tag.

PLEASE RETURN THIS TAG WITH THE UNIT

REMOVED DUE TO: Pulled 12/10/10 121-125
REMOVED BY: [REDACTED]
AMT: _____ SUPR or LEAD: _____

CONTAINS CONFIDENTIAL INFORMATION

Southwest®

Check Type:	Shop	A/C, Eng S/N, or Shop	SHOP	Sta:	DAL	Date	1/16/218
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Quantity: 1	Repair Order Number (RO): 0710037-JGR ✓
Stock Item Number (SI/N): 0710037 ✓	Manufacturer Part Number (MPN) 314-2100-3 ✓
Component Serial Number (S/N): 400900	
<i>(SN on D-Tag 4009001)</i> Routine and Non Routine Planned Work	

[illegible]

SA-M 122 Master Inspection/Check Tally Sheet**Southwest**

Rev 17-02 08/24/2017

Check Type: A/C, Eng S/N, or Shop: Sta: Date:

Carryover items are circled in Red.

Note: Priorities column indicates the planning priority code from Wizard. Margins will be used to annotate C/O authorization.**Note:** Maintenance Production Supervisors/Leads must verify and annotate the date/time carryover and the person who authorized the carryover on the tally sheet in accordance with work priorities in *MPM 51 General Maintenance Policies and Procedures*.

Authorization requirements for MELs, CDLs, and MX Notes differ from other deferred maintenance items.

Authorization to carryover resolution on these items must come directly from Maintenance Control. It is not necessary to contact the Maintenance Router.

Authorization to carryover tasks must come from the following:

Priority Code

First priority "A" must be done before further flight unless carryover approved by

- 1 Senior Director Maintenance Operations Center
- 2 Manager Maintenance Operations/Control
- 3 Senior Manager Aircraft Maintenance Planning
- 4 Manager Operations Team Leader
- 5 Maintenance Router
- 6 Director Maintenance Eastern Region, Director Maintenance Western Region, Director Maintenance Central Region, or Director Maintenance Dallas

Second priority "B" planning priority will have an adverse effect on scheduling when not complied with. Must be done before lesser priorities. Will be carried over by

1. Senior Director Maintenance Operations Center
2. Manager Maintenance Operations/Control
3. Senior Manager Aircraft Maintenance Planning
4. Manager Operations Team Leader
5. Maintenance Router
6. Director Maintenance Eastern Region, Director Maintenance Western Region, Director Maintenance Central Region, or Director Maintenance Dallas

When using MCTALLY, non-check priority "B" items are carried over with discretion of Supervisor/Lead or designee.

Third priority "C" must be done before non-priority items and are carried over with discretion of Supervisor/Lead or designee.

Items listed are accounted for and carryover items have been date reviewed for dispatchability

Lead AMT and/or Supervisor: ✓ Date:

To locate the policies, procedures, and controls for carryover/deferred items, refer to

*MPM 51 Work Order Policy**MPM 51 Work Order (WO)/MCTALLY Procedures for Supervisors/Leads**MPM 24 Deferred Scheduled Maintenance Management*

44

SOUTHWEST AIRLINES
INTERNAL SHOP REPAIR ORDER
(ORIGINAL)

0710037-JGR

Date: 16JAN18

Vendor: R0579 SWA METL

Date Req: 15FEB18

Buyer: [REDACTED]

Tag	Disp	Qty	Mfg Part Number	Serial	Description
347991	REPR	1	314-2100-3	400900	CFM56-7 ENGINE INLET

Reason for Removal: PULLET RIVETS IN UP LIP SKIN

Install DT	ACN	Pos	Remove DT	TSN	TSO	TSR	AC Type
05JUN07	7718	2	07JAN18	34484	34484	34484	737-700

Open mod	Description	Remain	Due	Comply
Assignments: C71-10-0006	ENGINE INLET COWL AFT CHORD PREVENTATIVE	0	16Jan18	Y/N

END OF REPAIR ORDER 0710037-JGR

44

SA-M 549 Teardown/Repair Record

Rev 16-02 12/15/2016

Southwest

Parts Tag Number: 347991	Repair Order Number: 0710037-JGR
Date In: 1/16/2018	Date Completed:
Component Name: 700 INLET	Mfg P/N: 314-2100-3
S/N: 0710037	S/N: 400900
Malfunction Component Removed For: LOOSE FASTENERS	From: A/C 7718

The component identified above was repaired and/or inspected in accordance with current FAA regulations and was found airworthy for return to service. Pertinent details of the work accomplished are on file at this agency

Discrepancy: ☒ Confirm ☐ Non-Confirm	Corrective Action: ☐ Test ☐ Repair ☐ O/H ☐ Service
Loose Fasteners 6.00 pos.	Removed 16 loose fasteners at 6 o'clock HFE open holes refer 737 NDT PART 6 51-02-01 procedure 16
AMT: 	AMT: Insp: Date: 21 Jan 18

Additional Findings During IRAN

Discrepancy: UPPER CHORD WORKS	Corrective Action: upper chord is within limits per SRM 51-10-02-1A-1
AMT: 	AMT: Insp: Date: 22 Jan 18

Discrepancy: LOWER CHORD WORK	Corrective Action: Lower chord is within limits per SRM 51-10-02-1A-1
AMT: 	AMT: Insp: Date: 22 Jan 18

Discrepancy: Removed Upper Barrel SKIN TO FOM.	Corrective Action: OK TO INSTALL 34455 INSTALL UPPER BARREL SKIN PER SRM 51-40-02 & CMM 71-11-22
AMT: 	AMT: Insp: Date: 01/23/18

SA-M 549 Teardown/Repair Record

Rev 16-02 12/15/2016

Southwest

Parts Tag Number: 347991	Repair Order Number: 0710037-JGR
Date In: 1/16/2018	Date Completed: Final Inspection:
Component Name: 700 INLET	Mfg P/N: 314-2100-3
SI/N: 0710037	S/N: 400900
Malfunction Component Removed For: LOOSE FASTENERS	From: A/C 7718

Additional Findings During IRAN

Discrepancy: <i>Removed Lower Barrel SKIN To FOM.</i>	Corrective Action: <i>OK TO INSTALL</i> <i>INSTALLED LOWER BARREL SKIN PER SRM 51-40-02 & CMM 71-11-22</i>
AMT: 	AMT: Insp: Date: 01/23/18

Discrepancy: <i>14 ea Loose Fasteners at 3 o'clock position</i>	Corrective Action: <i>Removed 14 ea Loose Fasteners at 3 o'clock pos. HFEC open holes refer 737 NDT para 6 51-40-02 Procedure 16</i>
AMT: 	AMT: Insp: Date: 21 Jan 18

Discrepancy: <i>Removed 14 ea Loose fasteners at 3 o'clock pos</i>	Corrective Action: <i>Removed and Replaced fasteners at 3 o'clock pos. PER SRM 54-10-01A-2 AND CMM 71-11-22</i>
AMT: 	AMT: Insp: Date: 21 Jan 18

Discrepancy: <i>Removed Loose Fasteners at 6 o'clock pos</i>	Corrective Action: <i>R/P 16 Loose Fasteners at 6 o'clock pos. PER SRM 54-10-01A-2 AND CMM 71-11-22</i>
AMT: 	AMT: Insp: Date: 21 Jan 18

SA-M 549 Teardown/Repair Record

Rev 16-02 12/15/2016

Southwest[®]

Parts Tag Number: 347991	Repair Order Number: 0710037-JGR
Date In: 1/16/2018	Date Completed:  Final Inspection: 
Component Name: 700 ENG INLET	Mfg P/N: 314-2100--3
SI/N: 0710037	S/N: 400900
Malfunction Component Removed For: LOOSE FASTENERS	From: 7718

The component identified above was repaired and/or inspected in accordance with current FAA regulations and was found airworthy for return to service. Pertinent details of the work accomplished are on file at this agency.

Discrepancy: ☐ Confirm ☐ Non-Confirm	Corrective Action: ☐ Test ☐ Repair ☐ O/H ☐ Service
Apply Aluminized Epoxy Primer To Acoustic Panel	Painted Acoustic Panel Per SOPM 20-41-04
AMT: 	AMT:  Insp:  Date: 23 JAN 18

Additional Findings During IRAN

Discrepancy: Touch up Exterior Paint	Corrective Action: touched up Exterior Paint Per AMM 51-21-99
AMT: 	AMT:  Insp:  Date: 24 JAN 18

Discrepancy:	Corrective Action:
AMT:	AMT: Insp: Date:

Discrepancy:	Corrective Action:
AMT:	AMT: Insp: Date:

44

SA-M 631 REV: 01/24/02 RCB: 6096		SOUTHWEST AIRLINES COMPONENT CHANGE ORDER				A/C NO: Spare	
						DATE: 16-Jan-17	
						COMPONENT S/N: 4009001	
CCO #: 71-10-0006						FLEET: 737-700	
DATE: 11/26/03						4 DIGIT ATA: 71-10	
REV: N/A						EVALUATION #	
REV. DATE: N/A						(IF APPLICABLE):	
PAGE 1 OF 7							

				INTERNAL MOD				
COPY TO:		N/A						
TITLE:		ENGINE INLET COWL AFT CHORD PREVENTIVE PAINTING						
REQUESTED BY:		PREPARED BY: ROSE ARCENEUX 214/792-2790			REVIEWED BY:		SIG. ON FILE	
ENGINEERING		REVISED BY: N/A			APPROVED BY:		SIG. ON FILE	
DESCRIPTION:		APPLY PRIMER COAT AND TEFLON PAINT ON THE INLET COWL AFT CHORD.						
REASON:		THE PRIMER AND TEFLON PAINT WILL FORM A PROTECTIVE BARRIER ON THE INLET COWL AFT CHORD TO PREVENT CHAFING BY THE FAN COWL DUE TO INFLIGHT VIBRATIONS. WITHOUT PAINTING, THE METAL AND RIVET HEADS OF THE AFT CHORD WILL BEGIN TO WEAR.						
APPROVED DATA:		N/A						
REFERENCE DATA:		BOEING STANDARD OVERHAUL PRACTICE MANUAL (BSOPM): 20-30-02, 20-30-03, 20-41-02, 20-44-01. 737-700 STRUCTURAL REPAIR MANUAL (SRM): 51-20-01. 737-600/-700/-800 AIRCRAFT MAINTENANCE MANUAL (AMM): 27-81-00, 71-11-02.						

SA-M 631 REV: 01/24/02 RCB: 6096		SOUTHWEST AIRLINES COMPONENT CHANGE ORDER		A/C NO: Spare
				DATE: 16-Jan-17
CCO #: 71-10-0006				COMPONENT S/N: 4009001
DATE: 11/26/03				FLEET: 737-700
REV: N/A				4 DIGIT ATA: 71-10
REV. DATE: N/A				EVALUATION # (IF APPLICABLE):
				PAGE 2 OF 7

RELATED AIRPLANE SERVICE BULLETIN:	N/A	
NOMENCLATURE:	INLET COWL	
EFFECTIVITY:	ALL MPN 314-2100-2 AND 314-2100-3	
EXCEPTIONS:	N/A	
	EXISTING	NEW
MFG MODEL #	N/A	N/A
MFG P/N:	314-2100-2 AND 314-2100-3	N/A
MFG S/N:	ALL	N/A
SWA STOCK ITEM #	0710037	N/A
INTERCHANGEABILITY AFFECTED:	NO	
SWA MPD25 AFFECTED:	N/A	
HOW DOES VENDOR SHOW MOD ACCOMPLISHED:	N/A	
CLASSIFICATION:	MINOR ALTERATION	
WEIGHT & BALANCE: (N/A IF NO CHANGE)	N/A	
SWA RELATED DOCUMENTS:	N/A	
PUBLICATIONS AFFECTED:	N/A	
BOEING PCR #:	N/A	
CUSTOMER PUBLICATION CHANGE REQUEST:	N/A	
WARRANTY:	NO	
WARRANTY NUMBER:	N/A	
APPLICABLE TO COMPONENTS ON NEW DELIVERY AIRCRAFT:	YES	
APPLICABLE TO COMPONENTS ON FUTURE LEASE AIRCRAFT:	YES	
MOD TO ACCOMPLISH IN CONJUNCTION WITH THIS MOD:	N/A	

SA-M 631 REV: 01/24/02 RCB: 6096		SOUTHWEST AIRLINES COMPONENT CHANGE ORDER		A/C NO: Spare
				DATE: 16-Jan-17
CCO #: 71-10-0006				COMPONENT S/N: 4009001
DATE: 11/26/03				FLEET: 737-700
REV: N/A				4 DIGIT ATA: 71-10
REV. DATE: N/A				EVALUATION # (IF APPLICABLE):
PAGE 3 OF 7				

MOD TO ACCOMPLISH PRIOR TO THIS MOD:	N/A						
THIS CCO SUPERSEDES:	N/A						
THIS MOD TERMINATES SWA INSPECTION DOCUMENT:	N/A						
SCHEDULING REQUIREMENTS							
		AIRCRAFT		COMPONENT			
	LABOR HRS:	1.0		3.0			
	DOWNTIME HRS:	1.0		3.0			
LIMIT SPECIFICATIONS: ☐ REGULATORY MANDATE ☐ SWA MANDATE ☒ SWA RECOMMENDED ☐ ON ATTRITION	HRS/CYC/DAYS/DIE DATE (DIE DATE = REGULATORY MANDATES ONLY) N/A						
RECOMMENDED LOWEST LEVEL CHECK TYPE COORDINATED WITH MX OPS:	HANGAR RON IN DAL, HOU, PHX & MDW ONLY.						
MATERIALS NEEDED:	<u>SI/N</u>	<u>MPN</u>	<u>DESCRIPTION</u>	<u>QTY</u>	<u>UM</u>	<u>(PER A/C)</u>	<u>%</u>
	1989895	BMS10-11TY1CLA	PRIMER (2 OZ)	1	EA.	1	100
	1989731	BMS10-86ETY1BAC707	TEFLON PAINT	1	KT	.25	100
	1980474	34019M	ISOPROPYL ALCOHOL (16 OZ)	1	EA	.25	100
SPECIAL TOOLS/EQUIPMENT REQUIRED:	<u>SI/N</u>	<u>MPN</u>	<u>DESCRIPTION</u>	<u>QTY</u>			
	N/A	N/A	N/A	N/A			
COMMENTS:	N/A						

SA-M 631 REV: 01/24/02 RCB: 6096		SOUTHWEST AIRLINES COMPONENT CHANGE ORDER		A/C NO: Spare
				DATE: 16-Jan-17
CCO #: 71-10-0006				COMPONENT S/N: 4009001
DATE: 11/26/03				FLEET: 737-700
REV: N/A				4 DIGIT ATA: 71-10
REV. DATE: N/A				EVALUATION # (IF APPLICABLE):
PAGE 4 OF 7				

WORK ACCOMPLISHMENT INSTRUCTIONS	MECH	INSP	DATE
GENERAL NOTES: - Refer to Figure 1 for an illustration of the repair area. - Contact Structures Engineering for disposition if any existing conditions prohibit the accomplishment of the instructions as specified in this document. - Obey all warnings and cautions provided in the applicable manual. - Insure that surrounding areas are adequately protected from chemicals and finishes. - Many solvents are flammable, poisonous or can cause corrosion. - Take appropriate precautions (chemical-resistant gloves and clothing, goggles, face shields, etc.) when handling solvents. - Do not paint in the rain or hot sun. - Paint only the area that can be worked at one time. - Keep the paint only in the area to be worked. Do not let it splash or run.			
1. ACCESS			
A. Retract and deactivate the leading edge slats per 737-600/-700/-800 AMM 27-81-00.	N/A [REDACTED]		24 Jan 2018
B. Open the left and right fan cowls per 737-600/-700/-800 AMM 71-11-02.	N/A [REDACTED]		24 Jan 2018

SA-M 631 REV: 01/24/02 RCB: 6096		SOUTHWEST AIRLINES COMPONENT CHANGE ORDER		A/C NO: Spare
				DATE: 16-Jan-17
CCO #: 71-10-0006				COMPONENT S/N: 4009001
DATE: 11/26/03				FLEET: 737-700
REV: N/A				4 DIGIT ATA: 71-10
REV. DATE: N/A				EVALUATION # (IF APPLICABLE):
PAGE 5 OF 7				

WORK ACCOMPLISHMENT INSTRUCTIONS	MECH	INSP	DATE
2. <u>APPLY FINISHES</u>			
Check the aft chord for damage. Apply primer and Teflon paint.			
A. Clean the entire outer circumference of the aft chord per BSOPM 20-30-03. See Figure 1.			24 Jan 2018
B. Perform a general visual check of the outer circumference of the aft chord. If there is damage to the aft chord, issue a NRC.			24 Jan 2018
NRC # _____			
<u>NOTE:</u> Damage must be repaired prior to paint application.			
C. Mask off areas surrounding the outer circumference of the inlet cowl aft chord.			24 Jan 2018
D. Apply a coat of BMS 10-11 primer to the aft chord (entire circumference) per BSOPM 20-41-02, brush application.			24 Jan 2018
E. Apply BMS 10-86 abrasion resistant Teflon paint per BSOPM 20-44-01, Brush Application, to the outer circumference of the aft chord.			24 Jan 2018

SA-M 631
REV: 01/24/02
RCB: 6096

SOUTHWEST AIRLINES COMPONENT CHANGE ORDER

A/C NO: Spare

DATE: 16-Jan-17

COMPONENT S/N: 4009001

CCO #: 71-10-0006

DATE: 11/26/03

FLEET: 737-700

REV: N/A

4 DIGIT ATA: 71-10

REV. DATE: N/A

EVALUATION #
(IF APPLICABLE):

PAGE 6 OF 7

WORK ACCOMPLISHMENT INSTRUCTIONS

MECH

INSP

DATE

3. CLOSE UP

- A. Close the left and right fan cowls per 737-600/-700/-800
AMM 71-11-02.

N/A

24
Jan
2018

NOTE: Make sure the paint is completely dry before closing the fan
cowls.

- B. Activate the leading edge slats per 737-600/-700/-800
AMM 27-81-00.

N/A

24
Jan
2018

SA-M 631 REV: 01/24/02 RCB: 6096		SOUTHWEST AIRLINES COMPONENT CHANGE ORDER		A/C NO: Spare	
				DATE: 16-Jan-17	
				COMPONENT S/N: 4009001	
CCO #: 71-10-0006				FLEET: 737-700	
DATE: 11/26/03				4 DIGIT ATA: 71-10	
REV: N/A				EVALUATION # (IF APPLICABLE):	
REV. DATE: N/A				PAGE 7 OF 7	

FIGURE 1 - INLET COWL AFT CHORD

