SUBMISSION OF THE
ALLIED PILOTS ASSOCIATION
TO THE NATIONAL TRANSPORTATION
SAFETY BOARD

AMERICAN AIRLINES FLIGHT 1400
Lambert- St. Louis International Airport
St. Louis, Missouri, USA
29 SEPTEMBER 2007

NTSB CHI07MA310

In accordance with 49 CFR 831.14, the Allied Pilots Association (APA) a designated Party to the National Transportation Safety Board (NTSB) investigation of the accident, respectfully submits to the Board its findings and recommendations.

Communication with respect to this submission may be addressed to:

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EXECUTIVE SUMMARY

On September 29, 2007, at 1316 Central Daylight Time, a McDonnell Douglas DC-9-82 (MD-82), Aircraft Registration N454AA, operated by American Airlines as Flight 1400, executed an emergency landing at Lambert-St Louis International Airport (STL), St. Louis, Missouri. The flight crew received an engine start valve alert followed by a left engine fire warning during departure climb from the airport. Visual meteorological conditions prevailed and an instrument flight rules flight plan was filed for the 14 CFR Part 121 scheduled domestic flight. The two FAA-licensed airmen flew the aircraft observing rules, regulations, and governances mandated by Federal Aviation Regulation (FAR) Part 121. The pilots also adhered to rules and procedures stipulated by the Federal Aviation Administration (FAA), the aircraft manufacturer, Boeing, and the certified carrier, American Airlines. After landing, the flight crew, three flight attendants, and 138 passengers deplaned via air stairs and no injuries were reported. The intended destination of the flight was Chicago O'Hare International Airport (ORD), Chicago, Illinois.

Upon receiving the left-engine fire warning during climb, the flight crew discharged the aircraft engine fire bottles into the affected engine. During the visual return and single-engine approach to the airport, the nose landing gear did not extend. After initiating a go-around, the flight crew then extended the nose landing gear using the emergency landing gear extension procedure. The airplane returned and then landed on runway 30L (11,019 feet by 200 feet, grooved concrete) and was met by STL Airport Rescue and Fire Fighting (ARFF) vehicles.

ALLIED PILOTS ASSOCIATION'S ROLE IN THE INVESTIGATION

The National Transportation Safety Board (NTSB) is leading the investigation into American Airlines Flight 1400 engine-fire accident. Assisting the NTSB in their investigation are the Federal Aviation Administration (FAA), American Airlines (AA), the Allied Pilots Association (APA), Boeing, and other designated parties.

As a party in this investigation, APA's role is to participate in all aspects of this investigation.

The NTSB requested that all parties submit proposed findings to be drawn from the evidence revealed during the course of the investigation.

The Allied Pilots Association has responded to the NTSB request with this document, which:

- Provides an assessment of the evidence and other pertinent data.
- Identifies findings and recommendations from the factual evidence in the investigation.
- Lists future APA actions.
- Offers a conclusion based on findings and analyses.

FINDINGS AND RECOMMENDATIONS

The Allied Pilots Association's assessment of the evidence is based upon observations of the aircraft, accident site, post-accident examination of aircraft systems and components, the air carrier's maintenance records, log book, and manuals, Boeing flight operational and maintenance manuals, flight data recorder (FDR) data, the cockpit voice recorder (CVR) transcript, flight crew interviews, mechanic interviews, and ARFF interviews.

MAINTENANCE RECORDS

Findings

- A review of the air start valve change history for the left engine revealed that the start valve (designated VAL6256) was changed six times within 12 days. The latest air start valve change prior to the accident was on September 27, 2007. (See attachment 1)

- The left engine start switch was changed once and the left engine start valve operation was deferred four times. The latest deferral occurred on September 27, 2007. (See attachment 1)

- The air carrier's maintenance reliability program failed to identify and respond in a timely manner to a chronic mechanical aircraft problem. Repeat maintenance items are tracked through Chapter 23 of the air carrier's General Procedures Manual (GPM) via the Reliability/Performance Analysis System. This section describes methodology used to identify dependability issues and reporting responsibilities within Maintenance & Engineering Group personnel. (See attachments 2 and 22)

- A review of the Action To Be Taken (ATBT) entries to the Field Maintenance Reliability System (FMRS) revealed that on three separate occasions (September 18, 19, and 27, 2007), Technical Services (Maintenance Control, located at Tulsa) sent ATBTs to the line mechanic(s) for further guidance regarding the recurring issues associated with the air start valve. The FMRS documentation does not indicate that ATBTs were accomplished in the manner specified by the GPM. This is a requirement prior to use of certain deferral codes as outlined in the air carrier's own GPM. (See attachments 3 and 4)

- Boeing's DC-9/MD-80 Maintenance Manual recommended maintenance practices, listed in Section 80-10-00, "Cranking-Description and Operation," revealed two methods to manually start an engine. Boeing's instruction provides a CAUTION to only use either hand pressure on the override button or a specialized tool to engage the hex fitting. (See attachment 5)

- The mechanic's interview revealed periodic use of prying devices other than those specified in the air carrier's manual start procedure. (See attachment 7)

- As indicated in the NTSB's Maintenance Record Factual Report, no warning or informational placard is present near the start valve access panel.

- Boeing issued All Operator Letter (AOL) 9-2549, dated December 16, 1997, warning all airlines utilizing DC-9/MD-80 aircraft that an operator experienced a start valve open indication. Valve inspection revealed the manual override valve pin was bent. The letter warned of pin damage during actuation when a force greater than hand pressure is applied. The air carrier did not deactivate the valve in accordance with the Boeing procedure. (See attachment 9)

- The MEL allows an air carrier the latitude to move an aircraft to an airport where parts, tools, and certified mechanics are located in order to accomplish a corrective action. A review of aircraft N454AA's routing during the twelve days the left engine starting system was on a maintenance deferral shows the aircraft transited a Class 1 (Major Maintenance) facility numerous times. (See attachment 25)

- The NTSB's Maintenance Factual Report reveals the issuance of a repeat maintenance deferral of the left engine starting system. This resulted in resets of the MEL repair time limitations. The initial deferment occurred on September 17, 2007; the accident occurred 12 days later. (See attachment 1, 6, 8)

Recommendations

Based on these findings, APA recommends:

1. That industry and regulatory parties review the air carrier's reliability program. This review should evaluate the oversight procedures currently in place and monitor said program until such time its integrity and effectiveness is validated. (See attachment 2)

2. That the air carrier immediately adopt a no fix/no fly policy for specific repeat ATA systems failures until such time the oversight procedures within its reliability program can be validated.

3. That, as an integral part of the Reliability/Performance Analysis System, notifications be provided to flight crews regarding mechanical discrepancies on dispatch documents, denoting repeat discrepancies that have occurred during the preceding 30/60/90-day period. These notifications should be separate and apart from the E-6 log book and KVA entries.

4. That codes (RSN. in FMR entries) used in the deferral process (as provided for in the air carrier's GPM) must include the identification of the responsible maintenance personnel to ensure accountability. (See attachment 4)

5. That MEL deferral authorization and reference must be included in the load closeout prior to departure from the gate. This practice is in use at other major carriers and provides additional precautionary measures by notifying the flight crew and

dispatcher of deferred items that may affect safety of flight. Under the current system, the dispatcher may be unaware of the most recent items deferred per the MEL until after aircraft departure.

6. That the air carrier deactivate start valves in accordance with the procedure contained in Boeing's AOL 9-2549, dated December 16, 1997. (See attachment 9)

7. That maintenance sign-offs included in the Corrective Actions columns of the E-6 logbook include the appropriate MM, MPM, MCM, GPM, or ICA that is acceptable to the administrator for the applicable maintenance procedure.

8. That all notes, warnings, and cautions contained within the aircraft manufacturer's manuals be incorporated into all the applicable air carrier's manuals. As an example, the notes, warnings, and cautions contained within the Boeing DC-9/MD-80 Aircraft Maintenance Manual are not present in the air carrier's Maintenance Procedures Manual (MPM) 80-2. (See attachment 11 and 12)

9. That the FAA clarify and enforce language in the air carrier's GPM 16-04 to require full compliance with issued ATBTs. (See attachment 3)

10. That the FAA restrict the aircraft from continuing through Class 1 (Major Maintenance) facilities with maintenance deferrals. (See attachment 8)

11. That the FAA restrict the reset of the MEL repair time limitations when a discrepancy recurs following an attempt to repair it. The initial deferment date should establish the repair time limit. (See attachment 24)

12. That the FAA provide increased monitoring of the coding of deferrals in the FMRs to ensure their usage is consistent with proper maintenance practices. This is specifically in reference to the NTSB's Maintenance Records Factual Report, Section 20.0, page 15; the start valve was deferred per the MEL and numerous deferral codes were issued in the FMRs as the aircraft was dispatched station to station. (See attachment 4)

13. That the air carrier provide additional training to maintenance technicians, concerning manual start valve operation and valve deactivation.

14. That the air carrier immediately issue a bulletin to all applicable maintenance personnel describing the hazards associated with improper start valve procedures.

OPERATIONAL FACTORS/HUMAN PERFORMANCE

As the NTSB factual documentation clearly shows, this was an extremely dynamic and complicated compound emergency. The facts further show that while some single system

failures occurred, many – such as those impacting the electrical and hydraulic systems – involved multiple failures, including automatic features of these systems.

The NTSB Accident Factual Reports clearly illustrate the lack of any formal flight crew training that addresses multiple system failures this complex. They also clearly highlight the flight crew's professionalism and experience that enabled them to remain focused on flying their badly damaged aircraft. These efforts should be acknowledged as the sole reason the passengers and crew safely returned.

Findings

- The Engine Fire/Damage/Separation Checklist is improperly designed for an immediate return emergency.

- The crew had insufficient time after the landing gear failed to extend and before the landing decision point to reference the QRH Emergency Gear Extension Checklist.

- Information was not previously included in any of the air carrier's DC-9 operating manuals or training modules specifically highlighting the pneumatic cross feed valve interconnect with the engine fire handle.

- As indicated in the NTSB's System Factual Report, the failure of the auto-low-level shut-off function of the hydraulic power transfer unit (PTU) resulted in a loss of right hydraulic pressure and an unexpected complete hydraulic system failure. (See attachment 24)

Recommendations

Based on these findings, APA recommends:

1. That the air carrier change the Engine Fire/Damage Separation Checklist to "immediate return only" format. Steps 1 through 5, including Engine Fire Handle Discharge 1 or 2, should be adopted into Immediate Corrective Action Steps. (See attachment 13)

2. That the emergency gear extension procedure be displayed via aircraft placard in the cockpit in a location clearly visible to the flight crew. (See attachment 14)

3. That the air carrier incorporate a training schematic associated with the interconnect between the cross feed valve and fire handle. This information should include highlighted cautions. (See attachment 15)

4. That the air carrier review all QRH procedures, and any system failures that could impact the integrity of either hydraulic system include a procedure that turns off the PTU, and that such procedures be integrated into the appropriate checklists.

SURVIVAL FACTORS

Finding

- As recorded by the cockpit voice recorder, the ARFF personnel inserted their headset plug into the cabin interphone jack instead of the cockpit jack, while attempting to establish ground-to-cockpit communication. (See attachment 16)

Recommendation

Based on this finding, APA recommends:

1. That the FAA require all U.S. commercial aircraft to have a placard installed clearly indicating the appropriate communication jack for ARFF use. (See attachment 17)

SYSTEMS

Finding

- At the time of the accident, there was no specific information concerning the low-level shutoff feature of the Hydraulic Power Transfer Unit (PTU) in the air carrier's DC-9 Operating Manual.

Recommendation

Based on this finding, APA recommends:

1. That the recent change to the air carrier's DC-9 Operating Manual, Vol. 2, Hydraulic Section 20-2, dated July 9, 2008, be upheld. (Post Accident). (See attachment 18)

POWERPLANTS

Findings

- As referenced in the NTSB's Power Plant Factual Report, Addendum 1, page 11, "The manual override button was buckled in an S-shape on the slender end of the rod closest to the ball valve." (See attachment 19)

- As reported by the air carrier, maintenance continues to report an excessive number of start valve open indications. Recent actions by the air carrier appear to address some of the pneumatic issues related to the DC-9 starting system. However, electrical issues remain.

Recommendations

Based on these findings, APA recommends:

1. That the air carrier install a warning placard adjacent to the start valve access panel denoting the appropriate tools and procedures to be used, along with the applicable cautions contained within the Boeing Aircraft DC-9/MD-80 Maintenance Manual. (See attachment 20)

2. That the NTSB order an immediate check of all start valves for possible damaged starter push button pins in accordance with the Boeing DC-9/MD-80 Aircraft Maintenance Manual 80-10-02, page 211. (See attachment 11)

3. That the NTSB require an immediate check of all start valve electrical harnesses and associated electrical components throughout the air carrier's DC-9 fleet. (See attachment 21)

APA ACTIONS

As a principal participant in the industry's safety community, APA will initiate the following actions:

1. APA will recommend to our membership to perform more comprehensive reviews of the E-6 logbook than is currently required in the Flight Manual, Part 1.

2. APA will continue to educate our membership of general logbook procedures and policies, including sign-off procedures, MEL procedures, reasons for maintenance deferrals, and Required Inspection Items (RII).

3. APA will remind our membership of the need for increased diligence when accepting an aircraft that, while legal, has a history of chronic mechanical discrepancies. (See attachment 22)

CONCLUSION

The Allied Pilots Association believes that the evidence gathered supports the following conclusion for the accident:

The air carrier has the processes in place to identify and report maintenance issues, those processes are not consistently followed, clearly compromising the effectiveness of their maintenance reliability program. The ability to identify and report reliability issues within the program *must* be accompanied by *timely* and *effective* controls to validate positive corrective maintenance action or to provide for further analysis outside revenue flight. (See attachments 2 and 10.)

The Allied Pilots Association has stated findings and recommendations we believe address those areas found to be causal or contributing factors to this accident. We are confident the NTSB will determine probable cause consistent with these findings and put forth appropriate recommendations.

ATTACHMENT 1

Allied Pilots Association
Flight 1400 Submission

Maintenance Factual Report, Pages 10 - 12

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

Powerplant Maintenance Specification 9000 - Contains the complete specifications for the detailed shop inspection and repair requirements for the Pratt & Whitney JT8D series engines operated by AA. This specification is to be applied to the complete engine as well as to the individual modules of the engine.

Manufacture Supplied Manuals - Aircraft/Engine Maintenance Manuals, Structural Repair Manuals, Wiring Diagrams, Overhaul Manuals, Illustrated Parts Catalog, Corrosion Program Manual, Non-Destructive Testing (NDT) Manual, Significant Structure Items Manual, SBs and Engine Manuals.

17.0 No. 1 Engine Start Valve Discrepancy History

A review of the maintenance log records for the accident airplane for the between September 1, 2007, and September 30, 2007, for start valve discrepancies or engine start problems revealed the following (**Attachment 1**):

September 16, 2007, KTPA (Tampa), Log Page: 45480E650

Discrepancy:[9]	"LH start Valve Will Not Open"
Maintenance Action:	"Replaced Left Eng start Valve- OPS Normal"

September 16, 2007, KORD (Chicago) Log Page 45480E651

Repeat Write up:	"Repeat Write Up #79 Left Start Valve Will Not Open"
Maintenance Action:	"Removed And Replaced #1 ENG start Valve Per M/M Start Valve Operation Normal"

September 17, 2007, KORD (Chicago), Log Page 45480E659

Discrepancy:[10]	"Left engine start Valve Will Not Open."
Maintenance Action	"MEL Entered In MIC Sheet. Placarded Left Engine Start Valve Auth 9-1455C-C."

September 17, 2007, KDFW (Dallas-Ft Worth), Log Page 45480E659

Info:[11]	"MEL Continued"
Maintenance Action:	"Replaced Start Valve, Found Air Filter Not Allowing Air Flow To Valve. Part NIS At DFW. Continue Deferral. Tulsa Tech Notified."

[9] Pilot report #79.
[10] Pilot report #86.
[11] Information from Line Maintenance.

September 17, 2007, KORD (Chicago), Log Page: 45480E659

Maintenance Action:	"Removed and Replaced 8th Stage Check Valve And Air Filter For Start Valve. On Initial Start Sequence W/ APU Air On. Start Valve Wont Open. After Cycling Start Switch The Second time, Start Valve Opens And Engine Starts Turning. Only Happens When APU Air Switch Is Initially Turned On W/O Duct Pressure."

September 17, 2007, KORD (Chicago), Log Page: 45480E658

Maintenance Action:	"MEL 09-1455C-C Engine Start valve"
INFO Entry	ATBT accomplished. No Help. Needs Further T/S

September 17, 2007, KDFW (Dallas-Ft. Worth), Log Page: 45480E658

Maintenance Action:	"Replaced Start Valve, No Help, Found Air Filter (CPN 5463619) Not Allowing Air Flow To Valve. Part NIS At DFW. Continue Deferral. Tulsa Tech Notified."

September 18, 2007, KTUL (Tulsa), Log Page: 45480E658

ATBT Entry:[12]	"Field Reports LT ENG start Switch Requires Engagement Twice To Open Start Valve Even Though APU Air Ramps Up To 40 PSI. Ref WDM 74-11-00 PG 557 and WDM 49-31-01 PG 516 SHT 3. Remove APU ECU and Disc Starter Plug P1-838 and MEG Wiring From CB B1-1 To Pin A Of Plug P1-838 and Pin B10 Of ECU Plug R5-604A. The Start Signal Splits From Terminal Block S3-48 and Goes To Both Starter And ECU.2."
FACT:[13]	"Started L/H ENG Several Times, Could Not Duplicate. Start Valve Operated Normally. OK For Service. RMVD Placard And Cleared MIC Sheet."

September 19, 2007, KORD (Chicago), Log Page: 45480E65F

Discrepancy:[14]	"Left Engine Start Valve would Not Open Until The Fourth Attempt."
Maintenance Action:	"Deferred Left engine starter shut Off Valve Maint PER MEL Entered on MIC Sheet. MPM 80-2 Accomplished.

[12] ATBT is an abbreviation for "Action To Be Taken". It is an instruction given to maintenance by Tech Services, Maintenance Operations Control (MOC) department of American Airlines in Tulsa, Oklahoma. Tech Services executes part of the airline's CASS program.
[13] Maintenance action listed as "FACT" for final action taken.
[14] Pilot report #89.

	MEL 09-1672C-C."
ATBT (TUL) Entry:	"Previous History. 2 Valves Replaced, No Help...Troubleshoot wiring PER WDM 74-11-00. Repair As Required."

September 19, 2007, KAUS (Austin), Log 45480E65F

FACT:[15]	"Replaced #1 Engine Start Switch And Start Valve. OPS CKS OK. LK CK OK. Removed Placard Cleared MIC"

September 27, 2007, KDFW (Dallas-Ft. Worth), Log Page: 45480E673

Discrepancy:[16]	"Left Start Valve Did Not Open On Engine Start"
INFO:	"Replaced LT ENG Start Valve No Help Placarded LT ENG Start Valve Inop PER MEL VLV Opened And Verified Closing PER MPM."
ATBT Entry:	"Suggest Troubleshooting Wiring. REF WDM 74-11-00 Start Valve Has Been Replaced REF MM 80-10-02-2. Check Operation Of Valve Repair Per Your Finding.***Note Start Valve Replace In DFW 27/SEPT/07 And In ORD 16/SEPT/07 Start Valve Switch Replace In SEPT/19/07"

18.0 No. 1 Engine Start Valve Maintenance Actions

Review of the air start valve change history for the No. 1 engine revealed that the start valve (designated VAL6256)[17] was changed six times within 12 days (See section 17.0 for details). According to the Field Maintenance Report (FMR) print out for N454AA, there were no ATA 8000 (start system) faults for the 60 days prior September16, 2007, which was the first reported start problem (**Attachment 2**). The left engine start switch was changed once and the left engine start valve operation was deferred four times and each time, entered on the MEL list. After arriving at a suitable maintenance base (Class 1 or 2)[18] the start valve was removed and replaced, an operational check was performed on the start system, and the deferred item was removed from the MEL list. Review of the Action To Be Taken (ATBT) entries to the Field Maintenance Report (FMR) revealed that on three separate occasions (September 18, 19, and 27, 2007), technical services (maintenance control located at Tulsa) sent ATBT to the line mechanic for further air start valve troubleshooting guidance to address the problems.

[15] Maintenance action listed as final action taken.
[16] Listed as MDIS for maintenance discrepancy.
[17] AA designated the No. 1 (left) engine start valve as VAL6256 in their parts inventory and tracking programs. The No. 2 (right) engine start valve is designated VAL6257.
[18] Class 1 is a lightly staffed maintenance base and a Class 2 is a fully staffed AA maintenance facility.

ATTACHMENT 2

Allied Pilots Association
Flight 1400 Submission

NTSB Maintenance Group Factual Report
Attachments 10 and 11

ATTACHMENT 10

MAINTENANCE GROUP CHAIRMAN'S FACTUAL REPORT

DCA-07-MA-310

GPM Chapter 23 Surveillance 23-01 Reliability/Performance Analysis

Chapter 23: Surveillance

23-01 RELIABILITY/PERFORMANCE ANALYSIS

NOTE: **Any change to this GPM Section requires prior approval by the FAA Airworthiness Principals before implementation.**

A. GENERAL

1. The Continuing Analysis and Surveillance System (CASS) is composed of two basic elements in accordance with 14 CFR Sec. 121.373. One element is the Reliability/Performance Analysis System.

   NOTE: The other element is covered by the CASS Manual.

2. The Reliability/Performance Analysis System provides long-term monitoring related to the mechanical reliability of aircraft systems, structures, engines and components.

   NOTE: Dependability is the ability of a system (in this case Maintenance) to deliver its intended level of service to its users. The attributes of dependability express the properties which are expected from a system. Three primary attributes are reliability, availability and safety.

   Reliability is a measure of the continuous delivery of correct service. High reliability is required in situations when a mechanical system is expected to operate without interruptions or when maintenance cannot be performed because the system cannot be accessed.

   Availability is the proportion of time where the system is able to deliver its intended level of service. Impairments to availability usually are the results of aircraft damage, part shortages, manpower, and several other factors.

   Safety is the ability of the system to perform its functions correctly.

   Thus, if an aircraft is reliable, available, and safe, it can be said it is dependable.

   As previously mentioned, the Reliability/Performance Analysis system is responsible for measuring and reporting on the mechanical reliability of AA's fleet.

3. The aircraft reliability program, as described by this document, is authorized and incorporated into AA's overall maintenance program by approval of the applicable Part "D" Operations Specification page.

B. AUTHORITY AND RESPONSIBILITY

1. Managing Director, Fleet Operations Engineering (FOE)

   The Managing Director, FOE has responsibility for ensuring the Reliability/Performance Analysis Element of CASS is properly established, implemented and maintained. This position will:

   a. Establish and maintain adequate Reliability/Performance Analysis procedures.

   b. Ensure adequate resources are in place to support the Reliability/Performance Analysis Element.

   c. Modify/revise procedures as appropriate.

   d. Ensure that an active and effective interface exists between both the Surveillance and Reliability CASS Elements.

   All responsibilities of the Director of FOE can be delegated per GPM Sec. 01-01.

C. RELIABILITY/PERFORMANCE ANALYSIS POLICY/DESCRIPTION

This section provides a general description of:

- AA's Reliability Program
- Organizational structure, duties, and responsibilities
- Individual systems within the program
- Changes that require FAA approval

NOTE: Per FAA Advisory Circular (AC) No 120.17A (Chapter 3, Section 26, Paragraphs a & b).

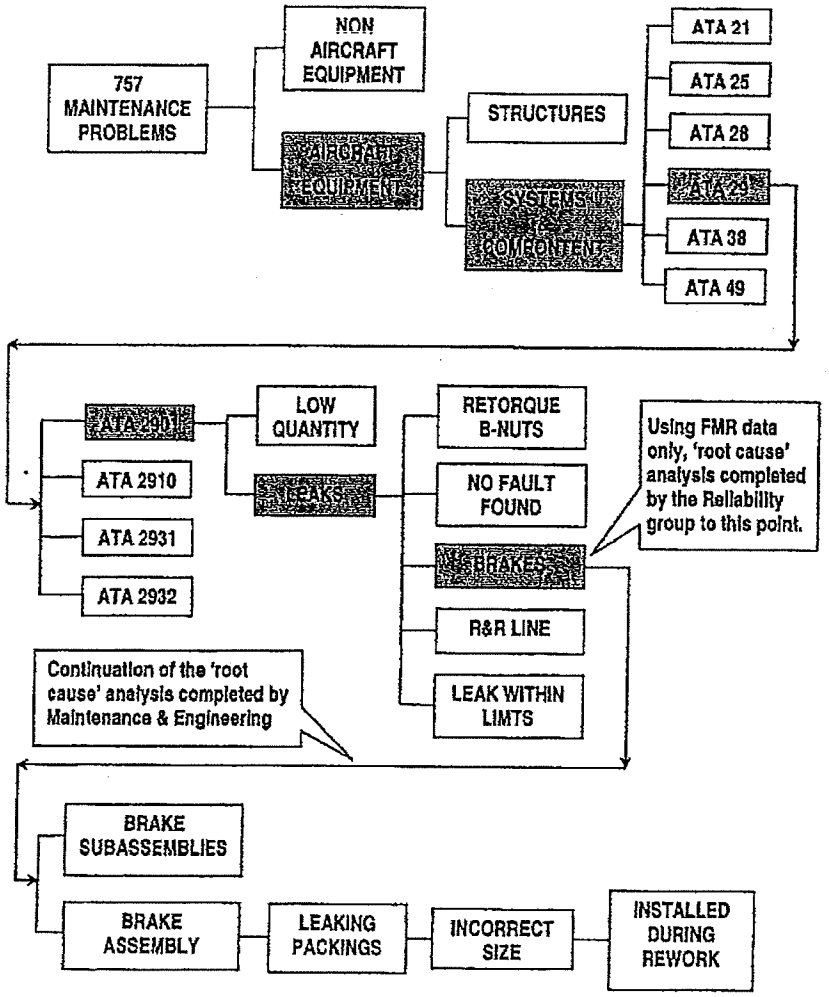
1. Reliability/Performance Analysis System, Long Term Monitoring

   a. Reliability/Performance Analysis System Objective.

   The basic philosophy of AA's Reliability/Performance Analysis System is to ensure the realization of the inherent safety and reliability levels of the aircraft flown by AA by accomplishing the following objectives:

   - Identify those systems/components whose inherent reliability prove inadequate and provide this information to the appropriate Engineering and Maintenance groups to develop enhancements, as required, to restore reliability to its inherent level.
   - Provide data displays (reports, graphs, etc.) that accurately summarize the fleet performance to the appropriate Engineering and Maintenance groups to help evaluate the effectiveness of the total maintenance program.

   These objectives are achieved through a continuous cycle of data collection and analysis, maintenance program adjustment and monitoring/feedback as shown in Figure 1.



ROOT CAUSE ANALYSIS EXAMPLE

15

Figure 1.

Also, these objectives recognize that scheduled maintenance, as such, cannot correct deficiencies in the inherent safety and reliability levels of the aircraft. The scheduled maintenance can only prevent deterioration of such inherent levels. If the inherent levels are found to be unsatisfactory, design modification is necessary to obtain improvement.

b. Operational Concept of the Reliability/Performance Analysis System

(1) American's Reliability/Performance Analysis System collects and analyzes data.

The system collects operational data. This data reflects the performance of the aircraft outside of scheduled maintenance visits such as Main Base Visits.

(2) The analysis of the data begins by compiling all the mechanical events that have impacted the airline operation to identify the top operational impact ATA systems. Analyzing the events that impact the airlines' operation aids in eventually identifying those systems/components with deteriorating performance that affect safety and operational costs. This method of analysis is known in industry as an "event" based system and is the basis for AA's Reliability/Performance Analysis System.

NOTE: 'Event' based programs are also known as 'Non-alert' programs and are acceptable methods of analysis per FAA Advisory Circular (AC) No. 120-17A (Chapter 2, Section 15, Paragraph b.(2)).

(3) Using "trend" analysis on the top operational impact ATA systems identifies those systems with deteriorating performance trends. This analysis proves useful when evaluating an adjustment to the maintenance program and/or a modification. However, if the objective is to identify the cause of the deteriorating performance, further analysis is required.

(4) This requires the accomplishment of "root cause" or contributing factor analysis to determine various causes for the poor performance and to find an effective solution. In some systems, this analysis may only require the review of the appropriate data found in the Field Maintenance Reliability (FMR) system. Other ATA systems may require a more intensive analysis that requires the simultaneous review of data in FMR and shop findings to fully define the problem and find the solution.

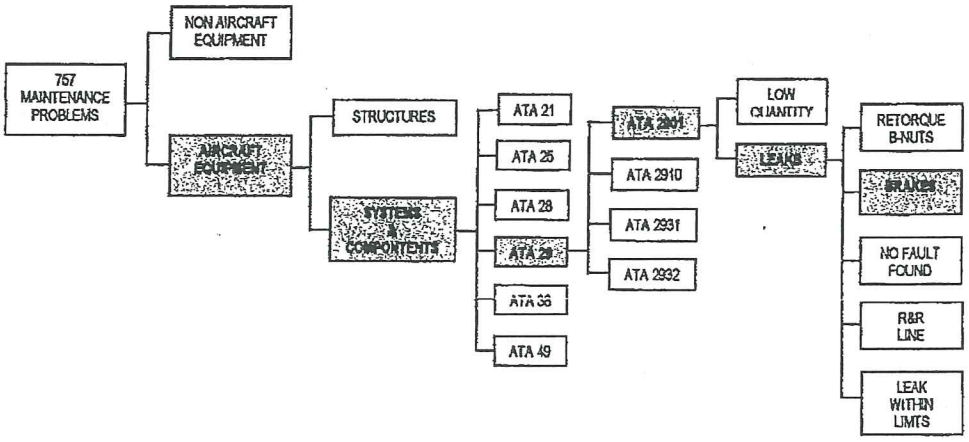
"Root cause" analysis can become a complex process when trying to find an effective solution. Consequently, the process is broken into two manageable steps. The Reliability Engineer accomplishes the first step by defining the problem by analyzing FMR data. This review only takes it to a component or system level, if possible.

(5) Components/systems found with deteriorating performance by the Reliability/Performance Analysis group are submitted to the appropriate Engineering and Maintenance groups for review and possible corrective action development. If accepted, the responsible groups, start the second step, 'ROOT CAUSE' Analysis. With the FMR data exhausted, new data sources, such as shop findings, vendor reports, field/dock experience, Engineering investigation, etc. are required to further define the actual problem and to find an effective solution to the problem. This review, for example, could go down to a resistor found on a printed circuit board installed in a sensor assembly. Figure 2 & Figure 3 provide a general overview of the root cause analysis process.

(6) With an "event" based system, AA's Reliability/Performance Analysis System identifies deficient items that impact the airlines operations, but focuses primarily on those items that also have cost effective solutions. Thus, in lieu of chasing several items such as a "Top Ten" list, the Reliability/Performance Analysis System carefully directs the limited resources in M&E on items that can be worked completely through the corrective action development phase to full implementation.

(7) The type of corrective action used varies with the problem. Corrective actions may require modification (accomplished by an Engineering Change Order) or an adjustment to the maintenance program (accomplished by a revision to the Engineering Specification Manual). In all situations, the various methods used to complete a corrective action are contained in American's approved manual system (EPM, GPM, etc.).

(8) Continued analysis of the operational data by comparing the current 12 months vs. the previous 12 months will provide a general impact assessment of maintenance program adjustments and/or system/component modification. The rolling 24-month timeline provides an optimum period for allowing ample time for implementing significant maintenance program adjustments and/or equipment modifications on a fleet and determining if the desired affects were achieved.



ACCOMPLISHED BY THE RELIABILITY GROUP

In this example, the Boeing 757 is reviewed for maintenance problems. The Reliability/Performance Analysis System is only concerned about the performance of aircraft equipment. The program does not address dependability issues (non-aircraft equipment) such as why an aircraft was late out of a check.

Next, the program focuses on the reliability of aircraft systems and components. The respective Production & Engineering Groups address aircraft structure issues.

By analyzing the performance data such as delays, cancels, air interrupts, and out-of-service, the top operational impact ATA systems are identified. To further narrow the work scope, systems with deteriorating PIREP trends are flagged.

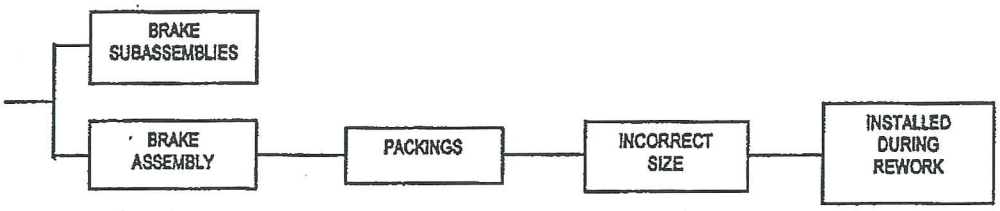
This example identified ATA 2901 as a system with deteriorating performance and PIREP trends. With a 4-digit ATA identified as an offender, the FMR data is "mined" to extract/classify the Mainteance Discrepancies (MDIS).

By sorting all MDISs into various discrepancy classifications and totaling the number of events, the overall impact of each type of discrepancy can be quantified. If the resulting analysis shows that a large percentage of the problems can be isolated to only a few discrepancies or a small discrepancy happens to be a big contributor to delays and cancellations, the discrepancy is identified as a possible corrective item candidate. In this example, leaks and low quantity are the two major discrepancies for system 2901.

Further sorting of the data can be completed against each discrepancy to classify the corresponding Final Action Taken (FACT). The resulting data provides direction in identifying problems experienced by the system. The majority of fixes in this example were re-torquing B-nuts, servicing the brakes, and replacing hydraulic lines.

At this point, the brakes are chosen as a corrective item to be presented to the appropriate Engineering and Maintenance groups.

Figure 2.



ACCOMPLISHED BY ENGINEERING/MAINTENANCE

Continuing the process, the item has been submitted to the appropriate Engineering and Maintenance groups for corrective item review and acceptance. For those items accepted, Engineering/Maintenance coordinates the corrective action development.

In this example, several organizations may be involved in continuing the "root cause" analysis. Since the FMR data was exhausted, new data sources, such as shop findings, vendor reports, field/dock experience, Engineering investigation, etc. are required to aid in finding the root cause of the leaking brakes. After the problem is clearly defined, the installation of undersized packings at time of last rework, an effective solution can be developed.

Figure 3.

c. Reliability/Performance Analysis System Application

(1) The Reliability/Performance Analysis System has the provisions for analyzing the operational reliability of the entire aircraft, its systems, rotable components, structures, and powerplants.

Items found with deteriorating performance are presented to appropriate Engineering and Maintenance groups for evaluation and possible corrective action development.

(2) The Reliability/Performance Analysis System evaluates operational data, such as, delays, cancels, air-interrupts and out-of-service to determine the integrity of the maintenance program.

The time limitations for inspections and checks of the aircraft and related systems, including major appliances and components are contained in the Maintenance Check Manual (MCM) and Engineering Specification Maintenance (ESM) documents for each model and series aircraft and/or Aircraft/Shop Engineering Specification Order (ESO). Any adjustment to the ESM and/or MCM is the responsibility of Engineering and is accomplished per EPM 5-50 and GPM, Sec. 23-23.

NOTE: The Reliability Program cannot adjust the Inspection Interval on Life Limited Parts, CMRs or AD related items.

(3) The Reliability/Performance Analysis System evaluates the effectiveness of maintenance program adjustments by routine monthly reviews.

Corrective actions to restore the inherent reliability of a component or system such as accomplishing modification work and adjustments to the maintenance program to escalate a check interval, shall be evaluated by comparing the current 12 months vs. the previous 12 month 4 digit ATA Operational Data.

(4) GPM Chapter 22 contains the policy and operating procedures for Extended Operations (ETOPS). The special maintenance program requirements contained in the GPM provide tighter control on aircraft utilized in ETOPS. A primary goal of these event-oriented procedures is the early identification and prevention of ETOPS related problems.

In addition to the requirements found in the GPM Sec. 22-02, the Reliability/Performance Analysis System accomplishes a "trend" analysis on the primary ATA systems that are identified in GPM Sec. 22-03 and all ER incidents.

d. Reliability/Performance Analysis System Systems

(1) The objective of identifying deteriorating performance and evaluating the effectiveness of maintenance program adjustments is achieved through the accomplishment of several processes. These processes when completed on a continuous basis, provide a "closed loop" system that not only identifies negative trends that require attention, but also tracks any corrective actions to ensure that the identified deficiencies are corrected.

The following systems contain the policies and procedures applicable to the Reliability/Performance Analysis

Group:

PROCESS	GPM SECTION
Responsibility for Maintenance Publications	03-01
Data Collection	23-20
Data Analysis	23-21
Data Display	23-22
ESM Substantiation	23-23

(2) Policies and procedures used by other organizations that augment the overall Reliability/Performance Analysis System and contained in other chapters in the GPM or documents in AA's manual system are listed below.

PROCESS	MANUAL REFERENCE
Aircraft ECO preparation	EPM Sec. 5-02
Shop ESO	EPM Sec. 5-26
Event Review Board Policy for M&E	GPM Sec. 11-05
Repeat Control	Technical Services Procedures Manual
Extended Operations	GPM Sec 22
Powerplants Condition Monitored Maintenance	GPM Sec. 16-21

e. Reliability/Performance Analysis Organization Structure.

The Reliability/Performance Analysis Group is responsible for administering the Reliability/Performance Analysis System. The organization chart in Figure 4 shows the organization elements.

The names of the individuals currently accomplishing the responsibilities of the various positions shown in Figure 4 are available on the Reliability website at:

http://me.aa.com/engineering/foe/reliability/main.asp.

Reliability/Performance Analysis Group

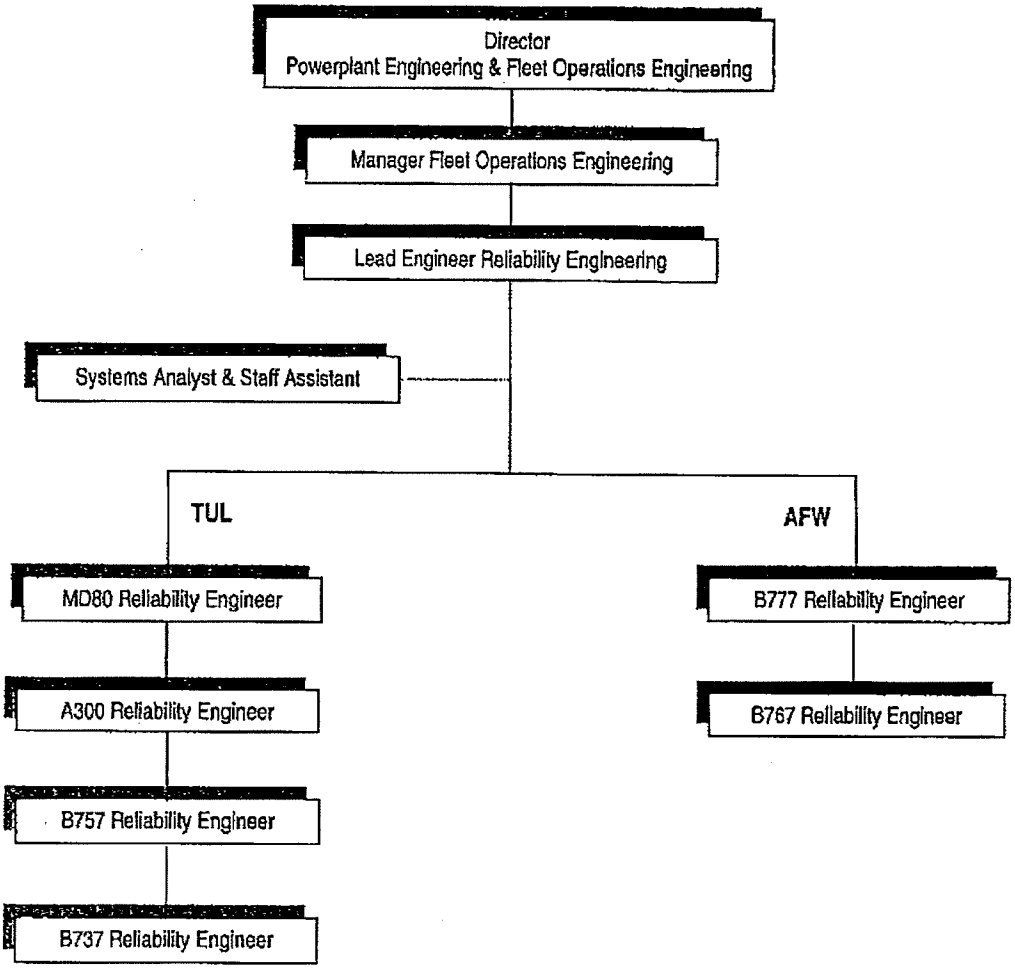


Figure 4.

The following lists the primary duties and responsibilities for each member of the Reliability/Performance Analysis Group.

(1) Reliability/Performance Analysis Group Members

(a) Manager Fleet Operations Engineering

[1] Participate as required in the operation of the Reliability/Performance Analysis System.

[2] Perform other duties as delegated by the Director of FOE.

All responsibilities of the Manager FOE can be delegated per GPM Sec. 01-01 (except for delegated duties).

(b) Reliability/Performance Analysis Lead

[1] Act as an administrator for the Reliability/Performance Analysis System application.

[2] Act as a facilitator for training activities common to the Reliability/Performance Analysis Group.

[3] Coordinate activities between all members of the reliability/performance analysis group.

[4] Participate in the development of new analysis methods.

[5] Participate in the development and publishing of reliability data.

(c) Reliability/Performance Analysis Engineer

[1] Review ESM Substantiation File Letters.

[2] Analyze performance data to identify corrective items through trend and root cause analysis.

[3] Coordinate corrective items with appropriate Engineering & Maintenance Groups.

[4] Evaluate maintenance program adjustments (comparison analysis).

[5] Participate in the development of new analysis methods.

[6] Participate in the development and publishing of reliability data.

[7] Work with Fleet Managers on special issues and projects/presentations.

[8] Work with the CASS department on operational concerns.

[9] Interface with FAA.

f. Reliability/Performance Analysis Personnel Qualifications

(1) Each member of the Reliability/Performance Analysis Group must be determined to be qualified and competent to perform their assigned duties and responsibilities.

(2) An integral part of the Reliability/Performance Analysis Engineers is the use of individuals with technical backgrounds to compile and analyze performance data to arrive at meaningful conclusions.

g. Reliability/Performance Analysis Personnel Training Requirements

(1) Training will consist of documented on-the-job training (OJT) and/or classroom training for the procedures found in the applicable systems listed in paragraph C. 1. d. (1).

(a) A qualified Reliability/Performance Analysis Engineer, or Lead may conduct the required training.

(b) Additional training will be completed for other functions that fulfill regulatory requirements.

(2) It is the responsibility of the Lead to determine, implement and record the training requirements of each member in the group.

h. Reliability/Performance Analysis Revision Procedures

(1) As conditions warrant, procedural changes to the Reliability/Performance Analysis System may be necessary.

Requests or recommendations concerning changes to the procedures shall be accomplished by using the Manual Revision Checklist (TULE Form 1262A) in front of this manual, unless using the Electronic Document Approval process the form is not required. Make changes in RED ink on a copy of the current applicable page(s). DO NOT retype the page(s) with changes. However, typed draft revision(s) proposals can be attached to the marked-up page(s). Attach these changes to TULE Form 1262A or the electronic document approval process.

Submit completed package to Maintenance Publications, MD 1-420, MCI . Editor of the GPM will prepare a draft to accompany TULE Form 1262A, which is then circulated for AA approval signatures.

NOTE: Review and approval of the change must be obtained by the Manager of Fleet Operations Engineering (FOE), MD 207.

(2) Revision(s) to any of the Reliability/Performance Analysis procedures require FAA approval and shall be obtained per the procedures given in GPM Sec. 03-01.

(3) In the event that unforeseen problems arise as a result of procedural changes, those concerns should be reported to the Manager of FOE for review.

i. Reliability/Performance Analysis Assessment

(1) Accomplishment of both external and internal audits shall serve as a means to ensure that all procedural requirements of the Reliability/Performance Analysis System are appropriate and are complied with.

(2) Any procedural deficiency identified during the normal course of business shall be evaluated and resolved appropriately.

2. Daily Monitoring

Maintenance Operations Control (MOC) provides 24-hour coverage of the maintenance operation. A Manager-On-Duty (MOD), Technical Manager-On-Duty (TMOD), and Tech Services are on duty at all times to monitor maintenance operations and initiate corrective actions as necessary to assure aircraft airworthiness and dependability. Daily monitoring of operating aircraft and associated maintenance activities is conducted in system-wide telephone conferences. Daily conferences are:

Aircraft Status Conference	Reviews the status of overnight aircraft, out-of-service aircraft and plans to cover morning originations. It also includes a review of the status of parts, equipment or provides technical assistance that may be pending.
M & E Maintenance Performance Conference	Review maintenance performance from previous day's operations, including: delays, cancellations, engine shut-downs/removals, incidents and other significant events. It also reviews the status of any events which may have an impact on the current day's operation.
International Maintenance Conference	Reviews the status of aircraft committed to international schedules. In addition to aircraft requirements, ground support needs are reviewed as appropriate.
Base Maintenance Conference	Reviews activities and status of TULE, MCIE and AFW aircraft docks, CAM shops and engine shops. Also reviews activities at maintenance stations that require support from the main bases and potential aircraft drops-in which may impact main base operations.

These conferences are held at previously announced times and are conducted by MOC, with participation as necessary from Fleet Operations Engineering, Quality Assurance, CASS Quality Surveillance, Engineering, Base and Line Maintenance and Inventory Control.

Procedures for providing technical support and control for the maintenance operation are contained in the General Procedures Manual and Tech Services Procedures Manual. Pertinent chapters that are followed are:

GPM Chapter 6	FOS, AMS, and Communications Systems
GPM Chapter 17	Repairs/Deferrals/MEL
Technical Services Procedures Manual	Tech Services Procedures

3. Emergency Responding

Emergency Responding includes identifying emergency/critical situations, determining causes and formulating a plan to ensure that similar conditions do not exist in like equipment. Typical examples of emergency/critical situations include:

- Uncontained engine failures
- Critical structural failures
- Any life-limited part failure

GPM Sec. 11-05, "Management action regarding aircraft damage, incidents and occurrences of compliance" describes Maintenance & Engineering policy concerning management action to be taken with incidents and occurrences of noncompliance and delineates the procedures to be followed in conducting investigations of such occurrences.

END

ATTACHMENT 11

MAINTENANCE GROUP CHAIRMAN'S FACTUAL REPORT

DCA-07-MA-310

GPM Chapter 23 Surveillance 23-21 Data Analysis

Chapter 23: Surveillance

23-21 DATA ANALYSIS

NOTE: Any change to this approved section, GPM Sec. 23-21, other than typographical corrections, requires prior approval by the Federal Aviation Administration (FAA) Airworthiness Principals.

A. GENERAL

1. This section provides instructions on how to analyze mechanical performance data. Data analysis is the process of evaluating mechanical performance data to identify characteristics indicating a need for program adjustment, revision of maintenance practices or hardware improvement (modification).

2. An "event" based program forms the basis for AA's reliability/performance analysis system. Analyzing the mechanical events and their associated Pilot Reports (PIREPs) that impact the operation of the fleet provides an excellent method of assessing the mechanical performance of the fleet.

   NOTE: "Event" based programs are also known as "non-alert" programs and are acceptable methods of analysis per FAA Advisory Circular (AC) No. 120-17A (Chapter 2, section 15, paragraph b.(2)).

3. Analyzing actual "events", such as maintenance related delays (code 46P, greater than fifteen minutes), cancellations (code 910, attributed to maintenance), and air interrupts, identify aircraft systems/components with deteriorating performance. Systems/components found with deteriorating performance may require modification and/or maintenance program adjustment.

   The overall analysis process encompasses several different steps that can only be completed through the use of a spreadsheet application. AA uses the spreadsheet application Microsoft Excel® to accomplish both the statistical analysis and the graphing functions required in this section. Refer to Figure 1 for an outline of the following analysis process.

   NOTE: All events (delays, cancels, air-interrupts) and PIREPs are assigned a four-digit Air Transport Association (ATA) numeric code. The actual number of codes varies by fleet type but range anywhere from 180 to 190 codes.

   Briefly, the first step of the analysis totals the number of events within each 4 digit ATA numeric code and ranks the totals in descending order to determine operational impact by 4 digit ATA systems. Next the analysis trends both the event parameters (delays, cancels, and air-interrupts) and PIREP count/rate to determine the performance of each metric (deteriorating/no change/improving) against the fleet. With the completion of this step, the general condition of the fleet can be determined and systems detrimental to the overall performance of the fleet can be identified.

   NOTE: A system's performance trend can be determined by analyzing the slope of the data's linear trend (utilizing Excel's® Least Square Curve Fit function). Visually, if the trend line slopes up then the system's performance is deteriorating. Mathematically, if the slope of the trend line is positive, then the system's performance is deteriorating.

   In addition, to account for seasonal effects, repeat aircraft, incorporation of maintenance program adjustments, dependability issues, etc., the time interval analyzed is 2 years.

   The next step trends both the event parameters (delays, cancels, and air-interrupts) and the PIREP count/rate within the top 4 digit ATAs to determine the performance of each metric (deteriorating/no change/improving). System ATAs that are found with increasing trends are flagged for additional analysis.

   Due to the different systems covered by the ATA codes, the analysis completed after this stage will vary depending on the type of system (interiors, structures, avionics, powerplant, etc.,). Typically, only the PIREPs associated with the delay, cancel, and air-interrupt events are reviewed. This step looks at the various maintenance discrepancies (MDIS) and/or the final action taken (FACT) of the PIREPs to assess the discrepancies and/or the fixes experienced during the event. Findings from this analysis may be shown in a tabulated chart or in a "pie" chart.

   A system(s) and/or component(s) found significantly impacting the operation and with identifiable reason(s) for the poor performance is provided to the cognizant Maintenance and Engineering groups for further evaluation on a monthly basis.

NOTE: After identifying a discrepant system/component through the review of event parameters and PIREPs, the Reliability Engineer shall try to determine the reason(s) for the inadequate performance. The deterioration may be due to a maintenance program adjustment, recent modification, repeating aircraft, or some other reason. Consequently, an attribute of this method of analysis is the inherent feature of assessing maintenance program adjustments and/or equipment modifications during routine monthly reviews.

The analysis accomplished by the Reliability Group only identifies, from mechanical performance data, the system/component causing the event. If, during the course of the reliability engineer's analysis, a firm explanation for the inadequate performance cannot be determined, or when plausible reasons are identified, the engineers can present their findings to the cognizant Maintenance and Engineering groups for further investigation and disposition. Maintenance and Engineering's analysis will attempt to identify both the failure mode of the affected system/component and whether a cost-effective solution exists. In some instances, where the affected system/component does not have a direct adverse effect on operating safety, and/or a cost-effective solution, the final disposition may simply be to continue operation of the affected system/component with its inherent reliability.

4. Another analysis step compares operational data (current 12 months vs. previous 12 months) to provide a general impact assessment of maintenance program adjustments and/or system/component modification. The rolling 24-month timeline provides an optimum period for allowing ample time for implementing significant maintenance program adjustments and/or equipment modifications on a fleet and determining if the desired affects were achieved.

5. The data analysis accomplished by the Reliability Group includes both schedule/routine and unique "ad hoc" analysis.

   All scheduled analysis shall be posted on the Reliability Website at http://me.aa.com/engineering/foe/reliability/main.asp. Unscheduled analysis originating from either a finding made during a scheduled analysis or requests made from organizations within Maintenance and Engineering shall be posted on the Reliability Website at the discretion of the Engineer who completed the review.

6. Enhancements to the process of data analysis shall be made as computer capabilities and analysis methods improve. Those enhancements that the Manager of Reliability considers to be of value to the overall reliability program shall be added to the FAA CMO approved procedures.

7. For these methods of analysis to be effective, qualified individuals are required. Consequently, an integral part of the Reliability/Performance Analysis System is the use of individuals with technical and computer backgrounds to compile and analyze the data to arrive at meaningful conclusions.

8. All evaluations initiated as a result of Reliability analysis findings that require participation of organizations within Maintenance and Engineering shall be recorded and tracked on the Reliability Project Tracking Website at http://me.aa.com/eqa/relitrack.

B. RESPONSIBILITY

1. The Reliability/Performance Analysis group is responsible for completing the analysis as detailed in this section.

2. Each fleet type will have a responsible Reliability Engineer. The Reliability Engineer is the chief advocate for the fleet's mechanical reliability. The Reliability Engineer will utilize the operational data at their disposal to accomplish the following:
   - Rank aircraft systems impacting the operation of the fleet.
   - Identify systems with deteriorating performance.
   - Categorize maintenance discrepancies (MDIS) and fixes (FACT).
   - Compare operational data.
   - Report findings to cognizant Maintenance and Engineering groups.

C. DATA ANALYSIS PROCEDURES

Microsoft Excel® forms the basis for running AA's reliability program. Both the data analysis and display functions contained within the procedures are accomplished using Excel®. Consequently, when the procedures require a specific operation such as applying a linear trend line to an event parameter graphing the resulting computations, generalized instructions are provided in lieu of listing the explicit steps of accomplishing the Excel® function.

Completion of these procedures by the Reliability Engineers ensures that the operational data is analyzed in a consistent

manner across the different fleets. Display of the data analysis results may vary slightly across the fleets. Final data display is determined at the discretion of the cognizant Reliability Engineer.

1. Monthly Fleet Review. The objective of this procedure is to identify discrepant systems/components that may require further evaluation by the cognizant Maintenance and Engineering groups.

   a. Access the master database on the Reliability Fileserver and obtain the previous month's operational data and add the new month's data into existing fleet specific database.

      NOTE: Existing fleet specific databases require a rolling minimum of 24 months of operational data (aircraft nose number, date, station, trip number, remarks, impact code, 4 digit ATA, delay/cancel/air-interrupt code).

      The previous month's data is usually available by the 10th working day into the new month. Monthly reviews shall be completed no later than the end of the month.

      For new aircraft fleets, originate a new fleet specific database. When 6 months of data is obtained, begin analyzing the data per these procedures.

   b. From the fleet specific database, complete the following operations:

      (1) Determine operational impact by four-digit ATA system. This operation determines operational impact of delays, cancels, and air-interrupts in each four-digit ATA system. Only the top 25 ATA sub-chapters affecting the operational performance of the fleet for a one-year period are charted.

         (a) Tabulate all delays, cancels, and air-interrupts within all four digit ATAs.

         (b) Rank all four-digit ATAs for the current 12 months in descending order and graph the top 25 four digit ATAs into a bar chart.

         (c) Chart will show total number of events and list separately the number of delays, cancels, and air-interrupts within each ATA system. See Figure 2 for an example of the chart.

      (2) Determine fleet events trend. This operation calculates the monthly rate for all delays, cancels, and air-interrupts in a 2-year period or longer.

         (a) Calculate the rate (events per Revenue Departures) for each event parameter (delays, cancels, and air-interrupts) for the previous month.

         (b) Plot the new rate with the previous 23 or more monthly rates of each event parameter on a line chart. Afterwards, apply a linear trend line to each line series.

         (c) Chart will show events per revenue departures and the time interval under review. See Figure 3 for an example of the chart.

         (d) Mathematically determine the slope for each event parameter for all top 25 ATA sub-charters identified in step b.(1) of this section. Retain results on the analysis spreadsheet.

      (3) Complete an air-interrupt chart and summary. This operation originates a tabulation chart that lists the number of air-interrupts from the previous month with in each ATA sub-code. The summary lists details for each air-interrupt.

         (a) Originate a chart that lists the number of air-interrupt events that occurred with in each four-digit ATA system. See Figure 4 for an example of a chart.

         (b) Originate summary of all events. Summary will detail each event by four digit ATA code, discrepancy, finding, and fix. See Figure 5 for an example of a summary.

      (4) Determine Year over Year Comparison of top 25 ATA systems. This operation compares the performance change of the top ATAs, by sub-chapter, between the current 12 months and the previous 12 months.

         (a) Using the tabulated totals obtained for the Operational Impact by four-digit ATA code, calculate the rates (events per Revenue Departures) for each top ATA.

         (b) Calculate the rates (events per Revenue Departures) for the same ATA codes using the tabulated totals from the previous 12 months.

(c) Graph the current versus the previous 12-month rates for each ATA number on a bar chart.

(d) Chart will show events per revenue departures and the four-digit ATA systems under review. See Figure 6 for an example of the chart.

(5) Determine PIREP trend. This operation calculates the PIREP rates for a 2-year period or longer and determines PIREP trends for PIREP total against a fleet and for those four-digit ATA systems that have recorded PIREPS.

(a) Using the total PIREP count, calculate the PIREP rate (per 1000 Flying Hours) for the previous month.

(b) Plot the new PIREP rate with the previous 23 or more monthly rates and PIREP count on a line chart. Afterwards, apply a linear trend line to the PIREP Rate line.

(c) Chart will show a PIREP count line and PIREP rate line and the time interval under review. See Figure 7 for an example of the chart.

(d) Mathematically determine the slope for each four-digit ATA systems that have recorded PIREPs. Retain results on the analysis spreadsheet.

c. With the computations completed against the previous month's data, review the results to identify any ATA systems found with deteriorating performance. Figure 1 outlines the aircraft system reliability review.

(1) Review each event parameter of the top 25 Operational Impact four-digit ATA systems. Systems found with a positive slope value in one or more event parameters (delay, cancel, air-interrupt) shall be checked to determined what factors caused the increase. Check to see if the rise is the result of repeating aircraft or from some other anomaly that is no longer a factor but still affects the trend line, or simply too few events to justify a maintenance program adjustment or modification. Any system found that can not be determined to be insignificant requires further review.

(2) Review the slope values for each four-digit PIREP trend. Identify those systems found with a positive slope value and check to see if those PIREP system(s) also show up as a top 25 Operational Impact ATA system under further review from step c.(1) of this section or if the system sufficiently impacts the performance of the fleet.

(3) Review those ATA systems that are identified as both a top 25 Operational Impact ATA system under further review with an increasing PIREP rate. Begin the review by gathering the associated PIREP to each event parameter and accomplish a "root cause" analysis as outlined in Figure 8 . Determine from the data if a meaningful conclusion can be ascertained from the various discrepancies and/or fixes.

(4) Review the PIREP system(s) identified in step c.(2) of this section that have been determined to sufficiently impact the performance of the fleet. Begin the review by gathering all the PIREPs in the particular ATA and accomplish a "root cause" analysis as outlined in Figure 9 . Determine from the data if a meaningful conclusion can be ascertained from the various discrepancies and/or fixes.

(5) Originate Four Digit ATA Trend Chart and "Pie" Chart. These charts are originated at the discretion of the Reliability Engineer and are for those four digit ATAs that will be presented to the cognizant Maintenance and Engineering groups for possible further analysis and disposition.

(a) Calculate the rate (events per Revenue Departures) for each event parameter (delays, cancels, and air-interrupts) for the previous month.

(b) Plot the new rate with the previous 23 or more monthly rates of each event parameter on a line chart. Afterwards, apply a linear trend line to each line series.

(c) Chart will show events per revenue departures and the time interval under review. See Figure 10 for an example of the chart.

(d) Prepare, as appropriate, a tabulated and/or "pie" chart showing the findings of the "root cause" analysis of the PIREPs. See Figure 11 for an example of a "pie" chart.

d. With the review completed against the entire database, prepare the following monthly report as follows.

(1) Prepare a Monthly Review Package as a Power Point presentation.

(a) Prepare the following required charts.

NOTE: The final content of the Monthly Review Package will vary month to month depending on the

outcome of the monthly review and due to the uniqueness of the individual fleets. The charts listed below represent the minimum required content of the Monthly Review Package. This listing does not prohibit the use of other charts that are determined to be necessary by the Reliability Engineer and/or cognizant Maintenance and Engineering groups.

- Top 25 Operational Impact Four-Digit ATA Systems Chart (as completed in step b.(1). of this section). See Figure 2
- Delay, Cancel, and Air-Interrupt Fleet Trend Chart (as completed in step b.(2). of this section). See Figure 3
- Air-Interrupt Tabulation Chart (as completed in step b.(3) of this section). See Figure 4.
- Previous vs. Current Year Comparison of the TOP 25 Operational Impact Four-Digit ATA Systems (as completed in step b.(4). of this section). See Figure 6 .
- PIREP Count/Rate Fleet Chart (as completed in step b.(5). of this section). See Figure 7.

(b) Supporting Four Digit ATA System Charts.

NOTE: The supporting charts are prepared at the discretion of the Reliability Engineer due to findings and/or request from the cognizant Maintenance and Engineering groups.

- Individual four-digit ATA Trend Chart with accompanying Tabulated or "Pie" chart, if applicable. See Figures 10 and 11 for examples of the charts.

(c) Assemble the charts together into a Power Point presentation.

(d) E-mail the completed package to the Managers of Production and Engineering. In addition, "carbon copy" the Reliability Staff Assistant for posting on the Reliability Website, http://me.aa.com/engineering/foe/reliability/main.asp.

(2) Prepare a Monthly Air-Interrupt Package as a Power Point presentation.

(a) Assemble the Air-interrupt Tabulated Chart and the Event Summaries together into a Power Point presentation. See Figures 4 and 5 .

(b) E-mail the completed package to Reliability Staff Assistant for posting on the Reliability Website, http://me.aa.com/engineering/foe reliability/main.asp.

2. Monthly ETOPS Reliability Review: the objective of this procedure is to prepare and provide event based information on the ER aircraft fleet reliability to the cognizant Maintenance and Engineering groups and AMR CMO.

NOTE: The charts listed below represent the minimum content of the monthly ETOPS report. This listing does not prohibit the use of other charts that are determined to be necessary by the Reliability Engineer and/or cognizant Maintenance and Engineering groups.

a. Prepare the following required charts: 12 Month Rolling In-Flight Shutdown Rate Chart (Ref. Figure 12), 12-month Rolling APU In-flight Start Rate Chart (Ref. Figure 13), ETOPS Incident Details (Ref. Figure 14), APU In-flight directed start program no-start details, ETOPS incident trend analysis.

b. APU In-Flight Start Review. The objective of this procedure is to determine 12-month rolling reliability for qualified environment in-flight APU starts for the ER fleets for evaluation by the cognizant Maintenance and Engineering groups.

(1) Capture all incidents on all three fleets that require an in-service, in-flight APU start by the QRH (i.e., IDG failure, engine IFSD, etc.) from FMR.

(2) Capture all starts made as part of the directed start program from ATA 49 FMR.

(3) Calculate the APU in-flight start rate.

(a) Only starts that occur within a qualified environment on ER aircraft are counted (Ref. GPM 22-02)

(b) In-service starts (regardless of cause) count as one start attempt.

(c) Every APU is given a maximum of 3 opportunities to start during a flight. If it takes 3 start attempts to start the APU, it will only count as one start attempt.

(d) Events where the APU does not start on the third attempt count as 1 no-start. If the APU does not start on the first or second attempts, and subsequent attempts are not made, 1 no-start is recorded.

(e) 12 month rolling reliability is equal to 1- ((the total number of no-start events in the 12 month period) divided by (the total number of start attempts in 12 month period)).

(f) Plot the new APU start rates for the ER fleets with the previous monthly rates on a line chart.

c. Assemble the charts together into a document presentation.

d. E-mail the completed package to Reliability Staff Assistant for posting on the Reliability Website (http://me.aa.com/engineering/foe/reliability/main.asp) and to the AMR CMO.

Aircraft System Reliability Review

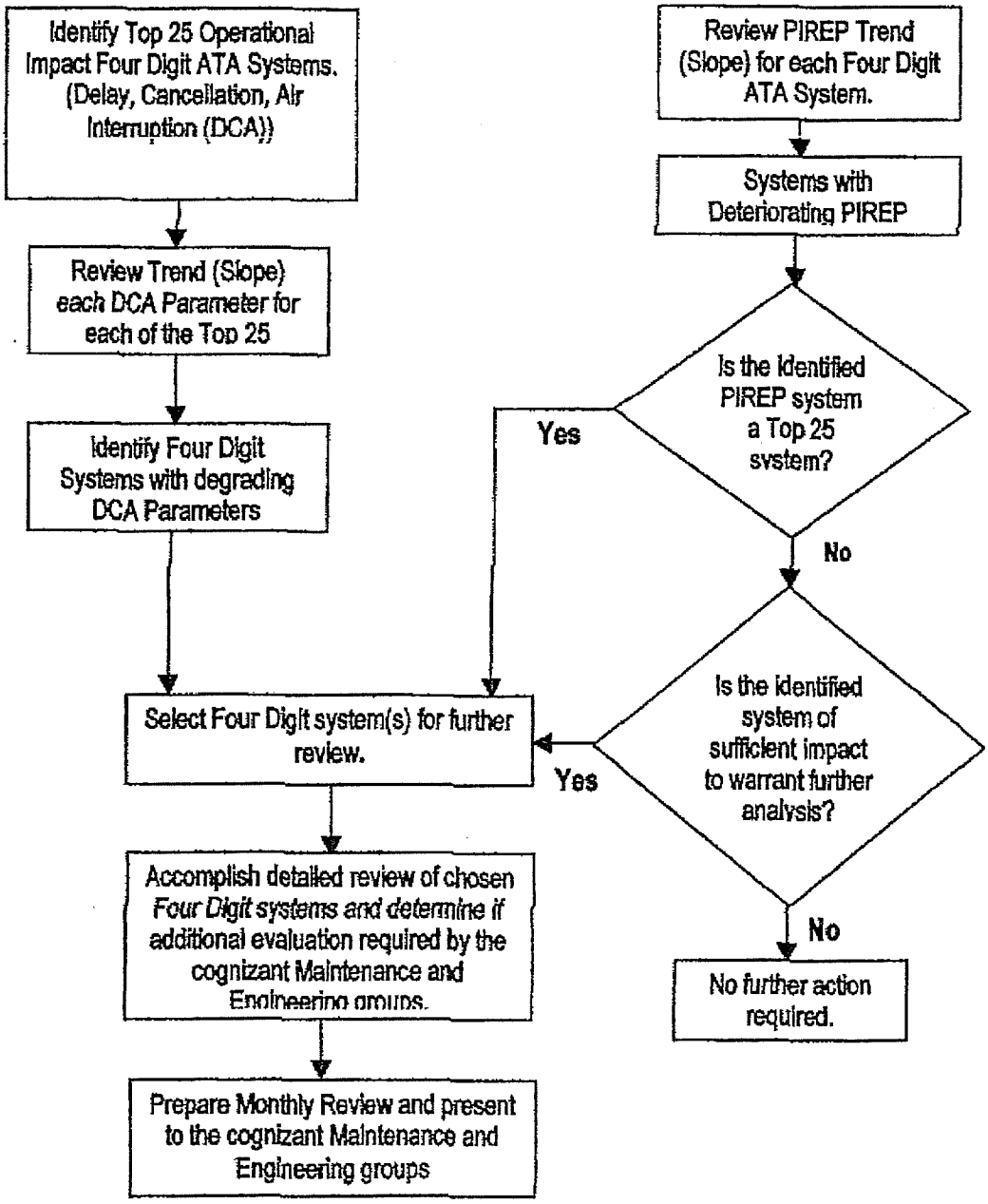
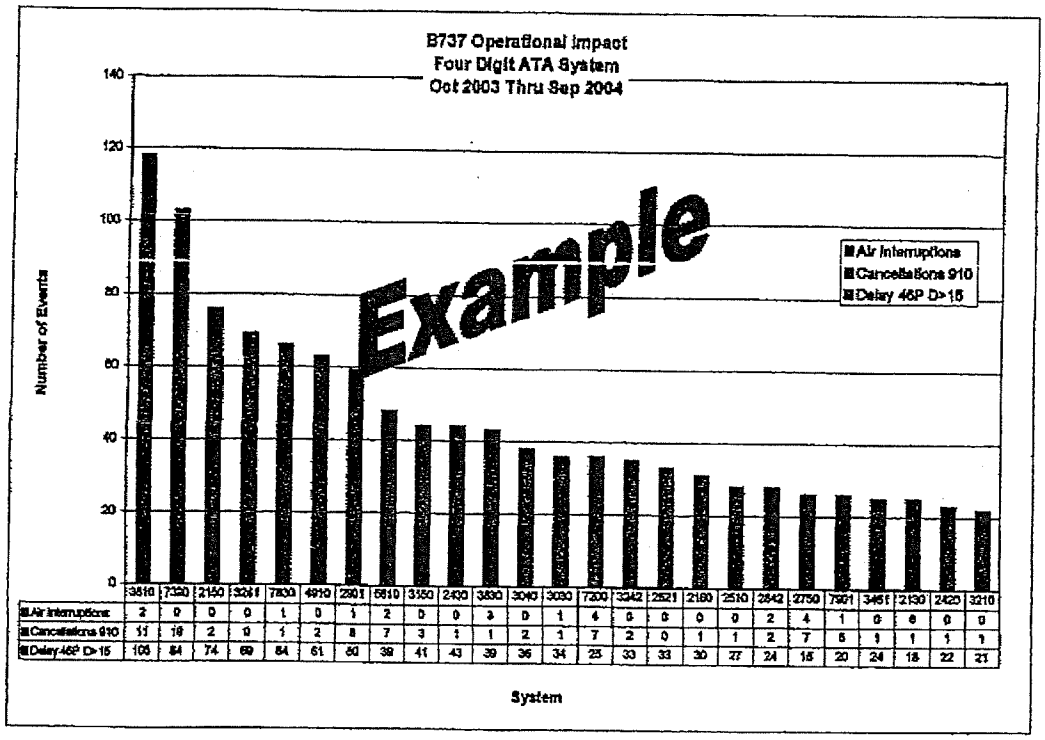


Figure 1. Aircraft System Reliability Review



	3610	7320	2150	3261	7800	4910	2901	5810	3150	2400	3830	3040	3030	7200	3342	2521	2160	2510	2842	2750	7901	3461	2130	2425	3210
Air Interruptions	2	0	0	0	1	0	1	2	0	0	3	0	1	4	0	0	0	0	2	4	1	0	0	0	0
Cancellations 910	11	10	2	0	1	2	8	7	3	1	1	2	1	7	2	0	1	1	2	7	5	1	1	1	1
Delay 46P D>15	106	84	74	69	84	61	60	39	41	43	39	36	34	25	33	33	30	27	24	16	20	24	18	22	21

Figure 2. Top 25 Operational Impact Four-Digit ATA Systems Chart

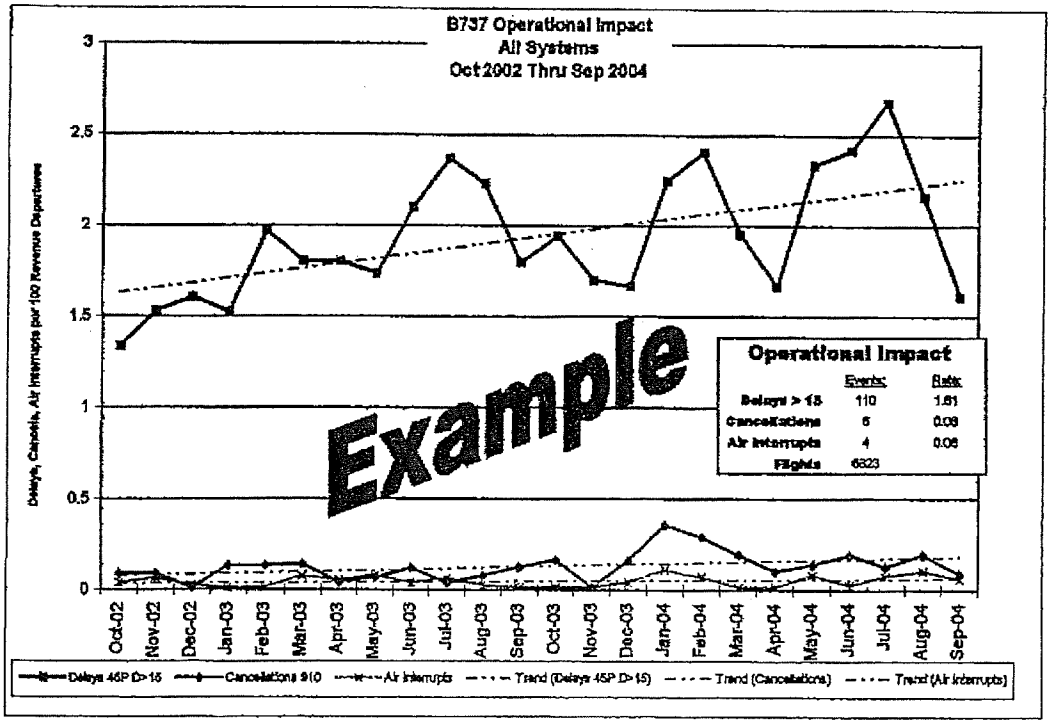


Figure 3. Delay, Cancel, and Air-Interrupt Fleet Trend Chart

B737 - Air Interruption Events
Four Digit ATAs - Oct 03 thru Sep 04

ATA	Description	Oct 03 thru Sep 04 *	Sep-04
2130	Air Conditioning - Pressurization	6	
2760	Flight Controls - Leading Edge	5	2
7200	Engine	4	
2750	Flight Controls - Flaps/Trailing Edge	4	
3830	Water/Waste - Waste Disposal	3	
2740	Flight Controls - Horizontal Stabilizer	2	
3810	Pneumatic - Distribution	2	
5610	Windows - Flight Compartment	2	

***Only Four Digit ATAs with more than one event are shown**

Figure 4. Air-Interrupt Tabulation Chart

B737 - Air Interruption Events
September 2004 Details

Date	Route	Trip	A/C	Sys	ATA	Code	Event Remarks	Event Driver	Final Fix
12/04	DFW-SNA	745	3BY	27	2760	A	RETURNED DFW ACCT L/E SLATS WOULD NOT RETRACT. NO EMERGENCY DECLARED, UNEVENTFUL LANDING, NOT OVERWEIGHT. REPLACED PROX SWITCH AND FSEU NO HISTORY. IN WORK.	UNABLE TO RETRACT L/E SLATS	R/R FSEU
15/04	MIA-IAH	37072	3BY	27	2760	A	RETURNED MIA ACCT L/E SLAT DISAGREE LIGHT. NO EMERGENCY. LANDED WITHOUT INCIDENT AND WAS NOT OVERWEIGHT. ACCOMPLISHED FDR DOWNLOAD. REPLACING AL[illegible] ACTUATORS. 3 PREVIOUS PENDING	/E SLAT ASSYMMETRY IGHT	R/R ACTUATORS
23/04	MIA-YUL	426	3BA	78	7830	A	LANDED RO[illegible] R LIGHT [illegible] UNEVENTFULLY, NOT O[illegible]WEIGHT. PLACARDED LH [illegible]SER PER MEL. NO HISTORY - OPEN MEL TFI	THRUST REVERSER LIGHT ILLUMINATED	R/R RIGHT UPPER T/R ACTUATOR
29/04	DFW-MEX	1653	3BD	22	2250	A	RETURNED DFW ACCT UNCOMMANDED YAW. EMERGENCY DECLARED. LANDING WITHOUT INCIDENT AND WAS NOT OVERWEIGHT. ACCOMPLISHED DFDR DOWNLOAD. SUSPECT CROSS/TAIL WINDS. TROUBLESHOOTING IN PROGRESS. NO HISTORY	UNCOMMANDED YAW	NO FAULT FOUND

Figure 5. Air-Interrupt Details

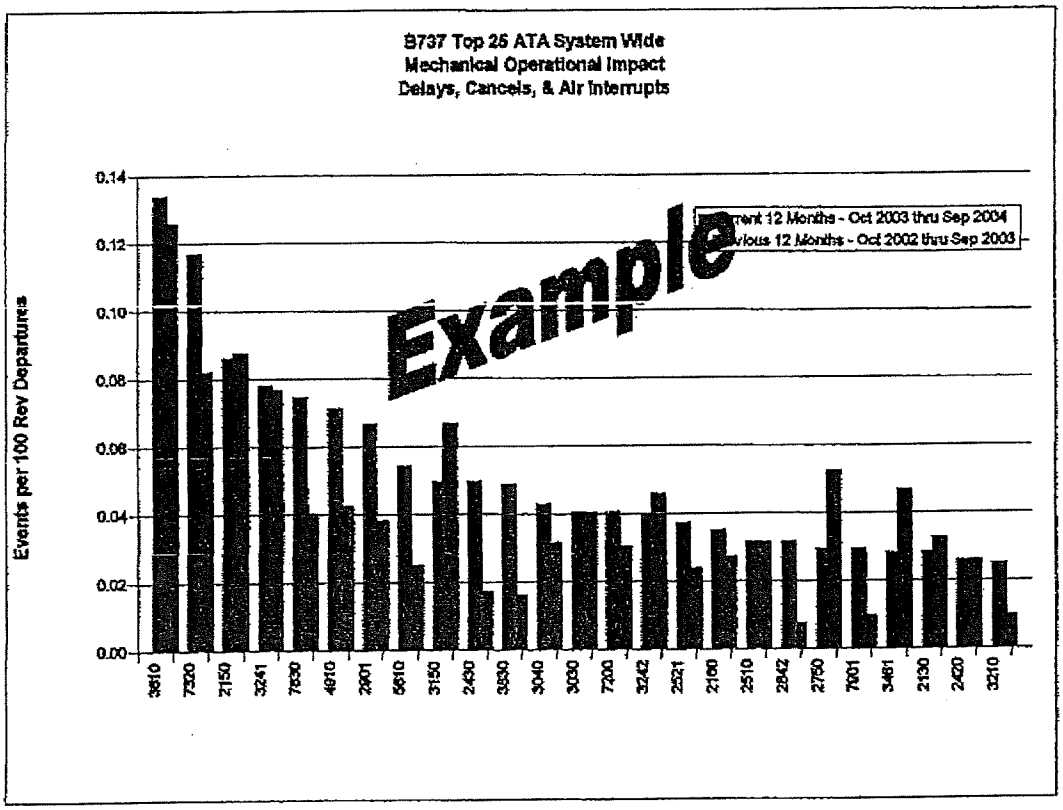


Figure 6. Previous vs. Current Year Comparison of the TOP 25 Operational Impact Four-Digit ATA Systems

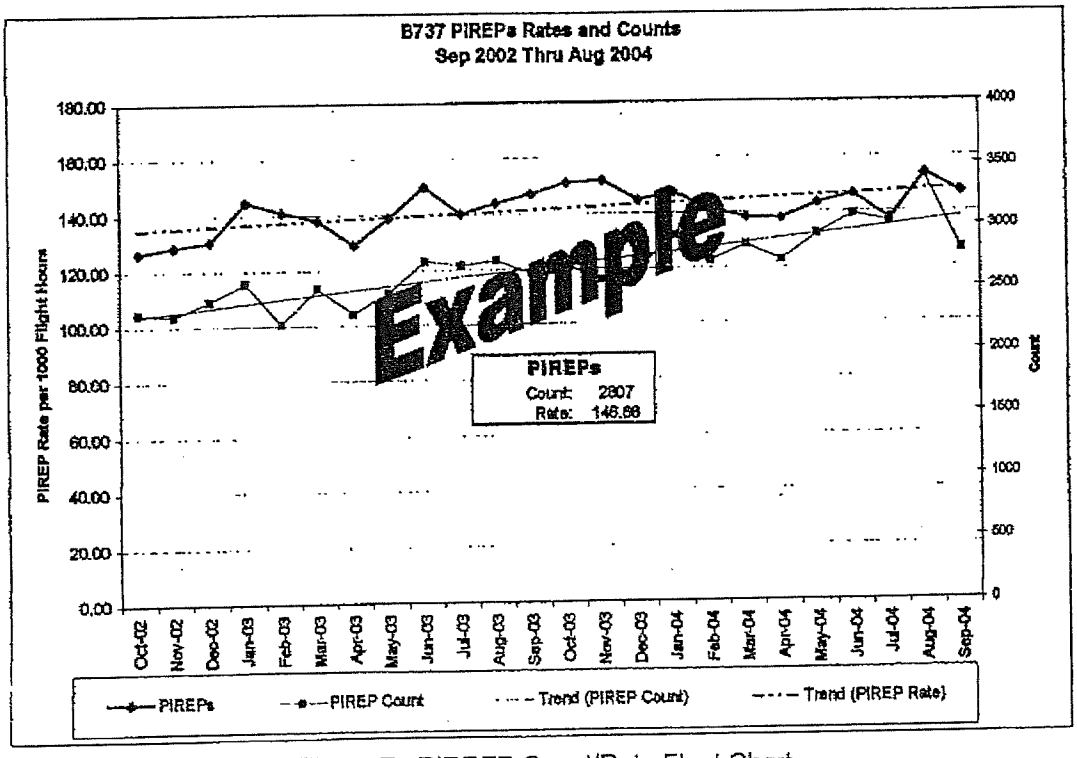


Figure 7. PIRREP Count/Rate Fleet Chart

Delay, Cancellation, Air Interruption, or Out of Service Root Cause Analysis

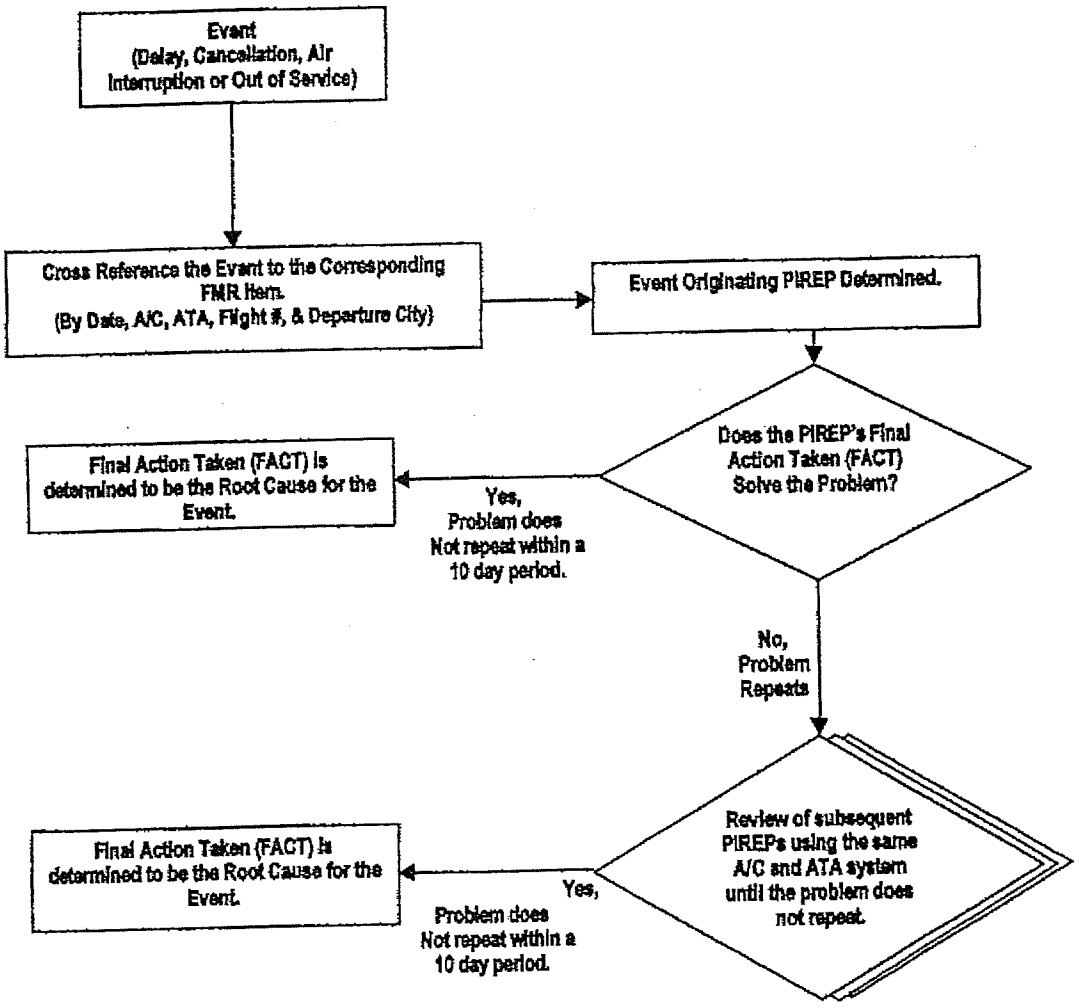


Figure 8. Delay, Cancellation, Air Interruption, or Out of Service Root Cause Analysis

PIREP
Root Cause Analysis

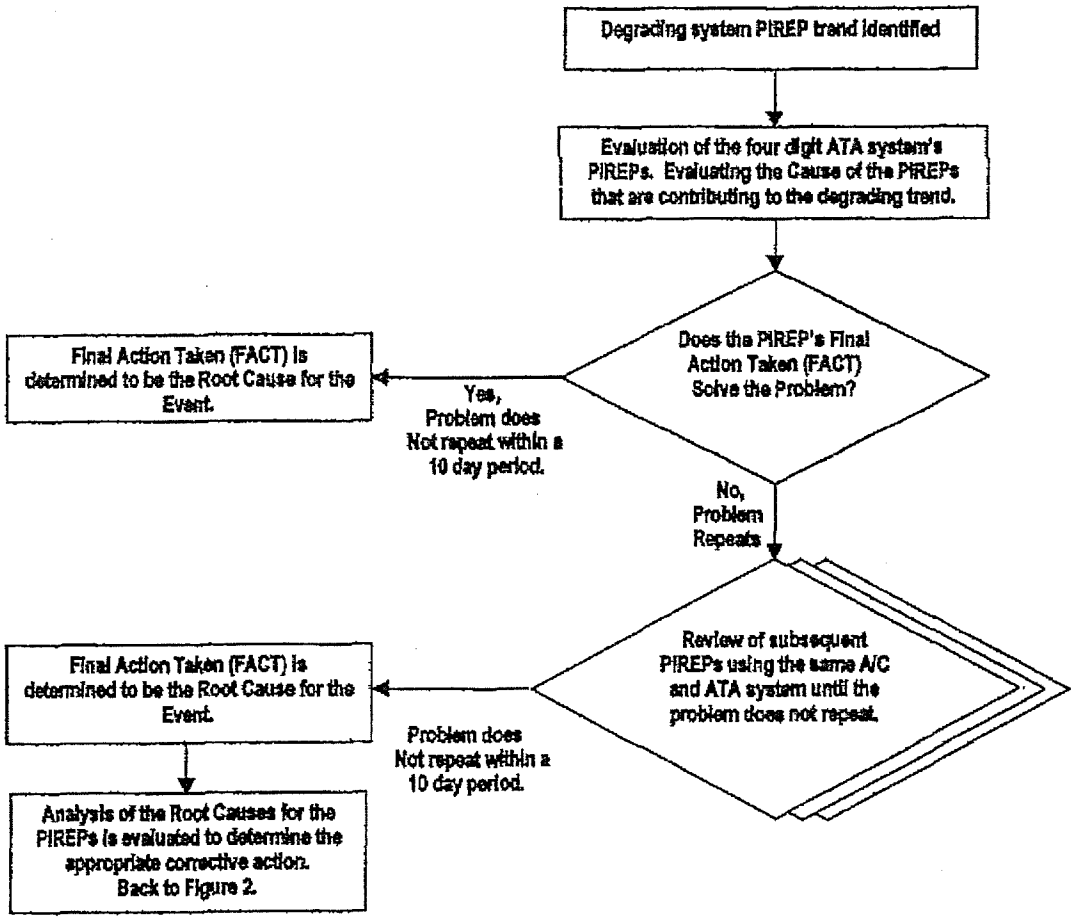


Figure 9. PIREP Root Cause Analysis

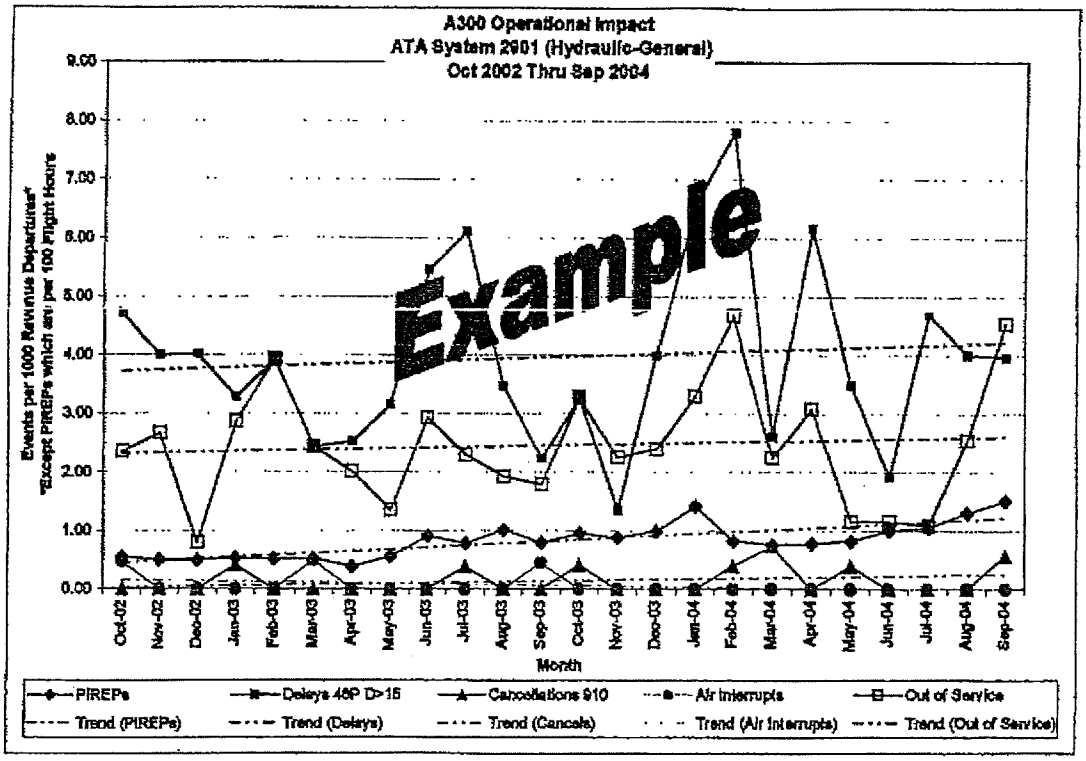


Figure 10. Four Digit ATA Trend Chart

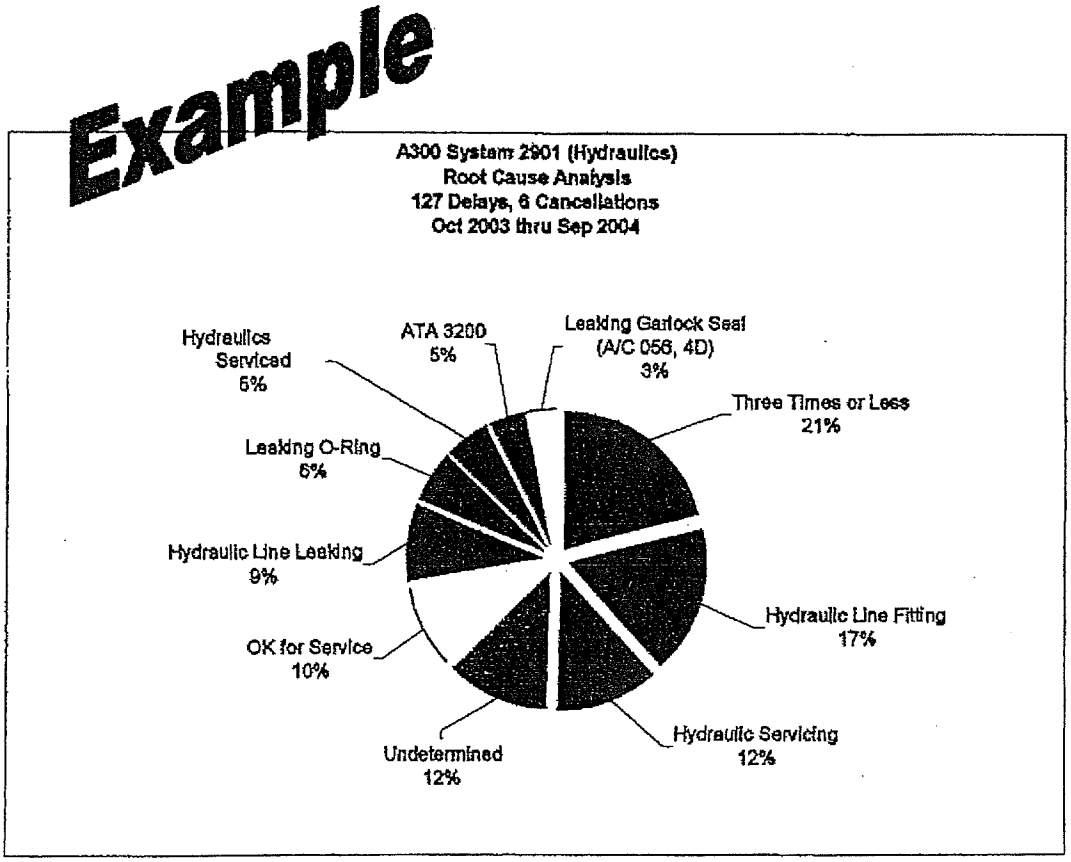


Figure 11. Four Digit ATA PIREP "Pie" Chart

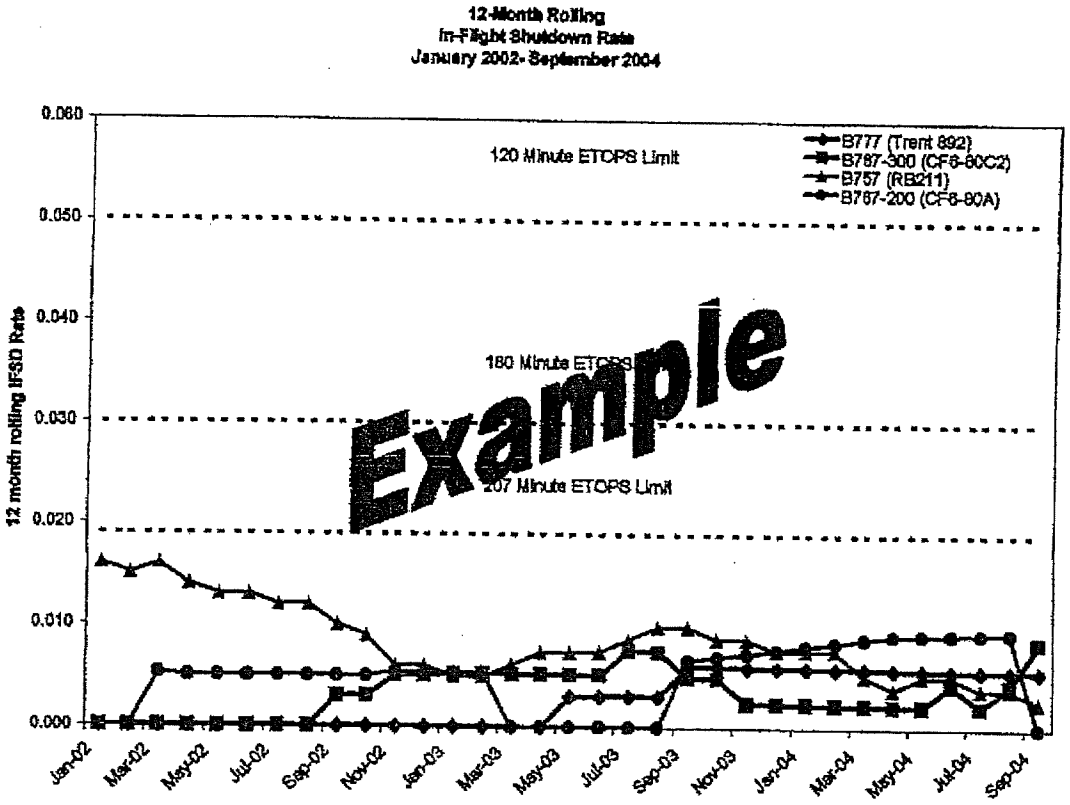


Figure 12. 12 Month Rolling In-Flight Shutdown Rate Chart

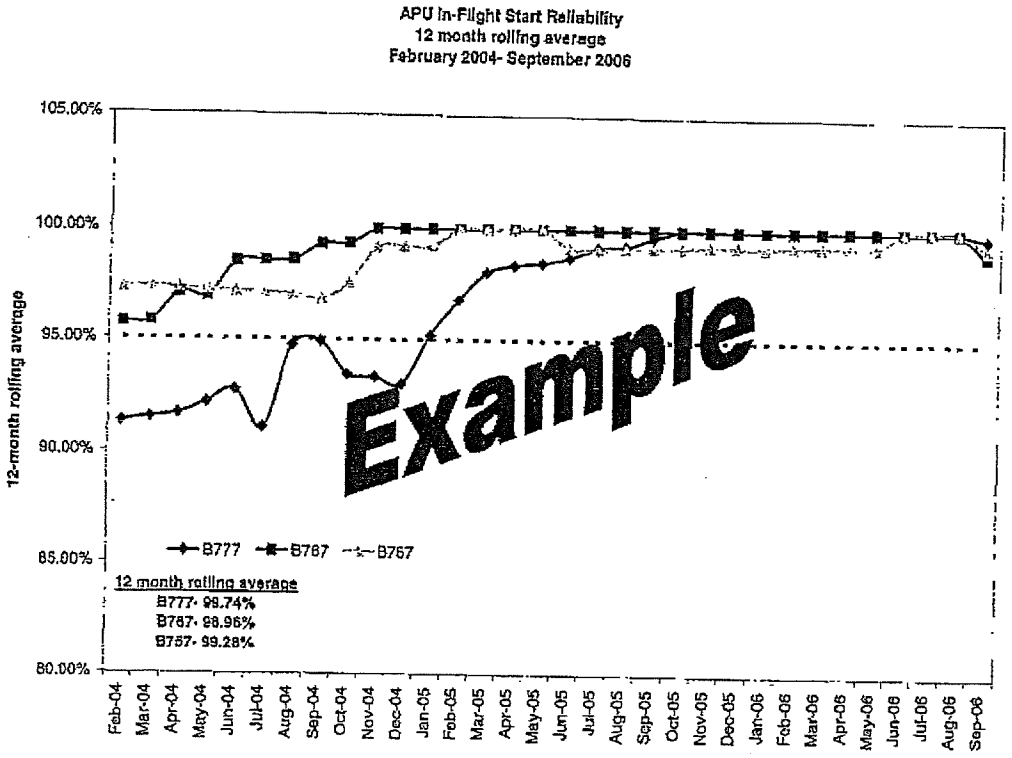


Figure 13. APU In-Flight Start Reliability Chart

B777 ETOPS INCIDENT DETAILS
JULY 2004- SEPTEMBER 2004

Fleet	Aircraft	ETOPS AC	ATA	Date	STATION	Flight	ETOPS FLIGHT	FMR	Final Fix
B777	7AU	ETOPS	2420	1-Jul	ORD	46	yes	STAUS MESSAGE ELEC GEN SYS L	NO CORRELATED MAINT.MSGS FOUND AT MAT, ACCOMPLISHED GROUND TESTS ON MAT OF LEFT GCU AND B ALL TESTS PASSED- MSG CLEARED, RAN ENGINES AND GEN S YS OPS CHECKS-NORMAL. CONTACTED TECH SERVICES. OK FOR SERVICE. 7AU242348 0101 0 1JUL ORD
B777	7BJ	ETOPS	2420	5-Jul	JFK	131	yes	DURING CRUISE/FLIGHT BUSINESS GALLEY CHILLERS AND OVENS W[illegible] ON,R ECEIVED ECAS CAU ELEC GEN OFF [illegible] MPT TO RESET THE GEN FAILED	R>R Y1 ENG IDG - ALL OPS AND LEAK CHKS GOOD 7BJ241DEE 0902 0 6JUL JFK
B777	7AJ	ETOPS	3426	6-Jul	JFK-NRT	167	YES	[illegible] STATUS MSG / LH HPSOV [illegible] ED WITHOUT INCIDENT AND WAS [illegible] EIGHT. REPLACED SAARU AND LH AIR [illegible] CONTROLLER. 2 PREVIOUS ITEM - ON WATCH.	FOUND MX MSG 34-36801. REPLACED SAARU. ALL REQUIRED TESTS PASS
B777	7AN	ETOPS	2420	13-[illegible]	[illegible]	[illegible]	[illegible]	[illegible] ELEC [illegible] N OFF L INDICATION ON ECAS	REPLACED LH IDG PER MM OPS CHECK NORMAL NO LEAKS FOUND PERFORM ED ALL REQUIRED TESTS 7AN242540 1319 13JUL DFW
B777	7AV	ETOPS	2420	18-[illegible]	[illegible]	78	yes	APU GENERATOR FAULT LITE CAME ON AND GENERATOR DROPPED OFF THE LINE	REMOVED AND REPLACED APU GENERATOR AS PER AMM. PERFORMED ALL T EST AND FOUND OK FOR SVC. REMOVED PLACARD. CLEARED MIC SHEET 7AV242AA6 1322 19J UL LGW
B777	7AA	ETOPS	2180	25-Jul	OFW	60	YES	ELECCTRICAL CDOR DETECTED INBUSINESS CLASS APPROXIMATELY 2 HRS 20MINUTES INTO FLIGHT; POW PORTS TURNED OFF AT PANEL AT 2R, CDEC DISPATED.	TURNED POWER PORT SYS ON; NO CDOR DETECTED THROUGHOUT CABIN. 7 AA213386 1744 25JUL OFW
B777	7AE	ETOPS	4910	30-Jul	AFW	9828	no	APU FAILED TO START DURING TWO CONSECTIVE START ATTEMPTS AT ALTITUDE 410 . MATS INDICATES EGT INCREASE. SUCCESSFUL START ATTEMPT AT LOWER ALTITUDE FL 55 0 EROPS CHECKS AFTER APU ST WHERE SATISFACTORY	INFO NOTED PERFORMED OPS)< MAT CHECK OF APU NO FAULT FOUND 7A E493134 1934130JUL AFW
B777	7BN	ETOPS	3655	1-Aug	DFW-FRA	0070	YES	LANDED ORD ACCT F/C AND BUSINESS CLASS LAVS SINKS OVERFLOWING. NO EMERGENCY DECLARED. UNEVENTFUL LANDING, NOT OVERWEIGHT. REPLACED RESTRICTOR VALVE IN MAIN WATER DRAIN. 8 PREVIOUS - OK.	FOUND FWD DRAIN LINE RESTRICTOR VALVE STOCK CLOSED REMOVED)< REPLACED VALVE PER M/M OPS CK NORMAL ALL B/C)< F/C LAV SINKS DRAIN OK NO LEAKS NOTED

Figure 14. ETOPS Incident Details

END

ATTACHMENT 3

Allied Pilots Association
Flight 1400 Submission

Air Carrier's Policy on Actions to Be Taken (ATBT)

16-04 ACCOMPLISHMENT OF FMR - ACTION TO BE TAKEN (ATBT) ITEMS

A. GENERAL

1. REV-> Action to be Taken (ATBT) items are issued by Technical Services.<-END

   a. Specifying sequential trouble-shooting or repair action required to correct a repeat PIREP, or

   b. Obtaining information for further analysis regarding the performance/condition of an aircraft system, component, or powerplant.

   c. Accomplishment priorities of FMR items are as explained in GPM Sec. 6-02.

B. POLICY

1. M&E policy is to accomplish all FMR ATBT items on overnight terminating aircraft at stations where AA maintenance personnel are regularly assigned and at other stations when desired.

2. REV-> MOD - MOC and Technical Services <-END have the responsibility and authority to control MELs and significant ATBT discrepancies.

   a. The M&E ATBT accomplishment policy is to accomplish ATBTs as specified. It is recognized some situations may exist which would necessitate a deviation from this policy. For example:

      (1) Investigation of the problem revealed a fault not related to the ATBT BOW, but when corrected, will result in correcting the problem.

      (2) Incoming PIREP provided additional information which could be a reason for revising the BOW as specified in the ATBT.

      (3) Local restrictions do not permit engine operations above idle power.

      (4) Required test equipment/parts/skills are not available.

      (5) Higher priority work at the terminating station.

      NOTE: The entries NO INCOMING PIREP or NO PIREP SINCE LAST MAINTENANCE ACTION will not be used as the Final Action unless prior approval is received from the respective REV-> Technical Service group.<-END

   b. Priority Workload Assignment Deviation

      (1) If, in the judgment of the terminating station, a priority ATBT labeled DO NOT DEVIATE, contains technical content which should not or cannot be accomplished as specified, it is the responsibility of the terminating station to promptly call the Priority Workload Assignment group or the applicable Tech Services group and discuss the item.

      (2) Should the call result in a technical action different from that specified in the priority ATBT, the discussion and agreement should be referred to in the FMR entry, including the tech specialist's name.

      (3) If a priority ATBT listed in a station's EW* workload cannot be accomplished for any reason other than for its technical content, it is the responsibility of the station to obtain concurrence from the MOD - TULE.

END

ATTACHMENT 4

Allied Pilots Association
Flight 1400 Submission

Field Maintenance Reliability (FMR) System

06-02 FIELD MAINTENANCE RELIABILITY (FMR) SYSTEM

A. GENERAL

1. FMR is a real-time Maintenance management computer system to maintain the maintenance status and needs of each airplane in the fleet. It relies upon current and accurate data available as promptly as possible to aid in accomplishing corrective action. It is used to monitor and control the various aircraft maintenance requirements, such as:

a. Mechanical irregularities and cabin discrepancies including information type items as reported by flight crews and cabin attendants.

b. Selected repairs requiring technical review.

c. Specific maintenance status and action on an aircraft system or aircraft.

d. Parts required and/or status of parts.

e. Technical assistance and/or work instructions.

2. The accuracy and ease of defining the problem, its symptoms, the parts or supplies necessary, and the data required to accomplish corrective action are essential. Definitive data fields are entered against the Aircraft Maintenance Record to identify the discrepancy, record the status of the corrective action, and to report corrective action. These fields include:

a. Mechanical Discrepancy (MDIS) describes the malfunctioning equipment of the aircraft. It must contain all essential data to describe the problem (no editing of flight crew reports is permitted).

b. Action to be Taken (ATBT) describes the work to be accomplished to correct a specific discrepancy.

c. Deferral (DFRL) Field describes the reason for deferring an item. It is limited to a two character code [see paragraph C.3.b.(2)]. No other text will be accepted or is necessary.

d. Part Field contains the resources, company part number, illustrated parts catalog reference, manufacturer's part number, and description required to complete the repair.

e. Information (INFO) Field is used to provide down-line stations with information regarding the discrepancy. This usually is the result of a partial Maintenance action or troubleshooting effort where some work remains to be accomplished. If DFRL is entered FT and additional data is available that will aid in accomplishing repairs, provide this data as INFO. Do not provide INFO that will not assist or expedite in the Final Action Taken (FACT) process. Weather, local conditions, parts data, equipment status or shortages, etc., are <u>not</u> INFO and are unnecessary entries.

f. Final Action Taken (FACT) Field is used to report corrective action taken. It should provide all pertinent repair action taken. This provides a history file for future reference if the MDS repeats. It provides data for the next progressive step in the repair process and eliminates wasted and repetitive action.

B. RESPONSIBILITIES

1. FMR System

a. The Engineering & QA Division, with necessary coordination of other M&E divisions and SCS personnel, is responsible for ensuring the FMR system meets M&E aircraft support requirements.

2. FMR Training

a. The Maintenance manager or supervisor at a station is responsible to ensure personnel who make FMR inputs have been trained.

b. The general manager at stations where there is no local Maintenance management is responsible

to ensure personnel who make FMR inputs have been trained.

C. FMR ENTRIES AND REQUIREMENTS

1. Aircraft Flight Log

a. Mechanical discrepancies and related information in aircraft logbooks should have the following basic information entered into FMR:

(1) Nose number

(2) Date entered shall be the Day of Discovery.

NOTE: The day of discovery is the calendar day an equipment malfunction was recorded in the aircraft log or maintenance record.

(3) Type check (If no check is assigned enter "NC".)

(4) Discrepancy

(5) Station

(6) Logbook

(7) Trip number ("Maintenance Entry" use 9999 preferred, or inbound flight.)

(8) Action taken

(9) Captain's employee number associated with discrepancy if Flight Crew generated.

(10) Mechanic's employee number associated with action taken

NOTE: Please ensure entries are properly identified as FACT or DFRL.

2. Technical Services, MEL/ATBT Engineering, and Quality Assurance Entries

a. FMR entries made by Technical Services/Engineering/Quality Assurance should have a priority code indicating to the station the level of urgency for accomplishing the entry. Priority codes are assigned to items that can be addressed during an overnight or extended daytime visit. These items are not normally addressed on turnarounds or flight layovers (less than 4 hours), but may be if operation is unaffected. In addition to priority/NFNF items assigned by MOC Workload Control, the FMR item coding system is as follows:

- NFNF - Must be accomplished. MOD and TMOD approval is required for deferral.

0 - Routine - Assigned by the computer when FMR record is created. (To be accomplished at all stations, if resources are available.)

1 - Mandatory Review - Assigned by a Tech Services group. (To be accomplished by all stations, if resources are available, and the station has the capability to do the work.)

2 - MEL - Assigned by a Tech Services group. (To be accomplished by all Class I and II.)

- NEF - Non-Essential Equipment Furnishings (NEF) Manual. These are items that do not impact airworthiness and are contained in the NEF Manual, which is FAA approved.
- TAC - A Tracking and Control item entry utilized by Fleet Operations Engineering to monitor a repetitive check or special maintenance item.
- SMMR - Special Maintenance Manual Revisions. (Follow-up items that have Engineering approval and require prescribed action at a later date.)

3 - Accomplishment assigned to stations scheduled for A Checks. No reporting required by other stations.

4 - Accomplishment assigned to stations scheduled for B Checks, Modification Checks and Drop-in Aircraft. No reporting required by other stations.

5 - Accomplishment assigned to TULE, MCIE, or AFW visit only. No reporting required by other stations.

6 - Accomplishment assigned to stations scheduled I or C Checks (see Priority 6 FMR for handling deferred items, GPM Sec. 17-09). No reporting required by other stations.

3. Status Report of FMR Entries

a. By 0900 local time, each station should report (in FMR) the status of FMR entries for which the station is responsible. If the work is not complete by 0900, reporting must be within two hours after the aircraft is released for schedule.

b. The following work should be reported for each open item.

(1) Accomplished - The reported irregularity/discrepancy has been satisfactorily resolved. A Final Action Taken (FACT) entry should detail the corrective action, including parts replaced.

(2) Deferred - On items which are not satisfactorily resolved prior to departure, one of the following reasons must be entered. No other text will be accepted. All troubleshooting information must be entered using the (KI) information format. EXCEPT in the case of PIREPS, all parts data must be entered using the (KP) parts format. (Parts data is not to be entered for PIREPS.)

EQ - Equipment - Used when required ground or test equipment is not available to accomplish the work, the CPN or MPN of the equipment shall be included as information (INFO) in FMR.

F T - Further Troubleshooting - Used when an ATBT has been fully accomplished but the item has not been satisfactorily resolved. Work accomplished shall be included as information (INFO) in FMR.

G T - Ground Time Insufficient - Used when aircraft total ground time was insufficient to accomplish the work.

H A - Hangar - Used when hangar space is not available to accomplish the work. Reason hangar space was needed shall be included as information (INFO) in FMR.

M P - Manpower Insufficient - Used when manpower was insufficient to accomplish the work.

M Q - Maintenance Qualification - Used when qualified personnel are not available to accomplish the work. The qualification or skill not available shall be included as information (INFO) in FMR.

N S - Not in Stock - Used when a part or parts are not in stock. The part(s) shall be identified with the CPN or MPN with the IPC reference which shall be included as information (INFO) in FMR.

R R - Requested Routing - Used when special routing has been assigned to a selected station for planned repair of this item. The selected station shall be included as information (INFO) in FMR.

E R - Error - Used to identify FMRs that have a missing or incorrect deferral code, missing employee number or no explanation in the INFO field. (This code is only available for MEL Compliance Review.)

4. Supply Services FMR Entries

a. Supply Services should make FMR entries to indicate the following:

(1) Corrections to part numbers.

(2) Status and availability of parts, including shipping information.

(3) Confirming the need for any part which should be purchased.

5. FMR Extended Outage - Alternate Input

a. If the computer is down for an extended period, then the same information from the log pages, which is normally entered into FMR, should be transmitted via fax to TULE Tech Services.

6. FMR Codes

a. The FMR codes for aircraft discrepancies are shown in the FMR ATA Code Reference Manual and on Form 7409 in the aircraft E6 logbook. The FMR ATA Code Reference Manual and a page size Quick Reference Guide are available on the M&E website at http://me.aa.com/manuals.asp. The FMR ATA Code Reference Manual is the primary source of ATA codes for American Airlines, and takes precedence over other documents and data sources for ATA codes.

7. For aircraft entering modification programs for 48 hours or less duration at TULE/AFW/MCIE,

Production Control may use the open FMR Items Run to correct noted discrepancies. When the FMR run is used, "ship copy" must be stamped on the run and must be included in the aircraft BOW. All completed work must be properly signed off on this "ship copy." The item will be facted out when the noted discrepancy has been corrected.

For aircraft entering modification programs and/or maintenance for over 48 hours Production Control will transfer open FMR items (use the priority level appropriate for the assigned check) to a non routine document. The FMR identification number will be reflected on the non routine document.

NOTE: FMR ITEMS WILL NOT BE FACTED OUT PRIOR TO AIRCRAFT INDUCTION.

When the FMR item is transferred to the non routine document Production Control personnel will fact out the FMR item using the statement found in Figure 1. Production Control will sign the fact line of the FMR item.

Quality Assurance will review the non routine document for RII or Conformation Check requirements prior to distribution to Aircraft Production. In DWMS, Production Control will select "none" as the buy back level and QA will review the electronic E58 and adjust the buyback level as required.

Item transferred to (non routine serial number) on the (station) (type of check) BOW dated (BOW date).

Figure 1. Transfer Statement

D. FMR ASSOCIATED SYSTEMS

Associated with FMR are several systems that provide for tracking and control of maintenance items. They provide the ability to generate computer assigned unique identifier numbers for certain maintenance items, automatically generate selectively programmed down line messages for unique maintenance requirements, provide input to other computer systems such as SOC and dispatch systems, and provide programmed time tracking and control of these items.

1. These associated systems are utilized by such programs as:

a. MEL/CDL issuing and control program. The authority to defer these items is the MEL/CDL Manual. (Ref. GPM Sec. 17-16.)

b. NEF issuing and control program. The authority to defer these items is the NEF Manual. (Ref. GPM Sec. 17-16.)

c. TAC issuing and control program. Used to track and control items such as inspections required after interim repairs, final repair requirements, special engineering requested/authorized items, etc. (Ref. GPM Sec. 17-21.)

NOTE: The TAC program does not authorize the deferral of any item. This program is used for tracking and control of the items only. The deferral authority must come from another approved source.

END

ATTACHMENT 5

Allied Pilots Association
Flight 1400 Submission

Boeing Recommended Cranking Procedures
NTSB Maintenance Group Factual Report Attachment 3

ATTACHMENT 3

MAINTENANCE GROUP CHAIRMAN'S FACTUAL REPORT

DCA-07-MA-310

DC-9/MD-80 Maintenance Manual (Boeing) recommended maintenance practices, section 80-10-00 Cranking – Description and Operation (Boeing Procedure)

CRANKING - DESCRIPTION AND OPERATION

1. General

A. The cranking portion of the engine starting system converts energy of high temperature compressed air into starting torque sufficient to accelerate the engine to starting and self-sustaining speed within the required time. Components utilized during cranking operations include the engine start switch, starter air shutoff valve, and pneumatic starter (Figure 1).

B. Pneumatic power for cranking operations is provided by the onboard APU, cross-bleeding from an operating engine, or an external power source.

C. The control and indicating system comprises the cranking portion of the engine starting system.

2. Control and Indicating

A. Description

(1) The control and indicating system provides means to actuate the starter air shutoff valve, control pneumatic supply to the starter, indicate position of starter shutoff valve, and terminate the starting cycle. The system consists of the engine start switch, starter air shutoff valve, pneumatic starter, and indicating light.

(2) Engine Start Switch - The engine start switch, located on the forward overhead panel in the flight compartment, controls the operation of the starter air shutoff valve. The switch is a toggle-type switch, and is actuated when placed and held in the ON position. The switch operates in conjunction with the ignition system controls. Power to the switch is provided by the DC TRANSFER BUS. For a complete description and operation of the ignition system (PAGEBLOCK 74-00-00/001 Config 2).

(3) Starter Air Shutoff Valve - The valve is a diaphragm-actuated, butterfly-type, pneumatic valve and is electrically controlled and pneumatically operated. The valve functions to control the flow of pneumatic energy to the starter. The valve consists of a valve body housing with an integral, butterfly-type closure element and appropriate inline end flanges for direct mounting; a diaphragm-type pneumatic actuator, mechanically coupled through a lever arm to the butterfly shaft; a solenoid-operated, single-ball selector valve with manual override button for control of valve position in the event of inoperative solenoid valve; a rate-control orifice which provides a controlled opening time; a stainless steel wire mesh filter; and a mechanical pointer for visual indication of valve position. The upper end of the butterfly shaft is provided with wrenching flats to allow manual opening of the valve in the event of loss of actuator supply pressure. (Figure 2)

(a) An electrical switch on the lower end of the butterfly shaft energizes the indicating light on the annunciator panel in the flight compartment when the butterfly valve is open.

(b) The solenoid-operated switcher valve controls the opening rate of the butterfly to limit maximum starter impact torque experienced during running engagements, such as restarts of an engine, windmilling in flight, or coast-down after shutdown on the ground.

(c) Access to the manual override button is through starter valve and manual override access door (7707C) for left engine or (7808C) for right engine, located on the forward lower cowl door or by opening forward lower cowl door.

(4) Pneumatic Starter - The starter is a single-stage turbine consisting of the following major components: scroll, turbine wheel, reduction gear train, overrunning clutch, splined output shaft, and starter housing.

AAL AAL 101-108, 110-190, 197, 201-207, 209-326, 401-599

AAL NOTE: (Figure 4)and (Figure 3).

AAL AAL ALL

(a) The starter gears and bearings are lubricated by a self-contained oil system. Fill and drain ports are provided in the housing for servicing the oil system. The housing also incorporates a mounting flange to match the pad on the engine accessory drive case.

(b) The starter output shaft, which is splined to the engine gearbox, is lubricated by the engine oil system. The shaft incorporates a shear section to protect the engine in the event of starter malfunction or failure.

B. Operation

(1) When the engine start switch is placed and held in the ON position, 28 vdc power is supplied to the starter air shutoff valve solenoid. (Figure 1)

(2) Actuation of the shutoff valve solenoid allows inlet air pressure to be ported to the open chamber of the valve actuator. Since the effective area of the open chamber is larger, relative to the close chamber, the actuator forces open the butterfly and keeps it open. As the butterfly moves away from the closed position, the valve position indicating switch closes and completes the indicating light circuit. This action causes the valve position indicating light on the annunciator panel to come on. Opening of the valve butterfly allows air to flow to the inlet of the starter.

(3) Air entering the starter inlet flows through the stator and is directed radially inward to propel the turbine wheel to high-speed rotation. Expended air is exhausted overboard through the exhaust duct.

(4) Initial reduction of the high rotational speed is accomplished as the pinion gear on the turbine wheel shaft drives the planetary gears in the reduction gear system. The planetary gears transmit the rotary motion to the spur gearshafts on which the gears are installed. The integral spur gears on the gearshafts in turn transmit motion to the ring gear, causing a further gear reduction and increase of torque.

(5) When rotating at low speeds, the pawl springs in the clutch system drive shaft force the drive shaft to engage with the ratchet jaw-teeth on the gear and hub-jaw. This action allows the gear and hub-jaw to transmit the rotational force to the engine gearbox through the drive and output shafts. The torque-speed relationship at the output shaft, when driving the engine through the gearbox, provides power to accelerate the engine to light-off speed and to assist the engine to self-sustaining speed. When engine lightoff and acceleration occur, the drive and output shafts rotate with the engine. The overspeed rotation causes the pawl to ratchet on the teeth of the slower rotating gear and hub-jaw. As the speed of the engine increases, the pawls function as flyweights and overcome the force of the pawl springs. This allows the pawls to be completely withdrawn from engagement with the ratchet jaw-teeth of the gear and hub-jaw and to disengage the starter from the engine.

(6) Releasing the engine start switch deenergizes the starter air shutoff valve solenoid. This action causes the shutoff valve to close and terminate the starting cycle. When the butterfly reaches the closed position, the valve position indicating switch opens and deenergizes the indicating light circuit. The indicating light goes off and remains off as long as the shutoff valve is in the closed position. The starting cycle can be terminated at any time by releasing the engine start switch.

CAUTION: DO NOT OPERATE THE STARTER SHUTOFF-VALVE MANUALLY WHEN THE SYSTEM IS NOT PRESSURIZED UNLESS SPECIFIED DIFFERENTLY. THIS WILL HELP PREVENT DAMAGE TO THE STARTER SHUTOFF-VALVE DIAPHRAGMS.

(CAUTION PRECEDES)

CAUTION: USE ONLY HAND PRESSURE TO DEPRESS OVERRIDE BUTTON. USE OF SCREWDRIVER OR OTHER TYPE OF PRYING DEVICE TO DEPRESS OVERRIDE BUTTON CAN DEFORM SLENDER PIN MECHANISM INSIDE VALVE. A DEFORMED OVERRIDE BOTTOM PIN CAN HOLD SOLENOID SWITCHER BALL OFF ITS SEAT WHICH ALLOWS VALVE TO OPEN UNCOMMANDED WHEN AIR PRESSURE IS AVAILABLE TO ENGINE START VALVE. IF UNDETECTED OR UNCORRECTED, THIS CONDITION WILL RESULT IN SIGNIFICANT DAMAGE TO ENGINE STARTER.

(7) In the event starter air shutoff valve solenoid valve is inoperative, the solenoid manual override button is depressed to actuate the starter air shutoff valve. Depressing the button accomplishes the same function as normal electrical actuation of the valve.

CAUTION: IF STARTER SHUTOFF VALVE HAS BEEN WRENCHED OPEN, VISUALLY CHECK VALVE POSITION INDICATOR TO ENSURE IT CLOSES WHEN WRENCH IS REMOVED. STARTER CAN FAIL DUE TO AN OVER-SPEED CONDITION IF SHUTOFF VALVE IS NOT CLOSED. WRENCH VALVE CLOSED IF NECESSARY.

AAL (8)

AAL **AAL 101-108, 110-190, 197, 201-207, 209-326, 401-599**

AAL In the event of loss of actuator supply pressure, the valve can be opened manually by engaging
AAL a wrench (WRE 9550 or equivalent) on the hexagon flats at the upper end of the butterfly shaft. A
AAL notch across the hexagon flats points to the words OPEN or CLOSED on the switch cover to
AAL indicate the valve butterfly position.

AAL **AAL ALL**

ATTACHMENT 6

Allied Pilots Association
Flight 1400 Submission

General Procedures Manual (GPM) 02-06
Classification of Maintenance Station

Chapter 02: Administration and Operating Procedures

02-06 CLASSIFICATION OF MAINTENANCE STATIONS

A. RESPONSIBILITY AND AUTHORITY

1. The Managing Director of Maintenance Operations has the responsibility and authority for the line station process. This position:

   a. Oversees the approval and authorization of FAA A&P certified personnel to accomplish work on AA aircraft (GPM Sec. 02-03) . The staffing resources are allocated based on an annual 4th quarter planning and budgeting process. Demand forecast inputs are based on, but not limited to, the number and type of maintenance checks scheduled, th number and type of aircraft/engine/component visits scheduled and the manhours required to complete the forecasted maintenance demand at each location.

   b. Ensures regulatory compliance, and technical accuracy of manuals.

   c. Governs management of AA's maintenance support, plans, and processes.

B. GENERAL

1. For purposes of management of its aircraft maintenance support plans, M&E designates the level of maintenance available at each station. The terms "Major Maintenance Base", "Base Maintenance", and "Maintenance Base" as used the maintenance manuals, refer to the TULE, MCIE and AFW M&E centers. Other locations where maintenance is performed are referred to as "Maintenance Stations". The following designates the station classification and the stations in each class.

C. PROCEDURES

1. Procedures relating to the line station process are located elsewhere in the GPM, or in separate second-tier manuals (see paragraph F). These sections/manuals will contain applicable procedures, controls, and process measurement for the respective processes.

D. AA MAINTENANCE STATION CLASSIFICATION

1. TULE, MCIE and AFW M&E Centers

   a. These are AA's main bases for maintenance activities. The TULE, MCIE and AFW M&E Centers have resources fo total support of the maintenance function through out AA's system.

   b. The TULE, MCIE and AFW Maintenance facilities may have shift coverage up to and including 7 days-a-week, 24 hours-a-day. These facilities have resources to accomplish all major checks, major alterations, and major repairs to all AA aircraft.

2. Class I Maintenance Stations

   a. Stations where AA maintenance personnel are assigned for 7-day, 24-hour-a-day coverage. They have resources t accomplish scheduled maintenance through a B Check and unscheduled maintenance as assigned by MOC.

   NOTE: Class stations identified by a plus (+) sign have resources to accomplish narrow body B Checks.

3. Class II Maintenance Stations

   a. Stations where AA Maintenance personnel are assigned for 7-day, 1, 2 or 3 shift coverage. These stations have the resources to accomplish maintenance as assigned by MOC and are capable of accomplishing "A" Checks and/or Periodic Service Checks.

   b. At certain Class II stations, during off shift periods, maintenance coverage may be provided by a contract maintenance agency. The name of the contractor may be obtained through DECS (RF 5432A/B/C STA).

4. Class III-A Maintenance Stations

   a. Stations where AA Maintenance personnel are assigned for 7-day midnight shift coverage only. These stations hav the resources to accomplish scheduled maintenance checks up to and including A Check.

5. Class III-B Maintenance Stations

   a. Stations where AA mechanics are assigned for routine operational support and/or on-call maintenance.

      NOTE: Class III stations identified by an asterisk (*) have additional maintenance support provided by a contract maintenance agency during off-shift periods. The name of the contractor may be obtained through DECS (RF 5432A/B/C STA).

6. Class III-C Maintenance Stations

   a. Stations where AA mechanics are assigned to perform aircraft modifications, specialty work and/or troubleshooting as assigned by MOC. They do not have the resources to accomplish scheduled maintenance checks.

7. Class IV Maintenance Stations

   a. Stations where AA maintenance personnel are not normally assigned and maintenance support is provided by a contract maintenance agency. The name of the contractor may be obtained through DECS (RF 5432A/B/C STA).

      EXCEPTION: At New Orleans (MSY) AA personnel provide on-call maintenance.

E. MAINTENANCE STATION CLASSIFICATIONS

Table 1. Class I Maintenance Stations

Station	Code
Chicago (O'Hare)	ORD
Dallas	DFW
Los Angeles	LAX
Miami	MIA
New York	LGA
New York	JFK
San Francisco	SFO
St. Louis	STL

Table 2. Class II Maintenance Stations

Station	Code
Atlanta	ATL
Austin	AUS
Boston	BOS
Buenos Aires	EZE
Denver	DEN
Detroit	DTW

Frankfurt	FRA
Kansas City	MCI
Las Vegas	LAS
London (Heathrow)	LHR
Minneapolis/St. Paul	MSP
Newark	EWR
Orlando	MCO
Panama City	PTY
Paris	CDG
Philadelphia	PHL
Phoenix	PHX
Quito	UIO
Raleigh-Durham	RDU
San Diego	SAN
San Jose	SJC
San Juan	SJU
San Antonio	SAT
Seattle	SEA
Tampa	TPA
Tulsa	TUL
Washington	DCA (National)

Table 3. Class III-A Maintenance Stations.

Station	Code

NOTE: There are no Class III-A Maintenance Stations at this time.

Table 4. Class III-B Maintenance Stations.

Station	Code
Antigua	ANU
Aruba	AUA
Barbados	BGI
Bogota	BOG
Cali	CLO
* Cancun	CUN

	Caracas	CCS
	Guayaquil	GYE
	Kingston	KIN
	La Paz (Bolivia)	LPB
	Lima	LIM
	Mexico City	MEX
	Montego Bay	MBJ
*	Monterrey (Mexico)	MTY
	Motevideo (Uruguay)	MVD
	Port-au-Prince	PAP
*	Port of Spain	POS
	Puerto Plata	POP
	Rio de Janerio	GIG
*	San Jose Cabo (Mexico)	SJD
	Santa Cruz (Bolivia)	VVI
	Santiago (Chile)	SCL
	Santiago (Dom. Rep.)	STI
	Santo Domingo	SDQ
	Sao Paulo	GRU
	St. Maarten	SXM
	St. Thomas	STT

Table 5. Class III-C Maintenance Stations

Station	Code

NOTE: There are no Class III-C Maintenance Stations at this time.

* Class III stations identified by an asterisk (*) have additional maintenance support provided by a contract maintenance agency during off-shift periods. The name of the contractor may be obtained through DECS (RF 5432A/B/C STA).

Table 6. Class IV Maintenance Stations

	Station	Code
#	Acapulco	ACA
	Albuquerque	ABQ
#	Anchorage	ANC
	Baltimore	BWI
	Barcelona	BCN

	Bermuda	BDA
	Belize City	BZE
	Birmingham	BHM
	Brussels	BRU
	Burbank	BUR
	Calgary	YYC
	Casa De Campo/La Romana D.R.	LRM
	Charlotte	CLT
	Colorado Springs	COS
	Columbus (OH)	CMH
	Cozumel	CZM
	Curacao	CUR
	Dayton	DAY
	Dublin	DUB
	El Paso	ELP
	Fort Lauderdale	FLL
#	Fort Myers	RSW
	Fresno	FAT
	Grand Cayman	GCM
#	Greensboro	GSO
	Guadalajara	GDL
	Guatemala City	GUA
#	Gunnison	GUC
	Hartford	BDL
#	Hayden, CO (Steamboat Springs)	HDN
	Honolulu	HNL
	Houston	IAH
	Huntsville	HSV
	Indianapolis	IND
#	Jackson Hole	JAC
	Jacksonville	JAX
	Kona	KOA
	Liberia (Costa Rica)	LIR
	Lihue (Kauai, HI)	LIH

	Louisville	SDF
	Madrid	MAD
	Managua	MGA
	Manchester (UK)	MAN
	Maui	OGG
	McAllen (TX)	MFE
	Medellin	MDE
	Memphis	MEM
	Milan	MXP
	Montreal	YUL
#	Montrose, CO	MTJ
	Moscow	DME
	Nashville	BNA
	New Delhi	DEL
%	New Orleans	MSY
	Norfolk	ORF
	NW Arkansas, AR	XNA
	Oklahoma City	OKC
	Ontario (CA)	ONT
	Omaha	OMA
	Palm Beach (West Palm Beach)	PBI
	Palm Springs	PSP
	Portland	PDX
	Providenciales, Turks/Caicos, Is	PLS
	Puerto Vallarta	PVR
	Punta Cana	PUJ
	Reno	RNO
	Richmond (VA)	RIC
#	Rome	FCO
	Sacramento	SMF
	Salt Lake City	SLC
	San Jose (Costa Rica)	SJO

	San Pedro Sula	SAP
	San Salvador	SAL
	Santa Ana	SNA
	Shanghai	PVG
	St. Croix	STX
	St. Kitts	SKB
	St. Lucia	UVF
	Tegucigalpa	TGU
	Tokyo	NRT
	Toronto	YYZ
	Tucson	TUS
#	Vail/Eagle, CO	EGE
	Vancouver	YVR
	Washington (Dulles)	IAD
	Wichita	ICT
#	Zihuatanejo (Mexico)	ZIH
	Zurich	ZRH

This station operates on a seasonal basis.

% AA personnel provide on-call maintenance at this station.

F. INTERFACES/RELATED PROCEDURES

1.	GPM Sec. 02-01	M&E Responsibilities Governing Maintenance Operations
2.	GPM Sec. 02-03	Aircraft Maintenance Representatives (AA Personnel)
3.	GPM Sec. 02-19	New Station start-ups
4.	GPM Sec. 03-02	Maintenance Manual Distribution Policy Ref. FAR Part 121, Subparts G and L, Manual Requirements
5.	GPM Sec. 09-14	Work Card Advance Action Red-Line Change - Line Stations
6.	GPM Sec. 16-03	Bills of Work (BOW) - Line Maintenance
7.	GPM Sec. 17-03	Line Stations Maintenance Item Deferment Procedures
8.	GPM Sec. 17-16	MEL/CDL Procedures
9.	GPM Sec. 17-16	Non-Essential Equipment Furnishings (NEF) Manual
10.	GPM Sec. 19-02	Training Policy
11.	GPM Sec. 24-02	Advance Action/Red-Line Procedures

12. Maintenance Operations Center Procedures Manual
13. Technical Services Procedures Manual

END

ATTACHMENT 7

Allied Pilots Association
Flight 1400 Submission

AA Mechanic Interview
NTSB Maintenance Group Factual Report
Attachment 6

ATTACHMENT 6

MAINTENANCE GROUP CHAIRMAN'S FACTUAL REPORT

DCA-07-MA-310

Line Mechanic Interview Statements

9/9/2008

To Whom It May Concern:

I performed maintenance on the American Airlines MD-80 that had a left engine fire. I do not recall the tail number. I was assigned to perform a manual start of the L/H engine due to the start valve being on a MEL deferral. When I received the assignment I felt I had adequate time to replace the valve and clear the MEL. I replaced the L/H start valve. The valve did not open when the operational check was performed. Knowing that the valve required an electrical and pneumatic input I opened the pneumatic connection to the valve. I found no air pressure so I opened the line above what I recall is an air filter installed between the bleed air source and the start valve. There was air pressure going into the filter. I believe I called Tulsa Tech and informed them of what I did. DFW did not have the filter in stock, I believe Tulsa did. The aircraft was going to be at ORD overnight so I think the filter was going to be sent to ORD for replacement. I believe I continued the deferral through a KI entry on an FMR run. This is the best I can recall the events that I was involved in.

Brian Moore

Interview with American Airlines Crew Chief Rich Gwyn

Telephone interview on September 4, 2008 concerning American Airlines flight 1400 engine fire on September 28th, 2007.

Persons present:

Ronald Price-NTSB

Lorenda Ward-NTSB

Keith Mueller-American Airlines

Steve Prehn-TWU

Brad Brugger-TWU

Christine Remmo-American Airlines

After reading your summary of our telephone interview concerning flight 1400, I find a few important points that were taken out of context.

1.) All references made by me concerning the use of the start valve button were meant to reflect on my experience with OZ/TWA aircraft.
2.) I never stated that I had witnessed the use of a prying device on any start valve at any time in my 41 years as a mechanic or crew chief.
3.) I never stated that the use of the override button was in fact a part of the procedure in the MPM. I read and informed the AMT's that the wrench was the only means to accomplish a manual start per the MPM.

I discussed this letter with Steve Prehn, the TWU Representative, who also took notes. He agreed these quotes as stated in this letter were either misunderstood or taken out of context.

Thank You,

Sincerely,

X Rich Gwyn

Rich Gwyn
Crew Chief

Interview with American Airlines Mechanic Rich Quinn

Telephone interview on September 4, 2008, concerning American Airlines flight 1400 engine fire on September 28, 2007.

Persons present:

Ronald Price-NTSB
Lorenda Ward-NTSB
Keith Muller-American Airlines
Steve Prinn-TWU
Brad Brugger-TWU
Christine Remmo-American Airlines

Mr. Quinn has been working as an aircraft mechanic since 1967. He formerly worked for Trans World Airlines before working for American Airlines in 2001 after the TWA/American merger. He stated that he has predominately worked on DC-9/MD-80 aircraft the entire time as a mechanic. He described the events of September 28, 2007, as mostly routine line mechanic work. He stated that Flight 1400 was known to have a left engine start problem that required a manual start by the mechanics on duty. He was one of three mechanics that accomplished the start. He stated that the flight was running late and they only had the airplane for about 5 minutes. He stated that the manual override button was frozen and therefore a wrench was required to open the butterfly valve. He said he got the signal to open the valve from the other mechanic, operated the valve, and said it took about a minute to do the start. He said the start was accomplished with no problems. He said he usually tried the button method because it saved time. He stated that he had never used any prying device to press the button, but had seen it done. He stated that the manual override button method was in the MPM. He stated that he used a maintenance work stand to reach the engine, but a ladder was used occasionally.

Interview with American Airlines Mechanic Paul Sontheimer

Telephone interview on September 4, 2008, concerning American Airlines flight 1400 engine fire on September 28, 2007.

Persons present:

Ronald Price-NTSB
Lorenda Ward-NTSB
Keith Muller-American Airlines
Steve Prinn-TWU
Brad Brugger-TWU
Christine Remmo-American Airlines

Mr. Sontheimer has been working as an aircraft mechanic since 1968. He formerly worked for Ozark Airlines, then TWA, before working for American Airlines in 2001 after the TWA/American merger. He stated that he has predominately worked on DC-9/MD-80 aircraft the entire time as a mechanic. He described the events of September 28, 2007, as mostly routine line mechanic work. He stated that Flight 1400 was known to have a left engine start problem that required a manual start by the mechanics on duty. He was one of three mechanics that accomplished the start. He was talking to the flight crew in the cockpit. He stated that the manual override button was frozen and therefore a wrench was required to open the butterfly valve. He said he tested the valve to make sure it was free to move, waited for the ok from the cockpit, then gave the signal for the manual operation of the valve. He said the start was accomplished with no problems. He said he always preferred the wrench method because it allowed the cowl to be open. An open cowl ensured that the butterfly valve was closed. **When asked about the manual override button, he stated that he had seen the procedure done, but preferred the wrench method.** He continued by saying he had used the button before, but just for maintenance reasons. **When asked about a prying tool to push the button, he stated that he had seen other mechanics use prying tools, including a broomstick.**

When asked about information flow from the company, he said sometimes they have a crew meeting at the start of a shift. When he is assigned to be the crewchief, he logs onto the company internet programs called jetwires and vianet. He explained that vianet also would provide any forms he would need, like the comp[any suggestion form.

ATTACHMENT 8

Allied Pilots Association
Flight 1400 Submission

MEL Section 1, Page 1

1. Introduction

1.1 FAA MASTER MEL PREAMBLE

The PREAMBLE to the FAA Master Minimum Equipment Lists (MMEL) explains the origin of the MEL, its intended scope, the administrative safeguards with which it is expected to be applied in day-to-day use, etc. The FAA PREAMBLE is quoted below:

"The following is applicable for authorized certificate holders operating under Federal Aviation Regulations (FAR) Parts 121, 125, 129, 135: The FAR require that all equipment installed on an aircraft in compliance with the Airworthiness Standards and the Operating Rules must be operative. However, the Rules also permit the publication of a Minimum Equipment List (MEL) where compliance with certain equipment requirements is not necessary in the interests of safety under all operating conditions. Experience has shown that with the various levels of redundancy designed into aircraft, operation of every system or installed component may not be necessary when the remaining operative equipment can provide an acceptable level of safety. A Master Minimum Equipment List (MMEL) is developed by the FAA, with participation by the aviation industry, to improve aircraft utilization and thereby provide more convenient and economic air transportation for the public. The FAA approved MMEL includes those items of equipment related to airworthiness and operating regulations and other items of equipment which the Administrator finds may be inoperative and yet maintain an acceptable level of safety by appropriate conditions and limitations; it does not contain obviously required items such as wings, flaps, and rudders. The MMEL is the basis for development of individual operator MELs which take into consideration the operators particular aircraft equipment configuration and operational conditions. Operator MELs, for administrative control, may include items not contained in the MMEL; however, relief for administrative control items must be approved by the Administrator. An operator's MEL may differ in format from the MMEL, but cannot be less restrictive than the MMEL. The individual operator's MEL, when approved and authorized, permits operation of the aircraft with inoperative equipment.

Equipment not required by the operation being conducted and equipment in excess of FAR requirements are included in the MEL with appropriate conditions and limitations. The MEL must not deviate from the Aircraft Flight Manual Limitations, Emergency Procedures or with Airworthiness Directives. It is important to remember that all equipment related to the airworthiness and the operating regulations of the aircraft not listed on the MMEL must be operative.

Suitable conditions and limitations in the form of placards, maintenance procedures, crew operating procedures and other restrictions as necessary are specified in the MEL to ensure that an acceptable level of safety is maintained.

The MEL is intended to permit operation with inoperative items of equipment for a period of time until repairs can be accomplished. It is important that repairs be accomplished at the earliest opportunity. In order to maintain an acceptable level of safety and reliability the MEL establishes limitations on the duration of and conditions for operation with inoperative equipment. The MEL provides for release of the aircraft for flight with inoperative equipment. When an item of equipment is discovered to be inoperative, it is reported by making an entry in the Aircraft Maintenance Record/ Logbook as prescribed by FAR. The item is then either repaired or may be deferred per the MEL or other approved means acceptable to the Administrator prior to further operation. MEL conditions and

ATTACHMENT 9

Allied Pilots Association
Flight 1400 Submission

Boeing All Operators Letter (AOL),
Number 9-2549, dated December 16, 1997

NTSB Maintenance Group Factual Report
Attachment 4

ATTACHMENT 4

MAINTENANCE GROUP CHAIRMAN'S FACTUAL REPORT

DCA-07-MA-310

Boeing All Operators Letter, Number 9-2549, dated December 16, 1997

AOL ALL OPERATOR LETTER	PRODUCT SUPPORT

BOEING

December 16, 1997
C1-L30-053/AOL/RED
9-80-10-0

AOL 9-2549

To: All DC-9 and MD-80 Operators

Subject: ENGINE STARTING SYSTEM

Applicable To: All DC-9 AND MD-80 Airplanes

Reference:
(a) Minimum Equipment List (MEL) Procedures Manual, Item 80-1, Revision 12, dated August 1996
(b) DC-9/MD-80 Maintenance Manual (MM) Chapter 80-10-0/80-10-00

REASON

ENGINE STARTER FAILURE RESULTS IN PROCEDURAL CLARIFICATION AND REVISION.

In December 1996, an operator experienced an engine start valve indication problem (START VALVE OPEN) prior to take off. Maintenance on the start valve annunciator system was deferred per reference (a). During departure climb-out, an engine starter failure occurred which caused an engine fire warning alert, an air turn back, and an in-flight shutdown of the engine. Although a nacelle fire had not occurred, some engine-mounted components were damaged.

A start valve teardown inspection found that the manual override button pin tip, Part Number (P/N) 3168376-1, was bent and that the button was stuck in the depressed (override) position. This condition can hold the solenoid switcher ball off its seat and allows the start valve to open uncommanded whenever air pressure is available to the valve, even when the valve has been wrenched closed. Since the valve position annunciator was indicating START VALVE OPEN before and during this event, it is possible that the valve annunciator was indicating properly and that the engine starter had been motoring the entire time.

It is possible to damage the manual override button pin during its actuation by using something other than hand pressure. Since a stroke of approximately 1/16 inch is all the motion needed for the override button to push the solenoid switcher ball off its seat, there is only a small amount of tactile feedback to indicate that the button has been pressed. A mechanic should not use force in an attempt to obtain more stroke on the override button. Using a tool as a pry bar to depress the manual override button could very easily apply sufficient force to deform the slender steel pin.

Verification that the start valve is closed after the engine start is not an easy task. Although the valve has been wrenched closed, there is no guarantee that the valve will stay closed if a bent pin condition exists; therefore, a START VALVE OPEN annunciation should be assumed to be true in all cases.

To clarify proper maintenance dispatching action when the annunciator system malfunctions, the recommended maintenance procedure per the Master Minimum Equipment List (MMEL), Item 80-1, will be revised to specify for conditions when the annunciator light is inoperative OFF and inoperative ON. These changes will provide assurance that the valve is not open and will not open.

The maintenance procedures included in DC-9 MEL Procedures Manual, Item 80-1, START VALVE OPEN Annunciator Systems, will be amended at the next revision to read as follows:

1. Start valve open light inoperative OFF:
   a. Start affected engine.
   b. Check that start valve closes after engine start.
   c. If start valve remains open, wrench the valve closed using the manual start hex head feature.

2. Start valve open light inoperative ON (annunciator illuminated):
   a. Open the appropriate engine lower cowl door.
   b. Deactivate the start valve as follows:
      (1) Disconnect the control air line at the valve port.
      (2) Install a plug in the control air line and secure the control air line.
      (3) Install a cap on the start valve control air port.
   c. For engine start, open the start valve using the manual start hex head feature.
   d. Coordinate with the flight crew to close the valve after engine start.
   e. Verify that the start valve external position indicator indicates the valve is CLOSED and that no air discharges from the starter exhaust outlet after starting.

In addition, temporary revisions will be issued to DC-9 MM, Chapters 80-10-0 and 80-10-2, and MD-80 MM, Chapters 80-10-00 and 80-10-02, with the following caution and note.

CAUTION:

Use only hand pressure to depress the override button. Use of a screwdriver or other tool as a pry bar to depress the override button can deform the slender pin mechanism inside the valve. A deformed override button pin can hold the solenoid switcher ball off its seat which allows the valve to open uncommanded when air pressure is available to the engine start valve. If undetected and uncorrected, this condition will result in significant damage to the engine starter.

NOTE:

The normal stroke of the override button is approximately 1/16 inch. If the button stroke appears greater than 1/16 inch or if the return action appears sticky, then a deformed override button pin should be suspected.

Should additional information be required, please submit your inquiries through your local Field Service Representative or to Boeing Commerical Airplane Group - Douglas Products Division, ATTN: Technical and Fleet Support - Propulsion/Environmental and Interior Systems, P. O. Box 1771, Long Beach, California 90801; SITA: TOAMD7X, ARINC: LAXMDCR, Telex 674357, FAX: (562) 593-7710, or call (562) 593-7268.

THIS AOL IS FOR ADVISORY PURPOSES ONLY. NO FAA APPROVAL IS REQUIRED.

F. C. Haas
Director
Technical and Fleet Support
Service Engineering
Customer Division

RED:mp
(NAA)

ATTACHMENT 10

Allied Pilots Association
Flight 1400 Submission

Air Carrier's Line Maintenance Organizational Chart
NTSB Maintenance Group Factual Report
Attachment 1

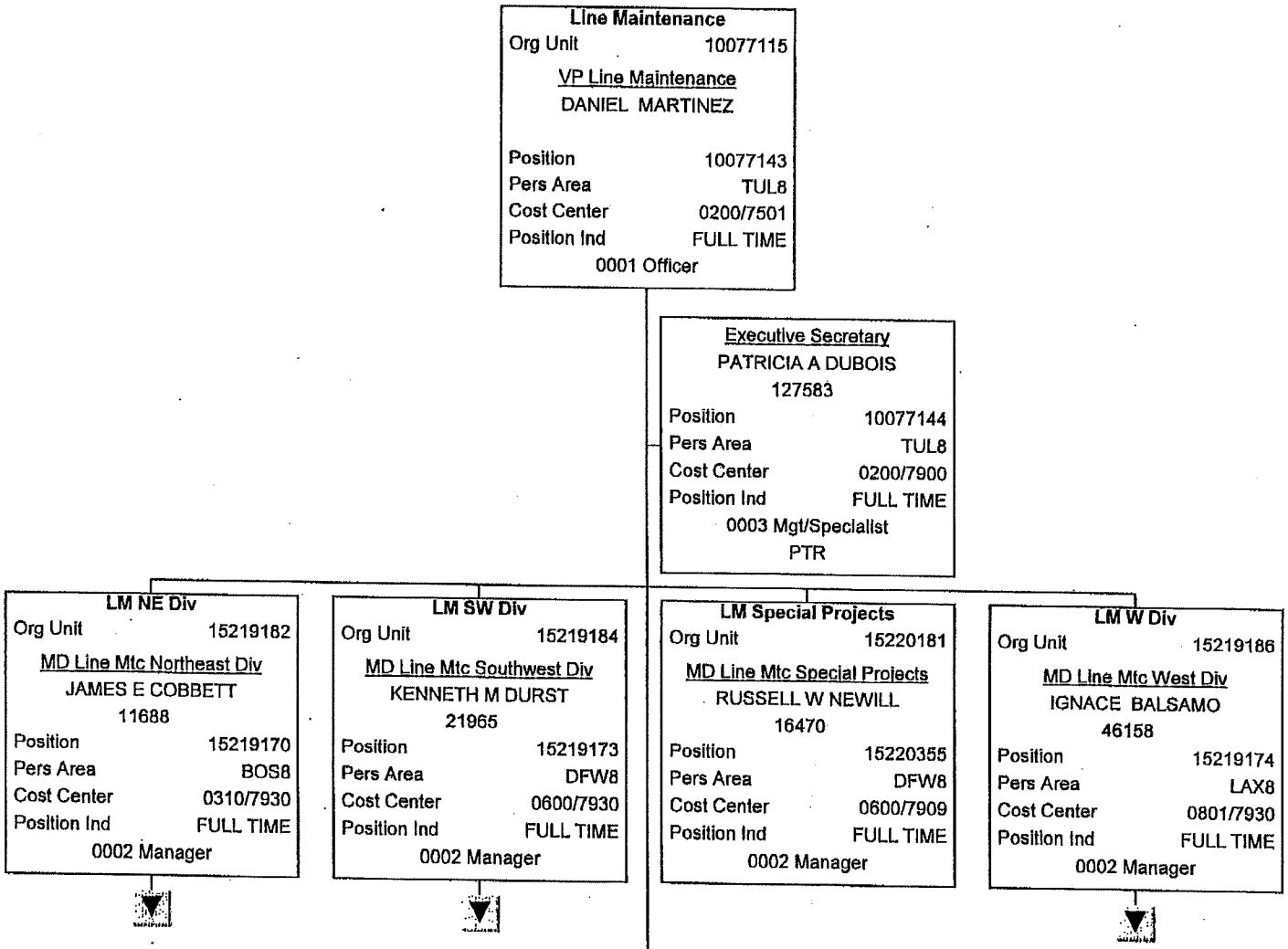
ATTACHMENT 1

MAINTENANCE GROUP CHAIRMAN'S FACTUAL REPORT

DCA-07-MA-310

AA Line Maintenance Organization Chart

Line Maintenance



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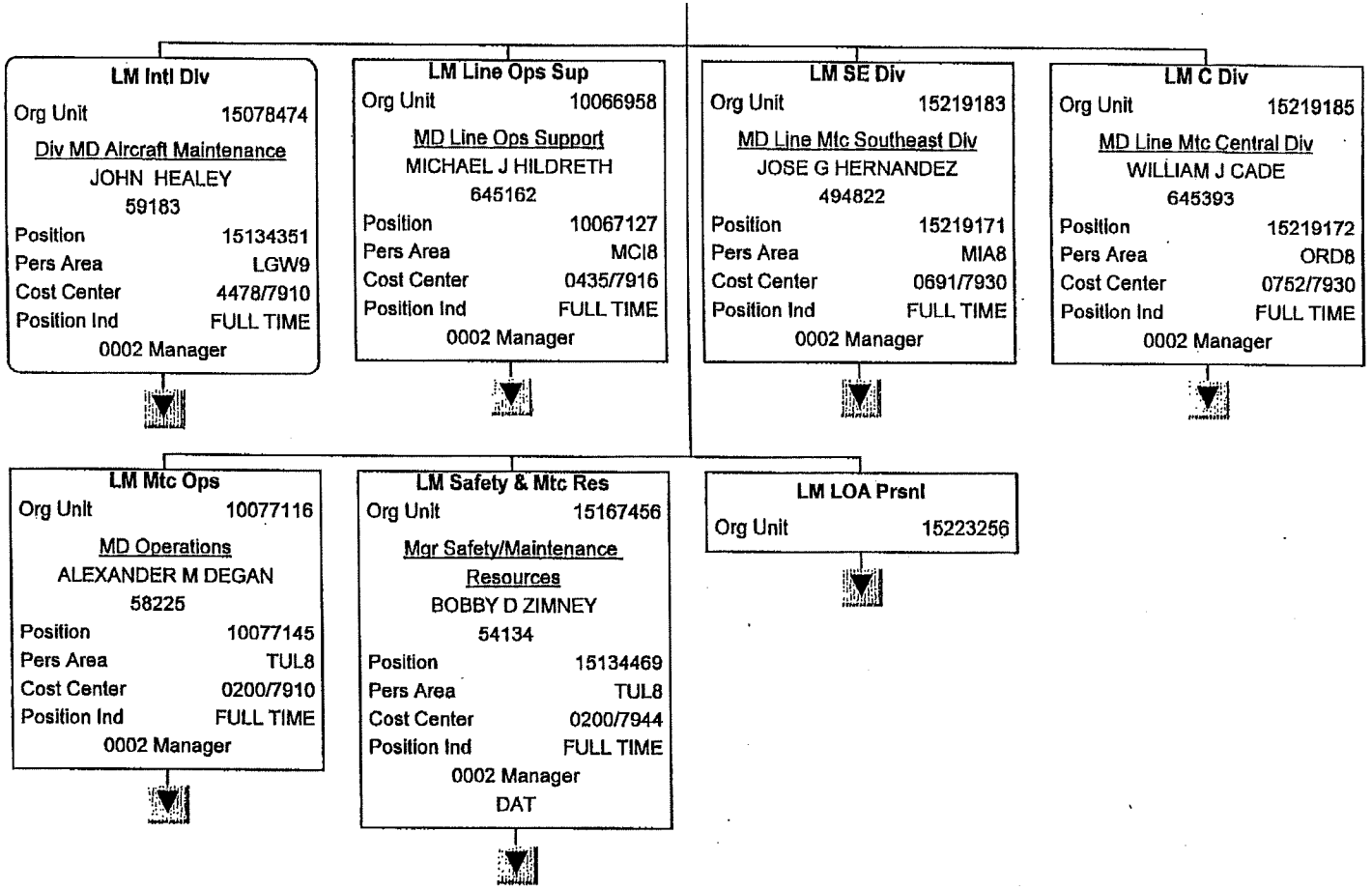
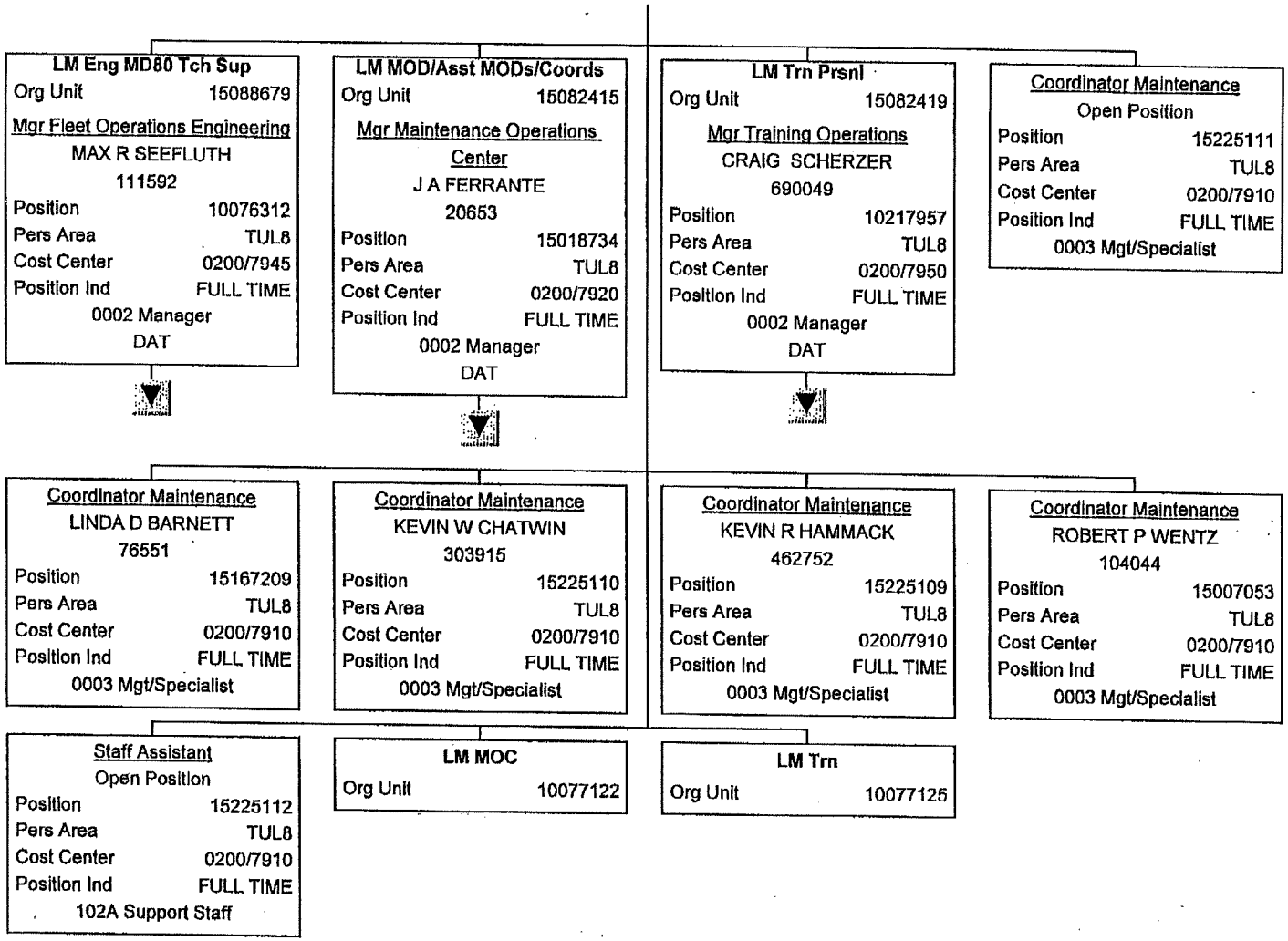

LM Intl Div
Org Unit 15078474
Div MD Aircraft Maintenance
JOHN HEALEY
59183
Position 15134351
Pers Area LGW9
Cost Center 4478/7910
Position Ind FULL TIME
0002 Manager
LM Line Ops Sup
Org Unit 10066958
MD Line Ops Support
MICHAEL J HILDRETH
645162
Position 10067127
Pers Area MCI8
Cost Center 0435/7916
Position Ind FULL TIME
0002 Manager
LM SE Div
Org Unit 15219183
MD Line Mtc Southeast Div
JOSE G HERNANDEZ
494822
Position 15219171
Pers Area MIA8
Cost Center 0691/7930
Position Ind FULL TIME
0002 Manager
LM C Div
Org Unit 15219185
MD Line Mtc Central Div
WILLIAM J CADE
645393
Position 15219172
Pers Area ORD8
Cost Center 0752/7930
Position Ind FULL TIME
0002 Manager
LM Mtc Ops
Org Unit 10077116
MD Operations
ALEXANDER M DEGAN
58225
Position 10077145
Pers Area TUL8
Cost Center 0200/7910
Position Ind FULL TIME
0002 Manager
LM Safety & Mtc Res
Org Unit 15167456
Mgr Safety/Maintenance Resources
BOBBY D ZIMNEY
54134
Position 15134469
Pers Area TUL8
Cost Center 0200/7944
Position Ind FULL TIME
0002 Manager
DAT
LM LOA Prsnl
Org Unit 15223256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Org Unit 15088679
Mgr Fleet Operations Engineering
MAX R SEEFLUTH
111592
Position 10076312
Pers Area TUL8
Cost Center 0200/7945
Position Ind FULL TIME
0002 Manager
DAT
LM MOD/Asst MODs/Coords
Org Unit 15082415
Mgr Maintenance Operations Center
J A FERRANTE
20653
Position 15018734
Pers Area TUL8
Cost Center 0200/7920
Position Ind FULL TIME
0002 Manager
DAT
LM Trn Prsnl
Org Unit 15082419
Mgr Training Operations
CRAIG SCHERZER
690049
Position 10217957
Pers Area TUL8
Cost Center 0200/7950
Position Ind FULL TIME
0002 Manager
DAT
Coordinator Maintenance
Open Position
Position 15225111
Pers Area TUL8
Cost Center 0200/7910
Position Ind FULL TIME
0003 Mgt/Specialist
Coordinator Maintenance
LINDA D BARNETT
76551
Position 15167209
Pers Area TUL8
Cost Center 0200/7910
Position Ind FULL TIME
0003 Mgt/Specialist
Coordinator Maintenance
KEVIN W CHATWIN
303915
Position 15225110
Pers Area TUL8
Cost Center 0200/7910
Position Ind FULL TIME
0003 Mgt/Specialist
Coordinator Maintenance
KEVIN R HAMMACK
462752
Position 15225109
Pers Area TUL8
Cost Center 0200/7910
Position Ind FULL TIME
0003 Mgt/Specialist
Coordinator Maintenance
ROBERT P WENTZ
104044
Position 15007053
Pers Area TUL8
Cost Center 0200/7910
Position Ind FULL TIME
0003 Mgt/Specialist
Staff Assistant
Open Position
Position 15225112
Pers Area TUL8
Cost Center 0200/7910
Position Ind FULL TIME
102A Support Staff
LM MOC
Org Unit 10077122
LM Trn
Org Unit 10077125

ATTACHMENT 11

Allied Pilots Association
Flight 1400 Submission

Boeing DC-9/MD-80 Aircraft Maintenance Manual
Start Valve Override Button Notice

(4) Check that START VALVE OPEN light located on annunciator panel comes on.

NOTE: Communications with flight compartment is essential during this test.

(5) Check for N_2 tachometer indication.

(6) Release engine start switch.

(7) Check that START VALVE OPEN light located on annunciator panel goes off.

(8) De-energize electrical buses.

B. Test Manual Override Button

(1) Place fuel shutoff lever in OFF position.

(2) Make certain ignition selector switch is OFF.

CAUTION: USE ONLY HAND PRESSURE TO DEPRESS OVERRIDE BUTTON. USE OF SCREWDRIVER OR OTHER TYPE OF PRYING DEVICE TO DEPRESS OVERRIDE BUTTON CAN DEFORM SLENDER PIN MECHANISM INSIDE VALVE. A DEFORMED OVERRIDE BOTTOM PIN CAN HOLD SOLENOID SWITCHER BALL OFF ITS SEAT WHICH ALLOWS VALVE TO OPEN UNCOMMANDED WHEN AIR PRESSURE IS AVAILABLE TO ENGINE START VALVE. IF UNDETECTED OR UNCORRECTED, THIS CONDITION WILL RESULT IN SIGNIFICANT DAMAGE TO ENGINE STARTER.

(3) With electrical buses energized and regulated pneumatic supply of 36 ±5 psig (248.2 ±34.5 kPa)supplied to starter system, push manual override button and hold for approximately 30 seconds, or until engine stabilizes.

NOTE: The normal stroke of the override button is approximately 1/16 in. (1.6 mm). If the button stroke appears greater than 1/16 in. (1.6 mm) or if the return action appears sticky, then a deformed override button pin should be suspected.

(4) Release manual override button.

NOTE: If the starter air shutoff valve butterfly should stick during test, free butterfly as follows.

(5) Open or close valve as necessary using a wrench (WRE 9550 or equivalent) on wrenching flats located on position indicator shaft end. (Figure 201)

CAUTION: DO NOT EXCEED TORQUE OF 230 INCH-POUNDS (25.99N·M) WHEN MANUALLY OPENING OR CLOSING VALVE WITH WRENCH.

CAUTION: IF STARTER SHUTOFF VALVE HAS BEEN WRENCHED OPEN, VISUALLY CHECK VALVE POSITION INDICATOR TO ENSURE IT CLOSES WHEN WRENCH IS REMOVED. STARTER CAN FAIL DUE TO AN OVER-SPEED CONDITION IF SHUTOFF VALVE IS NOT CLOSED. WRENCH VALVE CLOSED IF NECESSARY.

CAUTION: BEFORE CLOSING VALVE WITH WRENCH, CLOSE ENGINE PNEUMATIC CROSS-FEED VALVE OTHERWISE DAMAGE TO STARTER MAY OCCUR AS RESULT OF OVERSPEED CONDITION.

(6) De-energize electrical buses.

6. Removal/Installation Pressure Relief Valve

NOTE: The following procedures only apply to later aircraft or aircraft with SB 80-14 incorporated.

A. Remove Relief Valve (Figure 202)

(1) Tag throttle/thrust reverser lever.

ATTACHMENT 12

Allied Pilots Association
Flight 1400 Submission

Air Carrier's Manual Start Valve Procedures
NTSB Maintenance Group Factual Report Attachment 5

ATTACHMENT 5

MAINTENANCE GROUP CHAIRMAN'S FACTUAL REPORT

DCA-07-MA-310

AA Maintenance Procedures Manual, MEL/CDL, chapter 80, Starter Shutoff Valve – Maintenance Practices AA MEL 80-2, dated October 27, 2006

STARTER SHUTOFF VALVES - MAINTENANCE PRACTICES
AA MEL 80-2

1. General: The following procedure is required for dispatch with an engine starter shutoff valve(s) inoperative per MEL 80-2.

2. Maintenance Procedures: Starter valve electrically failed in closed position

   A. Initial Deferral Procedure:

      1) Install placard in area of affected Start Valve Switch on overhead to read, "Start Valve INOP".

      2) Make the appropriate entry in the aircraft logbook-stating accomplishment of MPM 80-2.

   B. At each engine start manually open and close the engine start valve as directed by the flight crew:

      1) Gain access to engine starter valve.

      2) Establish communications with flight crew.

      CAUTION: ***The person controlling the starter valve should wear proper equipment for working environment (i.e. goggles, ear protection, and clothing). Avoid exhaust from starter outlet.***

      3) Open starter valve using start valve wrenching flats on start valve. Reference Figure 1

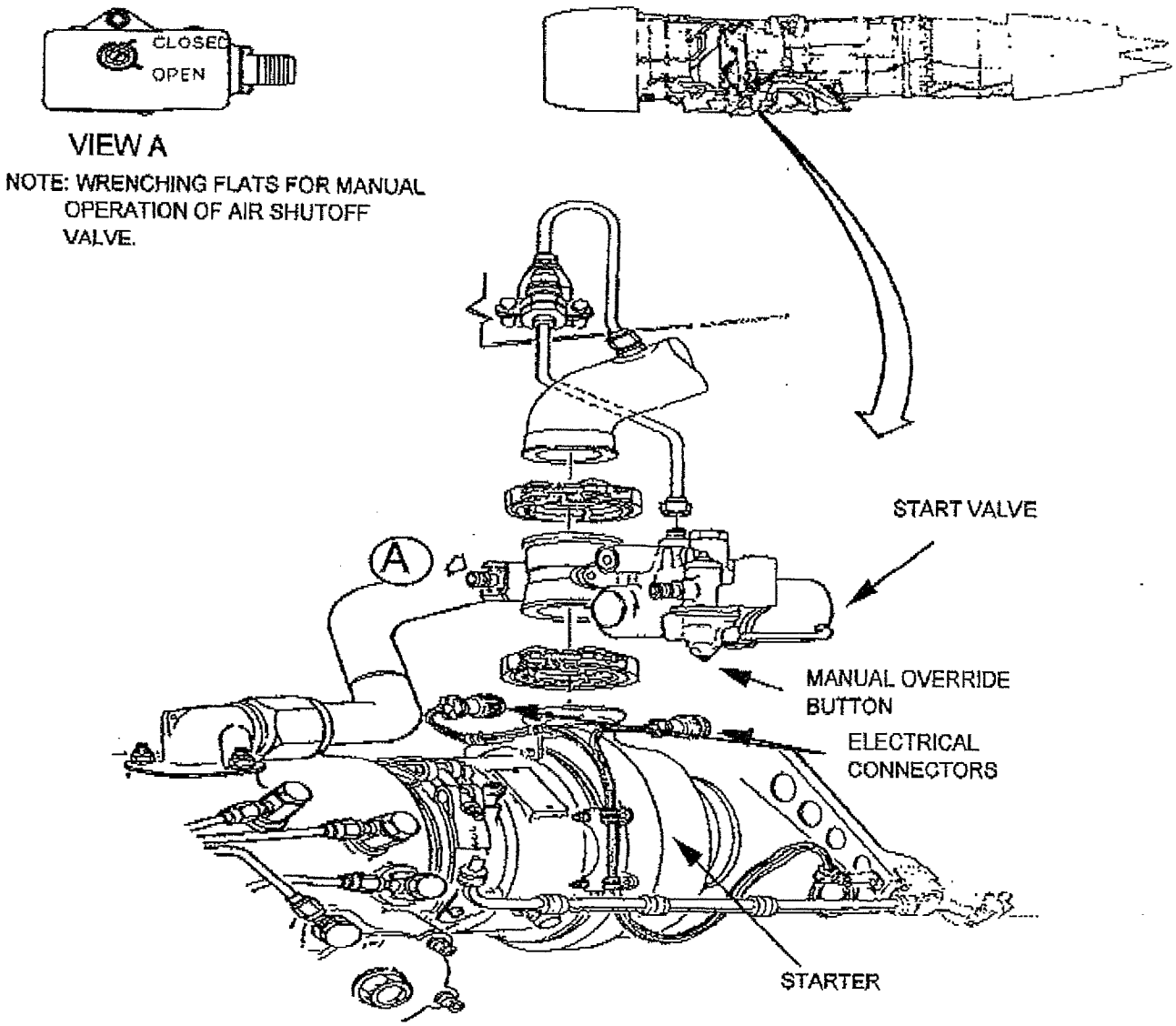
      4) Request affected engine start.

      5) Upon command from Flight Crew, close starter valve using start valve wrenching flats. Check that start valve is closed. Verify no air discharges from starter exhaust outlet after starting.

      NOTE: *Valve position indicator is located on engine side of starter valve, requiring inspection mirror for viewing.*

      6) Advise Flight Crew the start valve is in closed position.

STARTER SHUTOFF VALVES - MAINTENANCE PRACTICES
AA MEL 80-2



Starter Air Shutoff Valve and OPEN/CLOSED Indicator
Figure 1

STARTER SHUTOFF VALVES - MAINTENANCE PRACTICES
AA MEL 80-2

1. General: The following procedure is required for dispatch with an engine starter shutoff valve(s) inoperative per MEL 80-2.

2. Maintenance Procedures.

A. Initial Deferral Procedure:

1) Open the appropriate engine lower cowl door.

2) Deactivate the start valve as follows:

a) Disconnect the control air line at the valve port.

b) Install a plug (CPN-4141319 or equivalent) in the control air line and secure the control air line.

c) Install a cap (CPN-5883503 or equivalent) on the start valve control air port.

3) Close and secure cowling

4) Install INOP placard in area of affected Start Valve OPEN light on overhead.

5) Make the appropriate entry in the aircraft logbook-stating accomplishment of MPM 80-2.

B. At each engine start verify that the affected engine start valve is closed per the following: Reference Figure 1

1) Gain access to start valve.

2) Open the start valve using the manual hex head feature. CPN-WRE9550 or equivalent can be used.

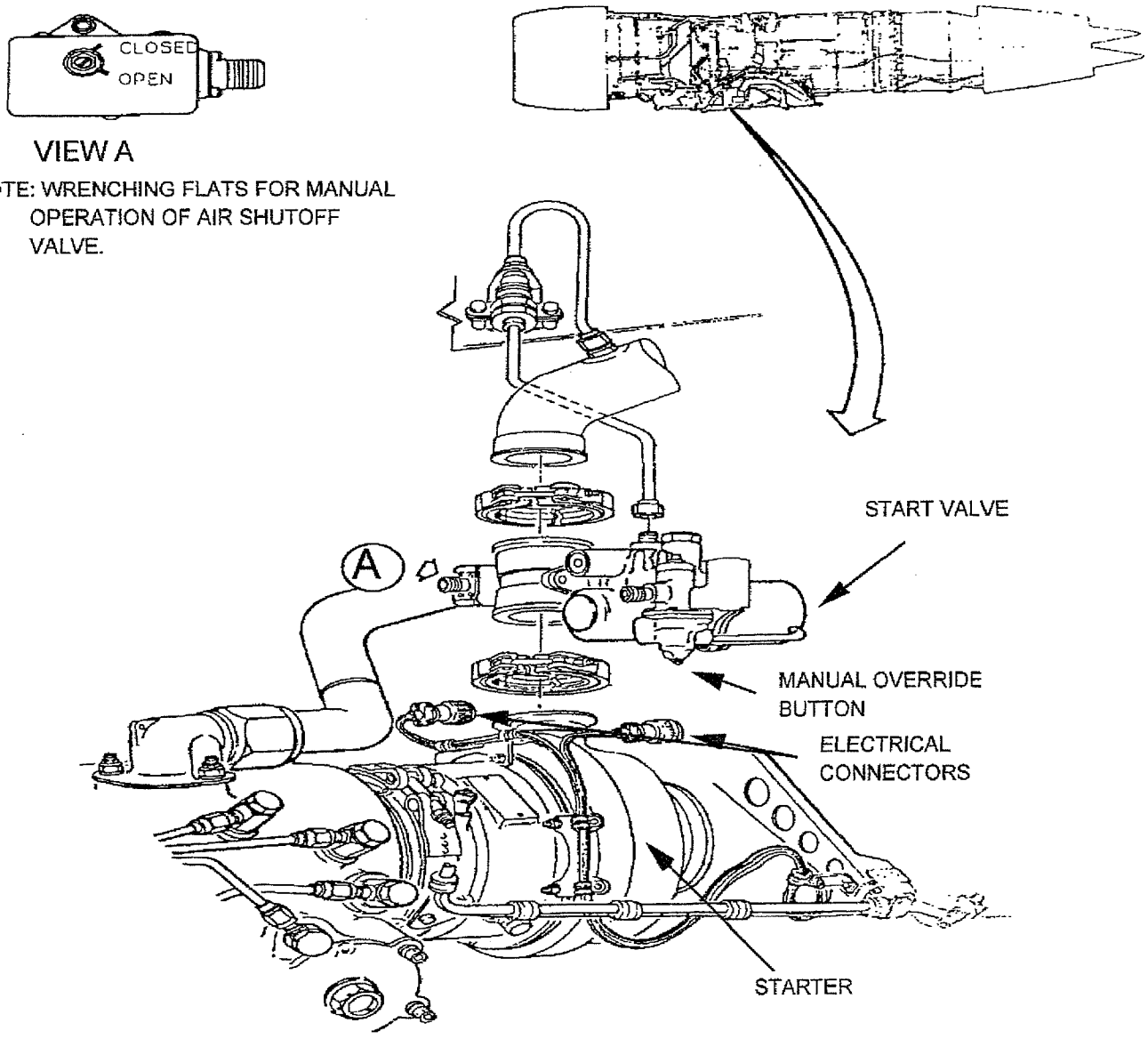
3) Coordinate with the flight crew to close the valve after engine start.

4) Verify that the start valve external position indicator indicates the valve is CLOSED and that no air discharges from the starter exhaust outlet after starting.

5) Close access to start valve.

6) Ensure Captain is advised that start valve has been visually checked closed and access secure.

STARTER SHUTOFF VALVES - MAINTENANCE PRACTICES
AA MEL 80-2



Starter Air Shutoff Valve
Figure 1

ATTACHMENT 13

Allied Pilots Association
Flight 1400 Submission

Engine Fire/Damage/Separation Checklist

Attachment 2

to Operational / Human Factors Group Report

DCA07MA310

ENGINE FIRE / DAMAGE / SEPARATION CHECKLIST

Engine Fire / Damage / Separation

Either pilot noting Engine Fire, Damage, or suspected Separation will identify affected engine and other pilot will verify affected engine.

For Engine Failure or other conditions requiring shutdown, refer to QRH 2.1 – Engine Failure / Inflight Shutdown.

AUTOTHROTTLE (PF) ..... OFF
__ THROTTLE (PF) ..... IDLE

Is ENG FIRE Light illuminated or is engine damage or separation suspected?

No

- At Captain's discretion, continue engine operation at idle.
- Refer to ENG – One Engine Landing.

END

Yes

— FUEL LEVER
(PM on Captain's command) ..... OFF
__ ENG FIRE HANDLE
(PM on Captain's command) ..... PULL

Is ENG FIRE Light illuminated?

No

Yes

__ ENG FIRE HANDLE (PM) ..... AGENT DISCH 1 or 2
Check the associated AGENT LOW Light illuminates.

■ **If ENG FIRE Light remains illuminated after 30 seconds:**
Discharge remaining fire bottle and check that other AGENT LOW Light illuminates.

Is an immediate landing planned?

No

Yes

No

Yes

APU ..... START
FUEL X-FEED ..... ON
HYDRAULIC SYSTEM ..... AS REQUIRED
Use flaps 28 for landing.
Use flaps 11 for go-around.
Set Airspeed bugs to:
- 0 / RET
- 0 / EXT
- 11 / EXT
- 28 / EXT

Notify Flight Attendants.
Refer to NOTES at the end of this procedure.
Accomplish ENG – One Engine Landing.
Accomplish QRH 13.1 – Emergency Landing.
Initiate QRH 14.1 – Ground Evacuation, if required.

END

__ PNEU X-FEED VALVE LEVER ..... CLOSE
APU ..... START
- Start APU (if available) to reduce electrical load on operating generator.
- Repeat start attempts as necessary. Probability of start increases at lower altitude.
- TWA Maximum altitude for APU start is FL300.

APU BUS SWITCH (inoperative engine) ..... CHECK ON
APU BUS SWITCH (operative engine) ..... OFF
ELECTRICAL LOADS ..... CHECK
FUEL TANK PUMPS / FUEL X-FEED ..... AS REQUIRED
Crossfeed as required to maintain fuel balance.
AIR COND SHUTOFF SWITCH ..... OVRD
__ AIR CONDITIONING SUPPLY SWITCH ..... OFF
TRI ..... MCT
ENG SYNC ..... OFF
OPERATING ENG HYD PUMP ..... HI
AUX AND TRANS HYD PUMPS ..... ON
__ ENGINE HYD PUMP ..... OFF
TRANSPONDER ..... TA
Land at nearest suitable airport.
Refer to ENG – One Engine Landing.
Accomplish QRH 13.1 – Emergency Landing.

NOTES

- **Crew should be alert for loop faults which could mask fire warnings. If a Loop Light is illuminated, accomplish FIRE – FIRE DETECTOR LOOP Light without Fire Warning procedure. If Loop test fails, consider moving Engine Fuel Lever to OFF and pulling Engine Fire Handle.**
- Indications of damage may include airplane vibration and, on affected side, N_1 and / or N_2 tachometers indication 0%, rapid loss of hydraulic pressure, and sudden loss of generator power.
- A fire warning may or may not occur with engine damage or separation.
- If fire warning ceases when throttle is retarded and all other relevant indications are normal, engine may be operated at idle at Captain's discretion. This may permit normal operation of systems.
- If fire warning does not cease when throttle is retarded to idle, move Engine Fuel Lever to OFF and pull Engine Fire Handle.
- Inoperative engine throttle must be aligned and worked with other Throttle.
- Autothrottle may be used.
- If only one generator source is available (engine or APU), avoid IMC, if practicable.
- Do not restart an engine with confirmed fire or severe damage.
- Refer to Vol. I – SYSTEMS – Ice & Rain – Airfoil Ice Protection Single Engine Operation, if required.
- Refer to Vol. I – SYSTEMS – FMS – PMS – Engine-Out Operation or Vol I – PERFORMANCE – EMER / ABNORM – 217 Engines or 219 Engines – One Engine Driftdown, if required.
- If engine windmilled, make E6 entry noting length of time, approximate RPM, and oil pressure indicated.

END

ATTACHMENT 14

Allied Pilots Association
Flight 1400 Submission

Emergency Gear Extension Checklist

Attachment 5

to Operational / Human Factors Group Report

DCA07MA310

EMERGENCY GEAR EXTENSION CHECKLIST

Emergency Gear Extension

GEAR HANDLE ..... DOWN
EMERGENCY GEAR EXTENSION LEVER ..... PULL / FULL UP
GEAR LIGHTS ..... CHECK THREE GREEN

It may be necessary to reduce speed to allow nose gear to latch down.

■ **If unsafe gear indication persists:**

Refer to LAND – Abnormal Landing Gear Configuration.

■ **If right hydraulic system pressurized:**

EMERGENCY GEAR EXTENSION LEVER ..... STOW

Stowing Emergency Gear Extension Lever closes gear doors. Lever is stowed by applying pressure toward left at base of hold open arm. It will be necessary to unload arm by holding up on emergency gear extension lever.

END

■ **If right hydraulic system cannot be pressurized:**

- Gear doors will remain open and GEAR DOOR OPEN Light will be illuminated. Limit airspeed to 300 kts / .70M.
- Landing roll should be minimized by use of moderate braking to avoid unnecessary damage to main gear doors.

After landing and before taxiing:

GEAR SAFETY PINS ..... INSTALL

CAUTION

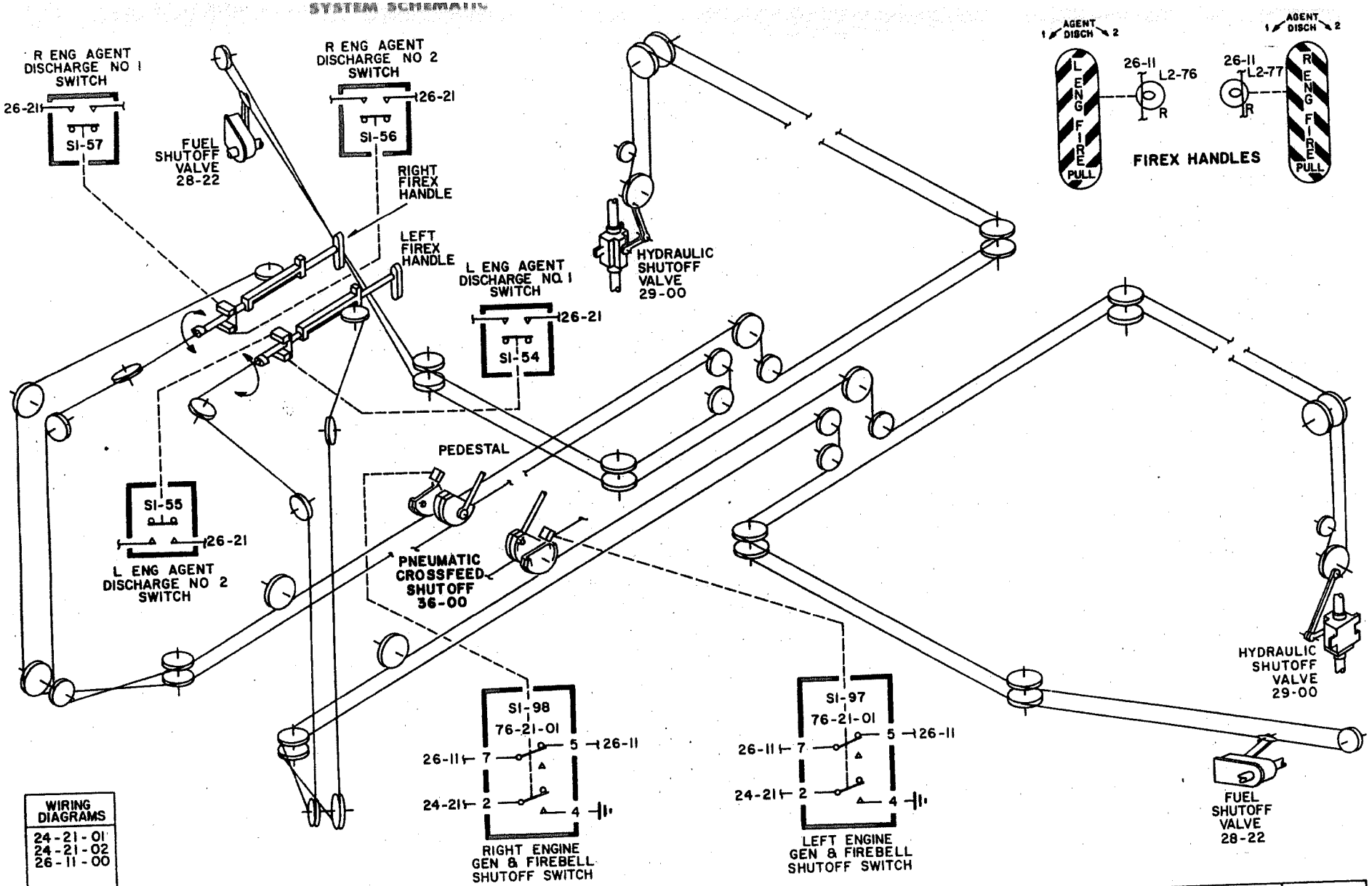
Do not stow emergency gear extension lever until door malfunction has been corrected or until main gear door hydraulic bypass handle has been pulled.

END

ATTACHMENT 15

Allied Pilots Association
Flight 1400 Submission

Engine Fire Handle
Interconnect LAMM Schematic



WIRING DIAGRAMS
24-21-01
24-21-02
26-11-00

APPROVAL & CHANGE RECORD			

MD-80

76-21-0
CODE 100

TITLE					
FIRE SHUTOFF	DOUGLAS	CHG A	CODE IDENT NO 88277		76-21-0
				INITIALS PREP BY: BUSTOS	DATE: 10-11-85

405
415

ATTACHMENT 16

Allied Pilots Association
Flight 1400 Submission

Interview with Captain Ellis Outlaw, STL ARFF

D. Interview Summaries

Captain Ellis Outlaw
3 years with STL ARFF
9 years prior experience as Fire Captain

Captain Outlaw saw the airplane when it made the first pass over airport. There was a lot of grey and black smoke coming from the left engine. He does not recall if he passed that observation along to air traffic control or anyone else. Seeing the smoke, he knew it was a real incident with seriousness.

He said that when the airplane first stopped he got back to the engine area "pretty quickly" and was positioned on the left side of the aircraft where the fire was. The fire was "nearly out from the bottles" and estimated it to be 90-95 percent extinguished when ARFF arrived at the airplane. He described the engine fire as "a small amount of visible flames and light smoke." The fire was burning internally, from the middle to lower third portion of the engine. ARFF sprayed water from a handline to extinguish the remaining fire, which went out immediately. Captain Outlaw stated that he did not directly assist in extinguishing activities. Once the fire was extinguished, he did not see any dripping fuel or on-going fuel leaks. He said he did not recall any concern from ARFF's perspective that the right engine continued to run.

Captain Outlaw mentioned that "puffs of smoke" would reappear over time and this caused ARFF enough concern to investigate further, getting a closer look into the engine and continued monitoring. This is when he was directed to go on-board by Chief Henderson. Captain Outlaw explained a period of time had passed, and Chief Henderson wanted someone to go on board. To make sure the crew and passengers were "okay" and to reassure the passengers everything was "under control." Captain Outlaw stated that boarding an airplane to check inside the cabin was a normal ARFF procedure after an event like this. ARFF personnel also took a thermal imaging camera on-board to make sure there was no evidence of smoke or heat.

He motioned to the flight crew that ARFF was going to set the airstair truck up to the door and ARFF personnel would be boarding. The airstair truck was positioned at the front left door of the airplane, but not all the way up to the door. Captain Outlaw did not recall who he motioned to on-board the airplane that ARFF was going to bring up the truck. A flight attendant opened the door and he told the flight attendant ARFF was going to come aboard to "check things out." Captain Outlaw noted the pilot's window was open.

Captain Outlaw walked the entire length of the airplane, conducting a visual inspection for smoke and/or fire as he walked through the cabin. He also asked both the passengers and flight attendants if they were 'okay.' He said his question to the passengers was a broad statement, loud enough so that most people could hear it. He is not exactly sure how he phrased it, but it was a general question if "everybody was all right and was anyone in need of any kind of particular assistance." He did not recall anyone needing any medical attention. He told passengers everything was under control and would be resolved shortly. He did this to reassure the passengers. Captain Outlaw said this was normal, upon entering he would typically speak to the flight attendants and talk to the passengers as they walked through the cabin.

NATIONAL TRANSPORTATION SAFETY BOARD
Office of Aviation Safety
Washington, D.C.

August 27, 2008

ADDENDUM TO THE SURVIVAL FACTORS GROUP CHAIRMAN'S FACTUAL REPORT

INTERVIEW NOTES

A. Accident : **DCA07MA310**

LOCATION	:	St. Louis, Missouri
DATE	:	September 28, 2007
TIME	:	1316 Central Daylight Time
AIRCRAFT	:	McDonnell Douglas DC-9-82 (MD-82), Flight 1400, N454AA
OPERATOR	:	American Airlines

B. Interviewers

Survival Factors Group Chairman:	Courtney H. Liedler National Transportation Safety Board Washington, D.C.
Operations Group Chairman:	David Tew National Transportation Safety Board Washington, DC
Human Performance Group Chairman:	Evan Byrne National Transportation Safety Board Washington, DC

C. Details

On June 12, 2008, at 1400 EDT, Safety Board staff re-interviewed STL ARFF personnel. The following is a summary of the interviews conducted.

tower, but he has the discrete frequency channel written down in his truck. He said if they authorized the discrete frequency they would ask for the airplane to switch to the discrete channel also. He explained that he was currently a field commander on his shift and it is a judgment call to use it or not. He was not aware of ARFF personnel having difficulty "plugging into" the airplane during this incident; ARFF did not have the equipment to do so. That is what the discrete frequency is for, and the tower can tell the flight crew to use it. Captain Outlaw added that if there was a jack to plug into, it would have been extremely helpful to have a placard advising which jack to plug into and have the equipment to do that.

He said if a plane seemed to be in real distress, he would ask to go on a discrete channel while the airplane was airborne to get as much information as he could. For example, if there was a fire on-board, he would want to find out the extent of the fire so ARFF could prepare for once the airplane lands, and know whether or not to evacuate the airplane immediately. He had done that in the past, since he had been a field commander.

Captain Outlaw said there are a few basic hand signals firefighters could use to communicate with flight crews. For example, there are signals to let pilots know they ARFF will chock wheels; tell the crew that they want to open a door, etc. He thought they had a signal for an evacuation but was not 100-percent certain. He said there is always room for improvement in that area. For example, if it is foggy or raining the flight crew may not be able to see ARFF well. He thought that perhaps colored or flashing lights might be of use. Captain Outlaw said that when an airplane comes to a stop he would conduct a visual inspection, and if something looked out of ordinary, he would radio ground control to relay that information to the flight crew. Initially, that would be the quickest way to get information to the flight crew. He said if firefighter saw something "good or bad" on the initial visual inspection they would find a way to tell the crew.

Captain Outlaw explained the one thing he would have done differently would have been to put firefighters on the plane immediately. With a real fire and the airplane landing "a little hard," in his opinion he would have had some firefighters board the airplane immediately when it stopped, and had other firefighters addressing the engine fire at the same time. He said safety was first and he would want to make sure there are no fire indications inside the cabin and everyone onboard the airplane was okay. However, in this situation the fire was just about out and he did not sense any urgency from what they saw outside from a danger standpoint, and the fire seemed to be out and it seemed secure at that time.

Captain Outlaw explained in the three years he has been at STL AAFF, he has had training "on paper" but no practical application regarding evacuations and/or slide deployments.

Captain Zeffrow Redding
15 years with STL ARFF
10 years prior experience in the military

Captain Redding was assigned to the West Firehouse and was one of three Fire Captains at the accident. He said that when the airplane flew by, he saw fire still burning in the engine, but it was not trailing any smoke. He knew that they had a problem on the aircraft. Captain Redding

In the cabin ARFF did a visual inspection of the area by engine to see if they noticed anything unusual, like smoke and/or smells. ARFF paid particularly "close attention" to the area around the left engine and used the thermal imaging camera to look for heat. Captain Outlaw did not see anything out of the ordinary in the area of the engine and did not recall seeing anything abnormal in the cabin. As Captain Outlaw was leaving the airplane he told the passengers "they would get them off the airplane as fast as they could and it should not be much longer." He let them know they "would be okay." He does not remember saying anything else and had no specific recall whether he had any other discussion with the crew as he left about the conditions in the cabin.

He said that when the fire was extinguished, there were no leaks for "quite a while." He was standing on the left side of the plane, directly across from engine, when suddenly a large pool of liquid, either fuel or hydraulic fluid, began to pour out. Captain Outlaw described its appearance "as if you were turning over a 5 or 10 gallon bucket." He said it poured out for 5 or 10 seconds, 15 seconds at the most. He was standing next to the Chief, who instructed firefighters to cover it with foam. Truck 43 was positioned at the left rear of the engine, close to the spill, and they foamed the ground and engine. He did not recall the foam turning any color.

Captain Outlaw mentioned when they made the decision to get the people off, the airstairs were no longer placed at the L1 door. The airstair truck had left the airplane. He explained that Captain Redding, the driver of the airstair vehicle, had some debris or something get into his eye. ARFF used the airstair truck transport Captain Redding to the medical station for an eye flush. When the airstairs were needed to get the passengers off the airplane, Captain Outlaw called for them to return. He did not feel it was necessary to evacuate the people down the slides at that point. He said as soon as the spill happened firefighters sprayed it with foam. There were no signs of fire or anything like and the liquid had stopped. Captain Outlaw said having passengers jump out slides may have been an additional hazard to the people. He believes that ARFF "made the right call," they put out the fire and were observant for any changes or flames. When the spill happened they had a controlled evacuation, in an orderly manner, and that was the best course of action.

He said that STL ARFF can make the decision to evacuate based on his training, but the decision should be made by the incident commander or airport fire chief, one or the other. He said the decision could come from inside the aircraft when they have an immediate danger inside, the crew would let ARFF know the airplane needed to be evacuated. When the problem is on the exterior of the airplane, ARFF could make the determination based on what they saw outside. He was not sure how typical it was for ARFF to call for an evacuation because this is the first incident he had experienced it first hand. Since the incident commander did not call for an evacuation immediately upon arriving at the airplane, Captain Outlaw assumed it was not necessary at that time.

Captain Outlaw did not talk to the flight crew on the scene, but saw another firefighter speaking to the flight crew through the Captain's open window. He said there were a couple of ways for ARFF to know if a flight crew wanted to evacuate passengers. Inside their ARFF vehicles, on the radios, ARFF could switch to a discrete channel and talk to the flight crew directly. Captain Outlaw said normally the radio is set on the ground frequency they would use to talk to the

ATTACHMENT 17

Allied Pilots Association
Flight 1400 Submission

CVR Transcript STL ARFF

INTRA-COCKPIT COMMUNICATION		AIR-GROUND COMMUNICATION	
TIME and SOURCE	CONTENT	TIME and SOURCE	CONTENT
1359:37.4 CAM-2	but the loop's testing right?		
1359:40.6 CAM-J	well * * * * *.		
		1359:44.1 GND	American fourteen hundred ground.
		1359:46.1 RDO-2	yeah go ahead.
		1359:47.1 GND	yeah is there * * another problem now?
1359:48.1 CAM-?	* * * * *.		
		1359:49.4 RDO-2	well no they're just uhm trying to pin the gear and uh I guess a couple of other things.
1359:53.2 CAM-1	you're plugged into the cabin interphone. can you plug into the other interphone slot?		
		1359:56.2 GND	okay.
		1400:00.6 TRK-53	St. Louis ground truck fifty three.
1400:00.6 CAM-1	plug into the other interphone.		
		1400:02.3 GND	truck fifty three ground go ahead.

INTRA-COCKPIT COMMUNICATION		AIR-GROUND COMMUNICATION	
TIME and SOURCE	CONTENT	TIME and SOURCE	CONTENT
		1400:04.2 TRK-53	truck fifty three I need ground I need to expedite to the D-concourse with a medical emergency of one of the fire personnel.
		1400:10.5 TRK-53	I'm on ah thirty left.
1400:13.1 CAM-2	no good. * * emergency for fire personnel.		
		1400:13.5 GND	abs- proceed as requested where do you need to go again.
		1400:16.0 TRK-53	D-concourse.
		1400:17.3 GND	D-concourse? go ahead and proceed it.
1400:17.9 INT-M	cockpit ground, copy?		
1400:19.1 CAM-2	ah.		
1400:19.4 INT-1	yeah can you hear me now? how do you hear? you still don't hear me?		
		1400:19.8 TRK-53	truck fifty three proceeding down thirty left to Papa heading for D-concourse fifty three.
1400:19.9 CAM-?	(yeah).		

ATTACHMENT 18

Allied Pilots Association
Flight 1400 Submission

DC-9 Operating Manual
Hydraulic Section, Page 20.2

A power transfer unit mechanically connects left and right hydraulic systems and enables hydraulic pressure to be transferred from the highest to the lowest side (the high pressure side operates as a motor and the low pressure side operates as a pump). The unit is controlled by a single motor operating two shutoff valves, one in each hydraulic system. Operation is controlled by a switch on the First Officer's instrument panel. A low level switch is activated when hydraulic fluid quantity falls below a critical level. This low level switch is electronically connected to the hydraulic power transfer unit and is designed to shut off the unit when fluid drops below a critical level. If the power transfer unit remains operating when one hydraulic system has limited or no hydraulic fluid quantity, it will fully drain hydraulic pressure from the operating hydraulic system.

NOTE

The downward movement of the piston may be inhibited in the event of rapid loss of hydraulic fluid quantity and pressure. This anomaly may prevent activation of the safety switch which would normally shutoff the power transfer unit. If rapid loss of hydraulic quantity and pressure on one system has preceded a complete loss of left and right system hydraulic pressure, shutting off the power transfer unit may restore pressure from a functional left or right hydraulic system. Several minutes and / or descent to FL 300 or below may be required to regain hydraulic pressure in an operating system after Trans HYD Pump Switch is moved to OFF.

Airplane systems that normally receive pressure from both hydraulic systems will operate at a reduced rate if one system is inoperative. Pump operation is controlled by switches on the First Officer's instrument panel. Annunciator panel lights, one for each system, will illuminate whenever either system pressure is low.

Hydraulic System Fluids

AA Standard

- Monsanto Skydrol LD-4

AA Approved Substitutes

- Chevron Hyjet IV - A
- Monsanto Skydrol 500B4
- Skydrol LD4

The approved substitutes may be used if Monsanto Skydrol LD-4 is not available without restrictions. An entry in the E6 is not required.

ATTACHMENT 19

Allied Pilots Association
Flight 1400 Submission

Maintenance Records Factual Report Photo 26

ATSV Manual
Override Button and Pin

Photo 25 – Photomicrograph of tip of solenoid plunger rod

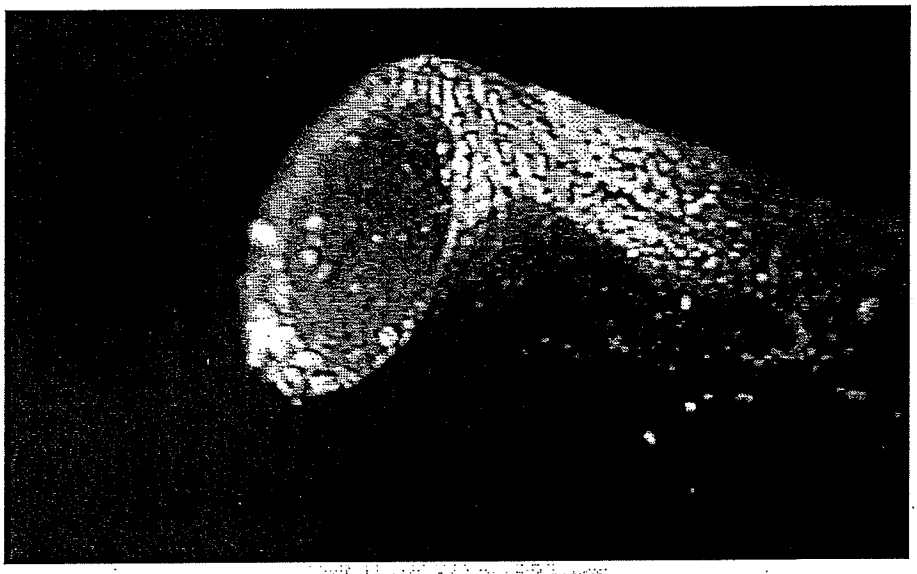
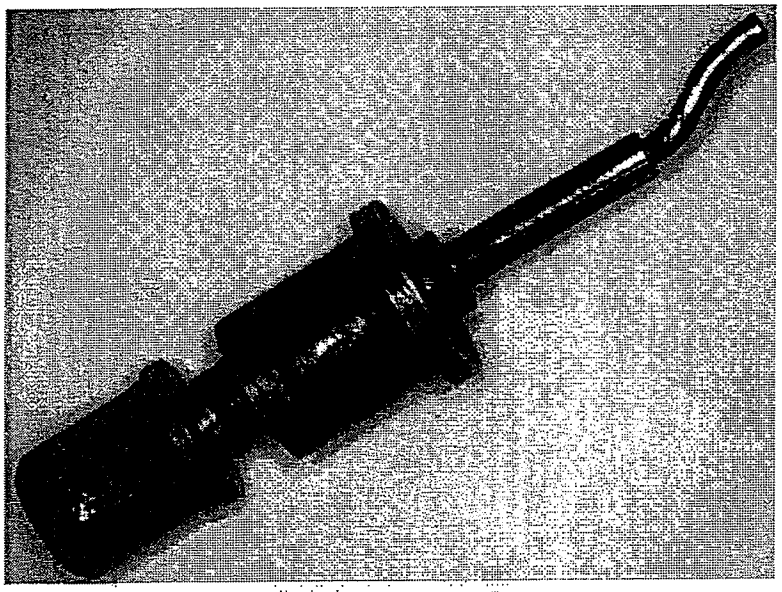


Photo No: DCAO7MA310-8589.tif

Photo 26 – ATSV manual override button - bent



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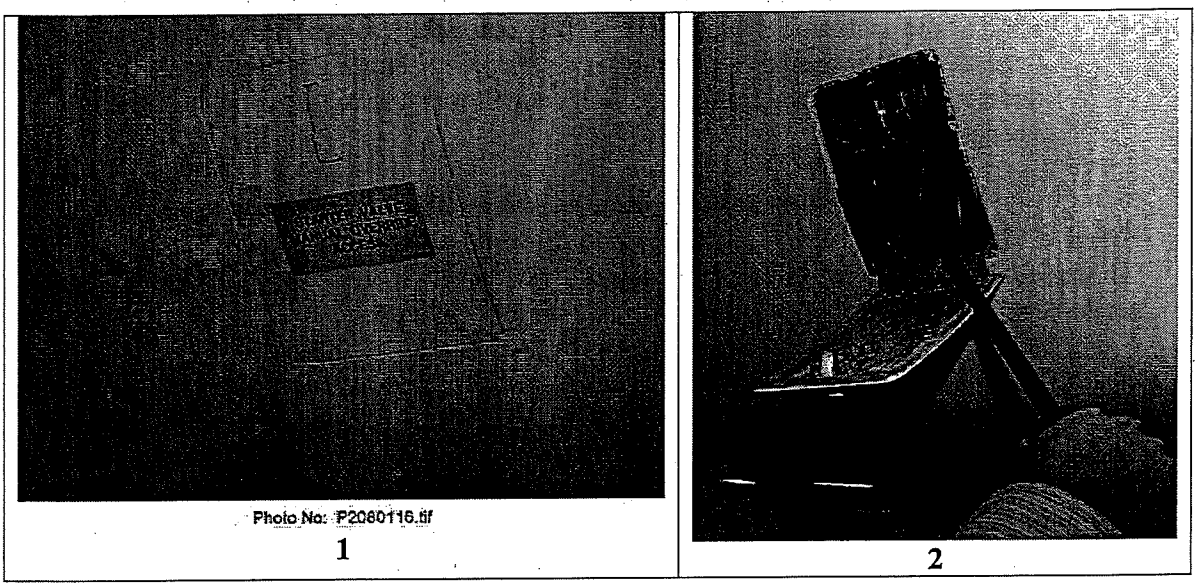
ATTACHMENT 20

Allied Pilots Association
Flight 1400 Submission

Maintenance Records Factual Report
Page 14, Photo 1

Although the written procedures to use the specialized tool were well known, according to interviews with line mechanics, it was customary and the most expeditious method to use the manual override button. Typically, a prying device, such as a screwdriver would be used to depress the override button in the event that a start valve failed to open and a manual start was necessary (**Photos 1 and 2**). Furthermore, according to line mechanics statements, AA maintenance supervisors were aware of the use of the override button to manually start the engine and did not take any action to prevent or dissuade its use (**Attachment 6**). Since the use of the override button was not an authorized procedure in the AA maintenance manual, no written CAUTIONS or WARNINGS statements, similar to those in the Boeing procedure, existed to warn the mechanic that prying the override button could result in a bent pin and a stuck override shaft.



Photos 1 and 2: Typical AA Method for Manual Engine Start

Discussions with AA engineering revealed that changes to the maintenance procedures can by requested by any AA employee by submitting a Form E63 "Request for Services" (**Attachment 7**). Guidance and the Form E63 are located in the GPM which is a guide to AA polices and procedures to be followed by all persons performing maintenance and inspection services on company aircraft. A review of the AA change requests did not reveal any requests for changes in the for manual start procedures. The MD-80 engineering section of AA in Tulsa stated that, had a request been submitted, action to review and revise the maintenance procedures would have been accomplished (**Attachment 8**). Review of the maintenance deferral procedures revealed that start valve failures could be deferred by maintenance personnel, the logbook entry completed, the start switch placarded, then the manual start could be attempted. The manual start procedures included coordination with the flightcrew such that the butterfly valve was manually held open, the flightcrew activated the start switch and completed the start normally, after which the maintenance person would close the butterfly valve and verify that the valve index was in the closed position.

ATTACHMENT 21

Allied Pilots Association
Flight 1400 Submission

Other Aircraft Start Valve Write-ups
NTSB Maintenance Group Factual Report Attachment 9

ATTACHMENT 9

MAINTENANCE GROUP CHAIRMAN'S FACTUAL REPORT

DCA-07-MA-310

Other Aircraft Start Valve Write-up between September 16- 28, 2007

BASE JFK TYPE DC9AA MONTH TO DATE REPORT REPORT NBR D013-S80 1 AUG 07

AC#	SYS ITEM	ACTN	DATE	STN TC	TEXT
201	8000 P009	MDIS	04AUG/LAX/1943.		AFTER 1ST ENG START - A LOUD WHISTLING SOUND I
		FACT	04AUG/LAX/TA...		RAN BOTH ENGS NO FAULT NOTED.
					20180D867 2020 04AUG LAX
207	8000 P017	MDIS	17AUG/DFW/890..		R START VALVE LIGHT OUT NO N1 NO N2 ON RIGHT E
		FACT	17AUG/DFW/TS...		REPLACED RT ENG START VALVE, OPS CHKS NORMAL O
					20780EE0A 2056 17AUG STL
207	8000 P010	MDIS	13AUG/SJC/1069.		STARTING RT ENGINE WITH GOOD PNEU PRESS N2 SPO
					COUPLE OF)? THEN SPED UP AGAIN FOR A NORMAL S
		FACT	13AUG/SJC/PS...		/CLEANED RH ENGINE START VALVE CONNECTOR. OPS
					20780EDFA 2306 13AUG SJC
227	8000 P047	MDIS	22AUG/DFW/731..		NO ROTATION ON LEFT ENGINE WHEN START SWITCHH
					NORMALLY ON APU.
		FACT	22AUG/DFW/TA...		REMOVED AND REPLACED NO. 1 ENG STARTER ASSEMBL
					LEAKS NOTED. NO. 1 ENGINE STARTS NORMAL OK FOR
					22780EEB0 1848 22AUG DFW
251	8000 T	MDIS	12AUG/TUS/.....		MEL 08-1168DC-C REF.8001 E
					VALVE LIGHT INOP
		PART	13AUG/TTS/.....		CPN...VAL6256...QTY 1...***CPN...5725996...QT
		INFO	14AUG/STL/.....		********** MEL 081168 CLEARED ON 13AUG AT STL
		ATBT	13AUG/TUL/.....		REPAIR/REPLACE START VALVE REFERENCE MM 80-10-
		FACT	13AUG/STL/PS...		RECRIPED LOOSE WIRE AT CANNON PLUG ON START VA
					SHEET.
					25180ED04 0748 13AUG TUL PRI=2
251	8000 P039	MDIS	12AUG/TUS/843..		REQUEST MAINTENANCE EVALUATION OF PROPER OPERA
					OPEN LIGHT.
		INFO	12AUG/TUS/.....		PLACARDED RT ENG START VALVE OPEN LIGHT INDICA
		DFRL	12AUG/TUS/TA...		GT...
		FACT	13AUG/STL/PS...		RECRIMPED LOOSE WIRE AT CANNON PLUG ON STGART
					SHEET.
					25180ED05 2125 13AUG STL
271	8000 T	MDIS	18AUG/DFW/.....		MEL 08-1711C-C REF.8002 E
					VALVE TRIPS CB.
		PART	18AUG/TTS/.....		CPN...VAL6256...QTY 1...***CPN...5725996...QT
		INFO	20AUG/DFW/.....		********** MEL 081711 CLEARED ON 20AUG AT DFW
		ATBT	18AUG/TUL/.....		REPLACE START VALVE REFERENCE MM 80-10-02-2.
					THIS T/A. CHECK THE CONNECTOR AND SEL AND REP
		FACT	19AUG/DFW/TA...		FOUND LOOSE WIRE ON CANNON PLUG OF LH START VA
					REF. E-58 9395946 CONTAINED WITHIN OTS WORK PA
					WORK PERFORMED. REMOVED MEL AUTH. 8-1711C-C A
					27180EB29 1432 18AUG TUL PRI=2
271	8000 P026	MDIS	18AUG/DFW/1221.		L. ENGINE WOULD NOT START. START VALVE LIGHT B
					PRESSURE VARIES 10 PSI-40 PSI.
		FACT	18AUG/DFW/0922.		REPLACED LEFT ENGINE STARTER AND START VALVE.
					U-42 POPPED. PLACARDED START VALVE ON LEFT ENG
					START. ENTER IN MIC
					27180EB2B 1756 18AUG DFW
279	8000 P006	MDIS	04AUG/LGA/1005.		RIGHT ENGINE START VALVE STAYED ON AFTER ENGIN

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                FACT  04AUG/LGA/TA... REPLACED RIGHT ENGINE START VALVE, OPS CHECK N
                                      27980EA26 1649 04AUG LGA

293  8000 P033  MDIS  31AUG/LGA/704.. LEFT ENGINE START VALVE OPEN, LIGHT FLICKERS T
                                      ********** MEL DATA **********
                                      REF.8002 ENGINE START VALVE.....
                PART  31AUG/TTS/..... CPN...5735079...QTY  1...***CPN...5701864...QT
                                      CPN...5689060...QTY  1...
                INFO  01SEP/AUS/..... ********** MEL 083015 CLEARED  ON 31AUG AT AUS
                ATBT  31AUG/TUL/..... SUSPECT WIRING PROB. AT PLUG P1-834. SEE WDM 7
                                      FINDINGS.
                UPDT  31AUG/TUL/..... REPLACEMENT OF START VALVE WAS ACCOMPLISHED AT
                FACT  01SEP/AUS/DC... /FOUND LOOSE WIRE AT START VALVE CANNON PLUG.
                                      REMOVED MEL
                                      29380E5E6 1443 31AUG TUL  PRI=2

4WA  8000 P027  MDIS  10AUG/YYZ/1311. RIGHT ENGINE WOULD NOT ROTATE WHEN SELECTED FO
                                      VALVE OPEN LIGHT
                FACT  10AUG/YYZ/TS... STARTER REMOVED QUEILL SHAFT ADAPTER REPLACED
                                      ENGINE )'2 RUN C/O BY CREW )< LEAK CHECK ACP.
                                      FOR SERVICE
                                      4WA801212 1953 10AUG ORD

4WN  8000 T     MDIS  27AUG/ORD/..... MEL 08-2649C-C                    REF.8002 E
                                      OPERATE ELECTRICALLY
                PART  27AUG/TTS/..... CPN...VAL6256...QTY  1...***CPN...5725996...QT
                INFO  28AUG/ORD/..... ********** MEL 082649 CLEARED  ON 27AUG AT ORD
                ATBT  27AUG/TUL/..... REPLACE START VALVE REFERENCE MM 80-10-02-2.
                FACT  27AUG/ORD/0922. REMOVED AND REPLACED LH ENGINE START VALVE.  N
                                      CLEARED MIC SHEET
                                      4WN80131F 1608 27AUG TUL  PRI=2

4WN  8000 P093  MDIS  27AUG/ORD/2333. LEFT START VALVE WILL NOT OPEN
                INFO  27AUG/ORD/..... PLACARDED LEFT ENG START VALVE INOP NEEDS MANU
                DFRL  27AUG/ORD/TA... GT...
                FACT  27AUG/ORD/0922. REMOVED AND REPLACED LH ENGINE START VALVE.  N
                                      CLEARED MIC SHEET
                                      4WN801323 2239 27AUG ORD

4WU  8000 P075  MDIS  28AUG/TPA/1009. LEFT ENGINE START VLV DID NOT OPEN ON ENGINE S
                FACT  28AUG/TPA/DC... INSPECTED )< FOUND CRACKED STARTER DUCT RMVD.)
                                      NML.
                                      4WU80DD21 1721 28AUG TPA

4XH  8000 P020  MDIS  13AUG/MEX/1156. R ENG START VALVE WILL NOT OPEN **********
                                      08-1237C-C                    REF.8002 ENGIN
                                      VALVE INOP ELEC--O.K MANUAL
                PART  13AUG/TTS/..... CPN...VAL6256...QTY  1...***CPN...5725996...QT
                INFO  13AUG/MEX/..... PLACARDED RT ENG START VALVE INOP. AS PER MEL.
                                      MEL 081237 CLEARED  ON 13AUG AT DFW **********
                ATBT  13AUG/DFW/..... REPLACE START VALVE REFERENCE MM 80-10-02-2.
                FACT  13AUG/DFW/NC... CONFIGURED A/C FOR ENGINE START AND PERFORMED
                                      REMOVED DEVIATION AND CLEARED MIC SHEET
                                      4XH8012B7 1833 13AUG DFW  PRI=2

4XL  8000 P009  MDIS  01AUG/PHX/1192. LEFT ENGINE START VALVE LITE CAME ON DURING ST
                                      THEN GO OUT.NO N1 INDICATION,PRESS FROM AIR SO
                FACT  01AUG/PHX/DC... REPLACED LEFT ENGINE START VALVE.OPS CKS NORM.
                                      4XL80D9BD 0719 01AUG PHX
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4YA	8000	P092	MDIS	31AUG/SAN/307..	EOAP PANEL HAS MON LIGHT ILLUMINATED.MONITOR D VALVE
			FACT	31AUG/SAN/TA...	/REPLACED L/H START VALVE GROUND RUN-UP OPS CH 4YA8012D4 2057 31AUG SAN
4YA	8000	P046	MDIS	15AUG/ORD/336..	-L START VALVE OPEN LIGHT- DISPLAYED ON EAP W/
			FACT	15AUG/ORD/TA...	PERFORMED MONITOR BITE FAULT CLEARED LEFT STAR 4YA801283 2112 15AUG ORD
4YA	8000	P019	MDIS	01AUG/EWR/1130.	ON SHUTDOWN 3 LIGHTS APPEARED ON OVERHEAD ANNU VALVE OPEN*, *LEFT ENGINE VALVE*.
			FACT	01AUG/EWR/DC...	ACCOMP MONITOR BITE CK. MSGS CLRD. OK FOR SV 4YA801258 0128 02AUG EWR
4YC	8000	P059	MDIS	20AUG/DFW/2091.	R ENGINE START VALVE COME ON DURING TAKE OFF S
			FACT	20AUG/DFW/NC...	SECURED CANNON PLUG ON RIGHT ENGINE START VALV 4YC801134 2108 20AUG DFW
4YF	8000	P079	MDIS	22AUG/DFW/1682.	WITH LEFT START VALVE OPEN APU AIR PRESSURE DR
			FACT	23AUG/DFW/NC...	PREFORMED ENGINE START ON BOTH ENGINE OBSERVED START. COULD NOT DUPLICATE OK FOR SERVICE. 4YF801282 2310 22AUG DFW
4YM	8000	P040	MDIS	07AUG/AUS/480..	2X STARTS LEFT ENG 47.5 FOR 3 SEC. 2ND ATTEMPT RAPIDLY CLIMBED PAST 480. SHUT DOWN AND NOTIFI
			FACT	07AUG/AUS/TA...	/REPLACED START BLEED CONTROL VALVE PER MM. ST 4YM800FDB 0124 09AUG ORD
4YP	8000	P082	MDIS	31AUG/DFW/1792.	INFO TO MAINTENANCE WITH START CART RIGHT ENGI
			FACT	31AUG/DFW/TA...	WITHIN LIMITS AS PER MM 72-00-00-5 OK OR SERV 4YP8011D5 1939 31AUG DFW
4YP	8000	P081	MDIS	31AUG/DFW/1792.	INFO TO MAINTENANCE WITH START CART LEFT ENGIN
			FACT	31AUG/DFW/TA...	WITHIN LIMITS AS PER MM 72-00-00-5 OK OR SERV 4YP8011D4 1937 31AUG DFW
4YR	8000	P018	MDIS	17AUG/ORD/1806.	INFO TO MAINTENANCE...LEFT ENGINE START EGR RE
			FACT	17AUG/ORD/TS...	INFO NOTED...NO ACTION REQUIRED PER M.M. 72-00 4YR801153 0840 17AUG ORD
4YR	8000	T	MDIS	02AUG/ORD/.....	MEL 08-178DC-C REF.8001 E NOT ON DURING START
			PART	02AUG/TTS/.....	CPN...VAL6256...QTY 1...***CPN...5725996...QT
			INFO	02AUG/LAS/.....	HEAVY W/L WORKING OTS A/C)< CSD/GEN CHANGE ** **********
			DFRL	02AUG/LAS/PS...	MP...
			ATBT	02AUG/TUL/.....	REPLACE START VALVE REFERENCE MM 80-10-02-2. FINDINGS.
			FACT	04AUG/ORD/0922.	REPLACED START VALVE AND CONNECTOR OPS CKED OK CLEARED MIC SHEET 4YR801104 1808 02AUG TUL PRI=2
4YR	8000	P075	MDIS	02AUG/ORD/1509.	RT ENGINE START VALVE LIGHT WILL NOT ILLUMINAT
			INFO	02AUG/ORD/.....	REF 80-1 AUTH 8-178DC-C PLACARDED RT ENG START ENG START VALVE CLOSED AFTER START HEAVY W/L W
			DFRL	02AUG/LAS/PS...	MP...
			DFRL	02AUG/ORD/AC...	***
			FACT	04AUG/ORD/0922.	REPLACED START VALVE AND CONNECTOR OPS CKED OK

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                                    CLEARED MIC SHEET
                                    4YR801105 1828 02AUG ORD

403  8000 T      MDIS  23AUG/ORD/..... MEL 08-2231C-C                    REF.8002 E
                 PART  23AUG/TTS/..... CPN...VAL6256...QTY  1...
                 INFO  24AUG/ORD/..... ********** MEL 082231 CLEARED  ON 24AUG AT ORD
                 ATBT  23AUG/TUL/..... REPLACE START VALVE REFERENCE MM 80-10-02-2.
                 FACT  23AUG/ORD/PS... INSTALLED NEW START VALVE)□VAL6256))ON )'1 ENG
                                       CLEARED MIC SHEET DEF)'80-02 AUTH)'8-2231-C
                                       40380E6B4 1324 23AUG TUL  PRI=2

403  8000 P043   MDIS  23AUG/ORD/374.. START VALVE LIGHT WILL NOT ILLUMINATE ON START
                                       GAUGE WHEN ACTIVATING START SWITCH
                 INFO  23AUG/ORD/..... PLACARDED LT ENG START VALVE INOP IAW MEL 80-2
                                       MPM 80-2 ACCOMPLISHED
                 FACT  23AUG/ORD/PS... INSTALLED NEW START VALVE)□VAL6256))ON )'1 ENG
                                       CLEARED MIC SHEET DEF)'80-02 AUTH)'8-2231-C
                                       40380E6B5 1350 23AUG ORD

433  8000 P026   MDIS  26AUG/SAN/590.. NO ROTATION ON RIGHT ENGINE WHEN START SWITCH
                                       BUT ENGINE DOES NOT ROTATE
                 FACT  27AUG/SAN/DC... /REPLACED R ENG PNEU STARTER PER MM 80-10-01-4
                                       43380E516 2336 26AUG SAN

439  8000 T      MDIS  25AUG/DFW/..... MEL 08-2453DC-C                    REF.8001 E
                                       INTERMITTENT
                 PART  25AUG/TTS/..... CPN...VAL6256...QTY  1...***CPN...5725996...QT
                 INFO  26AUG/ATL/..... ********** MEL 082453 CLEARED  ON 25AUG AT ATL
                 ATBT  25AUG/TUL/..... REPLACE START VALVE REFERENCE MM 80-10-02-2.
                 FACT  25AUG/ATL/AC... RPLCD START VALVE.NO HELP.FURTHER T/S FOUND BR
                                       MEL.CLRD MIC.
                                       43980E2AC 1541 25AUG TUL  PRI=2

439  8000 P036   MDIS  25AUG/DFW/2321. LEFT START VALVE OPEN LIGHT FAILED DURING STAR
                                       PRESSURE AFTER START VALVE RELEASE.
                 INFO  25AUG/DFW/..... PLACARDED LH START VALVE OPEN LIGHT INOP PER M
                 DFRL  25AUG/DFW/TS... FT...
                 FACT  25AUG/ATL/AC... RPLCD START VALVE.NO HELP.FURTHER T/S FOUND BR
                                       OK.RMVD MEL.CLRD MIC.
                                       43980E2AD 2203 25AUG ATL

450  8000 P047   MDIS  28AUG/IAD/1962. LEFT ENGINE START VALVE OPEN LIGHT FLICKERS ON
                                       SEQUENCE START IS NORMAL IN ALL OTHER INDICATI
                 FACT  28AUG/IAD/LT... ACCOM DRY MOTOR TO 20 PERCENT N2 START VALVEOP
                                       PREV HISTORY OKFOR SERVICE
                                       45080E1A9 2108 28AUG IAD


456  8000 P021   MDIS  15AUG/STL/784.. LEFT ENGINE DIFFICULT TO START )< NOT OVERTEMP
                                       30)? N2 THEN EGT HAS NASTY HOOK AND QUICKLY AC
                                       TURNED OFF TO HELP.
                 FACT  15AUG/STL/DC... INSPECTED INLET EXHAUST AND PNEU DUCTING. AMM
                                       FOR FOLLOWUP OK FOR SVC
                                       45680E43B 1934 15AUG STL

472  8000 P086   MDIS  22AUG/DFW/1257. MAINT ENTRY. MPM 80-2 NEEDS TO BE ACCOMPLISHED
                 FACT  22AUG/DFW/TS... ACCOMPLISHED MPM 80-2.
                                       47280E6F8 2152 22AUG MSP

472  8000 T      MDIS  20AUG/DFW/..... MEL 08-1898C-C                    REF.8002 E
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					VALVE INOP
			PART	20AUG/TTS/.....	CPN...5691096...QTY 1...***CPN...STA3000...QT
			INFO	23AUG/MSP/.....	********** MEL 081898 CLEARED ON 22AUG AT MSP
			ATBT	20AUG/TUL/.....	TROUBLESHOOT R/H ENGINE SRARTER SWITCH AND REP
			FACT	22AUG/MSP/AC...	CLEANED)< RESECURED CANNON PLUG ON R/H ENGINE CLEARED MIC SHEET. 47280E6EE 1137 20AUG TUL PRI=2
472	8000	P083	MDIS	20AUG/DFW/9999.	MPM 80-2 NEEDS TO BE ACCOMPLISHED TO COMPLETE
			FACT	20AUG/DFW/TA...	ACCOPMLISHED MPM 80-2 NEEDS TO BE ACCOMPLISHED 47280E6F5 2340 20AUG OKC
472	8000	P082	MDIS	20AUG/DFW/1351.	RIGHT ENGINE START SWITCH WILL NOT OPEN START
			DFRL	20AUG/DFW/TA...	NS...
			FACT	22AUG/MSP/AC...	CLEANED)< RESECURED CANNON PLUG ON R/H ENGINE CLEARED MIC SHEET. 47280E6F4 2256 20AUG OKC
473	8000	P091	MDIS	16AUG/DEN/558..	RIGHT ENG WOULD NOT START ON TAXI OUT
			FACT	16AUG/DEN/TS...	CHECK RT ENG FUEL CONTROL RIG AND CANNON PLUGS PARAMETTERS NORMAL OK FOR FLT 47380E4AD 0936 16AUG DEN
486	8000	T	MDIS	31JUL/ORD/.....	MEL 07-2917C-C REF.8002 E O*RIDE MANUAL
			PART	31JUL/TTS/.....	CPN...VAL6256...QTY 1...***CPN...5725996...QT
			INFO	01AUG/EWR/.....	********** MEL 072917 CLEARED ON 01AUG AT EWR
			ATBT	31JUL/DFW/.....	REPLACE START VALVE REFERENCE MM 80-10-02-2.
			FACT	01AUG/EWR/0922.	FOUND BROKEN WIRE ON START VALVE CANNON PLUG. 48680E200 1012 31JUL TUL PRI=2
486	8000	P027	MDIS	31JUL/ORD/2313.	NO N1 OR N2 ROTATION ON RIGHT ENGINE START D
			INFO	31JUL/ORD/.....	DFRD RT ENG START VALVE INOP PER MEL MPM 80-2
			DFRL	31JUL/ORD/TS...	FT...
			DFRL	31JUL/ORD/XX...	***
			FACT	01AUG/EWR/0922.	FOUND BROKEN WIRE ON START VALVE CANNON PLUG. 48680E201 1154 31JUL ORD
502	8000	T	MDIS	23AUG/DFW/.....	MEL 08-2262DC-C REF.8001 E INTERMITTENT
			PART	23AUG/TTS/.....	CPN...VAL6256...QTY 1...***CPN...5725996...QT
			INFO	24AUG/ATL/.....	********** MEL 082262 CLEARED ON 23AUG AT ATL
			ATBT	23AUG/TUL/.....	REPLACE START VALVE REFERENCE MM 80-10-02-2.
			FACT	23AUG/ATL/PS...	FOUND BROKEN CONNECTOR INSTALLED NEW PINS .OPS 50280E2A4 1941 23AUG TUL PRI=2
502	8000	P077	MDIS	23AUG/DFW/1771.	LEFT START VALVE LIGHT ON INTERMITTENTLY DURIN
			INFO	23AUG/DFW/.....	PLACARDED LEFT ENGINE START VALVE LIGHT INOP P
			DFRL	23AUG/DFW/XX...	GT...
			FACT	23AUG/ATL/PS...	FOUND BROKEN CONNECTOR INSTALLED NEW PINS.OPS 50280E2A7 0016 24AUG ATL
513	8000	P093	MDIS	25AUG/ATL/1074.	INFO TO MAINT. WITH 35PSI DUCT PRESSURE, NO TA RIGHT ENGINE N2 ACCELERATES TO ONLY 20 PERCENT START TEMPS NEVER EXCEEDED 425C.
			FACT	25AUG/ATL/0922.	CKD RT ENG START VALVE.OPS CKS NML.20 PERCENT 51380E13A 1933 25AUG ATL
539	8000	P044	MDIS	30AUG/MSP/1093.	DURING RIGHT ENTGIEN START RT START VAVLE OPN

					INDICATIION SECOND ATTEMPT NO N2 NO N1 INDICAT
			FACT	30AUG/MSP/DC...	REPALCED R/H ENG STARTER OPS CK GOOD LK CK GOO
					53980DEDE 0511 31AUG MSP
541	8000	P096	MDIS	20AUG/OKC/1839.	RIGHT START VALVE WILL NOT OPEN
			FACT	20AUG/OKC/TA...	REMOVED)< CLEANED START VALVE CANNON PLUG. RE
					54180E068 0946 21AUG DFW
549	8000	P074	MDIS	04AUG/SAT/9999.	LH ENGINE STARTER DUCT CRACKED.
			FACT	05AUG/SAT/AC...	REPLACED LH ENG PNEUMATIC STARTER DUCT,OPS)<
					54980E179 0119 05AUG SAT
562	8000	P074	MDIS	13AUG/ORD/9999.	MAINT ENTRY: REPEAT PIREP 69,68 67,57)< 48. U
					AIR START CART, EGT WOULD HAVE BEEN EXCEEDED.
			FACT	13AUG/ORD/PS...	STARTED RIGHT ENGINE AT MAX MOTOR)(24)?N2)).
					ENG OK FOR SERVICE. TECH SERVICES NOTIFIED.
					56280E2BF 2045 13AUG ORD
564	8000	P041	MDIS	21AUG/ORD/1673.	LEFT START VALVE OPEN LIGHT WEAK $ INTERMITTEN
			FACT	21AUG/ORD/TS...	RAN LEFT ENGINE, LEFT START VALVE OPEN LIGHT
					56480E12D 2101 21AUG ORD
584	8000	P017	MDIS	22AUG/IND/2349.	START VALVE OPEN ON RIGHT ENGINE NO ROTATION N
					WITH ENGINE CROSSWEED.
			FACT	23AUG/IND/NTA..	REMOVED AND REPLACED)'2 ENG START VALVE IAW A
					CONTINUED SERVICE.
					58480DEE8 0043 23AUG IND
585	8000	P064	MDIS	27AUG/SJC/1526.	LEFT ENGINE WILL NOT ROTATE USING MANUAL START
			FACT	27AUG/SJC/TA...	REPLCD L/H STARTER AND START VALVE OPS CKS OK
					58580DDEB 2250 27AUG OKC
585	8000	P062	MDIS	26AUG/DFW/1286.	WHEN SELECTING LEFT ENGINE START SWITCH, LEFT
					PRESSURE INCREASES, BUT NO N2 OR N1 ROTATION.
					********** MEL 08-2572C-C
					VALVE..... LH START VALVE INO
			PART	26AUG/TTS/.....	CPN...VAL6256...QTY 1...***CPN...5725996...QT
					PARTS. CHECK IPC FOR EFFECTIVITY AND APPLICAB
			INFO	26AUG/DFW/.....	PLACARD)'1 ENGINE START VALVE INOP PER MEL-MU
					ACCOMPLISHED MPM 80-2 ENTERED IN MIC *********
			DFRL	26AUG/HNL/AS...	***
			ATBT	26AUG/TUL/.....	REPLACE START VALVE REFERENCE MM 80-10-02-2.
			FACT	27AUG/SJC/TA...	REPLD LH STARTER AND START VALVE OPS CKS OK RM
					58580DDE8 1910 26AUG TUL PRI=2
585	8000	P054	MDIS	23AUG/DFW/1032.	RIGHT ENG START VALVE OPEN LIGHT WILL NOT ILLU
					NORMAL ********** MEL DATA *********
					REF.8001 ENGINE *START VALVE OPEN* LIGHT.....
			PART	23AUG/TTS/.....	CPN...VAL6256...QTY 1...***CPN...5725996...QT
			INFO	23AUG/DFW/.....	PLAACRDED RIGHT ENGINE START VALVE LIGHT INOP
					SHEET REPAIED A BROKEN WIRE ON RIGHT ENGINE ST
					CLEARED ON 23AUG AT DFW **********
			DFRL	23AUG/DFW/TA...	FT...
			ATBT	23AUG/TUL/.....	REPLACE START VALVE REFERENCE MM 80-10-02-2.
			FACT	23AUG/DFW/PS...	RAN RH ENGINE LT OPS CHECK GOOD REMOVED PLACAR
					58580DDD8 1105 23AUG TUL PRI=2
599	8000	P018	MDIS	05AUG/DFW/1408.	LEFT START VALVE OPEN LIGHT INITIALLY CAME ON
					VALVE SWITCH WAS RELEASED **********

REF.8001 ENGINE *START VALVE

		PART	05AUG/TTS/.....	CPN...VAL6256...QTY 1...***CPN...5725996...QT
		INFO	05AUG/DFW/.....	PLACARDED LEFT ENGINE START VALVE LIGHT INOP A SHEET ********** MEL 080476 CLEARED ON 05AUG
		ATBT	05AUG/TUL/.....	REPLACE START VALVE REFERENCE MM 80-10-02-2. VISIBLE WIRING AND CONNECTOR..CHECK FOR PINS E
		FACT	05AUG/PHX/DC...	FOUND BROKEN WIRE ON START VALVE CONNECTOR.REP 8-476DC-C.CLEARED MIC SHEET. 59980D909 1721 05AUG TUL PRI=2
4YL	8099 P060	MDIS	11AUG/ORD/818..	L ENG TEMP TO 475DEG SHUT DOWN ENG
		FACT	11AUG/ORD/TS...	INFO NOTED. WITHIN MM LIMITS. ENG START OK 4YL80123C 2031 11AUG ORD
428	8099 M000	MDIS	06AUG/MOC/.....	PLEASE VISUAL THE VAL6256)□STARTER AIR SHUTOF FMR AS THIS INFO IS NEEDED TO VERIFY A/C RECOR
		FACT	06AUG/DCA/PS...	S/N)'3771C AAID)'979410-9-1 42880E5BF 1332 06AUG TUL
482	8099 M000	MDIS	06AUG/MOC/.....	PLEASE VISUAL THE VAL6256)□STARTER AIR SHUT O INTO FMR AS THIS INFO IS NEEDED TO VERIFY A/C
		FACT	06AUG/DFW/AC...	)'1 ENG S/N 3507C, NO AAID PLACARD ON PART.) 48280E318 1329 06AUG TUL

□BASE JFK TYPE DC9AA MONTH TO DATE REPORT REPORT NBR D013-S80 1 JUL 07

AC#	SYS	ITEM	ACTN	DATE	STN	TC	TEXT
201	8000	P003	MDIS	30JUL/MCI/1659.			RIGHT ENGINE START VALVE FLICKERS WHILE STARTE
			FACT	30JUL/MCI/DC...			/REPLACED RIGHT ENG START VALVE LK)< OPS CK N 20180D85D 0013 31JUL MCI
201	8000	P063	MDIS	05JUL/LAX/813..			RH ENG START VLV LT FAINT FLICKERS ON AND OFF
			FACT	05JUL/LAX/TA...			RMVD AND CLEAN CANNON PLUGS ON RH ENG START VL 20180D819 1607 05JUL LAX
218	8000	P062	MDIS	09JUL/ORD/9999.			MAINT ENTRY REPEAT PIREP)'61 L/H ENGINE REACH ACCOMPLISH START
			FACT	09JUL/ORD/TA...			REMOVED AND REPLACED LH ENGINE START VALVE. OP 21880EA87 2110 09JUL ORD
218	8000	P061	MDIS	08JUL/ORD/422..			LEFT ENG STARTING N2 GOT TO 19)? FOR 2-3 SECS ATTEMPTS-THIRD TRY STARTED NORMALLY
			FACT	08JUL/ORD/DC...			STARTED LEFT ENGINE. NO DEFECTS NOTED IN N2 IN 21880EA86 2341 08JUL ORD
259	8000	P045	MDIS	25JUL/DFW/2395.			LEFT START VALVE FLICKERED THEN STARTED GOING PRESSURE NORMAL
			FACT	25JUL/DFW/TA...			STARTED LEFT ENGINE START VALVE, LIGHT WORKS N 25980ECD5 1645 25JUL DFW
4WJ	8000	P071	MDIS	06JUL/BOS/874..			REPEAT 67 LEFT ENGINE START VALVE OPEN LIGHT C ENGINE STARTS NORMALLY
			FACT	06JUL/BOS/TS...			T/S START VALVE FOUND WIRE BROKEN IN CONNECTOR 4WJ80101A 2233 06JUL BOS
4WJ	8000	P067	MDIS	01JUL/DFW/473..			LEFT ENGINE START VALVE OPEN LIGHT INTERMITTEN ROTATION CONTINUED TO INCREASE DURING PERIODS
			FACT	01JUL/DFW/AC...			REPLACED CONTACT ON START VALVE CONNECTOR. OPS 4WJ801011 0048 02JUL DFW
4WY	8000	P004	MDIS	16JUL/ONT/750..			EGT RAPIDLY APPROACHED 475 WHEN STARTING RF EN FRO 20 SEC. MAX EGT WAS 475. WHEN A SECOND STA ACHIEVED.
			FACT	16JUL/ONT/TH...			REMOVED AND REPLACED PNEUMATIC RH STARTER PER 4WY801085 2301 16JUL ONT
4YL	8000	P019	MDIS	24JUL/DFW/1859.			UPON STARTING THE RIGHT ENG. TH N2 WAS SLOW TO DEG C START WAS ABORTED TO AVOID OVER TEMP. FO ENG. F/O SAYS HE FELT A VIBRATION IN RIGHT STA PRIOR TO RELEASE OF START SWITCH WITH ROLL BAC
			FACT	24JUL/DFW/TS...			INSPECTED AND FOUND RH STARTED SHEARED. R/R RH 4YL8011F6 2331 24JUL SEA
414	8000	P060	MDIS	30JUL/DFW/1900.			INFO TO MAINT RT ENG START ABORTED TO PREVENT OAT 27 DEG C. FF 1000 PPH PEAK EGT 470 MOMENTA
			FACT	30JUL/DFW/TA...			ENGINE START TEMP WITHIN M/M LIMTIS NO FUTHER 41480E530 1906 30JUL DFW
424	8000	P070	MDIS	28JUL/DFW/9999.			MAINT ENTRY-STARTER DUCT REMOVED FOR AIRCRAFT ENGINE START
			FACT	29JUL/DFW/AC...			INSTALLED NEW STARTED DUCT FOR LEFT ENGINE PRE 42480E6DA 2154 28JUL DFW

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427  8000 P097  MDIS  28JUL/DFW/9999. WHILE INSP L ENG START VALVE FOUND BLOWN SENSE
                FACT  28JUL/PHX/TA... RPLD DUCT OPS CK OK
                                      42780E5D8 2138 28JUL PHX

427  8000 P092  MDIS  27JUL/DFW/2070. LEFT START VALVE DID NOT BEGIN ANNUNCIATING DU
                                      TESTED NORMAL. LIGHT CAME ON AT 25)? OUT WHEN
                                      ********** MEL 07-2515DC-C
                                      LIGHT..... START VLV LIGHT WONT ILLUMINATE
                PART  27JUL/TTS/..... CPN...VAL6256...QTY  1...***CPN...5725996...QT
                INFO  27JUL/DFW/..... VERIFIED START VALVE OPERATION AS OK BUT LIGHT
                                      LIGHT INOP PER MEL 80-1 ENT IN MIC INFO ITEM.
                                      REPLACED START....NO HELP LIGHT INDICATION STI
                                      ********** MEL 072515 CLEARED  ON 28JUL AT PHX
                DFRL  27JUL/DFW/TA... GT...
                ATBT  27JUL/TUL/..... REPLACE START VALVE REFERENCE MM 80-10-02-2.
                FACT  28JUL/PHX/TA... REINSTALLED LOOSE WIRE AD CONNECTOR AT START V
                                      42780E5D0 1358 27JUL TUL  PRI=2

428  8000 P049  MDIS  27JUL/BWI/1883. RT ENG WILL NOT START.NO RPM N1 OR N2.CROSSFEE
                                      LIGHT ILLUMINATED
                DFRL  27JUL/DFW/XX... ***
                FACT  28JUL/BWI/XX... REMOVED)$REPLACED )'2 ENG START VALVE)$STARTER
                                      SERVICE
                                      42880E59D 0519 28JUL DCA

432  8000 P095  MDIS  27JUL/DFW/356.. RIGHT ENGINE START VALVE WILL NOT STAY OPEN **
                                      MEL 07-2513C-C                    REF.8002 E
                PART  27JUL/TTS/..... CPN...VAL6256...QTY  1...***CPN...5725996...QT
                INFO  27JUL/DFW/..... PLACARD R/H NBR. 2 ENGINE START VALVE ENTERED
                                      ACCOMPLISHED MPM 80-02 ********** MEL 072513 C
                DFRL  27JUL/DFW/TA... GT...
                ATBT  27JUL/TUL/..... REPLACE START VALVE REFERENCE MM 80-10-02-2.
                FACT  28JUL/RDU/AC... REPLACED BROKEN PIN ON R/H ENGINE START VALVE
                                      7-2513C-C. CLEARED MICS
                                      43280E3AA 1350 27JUL TUL  PRI=2

433  8000 P047  MDIS  22JUL/DFW/466.. WHEN STARTING RIGHT ENG START VALVE OPEN LIGHT
                                      INDICATED. ********** MEL DATA *****
                                         REF.8002 ENGINE START VALVE.....
                PART  22JUL/TTS/..... CPN...VAL6256...QTY  1...***CPN...5725996...QT
                INFO  22JUL/DFW/..... PLACARDED START VALVE PER MEL ENTERED IN THE M
                                       ON 22JUL AT PHL **********
                DFRL  22JUL/DFW/TA... FT...
                ATBT  22JUL/TUL/..... REPLACE START VALVE REFERENCE MM 80-10-02-2.
                FACT  22JUL/PHL/TA... REPLCD RH ENG START VALVE VAL6356 OPS NORMAL R
                                      43380E498 1423 22JUL TUL  PRI=2

437  8000 P054  MDIS  17JUL/LAX/1308. RT START VALVE LITE DOES NOT ILLUMINATE WITH S
                                      MEL DATA ********** MEL 07-1554DC-C
                                      OPEN* LIGHT..... LITE INOP  VLV OK
                PART  17JUL/TTS/..... CPN...VAL6256...QTY  1...***CPN...5725996...QT
                INFO  17JUL/LAX/..... REPARIED STARTER SOLENOID VALVE CONNECTOR OPER
                                      CLEARED  ON 17JUL AT LAX **********
                ATBT  17JUL/TUL/..... REPLACE START VALVE REFERENCE MM 80-10-02-2.
                FACT  17JUL/LAX/TA... REPARIED STARTER SOLENOID VLV CONNECTOR OPER C
                                      43780E36D 1535 17JUL TUL  PRI=2


437  8000 P039  MDIS  06JUL/PHX/1849. R START VALVE OPEN LIGHT IS BARELY VISIBLE DUR
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                FACT  06JUL/PHX/TH... REPLACED RT START VALVE OPEN LIGHT. LIGHT OPS
                                      43780E351 2242 06JUL PHX

446  8000 P083  MDIS  10JUL/DFW/1218. RIGHT ENGINE START VALVE LITE DOES NOT COME ON
                                      ********** MEL DATA **********
                                      REF.8001 ENGINE *START VALVE OPEN* LIGHT......
                PART  10JUL/TTS/..... CPN...VAL6256...QTY  1...***CPN...5725996...QT
                INFO  10JUL/DFW/..... DEFERRED RH ENG START VAVLE LIGHT PER MEL 80-1
                                      START. ENTERED IN MIC SHEET AUTH. 7-871DC-C. W
                                      070871 CLEARED  ON 12JUL AT MSP **********
                DFRL  10JUL/DFW/TA... FT...
                DFRL  11JUL/DFW/DC... FT...
                ATBT  10JUL/TUL/..... REPLACE START VALVE REFERENCE MM 80-10-02-2.
                FACT  12JUL/MSP/AC... REPLACED START VALVE NO HELP REPLACED CONNECTO
                                      44680E704 1359 10JUL TUL  PRI=2

459  8000 E     MDIS  24JUL/DFW/..... REMOVER )'1 ENG STARTER DEFLECTOR FOR BORROWED
                FACT  24JUL/DFW/DC... REPLACED )'2 ENG STARTER DEFLECTOR.
                                      45980E556 0733 25JUL DFW

486  8000 T     MDIS  31JUL/ORD/..... MEL 07-2917C-C                    REF.8002 E
                                      O*RIDE MANUAL
                PART  31JUL/TTS/..... CPN...VAL6256...QTY  1...***CPN...5725996...QT
                INFO  01AUG/EWR/..... ********** MEL 072917 CLEARED  ON 01AUG AT EWR
                ATBT  31JUL/DFW/..... REPLACE START VALVE REFERENCE MM 80-10-02-2.
                FACT  01AUG/EWR/0922. FOUND BROKEN WIRE ON START VALVE CANNON PLUG.
                                      48680E200 1012 31JUL TUL  PRI=2

486  8000 P027  MDIS  31JUL/ORD/2313. NO  N1 OR N2  ROTATION ON RIGHT ENGINE START D
                INFO  31JUL/ORD/..... DFRD RT ENG START VALVE INOP PER MEL  MPM 80-2
                DFRL  31JUL/ORD/TS... FT...
                DFRL  31JUL/ORD/XX... ***
                FACT  01AUG/EWR/0922. FOUND BROKEN WIRE ON START VALVE CANNON PLUG.
                                      48680E201 1154 31JUL ORD

487  8000 P091  MDIS  20JUL/ORD/2328. ON LEFT ENG START, START LIGHT GOOD PRESSURE N
                FACT  20JUL/ORD/TS... 329058/ REMOVED AND REPLACED LT ENG STARTER PE
                                      48780DF07 1236 20JUL ORD

502  8000 P091  MDIS  09JUL/ABQ/1344. LT START VLV LITE DOES NOT COME ON WHEN START
                                      ********** MEL 07-774DC-C
                                      LIGHT..... LIGHT DOES NOT ILLUMINATE ON ST
                PART  09JUL/TTS/..... CPN...VAL6256...QTY  1...***CPN...5725996...QT
                INFO  09JUL/ABQ/..... PLACED ON MEL 80-1 PLCAD INSTALLED VERIFIED ST
                                      ON 10JUL AT SJC **********
                ATBT  09JUL/TUL/..... REPLACE START VALVE REFERENCE MM 80-10-02-2.
                FACT  09JUL/SJC/PS... /REPLACED BROKEN PIN ON VALVE CONNECTOR OPS CK
                                      50280E20C 1320 09JUL TUL  PRI=2

503  8000 P061  MDIS  01JUL/DFW/381.. LEFT ENGINE NO ROTATION ON ENGIEN START ATTEMP
                FACT  01JUL/DFW/TA... REMOVED AND REPLACED LEFT ENGINE STARTER AND C
                                      FOR SVC.
                                      50380E0C1 1351 01JUL DFW

504  8000 P045  MDIS  21JUL/DEN/9999. MAINT ENTRY..L/ENGINE START VALVE AIR DUCT HAS
                FACT  22JUL/DEN/AC... REPLACED L ENG START AIR DUCT LEAK AND OPS CHD
                                      50480E3DC 0028 22JUL DEN

513  8000 P039  MDIS  28JUL/SFO/319.. RT ENG START VALVE OPEN LIGHT DIDNT ILLUMINATE
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                                        MEL DATA ********************* MEL 07-2635C-C
                                        VALVE..................... RH START VALVE INO
          PART  28JUL/TTS/..... CPN...VAL6256...QTY  1...***CPN...5725996...QT
          INFO  28JUL/SFO/..... PLACARDED RT ENG START VALVE INOP PER MEL.ENTE
                                        29JUL AT RDU **********
          ATBT  28JUL/TUL/..... REPLACE START VALVE REFERENCE MM 80-10-02-2.
          FACT  29JUL/RDU/DC... RPLCD RH ENG START VALVE OP CK GOOD-RMVD PLACA
                                        51380E0CF 1721 28JUL TUL  PRI=2

524  8000 T   MDIS  31JUL/ORD/..... MEL 07-2966C-C                    REF.8002 E
                                        ELECTR MANUAL OK
          PART  31JUL/TTS/..... CPN...VAL6256...QTY  1...***CPN...5725996...QT
          INFO  31JUL/ORD/..... ********** MEL 072966 CLEARED  ON 31JUL AT ORD
          ATBT  31JUL/TUL/..... REPLACE START VALVE REFERENCE MM 80-10-02-2.
          FACT  31JUL/ORD/TS... FOUND STARTER INOP ON LEFT ENGINE. REPLACED ST
                                        SHEET
                                        52480E18A 1935 31JUL TUL  PRI=2

524  8000 P072 MDIS  31JUL/ORD/1956. L START VALVE WOULD NOT OPEN
          INFO  31JUL/ORD/..... PLACARDED LEFT ENGINE START VALVE. ENTERED ON
          FACT  31JUL/ORD/TS... FOUND STARTER INOP ON LEFT ENGINE. REPLACED ST
                                        SHEET AUTH 7-2966
                                        52480E18B 2110 31JUL ORD

529  8000 T   MDIS  04JUL/DFW/..... MEL 07-319C-C                     REF.8002 E
                                        OPEN ELECTRICALLY
          PART  04JUL/TTS/..... CPN...VAL6256...QTY  1...***CPN...5725996...QT
          ATBT  04JUL/TUL/..... REPLACE START VALVE REFERENCE MM 80-10-02-2.
          FACT  04JUL/DEN/PS... L/ENGINE START VALVE OPS CHECKS GOOD. REMOVED
                                        SHEET
                                        52980DFE7 2016 04JUL TUL  PRI=2

529  8000 P046 MDIS  04JUL/DFW/1187. LEFT START VALVE WILL NOT OPEN
          INFO  04JUL/DFW/..... DEFERRED L/ENGINE START VALVE PER MEL 80-02 AU
                                        ACCOMPLISHED MPM 80-02
          DFRL  04JUL/DFW/TS... RR...
          FACT  04JUL/DEN/PS... L/ENGINE START VALVE OPS CHECKS GOOD. REMOVED
                                        SHEET
                                        52980DFE8 2129 04JUL DEN

537  8000 T   MDIS  30JUL/ICT/..... MEL 07-2811C-C                    REF.8002 E
          PART  30JUL/TTS/..... CPN...VAL6256...QTY  1...
          INFO  30JUL/ICT/..... RH START VALVE PLACARDED PER MEL 80-02 ACCOMPL
                                        ********** MEL 072811 CLEARED  ON 31JUL AT DFW
          ATBT  30JUL/TUL/..... REPLACE START VALVE REFERENCE MM 80-10-02-2.
          FACT  30JUL/DFW/TH... REMOVED PLACARD, REPLACED )'2 ENGINE START VAL
                                        53780E1AD 1237 30JUL TUL  PRI=2

537  8000 P043 MDIS  30JUL/ICT/1494. RIGHT ENG START GOOD AIR PRESSURE / FLICKERING
          INFO  30JUL/ICT/..... RH START VALVE PLACARDED PER MEL 80-02 ACCOMPL
          FACT  30JUL/DFW/TH... REMOVED PLACARD, REPLACED )'2 ENGINE START VAL
                                        53780E1B0 0223 31JUL DFW

539  8000 P066 MDIS  16JUL/DFW/1317. UNABLE TO START RIGHT ENGINE   START VALVE WOU
                                        MANUALLY
          FACT  16JUL/DFW/TH... REMOVED )< REPLACED R/H ENGINE START VALVE. OP
                                        53980DE56 0215 17JUL DFW

539  8000 P065 MDIS  16JUL/EWR/558.. THE RIGHT ENGINE START VALVE DID NOT OPEN ON F
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					SLIGHTLY LESS THAN 10 SECONDS. **********
					07-1440DC-C REF.8001 ENGIN
					RESPOND
			PART	16JUL/TTS/.....	CPN...VAL6256...QTY 1...***CPN...5725996...QT
			INFO	16JUL/DFW/.....	********** MEL 071440 CLEARED ON 16JUL AT DFW
			ATBT	16JUL/DFW/.....	REPLACE START VALVE REFERENCE MM 80-10-02-2.
			FACT	16JUL/DFW/TH...	REMOVED)< REPLACED R/H ENGINE START VALVE. OP
					CLEARED MIC
					53980DE55 1502 16JUL TUL PRI=2
540	8000	P076	MDIS	27JUL/LGA/313..	DURING LEFT ENGINE START, START VALVE LIGHT FA
			FACT	27JUL/LGA/TA...	RESET CONNECTORS ON LEFT ENGINE START VALVE, A
					54080DF36 1053 27JUL LGA
553	8000	P078	MDIS	13JUL/BOS/1136.	REF PIREP)'72 LEFT START VALVE LIGHT HAS A DE
					START IS NORMAL
			FACT	13JUL/BOS/AC...	REPINNED CONNECTOR FOR START VALVE OPSN INDICA
					55380E0A2 0014 14JUL BOS
553	8000	P072	MDIS	09JUL/ORD/1769.	LEFT START VALVE VERY DIM DURING START
			FACT	09JUL/ORD/0922.	REMOVED AND REPLACED L/H START VALVE OPS NORMA
					55380E097 0633 10JUL ORD
564	8000	P086	MDIS	12JUL/STL/1170.	**L START VALVE OPEN* LIGHT FLICKERS ON)< OFF
					NORMAL.
			FACT	12JUL/STL/PS...	REPLACED LEFT ENGINE START VALVE AS PER AMM OP
					56480E0D1 2216 12JUL STL
573	8000	P004	MDIS	18JUL/STL/1060.	L START VALVE WILL NOT OPEN - NO ROTATION ON L
			FACT	18JUL/STL/TS...	REINSTALLED LINE TO START VALVE, OPS CHKD NORM
					57380D9D1 1952 18JUL STL
574	8000	P007	MDIS	10JUL/ORD/1179.	DURING LEFT ENG START WE GOT A HOT START SO WE
					TRYED AGAIN AND GOT START VALVE OPEN LITE BUT
			FACT	10JUL/ORD/PS...	REMOVED AND REPLACED PER M/M 80-10 LEFT ENG ST
					57480DC70 1620 10JUL ORD
599	8000	T	MDIS	08JUL/ORD/.....	MEL 07-665DC-C REF.8001 E
					DURING START
			PART	08JUL/TTS/.....	CPN...VAL6256...QTY 1...***CPN...5725996...QT
			INFO	09JUL/BOS/.....	********** MEL 070665 CLEARED ON 08JUL AT BOS
			ATBT	08JUL/DFW/.....	REPLACE START VALVE REFERENCE MM 80-10-02-2.
			FACT	08JUL/BOS/TS...	REPLACED LT ENG START VALVE OPS OK REMOVED MEL
					59980D8BF 1334 08JUL DFW PRI=2
292	8099	M000	MDIS	11JUL/MOC/.....	PLEASE RE-VISUAL THE STARTER AIR SHUT OFF VALV
					AAID NUMBER INTO FMR. THIS INFORMATION IS NEED
					SDELOSIER ENGINE TIME CONTROL TUL
			DFRL	14JUL/DFW/NC...	MP...
			FACT	16JUL/RDU/AC...	S/N-99193C AAID-979410
					29280E97A 1528 11JUL TUL
292	8099	M000	MDIS	09JUL/MOC/.....	PLEASE VISUAL VAL6256)□STARTER SAIR SHUTOFF V
					FMR AS THIS INFO IS NEEDED TO VERIFY A/C RECOR
			FACT	09JUL/MOC/XX...	FACT OUT DUE TO PREVIOUS VISUAL
					29280E96F 1242 09JUL TUL
292	8099	M000	MDIS	05JUL/MOC/.....	PLEASE VISUAL CHECK THE STARTER AIR SHUT OFF V
					WITH AAID NUMBER INTO FMR. THIS INFORMATION I

					SDELOSIER ENGINE TIME CONTROL TUL
			INFO	05JUL/MSP/.....	CONT DFRL RR. CONTINUE DEFERRAL.
			DFRL	05JUL/MSP/PS...	RR...
			DFRL	06JUL/DFW/0922.	FT...
			FACT	10JUL/MSP/PS...	SN FOR NO2 ENG SHUTOFF VALVE VAL6256 IS S/N 99 29280E969 1429 05JUL TUL
4WA	8099	M000	MDIS	22JUL/MOC/.....	PLEASE VISUAL CHECK TH STARTING VAL6256 START RECORD SERIAL NUMBER ALONG WITH AAID NUMBER IN AIRCRAFT RECORDS. THANK YOU L HARRIS ENIGINE T
			DFRL	22JUL/ORD/XX...	***
			FACT	25JUL/BOS/AC...	: RIGHT SHUTOFF VALVE SN AA-10 AND AAID IS BBG BBFCSYF 4WA8011BB 0903 25JUL TUL
427	8099	M000	MDIS	30JUL/MOC/.....	PLEASE VISUAL CHECK THE STARTER AIR SHUT OFF V NUMBER ALONG WITH AAID NUMBER INTO FMR. THIS RECORDS. THANK YOU SDELOSIER ENGINE TIME CONT
			FACT	30JUL/LGA/BC...	NO. 2 ENG START VALVE S/N IS 3549C, NO AAID NU BBIILQYR. 42780E5EC 1019 30JUL TUL
494	8099	M000	MDIS	06JUL/MOC/.....	PLEASE VISUAL THE VAL6256)[STARTER AIR SHUTOF INTO FMR, AS THIS INFO IS REQUIRED FOR A/C REC
			FACT	06JUL/STL/AC...	P-N 979410-4 SER 5536C LEFT ENG START VALVE 49480E385 0837 06JUL TUL
599	8099	P082	MDIS	08JUL/ORD/2435.	L. ENGINE START VALVE LIGHT EXTINGUISHED DURIN)< N2 APPEARED NORMAL
			INFO	08JUL/ORD/.....	REF 80-1 AUTH 7-665DC-C PLACARDED LEFT ENG STA 7-665DC-C)< ENTERED IN MIC SHEET
			FACT	08JUL/BOS/TS...	REPLACED LT ENG START VALVE OPS OK REMOVED MEL 59980D8C1 1415 08JUL ORD

ATTACHMENT 22

Allied Pilots Association
Flight 1400 Submission

GPM Chronic Aircraft Definition

necessity of Engineering bill-of-work. A satisfactory Flight Confidence Check or satisfactory Ground Confidence Check must be accomplished before the aircraft can be upgraded to its highest LMP status.

d. Significant events requiring flight crew intervention (refer to par. A 9. of this section) will be reported by Maintenance immediately via phone or e-mail to Fleet Operations Engineering. Fleet Operations Engineering will report these events to the FAA Principal Avionics Inspector by phone or e-mail as soon as practical.

3. Technical Services

a. Technical Services personnel will receive LMP initial and annual recurrent training. Technical Services is responsible for monitoring, tracking, and determining the LMP status of each aircraft through processes and procedures as follows:

(1) Daily monitor the FOE CAT3 Autoland Alert System for alert aircraft, and will issue a MEL 22-90 for aircraft that require a Flight Confidence Check (FCC).

(2) Daily review of FMR for failed autoland/auto-approaches, and chronic aircraft, which shall be reported to FOE per Par A.3.b, or c. of this section.

(3) Response to PIREPs and to issuance of MEL 22-89 placards.

(4) Send Misc.-25 message as required for successful FCCs.

b. If an aircraft has repeat or chronic PIREPs (repeat defined as more than one write up in 5 days; more than two in 15 days, and more than 3 in 31 days; Chronic defined as an item that has not been corrected after all of the technical resources of the airline have been applied) against a LMP system or component, Technical Services is responsible to ensure that the LMP status of the aircraft is downgraded accordingly via the MEL process. In addition. Tech Services is to notify Engineering of a repeat PIREP per sub-paragraph 3-c. (1) (a) of this paragraph, and to enter into FMR any faults indicated during BIT/BITE testing / Flight Fault Review.

c. Technical Services is responsible to notify Fleet Operations Engineering of any unsatisfactory autopilot coupled approaches, HUD approaches, or autolands including significant events that require flight crew intervention. (See par A 9. of this section)

(1) Engineering Notification shall be accomplished as follows:

(a) During normal business hours refer to Engineering Contact List for responsible Fleet Operations Engineering engineer or the FOE Avionics Lead engineer. Contact by email, in person, or by phone.

(b) During off-hours, in the case of flight crew intervention, refer to Engineering Contact List for responsible Fleet Operations Engineering engineer or the FOE Avionics Lead engineer to contact by phone at home. For all repeat items refer to Engineering Contact List for responsible Fleet Operations Engineering engineer to contact by email. Copy the FOE Avionics Lead engineer in email.

4. Fleet Operations Engineering

a. The Fleet Operations Engineering Lead Avionics Engineer is directly responsible for the LMP per A.1.b. of this section. The Managing Director of Fleet Operations Engineering (FOE) is co-holder of overall responsibility for the LMP per A.1.b of this section.

b. FOE Avionics Engineers will review and respond to all received copies of Autoland form per paragraph A.2, of this section.

c. FOE Avionics Engineers will respond to all unsatisfactory LMP approach reports per paragraphs A.2., A.3., and A.9 of this section.

d. FOE Avionics Engineers will compile a quarterly report of LMP approaches per paragraph A.2, of this section.

e. FOE Reliability Engineers will collect, analyze, and respond to LMP related data per GPM Sec. 23-23 .

5. Essential LMP Equipment

ATTACHMENT 23

Allied Pilots Association
Flight 1400 Submission

Maintenance and Engineering Responsibilities
Governing Maintenance Operations

02-01 REV-> M&E RESPONSIBILITIES GOVERNING MAINTENANCE OPERATIONS REF. FARs 43.13, 91.403,<-END 121.367, 121.369 AND 121.373

A. GENERAL

1. FAR 43-13, Performance Rules (General), requires that all maintenance and alterations be performed using methods, techniques, and practices acceptable to the FAA administrator. As an air carrier, AA meets this requirement by following the requirements outlined in the approved manual system. American Airlines, through the maintenance and engineering manual system, defines an inspection program and a program covering other maintenance, preventive maintenance, and alterations that ensures that -

   a. Maintenance, preventive maintenance, and alterations performed by it, or by other persons, are performed in accordance with the manual system.

   b. Competent personnel and adequate facilities and equipment are provided for the proper performance of maintenance, preventive maintenance, and alterations; and

   c. Each aircraft released to service is airworthy and has been properly maintained for operation.

B. QUALITY STANDARDS

1. The M&E policy is that each aircraft be maintained both mechanically and in appearance so that the highest standards are met for safety, performance, and reliability. The goal is to produce a product that sets the industry standard for safety, security, and customer satisfaction.

2. Each person performing maintenance must ensure that the practices contained in the maintenance manual are followed. Any misrepresentation of facts or falsification of records is prohibited. In the event specifications and procedures are not defined, the work produced must be of an acceptable level using sound maintenance practices and procedures. **Under no circumstances, including scheduling demands, will aircraft safety be compromised.**

ATTACHMENT 24

Allied Pilots Association
Flight 1400 Submission

MEL General Section,
Section 1, page 11

Monitoring (ECAM) which provides different levels of system condition messages (WARNING, CAUTION, STATUS, and ADVISORY). Any message that affects airplane dispatchability will normally be at the WARNING, CAUTION or STATUS level.

c. F100 airplanes are equipped with Multi Function Display System (MFDS) which provides electronic messages referring to the different priority levels of system information (WARNING (red), CAUTION (amber), AWARENESS (cyan) AND STATUS (white). Any messages that affect airplane dispatchability will be at the WARNING, CAUTION or AWARENESS level. In these cases the MEL must be verified for dispatch capability and maintenance may be required. System conditions that only require maintenance are not presented on the flight deck. These maintenance indications/messages may be presented on the Maintenance Test Panel (MTP) or the Centralized Fault Display Unit (CFDU) and by dedicated Built In Test Evaluation (BITE) of systems.

AB. **Inhabited:** Areas not over frigid or tropical land for which equipment may be necessary for search and rescue operations because of the character of the terrain.

8. MEL/CDL Page Column Descriptions

A. **System Number and Title:** The System numbers and titles are based on ATA Specification 100 and correspond to the Maintenance Manual. Some MEL/CDL item titles also include the Master MEL/ AFM number for reference purposes.

B. **Item Identification Number and Title:** The item numbers are listed sequentially in the left hand column along with the title for that item. When making reference to an MEL/CDL item, both the System Number and the item number should be used; e.g., B737 Air Conditioning Pack is item 21-1, etc. An xx followed by a MEL title may appear in this column to direct the user to another ATA system where that MEL item is located.

C. **MEL Repair Categories:** American Airlines is required to restore MEL deferrals in accordance with specified time limits. The responsibility for compliance with MEL repair time limitations rests with Maintenance and Engineering, which also has the authority to extend Category B and Category C repair time limits. MEL items fall within one of the following classifications:

1. Category A: MEL items which have time limits based on cycles, hours or days. No time extensions are permitted for Category A items. These items must be repaired within the time interval specified in the right hand column.
2. Category B: MEL items which must be repaired within three calendar days, commencing on the day following the day of discovery.
3. Category C: MEL items which must be repaired within 10 calendar days commencing on the day following the day of discovery.
4. Category D: MEL items which must be repaired within 120 calendar days commencing on the day following the day of discovery. No time extensions are permitted for Category D items.
5. If the MEL has a repair category column, a dash in this column indicates that the item is an administrative control item and as such, there is no specified time limit in which repair must be accomplished.

ATTACHMENT 25

Allied Pilots Association
Flight 1400 Submission

Field Maintenance Report (FMR) print out for N454AA
NTSB Maintenance Group Factual Report Attachment 2

```
AC 454  AA  PIR.76                                          SYS 2210

MDIS.14SEP/STL  T-0854                                    EMPL 640150
      FO AP 2 LT INOP

FACT.14SEP/STL/TA                                         EMPL 629611
      RELAMPED THE FOS AP 2 BLUE ENGAGED LIGHT. OPS OKAY
45422E64C/2003.14SEP.STL                                  KQ NBR      1
```

▲ Update this Item ▲

```
AC 454  AA  PIR.82                                          SYS 2450

MDIS.17SEP/ORD  T-9999                                    EMPL 026510
       DC BUS OFF LIGHT ON

FACT.17SEP/ORD/TS                                         EMPL 091084
       T/S/S/ AND REPLACED RELAY R2326. DC EMERG PWR
      XFER RELAY AND DC BUS OFF LITE OPS CKS NORMAL
45424E654/1052.17SEP.ORD                                  KQ NBR      2
```

▲ Update this Item ▲

```
AC 454  AA  PIR.62                                          SYS 2430

MDIS.06SEP/ORD  T-2305                                    EMPL 137728
       DC BUS OFF LIGHT ILLUMINATED

FACT.06SEP/ORD/TS                                         EMPL 133275
       CYCLED POWER FAULT RESET   OPS NML
45424E637/0729.06SEP.ORD                                  KQ NBR      3
```

▲ Update this Item ▲

```
AC 454  AA  PIR.97                                          SYS 2520
                              G/M 01.5  A/M 00.0   G/TIME 01.5

MDIS.25SEP/STL  T-9999                                    EMPL 683904
      WINDOW SHADE AT 8A BROKEN
DFRL.1  /25SEP/STL /TA    RSN. GT                         EMPL 683904
INFO.2  /25SEP/STL                                        EMPL 683904
      DEFERRED WINDOW SHADE AGT SEATG 8A ENTERED ON MIC
      SHEET.RMVD WINDOW SHADE FROM AIRCRAFT. DEFERRAL REF
      25-99T AUTH NBR 9-8437-C

FACT.25SEP/DFW/NC                                         EMPL 138069
      REPLACED WINDOW SHADE ASSY AT SEAT 8A. REMOVED PDL
      9-8437*C, CLEARED MIC SHEET
45425E66E/1306.25SEP.STL                                  KQ NBR      4
```

▲ Update this Item ▲

```
AC 454  AA  TFI.                                            SYS 2520
                     KWRD MISC PART. POSN 8 A                 PRI 2
MEL PRIORITY CODE GRN

MDIS.25SEP/STL                                            EMPL MELINT
     PDL 09-9437-C                        REF.2599T
     MISSING OR BROKEN MISCELLANEOUS PART....
     WINDOW SHADE DAMAGED
PART.25SEP/TTS                                            EMPL 159280
     1   CPN REVR004              QTY      1
      VERIFY CORRECT PARTS PER THE IPC
INFO.1  /26SEP/DFW                                        EMPL 581839
      **********
      MEL 099437 CLEARED  ON 25SEP AT DFW
ATBT.25SEP/TUL     NAME M. D. ANDERSON                    EMPL 159280
1     REPLACE WINDOW SHADE AS PER FINDINGS.  CLEAR MIC
2     SHEET.
```

```
FACT.25SEP/DFW/NC                                          EMPL 138069
      REPLACED WINDOW SHADE ASSY AT SEAT 8A. REMOVED PDL
      9-8437*C, CLEARED MIC SHEET
45425E66D/1029.25SEP.TUL                                KQ NBR      5
```

▲ Update this Item ▲

```
AC 454  AA  PIR.96                                          SYS 2520

MDIS.22SEP/DFW  T-1783                                     EMPL CREW
      LONG STRIP BELOW O/H BIN 20AB IS LOOSE

FACT.22SEP/DFW/TA                                          EMPL MECH
      SECURED CKS OK
45425E66C/2123.22SEP.PHX                                KQ NBR      6
```

▲ Update this Item ▲

```
AC 454  AA  PIR.93                                          SYS 2521

MDIS.21SEP/DFW  T-1315                                     EMPL 089279
      SEAT 9D WONT STAY UPRIGHT

FACT.21SEP/DFW/TH                                          EMPL 120727
      SEAT 9D CHECKS OK
45425E669/0739.22SEP.DFW                                KQ NBR      7
```

▲ Update this Item ▲

```
AC 454  AA  PIR.91                                          SYS 2530

MDIS.20SEP/LAX  T-0379                                     EMPL 052440
      LATCH BROKEN ON GARBAGE BIN AT AFT LH GALLEY
      POSITION

FACT.20SEP/LAX/TA                                          EMPL 142047
      ADJUSTED LATCH OPS CKS NORMAL
45425E664/1442.20SEP.LAX                                KQ NBR      8
```

▲ Update this Item ▲

```
AC 454  AA  PIR.77                                          SYS 2530

MDIS.14SEP/STL  T-0854                                     EMPL 640150
      AFT GALLEY STATION 472 LONG TOOTH ON CART SECURING
      DEVICE STICKY

FACT.14SEP/STL/DC                                          EMPL 680455
      LUBED CART SECURITY ARM OPS NORMAL
45425E64D/2004.14SEP.STL                                KQ NBR      9
```

▲ Update this Item ▲

```
AC 454  AA  PIR.75                                          SYS 2521

MDIS.14SEP/STL  T-1419                                     EMPL 680696
      UPPER POUCH ON SEAT LOCK 5F HAS INBD SPRING BROKEN.
DFRL.1  /14SEP/STL /TA    RSN. GT                          EMPL 670370
INFO.2  /14SEP/STL                                         EMPL 670370
      PLACARDED PER PDL 25-99T ENTERED ON MIC
      SHEET.DEFERRAL REF 25-99T AUTH NBR 9-9232-C

FACT.14SEP/STL/DC                                          EMPL 680455
      REPLACED UPPER SEAT POUCH ARM SPRINGOPS NORMAL
45425E649/0743.14SEP.STL                                KQ NBR     10
```

▲ Update this Item ▲

```
AC 454  AA  TFI.                                            SYS 2520
                    KWRD MISC PART. POSN 5F                   PRI 2
MEL PRIORITY CODE GRN
```

```
MDIS.13SEP/STL                                          EMPL MELINT
     PDL 09-9232-C                        REF.2599T
     MISSING OR BROKEN MISCELLANEOUS PART....
     MAGAZINE POCKET SPRING BROKEN.
PART.14SEP/TTS                                          EMPL 536684
     1   CPN 4063978              QTY      1
     2   CPN 4063980              QTY      1
     3   CPN 4078096              QTY      4
INFO.1  /15SEP/STL                                      EMPL 699280
      **********
      MEL 099232 CLEARED  ON 14SEP AT STL
ATBT.14SEP/TUL      NAME W. R. PROSCH                   EMPL 536684
1     REPLACE THE LIT POCKET SPRING AS NECESSARY.

FACT.14SEP/STL/DC                                       EMPL 680455
      REPLACED UPPER SEAT POUCGH ARM SPRING OPS NORMAL
45425E648/0713.14SEP.TUL                              KQ NBR     11
```

▲ Update this Item ▲

```
AC 454  AA  PIR.73                                        SYS 2521

MDIS.13SEP/STL  T-0819                                  EMPL 638255
      SEAT 9D WILL NOT STAY UP

FACT.13SEP/STL/TA                                       EMPL 680482
      OPERATED SEAT 9D OPS CHECKED NORMAL
45425E645/1313.13SEP.STL                              KQ NBR     12
```

▲ Update this Item ▲

```
AC 454  AA  PIR.70                                        SYS 2532
                    KWRD MAKER      POSN G2 FORWARD
ARM CODE: 25321002                                MSG NBR: 02558943

MDIS.10SEP/LAX  T-1519                                  EMPL 198853
      HOT WATER LIGHT OUT IN GALLEY CM NBR 1 F/C

FACT.10SEP/LAX/AC                                       EMPL 433235
      RELAMPED F/C NBR 1 COFFEE MAKER OPS CHECKS OK.
45425E63F/1928.10SEP.LAX                              KQ NBR     13
```

▲ Update this Item ▲

```
AC 454  AA  PIR.68                                        SYS 2532
                    KWRD MAKER      POSN G1 FORWARD
ARM CODE: 25321001                                MSG NBR: 02558941

MDIS.10SEP/LAX  T-1519                                  EMPL 198853
      HOT WATER LIGHT ON CM NBR 1 AFT GALLEY

FACT.10SEP/LAX/AC                                       EMPL 433235
      RELAMPED F/C NBR 1 COFFEE MAKER OPS CHECKS OK.
45425E63D/1926.10SEP.LAX                              KQ NBR     14
```

▲ Update this Item ▲

```
AC 454  AA  PIR.67                                        SYS 2521
ARM CODE: 2521431D                                MSG NBR: 02558940

MDIS.10SEP/LAX  T-1519                                  EMPL 198853
      SEAT 31D WILL NOT STAY UPRIGHT

FACT.10SEP/LAX/AC                                       EMPL 566773
      SEAT RECLINE AT 31D ADJUSTED AND OPS CK GOOD.  SEAT
      OK FOR SVC.
45425E63C/1926.10SEP.LAX                              KQ NBR     15
```

▲ Update this Item ▲

```
AC 454  AA  PIR.66                                          SYS 2521

MDIS.10SEP/LAX  T-1519                                   EMPL 198853
      ARMREST AT 22A BROKEN

FACT.10SEP/LAX/AC                                        EMPL 566773
      REPLACED ARMREST CAP AT SEAT 22A AS REQUIRED.  SEAT
      OK FOR SERVICE.
45425E63B/1925.10SEP.LAX                              KQ NBR     16
```

▲ Update this Item ▲

```
AC 454  AA  PIR.61                                          SYS 2521
ARM CODE: 2521422E                                MSG NBR: 02558934

MDIS.03SEP/SMF  T-1827                                   EMPL 049537
      22E SEAT BACK WILL NOT RECLINE
INFO.1  /03SEP/SMF                                       EMPL CONTR
      DEFERRED SEAT 22E SEAT BACK PER MEL 2516B AUTH 9
      241C C ENTERED IN MIC SHEET

FACT.04SEP/DFW/TA                                        EMPL 111147
      ADJUSTED SEAT RECLINE 22E/OPS GOOD REMOVED DEV
      9-241C-C 25-16B CLEARED MIC
45425E636/1742.03SEP.SMF                              KQ NBR     17
```

▲ Update this Item ▲

```
AC 454  AA  MEL.                                            SYS 2521
                      KWRD PSGR SEAT. POSN 22E                PRI 2
MEL PRIORITY CODE YLW

MDIS.03SEP/SMF                                           EMPL MELINT
     MEL 09-241C-C                          REF.2516B
     PSGR SEAT SECURED UPRIGHT *DEGRADED*....
     RECLINE INOP - SEATBACK SECURED UPRIGHT
PART.03SEP/TTS                                           EMPL 684820
     1   CPN 4136907                QTY      1
     2   CPN 4065559                QTY      1
     3   CPN 4063530                QTY      1
      POSSIBLE PARTS.  CHECK IPC FOR EFFECTIVITY AND
      APPLICABILITY.
INFO.1  /04SEP/DFW                                       EMPL 443898
      **********
      MEL 090241 CLEARED  ON 04SEP AT DFW
ATBT.03SEP/TUL     NAME J. D. BARTHELS                   EMPL 684820
1     MAKE A THOROUGH CHECK OF THE SEAT RECLINE CABLE
2     ASSEMBLY AND THE HYDROLOCK.  REPLACE ANY SUSPECT
3     PARTS. ENSURE RECLINE MECHANISM PROPERLY ADJUSTED.
4     REF MM 25-23-04-1

FACT.04SEP/DFW/TA                                        EMPL 111147
      ADJUSTED SEAT RECLINE 22E/OPS GOOD REMOVED DEV
      9-241C-C 25-16B CLEARED MIC
45425E635/1914.03SEP.TUL                              KQ NBR     18
```

▲ Update this Item ▲

```
AC 454  AA  TFI.                                            SYS 2520
                      KWRD MISC PART. POSN CAPT               PRI 2
MEL PRIORITY CODE GRN

MDIS.31AUG/SFO                                           EMPL MELINT
     PDL 08-9635-C                          REF.2599T
     MISSING OR BROKEN MISCELLANEOUS PART....
     CAPT SEAT CUSHION WORN-USABLE
PART.31AUG/TTS                                           EMPL 509921
```

```
     1   CPN 4016636                QTY      1
INFO.1  /01SEP/LAX                                    EMPL 352147
      **********
      MEL 089635 CLEARED  ON 31AUG AT LAX
ATBT.31AUG/TUL      NAME L. R. CANTRELL               EMPL 509921
1     REPLACE THE CAPT SEAT BOTTOM CUSHION AS REQUIRED.

FACT.31AUG/LAX/NC                                     EMPL 350845
      REMOVED AND REPLACED CAPTS SEAT CUSHION REMOVED
      PLACARD CLEAR MIC.
45425E632/0540.31AUG.TUL                           KQ NBR     19
```

▲ Update this Item ▲

```
AC 454  AA  PIR.60                                       SYS 2510

MDIS.30AUG/SFO  T-1575                                EMPL CREW
      CAPTS SEAT CUSHION IS VERY HARD. NO CUSHION.
INFO.1  /30AUG/SFO                                    EMPL 433286
      DEFERRED PER PDL 25-99T AUTH 8-9645-C ENTERED IN
      MIC. REQUIRES CPN 4016636

FACT.31AUG/LAX/NC                                     EMPL 350845
      REMOVED AND REPLACED CAPTS SEAT CUSHION REMOVED
      PLACARD CLEAR MIC.
45425E630/0146.31AUG.SFO                           KQ NBR     20
```

▲ Update this Item ▲

```
AC 454  AA  PIR.59                                       SYS 2561

MDIS.30AUG/DFW  T-0670                                EMPL CREW
      SLIDE FELL OUT OF PACK ON FWD CABIN ENTRY DOOR.

FACT.30AUG/DFW/TA                    EMPL2 122503 EMPL 142438
      INSTALLED SERVICABLE SLIDE PACK L1 DOOR.
45425E62F/0144.31AUG.SFO                           KQ NBR     21
```

▲ Update this Item ▲

```
AC 454  AA  PIR.58                                       SYS 2561

MDIS.30AUG/AUS  T-9999                                EMPL MECH
      L-1 DOOR SLIDE LANYARD CABLE BROKEN.

FACT.30AUG/AUS/TA                                     EMPL 329380
      /REPLACED LANYARD.
45425E62E/0143.31AUG.SFO                           KQ NBR     22
```

▲ Update this Item ▲

```
AC 454  AA  TFI.                                         SYS 2620
                                    POSN BOTH

MDIS.29SEP/TUL                      **TECH LIST**     EMPL 650017
      REF OTS ACFT FIRE BOTTLES FIRED DE LH FIRE
PART.29SEP/TTS                                        EMPL 650017
     1   CPN EXT5288                QTY      2
ATBT.29SEP/TUL      NAME J. M. DICIOLLA               EMPL 650017
1     CHECK EACH BOTTLE CONNECTORS ANDVISIBLE WIRING..
2     IF OK THEN REPLACE BOTH FIRE BOTTLES AND CHECK
3     SYSTEM. REF MM 26-20-01-2.
45426E67A/1947.29SEP.TUL...DFRD    1 DAYS          KQ NBR     23
```

▲ Update this Item ▲

```
AC 454  AA  PIR.88                                       SYS 2760

MDIS.18SEP/TUL  T-9999                                EMPL 054490
      MAINT ENTRY SPOILER CONTROL SHUTOFF VALVE LEAKING
```

```
      L/H WHEEL WELL.

FACT.18SEP/TUL/0922                                    EMPL 054490
      REPLACED SPOILER CONTROL SHUTOFF VALVE.OPS CK  LK
      CK. OK.
45427E65D/0358.19SEP.TUL                          KQ NBR     24
```

▲ Update this Item ▲

```
AC 454  AA  TFI.                                        SYS 2899

MDIS.28SEP/TUL                                         EMPL 091705
      *******FLEET MANAGERS REQUEST*********
      DUE TO THE INCREASE OF MICROBIALGROWTH WITHIN THE
      MD80 FUEL TANKS.
      ***MINIMUM OF 8 HOURS OF DWELL TIME REQUIRED***
ATBT.28SEP/TUL     NAME D. L. BIGLER                   EMPL 091705
1     ***********MANDATORY, DO NOT DEVIATE***********
2     ACCOMPLISH MCM SECTION 5 WORK CARD 0926.
3
4     DO NOT ACCOMPLISH THE CARD UNLESS A MINIMUM OF 8
5     HOURS OF DWELL TIME FOR KATHON TOSIT IN TANKS IS
6     AVAILABLE.
7
8     ENTER INTO THE FMR THE DWELL TIME KATHON WAS IN
9     TANKS. CREDIT FOR THIS CARD WILLNOT BE ISSUED
10    UNLESS DWELL TIME IS ENTERED AND TIME IS 8 HOURS OR
11    GREATER.
45428E676/2052.28SEP.TUL...DFRD   2 DAYS          KQ NBR     25
```

▲ Update this Item ▲

```
AC 454  AA  PIR.64                                      SYS 2845

MDIS.08SEP/DFW  T-0339                                 EMPL 094185
      RT WING TANK HAS 7000# FUEL WITH FUEL IN CENTER
      TK.

FACT.08SEP/DFW/TH                                      EMPL 105598
      BALANCED FUEL VERIFIED VTO SHUTOFF GND CKS OK.
45428E639/1221.08SEP.DFW                          KQ NBR     26
```

▲ Update this Item ▲

```
AC 454  AA  PIR.63                                      SYS 2901

MDIS.07SEP/DFW  T-9999                                 EMPL 056762
      MAINT ENTRY: FLEET SERVICE REPORTS, POSSIBLE
      HYDRAULIC LEAK CENTER GEAR AREA

FACT.07SEP/DFW/NC                                      EMPL 130782
      REMOVED AND REPLACED RT GROUND SPOILER HYD P LINE.
      BORROWED FROM A/C NO 208. BORROWED PARTS TAG
      #109176. OPS AND LEAK CKS GOOD
45429E638/1834.07SEP.DFW                          KQ NBR     27
```

▲ Update this Item ▲

```
AC 454  AA  PIR.56                                      SYS 2988
                                   POSN L/H
ARM CODE: 29320101                              MSG NBR: 02958922

MDIS.29AUG/AUS  T-1629                                 EMPL 093980
      LEFT HYDRAAULIC QUANTITY READS OFF SCALE HIGH WITH
      PUMPS OFF

FACT.29AUG/AUS/DC                                      EMPL 329380
      BLED LH HYDRAULIC RESEROIR SERVICED TO FULL
45429E62A/2210.29AUG.AUS                          KQ NBR     28
```

▲ Update this Item ▲

```
AC 454  AA  TFI.                                          SYS 3130
                                    POSN DFDR DOWN        PRI 1

MDIS.28SEP/TUL                        **TECH LIST**     EMPL 650017
      **************ENGINEERING REQUEST**********
      ACCOMPLISH THE FOLLOWING MCM CARD FOR ENGINEERING
      EVALUATION.
PART.28SEP/TUL                                          EMPL 650017
     1   CPN TES9468              QTY     1
ATBT.28SEP/TUL     NAME J. M. DICIOLLA                  EMPL 650017
1     ACCOMPLISH MCM SECTION 12 CARD 31-92-11 AND PERFORM
2     FLIGHT DATA RECORDER DOWNLOAD AND UPLOAD TO THE RDS
3     SYSTEM PER CARD.
UPDT.28SEP/TUL     NAME J. M. DICIOLLA                  EMPL 650017
4     AIRCRAFT CAN NOT FLY UNTIL ENGINEERING HAS REVIEWED
5      DOWNLOAD AND ISSUED APPLICABLE BILL OF WORK AND
6     THAT BILL OF WORK IS COMPLIED WITH.
45431E675/1448.28SEP.TUL...DFRD   2 DAYS          KQ NBR     29
```

▲ Update this Item ▲

```
AC 454  AA  PIR.90                                        SYS 3150

MDIS.20SEP/AUS  T-9999                                  EMPL 113008
      MASTER CAUTION WARNING DOES NOT ILLUMINATE DURING
      ENG FIRE TEST.

FACT.20SEP/AUS/DC                                       EMPL 113008
      REMOVED AND REPLACED MASTER CAUTION CONTROL BOX OPS
      CHECKS GOOD.
45431E661/0838.20SEP.AUS                              KQ NBR     30
```

▲ Update this Item ▲

```
AC 454  AA  PIR.84                                        SYS 3260

MDIS.17SEP/TUL  T-2001                                  EMPL 168241
      ONE BULB BURNED OUT IN LEFT MAIN LANDING GEAR.

FACT.17SEP/TUL/TA                                       EMPL 074948
      REPLACED DEFECTIVE LAMPS IN LEFT LANDING GEAR
      ANNUNCIATOR. OPS CK GOOD IAW MM.
45432E656/1156.17SEP.TUL                              KQ NBR     31
```

▲ Update this Item ▲

```
AC 454  AA  PIR.99                                        SYS 3310
                                    POSN L/H
ARM CODE: 33101801                              MSG NBR: 03358994
                                G/M 00.5 A/M 00.0   G/TIME 00.5

MDIS.26SEP/DFW  T-1342                                  EMPL 013770
      CAPTS BRIEFCASE LIGHT INOP.

FACT.26SEP/DFW/NC                                       EMPL 507851
      RELAMPED BRIEF CASE LIGHT OPS CKOK.
45433E672/2153.26SEP.DFW                              KQ NBR     32
```

▲ Update this Item ▲

```
AC 454  AA  PIR.98                                        SYS 3320
ARM CODE: 33206108                              MSG NBR: 03358993

MDIS.26SEP/DFW  T-1619                                  EMPL 017126
      ONE BULB IN RIGHT AFT LAV INOP

FACT.26SEP/DFW/TA                                       EMPL MECH
      RELAMPED OPS CHECK GOOD
```

45433E671/2104.26SEP.DFW KQ NBR 33

▲ Update this Item ▲

AC 454 AA PIR.95 SYS 3325

MDIS.21SEP/IAD T-1710 EMPL CREW
30E READ LIGHT INOP

FACT.21SEP/IAD/TA EMPL MECH
RELAMPED OPS CK OK
45433E66B/2121.22SEP.PHX KQ NBR 34

▲ Update this Item ▲

AC 454 AA PIR.92 SYS 3325

MDIS.20SEP/LAX T-0379 EMPL 052440
READING LIGHT OUT AT F/A AFT JUMPSEAT

FACT.20SEP/LAX/TA EMPL 142047
RELAMPED LIGHT ASSY OPS CKS NORMAL
45433E665/1444.20SEP.LAX KQ NBR 35

▲ Update this Item ▲

AC 454 AA PIR.85 SYS 3340
POSN L/H
ARM CODE: 33401201 MSG NBR: 03358967

MDIS.17SEP/TUL T-0684 EMPL 089359
BOTH LEFT WING WHITE NAV LIGHTS BURNED OUT.

FACT.17SEP/TUL/TA EMPL 074948
FOUND UPPER LAMP LOOSE, SECURED AND OPS CK GOOD PER
MM.
45433E657/1234.17SEP.TUL KQ NBR 36

▲ Update this Item ▲

AC 454 AA TFI. SYS 3325
KWRD LIGHT..... POSN 31DEF PRI 2
MEL PRIORITY CODE YLW

MDIS.10SEP/LAX EMPL MELINT
PDL 09-9183-C REF.3399A
PSGR SEAT READING LIGHT *SEAT DEGRADED*.
NO SMOKING LIGHT INOP
PART.11SEP/TTS EMPL 612562
1 CPN LIGR007 QTY 1
INFO.1 /12SEP/STL EMPL 679008
****
MEL 099183 CLEARED ON 11SEP AT STL
ATBT.11SEP/TUL NAME S. CONLEY EMPL 612562
1 RELAMP OR REPLACE LIGHT ASSY PER YOUR FINDINGS.

FACT.11SEP/STL/DC EMPL 673036
REPLACED NO SMOKING SEAT BELT LENS ASSY CKD OPS
FOUND NORMAL NO SMOKING SIDE PREV DEACTIVATED
CLEARED MIC SHEET
45433E641/0642.11SEP.TUL KQ NBR 37

▲ Update this Item ▲

AC 454 AA PIR.71 SYS 3320
KWRD LIGHT POSN G1 FORWARD
ARM CODE: 33205001 MSG NBR: 03358944

MDIS.10SEP/LAX T-1519 EMPL 198853
GALLEY LIGHT F/C - OUT

```
FACT.10SEP/LAX/AC                                          EMPL 433235
      RELAMPED F/C GALLEY OPS CHECKS NML.
45433E640/1929.10SEP.LAX                                KQ NBR     38
```

▲ Update this Item ▲

```
AC 454  AA  PIR.69                                          SYS 3320

MDIS.10SEP/LAX  T-1519                                     EMPL 198853
      PSU NO SMOKING SIGN PLACARD MISSING AT SEAT 31DEF
PART.10SEP/LAX                                             EMPL 521717
     1   CPN LIGR007                QTY      1
DFRL.1  /10SEP/LAX /TA    RSN.NS                           EMPL 521717
INFO.2  /10SEP/LAX                                         EMPL 521717
      DEFERED NO SMOKING SIGN PLACARD DUE TO NO STOCK IN
      LAX.  DEFERAL REF. 33-99A AUTH NBR 9-9183-C ITEM
      ENTERED IN MIC SHEET.

FACT.11SEP/STL/DC                                          EMPL 673036
      REPLACED NO SMOKING SEAT BELT LENS ASSY CKD OPS
      FOUND NORMAL NO SMOKING SIDE PREV DEACTIVATED
      CLEARED MIC SHEET
45433E63E/1927.10SEP.LAX                                KQ NBR     39
```

▲ Update this Item ▲

```
AC 454  AA  PIR.65                                          SYS 3320

MDIS.10SEP/LAX  T-1519                                     EMPL 198853
      LAV LIGHT OUT IN RT AFT LAV

FACT.10SEP/LAX/AC                                          EMPL 433235
      RELAMPED RT AFT LAV OPS CHECKS NML.
45433E63A/1924.10SEP.LAX                                KQ NBR     40
```

▲ Update this Item ▲

```
AC 454  AA  PIR.87                                          SYS 3510

MDIS.18SEP/ORD  T-2329                                     EMPL 089611
       FLT CREW O2 BOTTLE PRESSURE LOW

FACT.18SEP/ORD/TS                                          EMPL 054457
       REPLACED CREW O2 BOTTLE  LEAK CK O.K..
45435E65B/1340.18SEP.ORD                                KQ NBR     41
```

▲ Update this Item ▲

```
AC 454  AA  PIR.74                                          SYS 3520

MDIS.13SEP/STL  T-0819                                     EMPL 638255
      THE PANEL THAT HOUSES THE AFT FAS 02 MASK CAME OFF
      AND WOULD NOT STAY ON.

FACT.13SEP/STL/TA                                          EMPL 680482
      REINSGTALLED COVER TO AFT FAS 02 MASK
45435E646/1314.13SEP.STL                                KQ NBR     42
```

▲ Update this Item ▲

```
AC 454  AA  PIR.81                                          SYS 4910

MDIS.16SEP/ORD  T-1311                                     EMPL 086068
       MAINT ENTRY:  FOUND APU BLEED VALVE NOT FULLY
      OPENING
DFRL.1  /16SEP/ORS /TS     RSN. RR                         EMPL 086060
INFO.2  /16SEP/ORD                                         EMPL 086060
       PLAC APU AIR INOP PER MEL 49-8 AUTH
      9-1353DC-CENTERED ON MIC SHEET
```

```
FACT.16SEP/ORD/DC                                          EMPL 084596
      REPLACED TRA 5159 ON APU OPS AND LKS CKS GOOD.
      REMOVED DEVIATION MEL REF 49-8. AUTH 9-1353DC-C.
      CLEARED MIC SHEET
45449E652/0128.17SEP.ORD                                KQ NBR     43
```

▲ Update this Item ▲

```
AC 454  AA  MEL.                                            SYS 4910
                      KWRD VALVE.....POSN APU AIR             PRI 2
MEL PRIORITY CODE YLW

MDIS.16SEP/ORD                                             EMPL MELINT
     MEL 09-1353DC-C                    REF.4908
     APU BLEED AIR VALVE *GRD AIR REQD*......
     LOW APU AIR PRESS.
PART.16SEP/TTS                                             EMPL 536684
     1   CPN VAL5836                QTY      1
     2   CPN 5937909                QTY      1
     3   CPN TRA5159                QTY      1
INFO.1  /17SEP/ORD                                         EMPL 037285
      **********
      MEL 091353 CLEARED  ON 16SEP AT ORD
ATBT.16SEP/TUL     NAME W. R. PROSCH                       EMPL 536684
1     REVIEW LOGBOOK AND PERFORM FAULT REVIEW ON
2     APU ECU, USING MCM SEC 12 CARD 49-96-92,
3     TROUBLESHOOT
4     AND REPAIR PER FINDINGS..

FACT.16SEP/ORD/DC                                          EMPL 084596
      REPLACED TRA 5159 ON APU OPS AND LK CKS GOOD.
      REMOVED DEVIATION MEL REF 49-8 AUTH 9-1353 CLEARED
      MIC SHEET
45449E64F/1318.16SEP.TUL                                KQ NBR     44
```

▲ Update this Item ▲

```
AC 454  AA  PIR.94                                          SYS 5250

MDIS.21SEP/DFW  T-1315                                     EMPL 089279
      FIRST CLASS LAV - RING AROUND LOCK LATCH LOOSE

FACT.21SEP/DFW/TH                                          EMPL 120727
      SECURED RING AT F/C LAV LOCK LATCH, CHECKS OK
45452E66A/0740.22SEP.DFW                                KQ NBR     45
```

▲ Update this Item ▲

```
AC 454  AA  TFI.                                            SYS 5399
                                                              PRI 4

MDIS.13SEP/TUL                                             EMPL 482896
      *******ENGINEERING REQUEST**********
      ***********B-CHECK ITEM ONLY***********
DFRL.3  /18SEP/TUL /0922  RSN. RR                          EMPL 115457
INFO.4  /23SEP/LGA                                         EMPL 673903
      INSPECTED LOWER WING TO BODY FILET PANELS FOUND NO
      SCRATCHES AND CREASES
DFRL.5  /24SEP/LGA /TS    RSN.RR                           EMPL 494625
INFO.6  /24SEP/LGA                                         EMPL 494625
      CONT DFRL TO NEXT B-CK
ATBT.13SEP/TUL     NAME J. E. HARDEE                       EMPL 482896
1     INSPECT LOWER WING TO BODY FILLET PANELS FOR ANY
2     POSSIBLE SCRATCHES OR CREASES. CONTACT TECH
3     SERVICES WITH FINDINGS.
45453E647/1402.13SEP.TUL...DFRD  17 DAYS                KQ NBR     46
```

▲ Update this Item ▲

```
AC 454  AA  TFI.                                              SYS 5400
                                    POSN LH

MDIS.29SEP/TUL                      **TECH LIST**     EMPL 650017
      INSPECT PYLON DUE TO FIRE
ATBT.29SEP/TUL     NAME J. M. DICIOLLA                EMPL 650017
1     REQUEST QA INSPECTION IN ADDITION TO REQUIRED
2     INSPECTION FOR ENGINE CHANGE PER MCM 0596-13.
3     OBSERVE MCM SECTION 8 CARD 8451. BEYOND CHECKS FOR
4     STRUCTURAL CONCERNS CHECK FOR FIRE DAMAGE TO
5     WIRING..CONNECTORS.. TUBING ETC. DOCUMENT YOUR
6     FINDINGS INT THE FMR.
45454E679/1911.29SEP.TUL...DFRD    1 DAYS          KQ NBR      47
```

▲ Update this Item ▲

```
AC 454  AA  TFI.                                              SYS 7110
                                    POSN L/H ENG              PRI 1

MDIS.29SEP/TUL                      **TECH LIST**     EMPL 344018
      REPLACE L/H ENGINE PYLON APRON ASSEMBLY DUE
      TO HEAT DAMAGE.
PART.29SEP/TUL                                        EMPL 344018
     1   CPN APR3003                QTY      1
     2   CPN 5541096                QTY      4
ATBT.29SEP/TUL     NAME S. R. ITAK                    EMPL 344018
1     DUE TO FIRE DAMAGE REPLACE L/H ENGINE APRON
2     ASSEMBLY PER M/M 71-10-04-2..SRM 57-30-01
3     REF IPC 71-10-06-05
45471E67C/2036.29SEP.TUL...DFRD    1 DAYS          KQ NBR      48
```

▲ Update this Item ▲

```
AC 454  AA  TFI.                                              SYS 7110
                                    POSN LH                   PRI 1

MDIS.29SEP/TUL                      **TECH LIST**     EMPL 650017
      REPLACE COWL ACCESS DOORS UPPER AND LOWER
PART.29SEP/TTS                                        EMPL 650017
     1   CPN COW3002                QTY      1
     2   CPN COW3004                QTY      1
     3   CPN COW3006                QTY     1
ATBT.29SEP/TUL     NAME J. M. DICIOLLA                EMPL 650017
1     DUE TO FIRE DAMAGE REPLACE ALL THREE COWL DOORS.
2     REF MM 71-10-03-2-1
45471E677/1901.29SEP.TUL...DFRD    1 DAYS          KQ NBR      49
```

▲ Update this Item ▲

```
AC 454  AA  TFI.                                              SYS 7290
DSN  725872                         POSN 1

MDIS.29SEP/FOE                                        EMPL ENGRMV
      SHUTDOWN NBR 1 ENG ON 29SEP AT STL.
              REASON - SHUTDOWN
      TSI             -  5339
      TSV             -  5339
INFO.1  /30SEP/FOE                                    EMPL ENGRMV
      120
      S/D 120LH ENGINE FIRE, START VALVE OPEN LIGHT ON..

FACT.29SEP/FOE/XX                                     EMPL ENGRMV
      CPN/SERIAL NBR S/D  ENG3327/          725872
45472E67B/2034.29SEP.TUL                          KQ NBR      50
```

▲ Update this Item ▲

```
AC 454  AA  TFI.                                              SYS 7200
```

```
                                        POSN LH                 PRI 1

MDIS.29SEP/TUL                        **TECH LIST**     EMPL 650017
      REPLACE LH ENGINE
PART.29SEP/TTS                                          EMPL 650017
     1   CPN ENG3327                  QTY      1
ATBT.29SEP/TUL     NAME J. M. DICIOLLA                  EMPL 650017
1     REPLACE THE LH ENGINE. OBSERVE MM 71-91-99.
UPDT.29SEP/TUL     NAME J. M. DICIOLLA                  EMPL 650017
2     ***IMPORTANT***REPLACE MOUNTS PRECAUTIONARY AND
3     CONE BOLTS. CHECK YOKES AND MOUNT FOR THE ISOLATORS
4     FOR DAMAGE.
45472E678/1907.29SEP.TUL...DFRD   1 DAYS          KQ NBR     51
```

▲ Update this Item ▲

```
AC 454  AA  TFI.                                        SYS 7290
DSN  717354                          POSN 2

MDIS.18SEP/FOE                                          EMPL ENGRMV
      REPLACED NBR 2 ENG ON 18SEP AT TUL.
      REMOVAL REASON - TIME
      TSI            -  8202
      TSV            - 19072
INFO.1  /19SEP/FOE                                      EMPL ENGRMV
      040 TIME - LIFE LIMITED PART
      LIFE LIMITED PART

FACT.18SEP/FOE/XX                                       EMPL ENGRMV
      CPN/SERIAL NBR OFF  ENG3327/          717354
         SERIAL NBR ON                      709934
45472E65C/0034.19SEP.TUL                          KQ NBR     52
```

▲ Update this Item ▲

```
AC 454  AA  PIR.72                                      SYS 7399

MDIS.12SEP/LAX  T-0793                                  EMPL CREW
      INFO TO MAINT:  LEFT EGT ENGINE REACHED 470 DEGREES
      ON START IN LAS.

FACT.12SEP/LAX/TA                                       EMPL 142047
      INFO NOTED EGT WITHIN LIMTS PER MM.
45473E642/1443.12SEP.LAX                          KQ NBR     53
```

▲ Update this Item ▲

```
AC 454  AA  PIR.57                                      SYS 7988
                                     POSN L/H
ARM CODE: 79010001                             MSG NBR: 07958923

MDIS.29AUG/AUS  T-1629                                  EMPL 093980
      LEFT ENGINE NEEDS OIL SERVICE

FACT.29AUG/AUS/DC                                       EMPL 329380
      SERVICED LEFT ENGINE OIL TO FULL
45479E62B/2211.29AUG.AUS                          KQ NBR     54
```

▲ Update this Item ▲

```
AC 454  AA  PML. 1 **ALERT**                            SYS 8000
DSN 19SEP/3 **REPEAT**KWRD VALVE..... POSN LT              PRI 2
MEL PRIORITY CODE YLW

MDIS.27SEP/DFW  T-2328                                  EMPL 092651
      LEFT START VLV DID NOT OPEN ON ENGINE START.
      ********************* MEL DATA *********************
     MEL 09-2293C-C                        REF.8002
     ENGINE START VALVE.....................
```

```
     LT START VALVE REPLACE NO HELP
PART.27SEP/TTS                                          EMPL 071625
     1   CPN 5725996                QTY      1
     2   CPN 5460085                QTY      2
INFO.1  /27SEP/DFW                                      EMPL 091747
      RPLCD LT ENG START VLV NO HELP PLCADED LT ENG START
      VLV INOP PER MEL VLV OPENED & VERIFIED CLOSED PER
      MPM.
ATBT.27SEP/TUL      NAME T. J. LACKMAN                  EMPL 071625
1     SUGGEST TROUBLESHOOT WIRING. REF WDM 7411-00
2     START VALVE HAS BEEN REPLACED REF MM
3     80-10-02-2.CHECK OPERATION OF VALVE REPAIR PER
4     YOUR FINDING.
5     **** NOTE START VALVE REPLACE IN DFW 27/SEPT/07
6     AND IN ORD 16/SEPT/07
7     START VALVE SWITCH REPLACE IN SEPT/19/07
45480E673/0901.27SEP.TUL...DFRD   3 DAYS          KQ NBR     55
```

▲ Update this Item ▲

```
AC 454  AA  PIR.86 **ALERT**                              SYS 8000

MDIS.17SEP/ORD  T-2333                                  EMPL 089359
      LEFT ENGINE START VALVE WILL NOT OPEN
INFO.1  /17SEP/ORD                                      EMPL 165219
      REF 80-2 AUTH 9-1455C-C PLACARDED LEFT ENG START
      VALVE INOP PER MEL. ENTERED IN MIC SHEET
INFO.2  /17SEP/DFW                                      EMPL 300005
      REPLACED START VALVE, NO HELP, FOUND AIR FILTER
      (CPN 5463619) NOT ALLOWING AIR FLOW TO VALVE.
      PART NIS AT DFW. CONTINUE DEFERRAL TULSA TECH
      NOTIFIED.
DFRL.3  /17SEP/ORD /PS    RSN. FT                       EMPL 113145
INFO.4  /17SEP/ORD                                      EMPL 113145
       432399/ REMOVED AND REPLACED 8TH STAGE CHECK VALVE
      AND AIR FILTER FOR START VALVE. ON INITIAL START
      SEQUENCE W/ APU AIR ON. START VALVEWONT OPEN.
      AFTER CYCLNG START SWITCH THE SECOND TIME, START
      VALVE OPENS AND ENGINE STARTS TURNING. ONLY HAPPENS
      WHEN APU AIR SWITCH IS INITIALLY TURNED ON W/ 0
      DUCT PRESSURE

FACT.18SEP/TUL/0922                                     EMPL 127531
      STARTED L/H ENG SEVERAL TIMES. COULD NOT DUPLICATE.
      START VALVE OPERATED NORMAL. OK FOR SERVICE. RMVD
      PLACARD AND CLEARED MIC SHEET.
45480E659/1641.17SEP.ORD                               KQ NBR     56
```

▲ Update this Item ▲

```
AC 454  AA  MEL.   **ALERT**                              SYS 8000
                   KWRD VALVE..... POSN LEFT                PRI 2
MEL PRIORITY CODE YLW

MDIS.17SEP/ORD                                          EMPL MELINT
     MEL 09-1455C-C                    REF.8002
     ENGINE START VALVE.....................
PART.17SEP/TTS                                          EMPL 612562
     1   CPN VAL6256                QTY      1
INFO.1  /17SEP/DFW                                      EMPL 300005
      REPLACED START VALVE, NO HELP, FOUND AIR FILTER
      (CPN 5463619) NOT ALLOWING AIR FLOW TO VALVE.
      PART NIS AT DFW. CONTINUE DEFERRALTULSA TECH
      NOTIFIED.
DFRL.2  /17SEP/ORD /PS    RSN. FT                       EMPL 113145
INFO.3  /17SEP/ORD                                      EMPL 113145
```

```
      432389/ ATBT ACCOMPLISHED . NO HELP. NEEDS FURTHER
      T/S..
INFO.4  /19SEP/TUL                                    EMPL 127505
      **********
      MEL 091455 CLEARED  ON 18SEP AT TUL
ATBT.18SEP/TUL     NAME S. CONLEY                     EMPL 612562
1     FIELD REPORTS LT ENG START SWITCH REQUIRES
2     ENGAGEMENT TWICE TO OPEN START VALVE EVENTHOUGH APU
3     AIR RAMPS UP TO 40 PSI.REF WDM 7411-00 PG 557 AND
4     WDM 49-31-01 PG 516 SHT 3. REMOVE APU ECU AND DISC
5     STARTER PLUG P1-838 AND MEG WIRING FROM C/B B11 TO
6     PIN A OF PLUG P1-838 AND PIN B10 OF ECU PLUG
7     R5-604A. THE START SIGNAL SPLITS FROM TERMINAL
8     BLOCK S3-48 AND GOES TO BOTH STARTER AND ECU.

FACT.18SEP/TUL/0922                                   EMPL 127531
      STARTED L/H ENG SEVERAL TIMES, COULD NOT DUPLICATE.
      START VALVE OPERATED NORMAL , OK FOR SERVICE. RMVD
      PLACARD AND CLEARED MIC SHEET.
45480E658/1543.17SEP.TUL                          KQ NBR     57
```

▲ Update this Item ▲

```
AC 454  AA  PML.89 **ALERT**                          SYS 8000
                   KWRD VALVE..... POS LH              PRI 2
MEL PRIORITY CODE YLW

MDIS.19SEP/ORD  T-1548  *DOD*                         EMPL 093693
      LEFT ENGINE START VALVE WOULD NOT OPEN UNTIL THE
      FOURTH ATTEMPT.
      ********** MEL DATA **********
     MEL 09-1672C-C                    REF.8002
     ENGINE START VALVE.....................
     WONT OPEN
DFRL.1  /19SEP/ORD /TA    RSN. FT     EMPL2 055300 EMPL 164808
INFO.2  /19SEP/ORD                                    EMPL 164808
      55300/DEFERED LEFT ENGINE STARTER SHUT OFF VALVE
      MAINT PER MEL ENTERED ON MIC SHEET MPM 80-2
      ACCOMPLISHED.
INFO.3  /20SEP/AUS                                    EMPL 340702
      **********
      MEL 091672 CLEARED  ON 19SEP AT AUS
ATBT.19SEP/TUL     NAME J. H. HAMILTON                EMPL 462616
1     PREVIOUS HISTORY.2 VALVES REPLACED, NO HELP...
2     TROUBLESHOOT WIRING PER WDM 7411-00.REPAIR AS
3     REQUIRED.

FACT.19SEP/AUS/DC                                     EMPL 329380
      /REPLACED #1 ENGINE START SWITCH AND START VALVE.
      OPS CKS OK. LK CK OK. REMOVED PLACARD CLEARED MIC.
45480E65F/1726.19SEP.TUL                          KQ NBR     58
```

▲ Update this Item ▲

```
AC 454  AA  PIR.79 **ALERT**                          SYS 8000

MDIS.16SEP/TPA  T-0214                                EMPL 680624
      LH START VALVE WILL NOT OPEN

FACT.16SEP/TPA/TS                                     EMPL 629413
      REPLACED LEFT ENG START VALVE- OPS NORMAL
45480E650/0125.17SEP.ORD                          KQ NBR     59
```

▲ Update this Item ▲

```
AC 454  AA  PIR.80 **ALERT**                          SYS 8000
```

```
MDIS.16SEP/ORD  T-1311                                    EMPL 027111
       REPORT WRITE UP #79 LEFT START VALVE WILL NOT
      OPEN

FACT.16SEP/ORD/TS                                         EMPL 086060
       REMOVED & REPLACED #1 ENG START VALVE PER M/M
      START VALVE OPERATION NORMAL
45480E651/0126.17SEP.ORD                              KQ NBR     60
```

▲ Update this Item ▲