Empowering Airline Customers

through Support Data

Jamie Kessel – Boeing Technical Architect

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- **Presentation Overview**
  - **Regulatory requirements**
    - **Engineering**
    - **Maintenance**
  - **Data Sources**
  - **Types of data**
    - **Engineering**
    - **Maintenance**
  - **Delivery methods**
  - **Access Methods**
  - **Wrap-up/Q&A**

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- **What are the pertinent regulations from the FAA for Airlines and Aircraft Manufacturers?**

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- **Federal Aviation Administration CFR Part 121 – Operating Requirements: Domestic, Flag, and Supplemental Operations**
- **Federal Aviation Administration CFR Part 135 – Rules for Commuter and On-demand Operations (e.g. Corporate, etc…)**
- **Federal Aviation Administration CFR Part 25 – Airworthiness Standards: Transport Category Airplanes**

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- **Sounds awesome! Where does the data come from for Engineering and Maintenance data customers use?**

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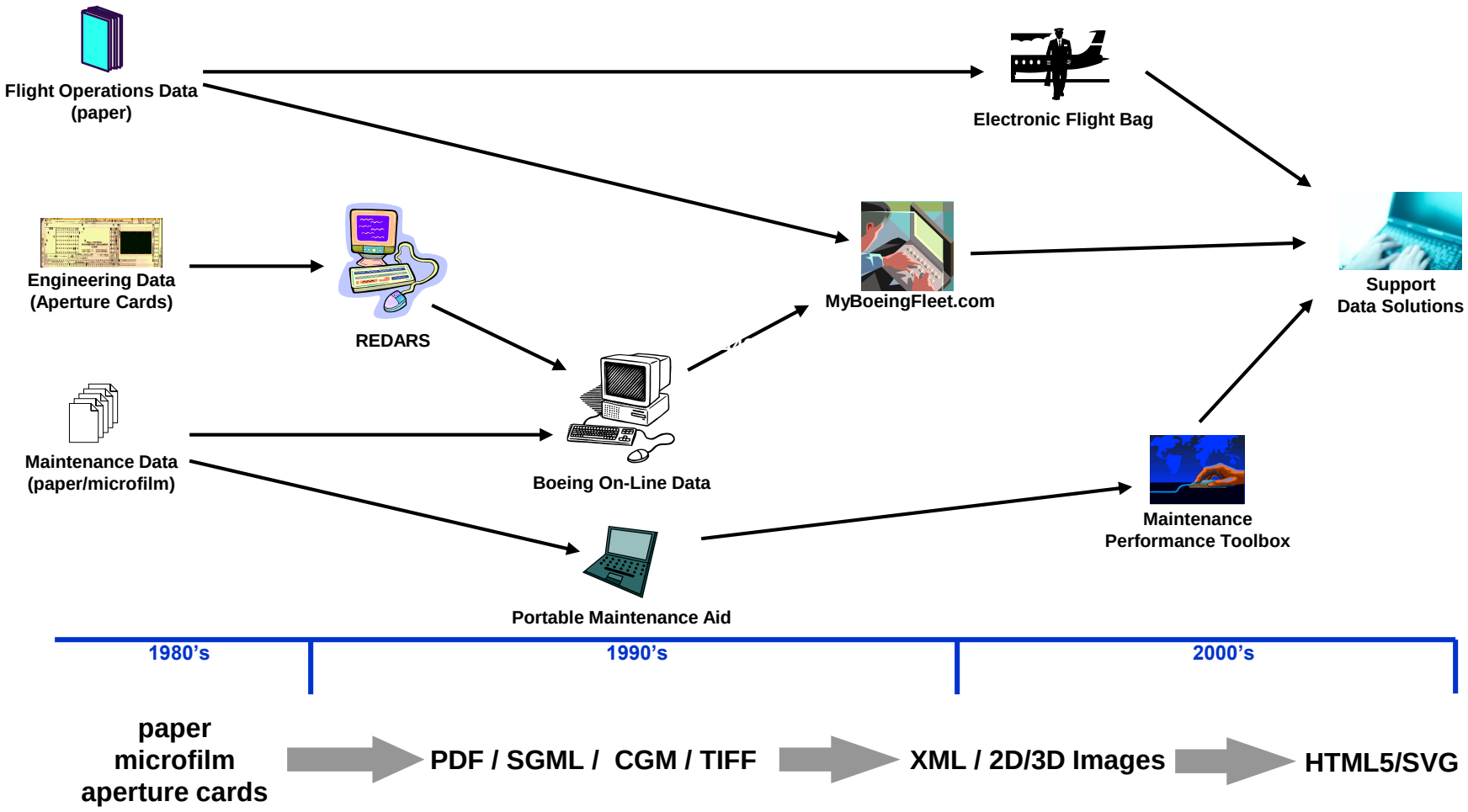

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- **Engineering Data**
  - **LOPA (Layout of Passenger Arrangements)**
  - **Standard Parts**
  - **Engineering Bill of Materials (EBOM)**
  - **Material and Process Specifications**
  - **Drawings & new Graphics formats (e.g. 3DPDF)**
  - **Extrusions & Shapes**
  - **Markers & Placards**

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Engineering Data used by Airline Customers

Engineering Drawings/ 3DPDFs

Engineering BOM

- **Understand Overall Configuration of Parts**
- **Find Part Number Based on Illustration**
- **View Shape of Part**
- **Identify Interchangeability**
- **View Part Dimensions & Tolerances**
- **Identify Part Effectivity**
- **Bill of Material Part Information/Notes**
- **Find Used-On and Component Breakdown of Parts**
- **Composite Ply-Layup Data**

- Primary User Communities
  - **Engineering Maintenance Support**
    - Support Inspection and Repair of Damage
    - Create Specification for Part Fabrication
  - **Project Engineers**
    - Write EO (Engineering Order) to Support Boeing-Generated Industry Service Bulletin
    - Write EO to Support Airline-Solicited Service Bulletin
    - Write EO to Support Internal Modification of Aircraft

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Maintenance Data used by Airline Customers

- Maintenance and Repair Documents
  - Aircraft Maintenance Manual (AMM)
    - Part 1 (System Description Section, SDS)
    - Part 2 (AMM)
  - Fault Isolation Manual (FIM)
  - System Schematics Manual (SSM)
  - Wiring Diagram Manual (WDM)
  - Standard Wiring Practices Manual (SWPM)
  - Illustrated Parts Catalog (IPC)
  - Structural Repair Manual (SRM)
- Service Documents
  - Service Bulletins (SB) and Service Letters (SL)
- Component Maintenance Manual (CMM)
- Structure of the Manuals
- Change Management
  - Revision Cycles
  - Temporary Revisions
  - Customer Originated Change (COC)

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Aircraft Maintenance Manual

- **AMM Part 1 - System Description Section (SDS)**
  Contains information on component location, system operation, and Training Information Points for all systems and equipment installed in the airplane.

- **AMM Part 2 – Practices and Procedures**
  Contains information required to service, trouble shoot, functionally check, and repair or replace all systems and equipment installed in the family of airplanes normally requiring such action on the line or in the maintenance hangar. The Airplane Maintenance Manual (AMM) also contains information on inspection and maintenance of airplane structure; however, information on repair of airplane structure is contained in the Structural Repair Manuals.

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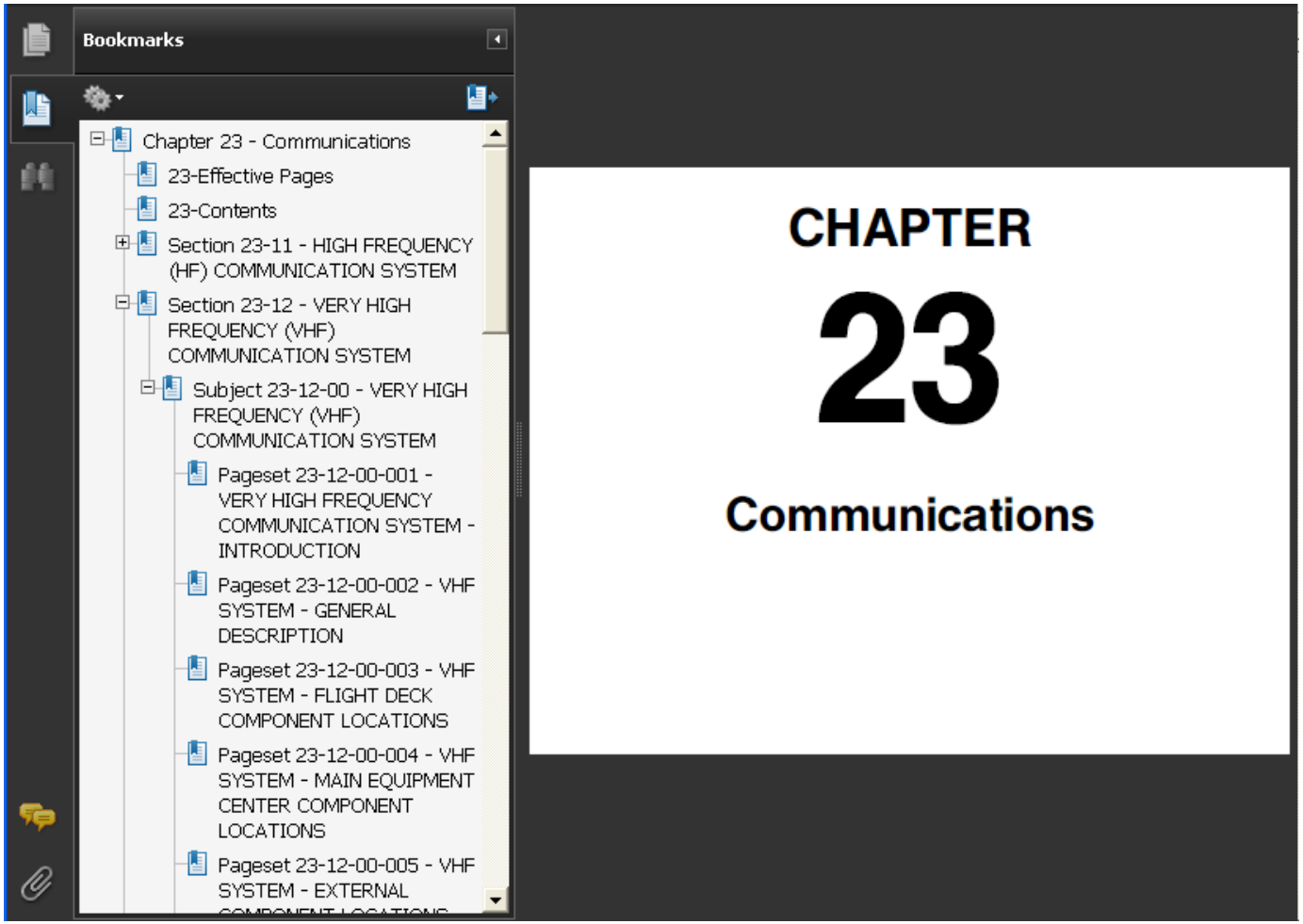
Aircraft Maintenance Manual



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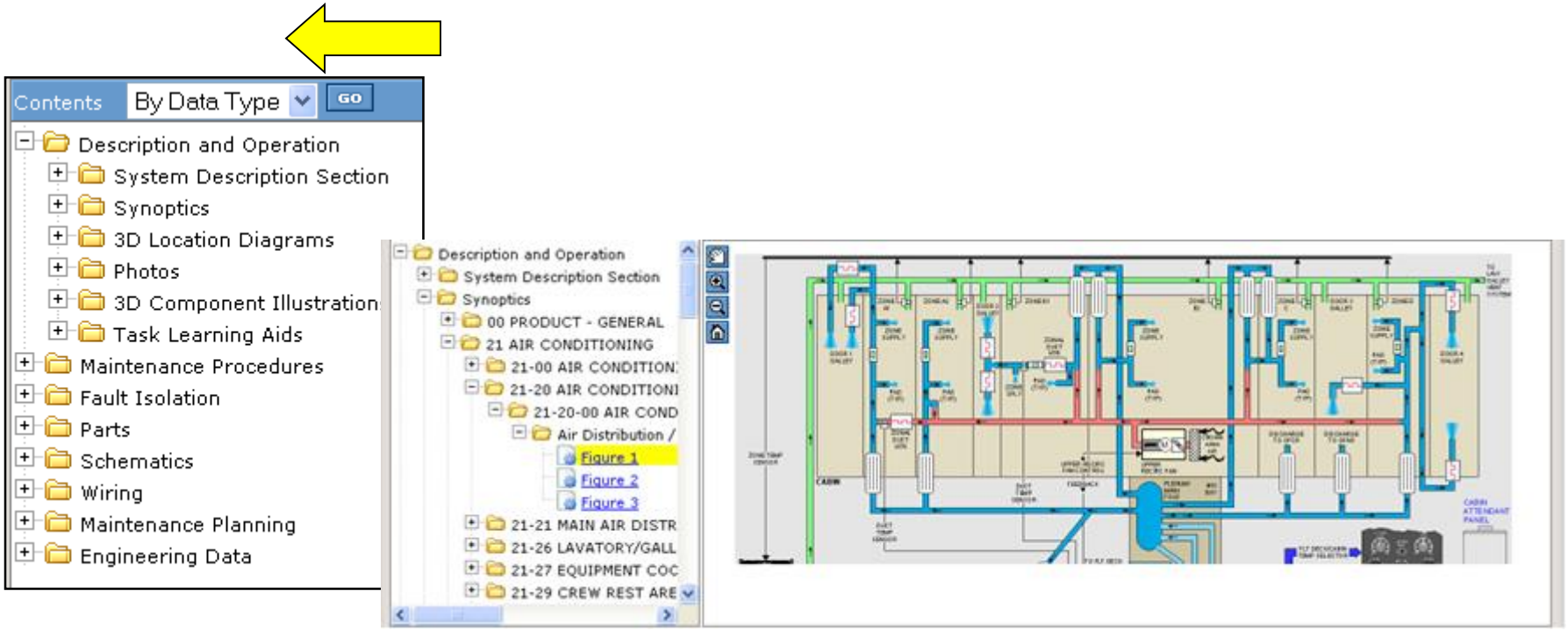
Synoptics



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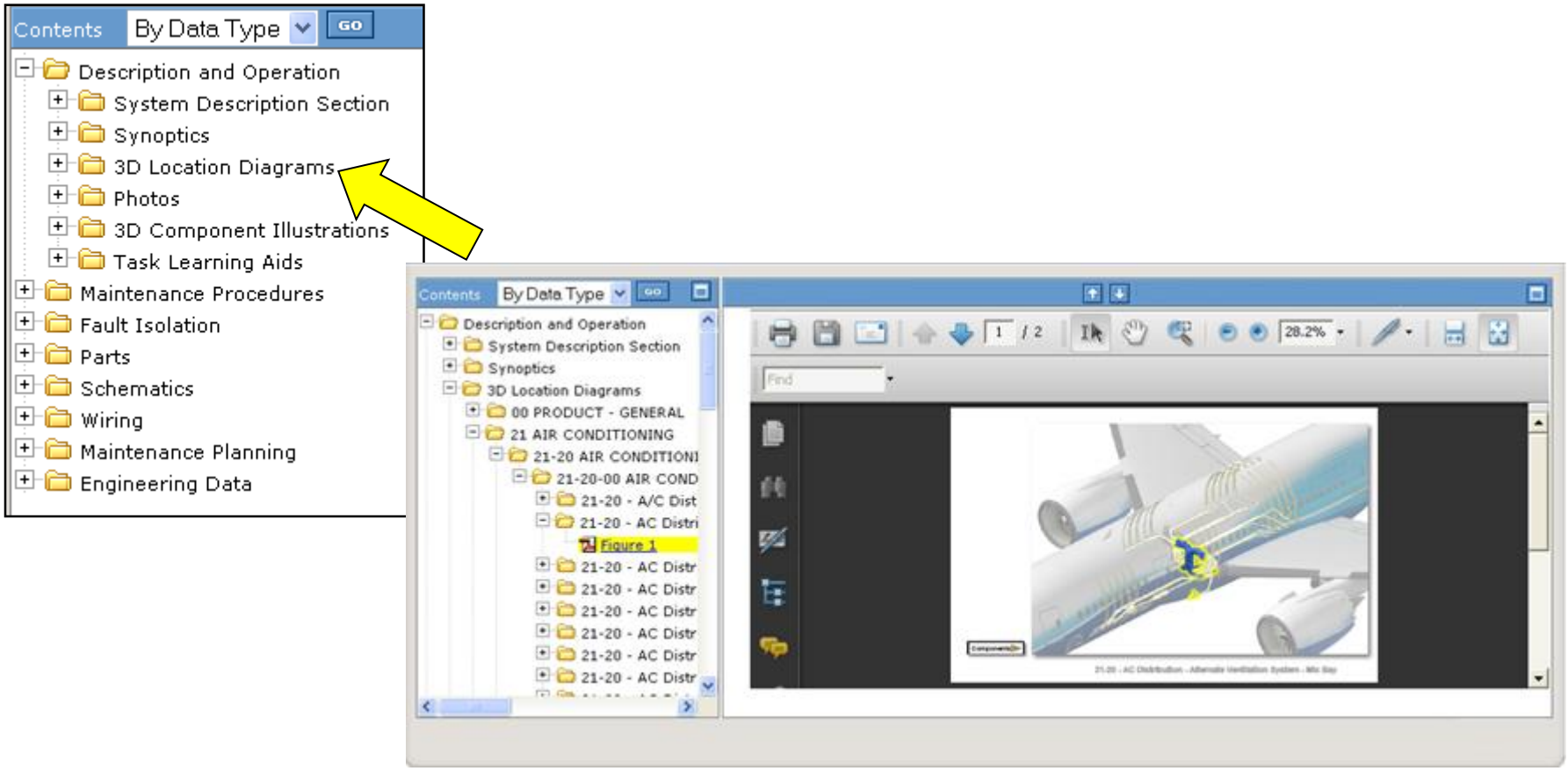
3D Component Locator Guide



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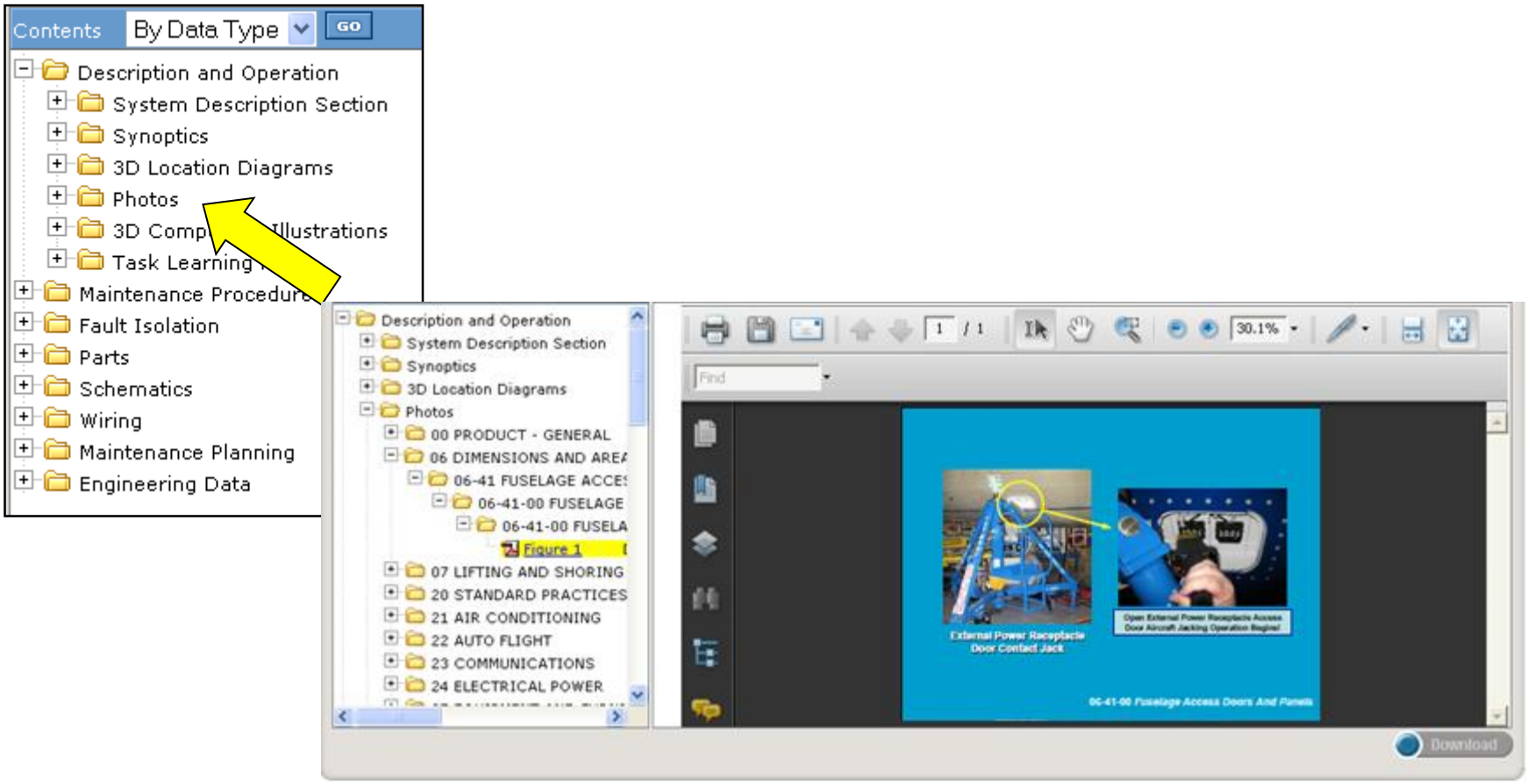
Photos



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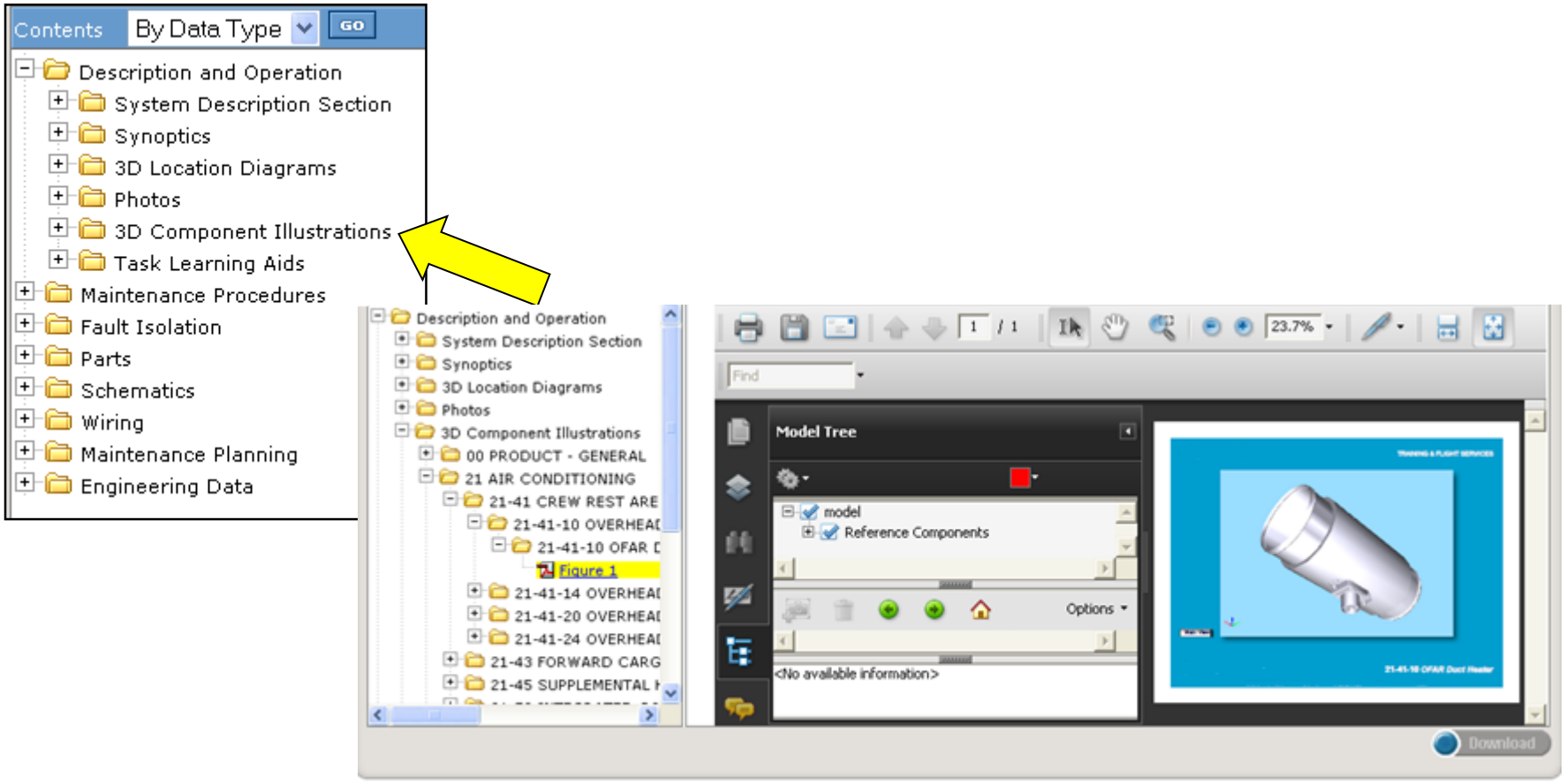
Global Product Data Interoperability Summit | **2017**



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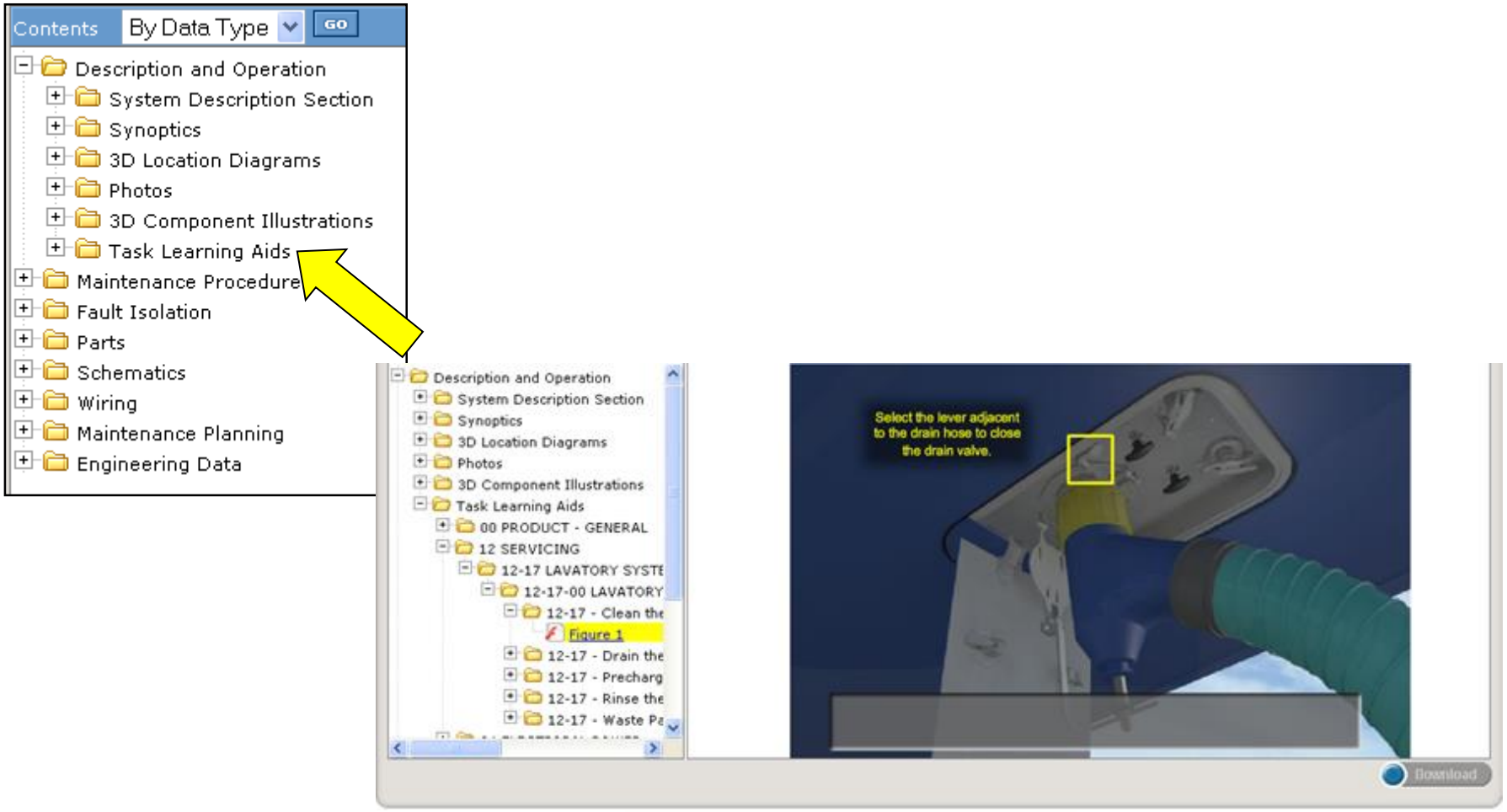
Tasks Training Materials



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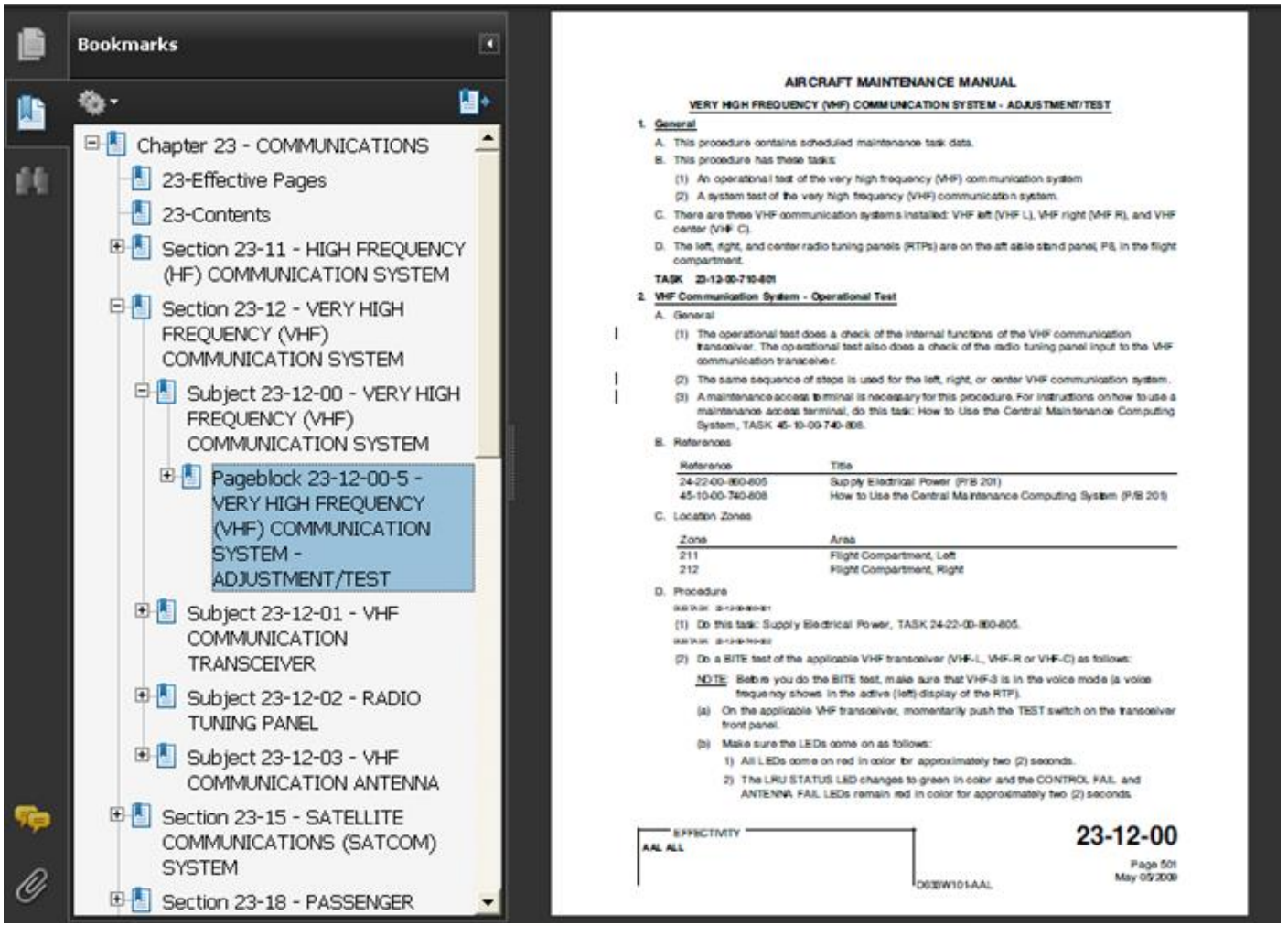
AMM Part 2 – Practices and Procedures



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Fault Identification Manual

- **What it is:**
- The Fault Isolation Manual contains information necessary to isolate and correct faults in systems and equipment installed.

- **What it's for:**
- Troubleshooting identified faults on the airplane

- **Primary Fault Identification:**
- EICAS Messages (the message that appears to the pilots on the instrument panel)
- Observed Faults (those faults that are detected by means other than BIT)
- Maintenance Messages (numeric code indicating a fault from a BIT)
- Cabin Faults (faults that appear in the cabin specifically)

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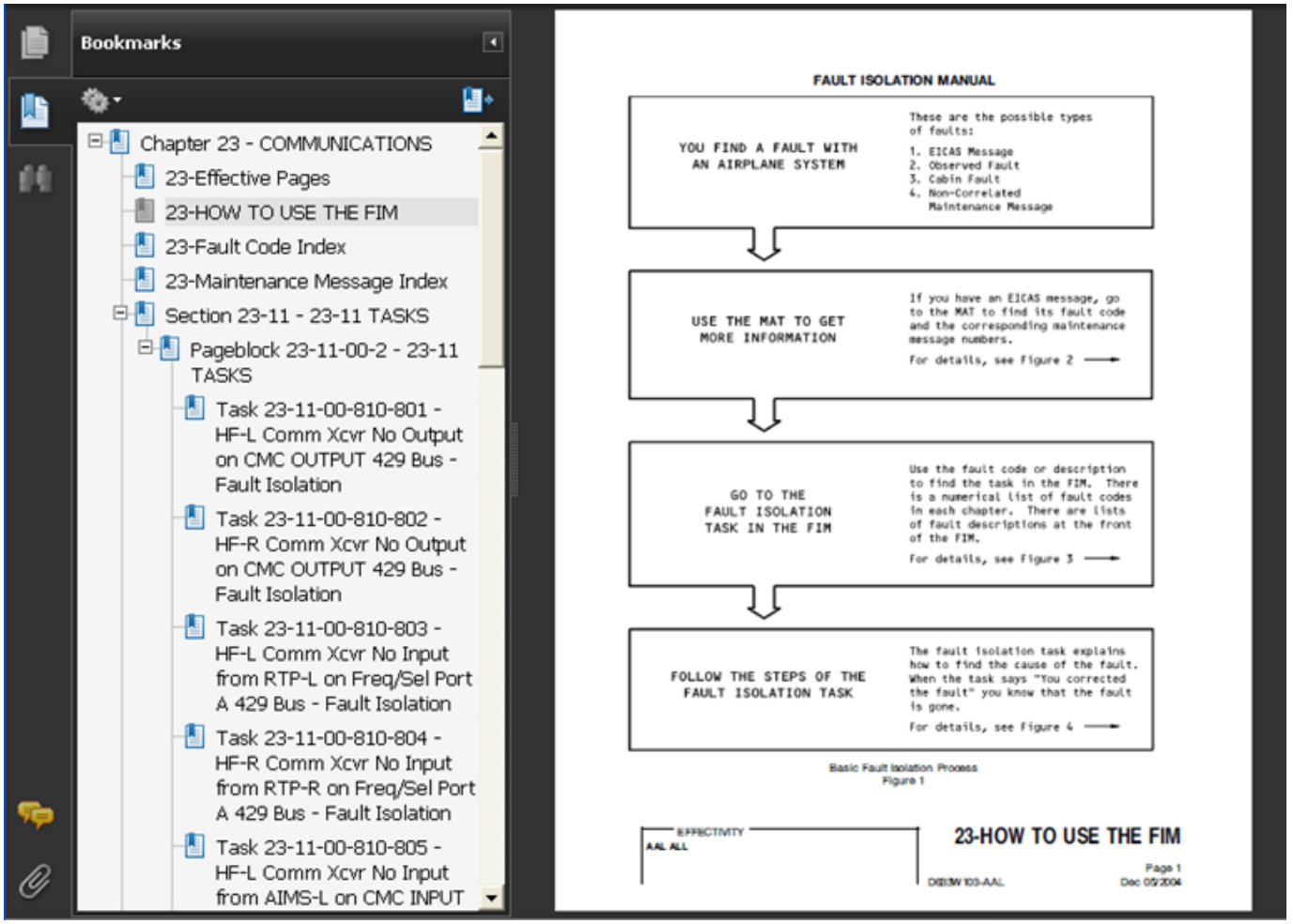
FIM Example



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Wiring Diagram Manual (WDM)

- **What it is:**
- The Boeing Wiring Diagram Manual (WDM) is a collection of diagrams, drawings, and Lists which define the wiring and hookup of associated equipment installed on the listed Boeing airplanes.

- **What it's for:**
- Detailed troubleshooting and engineering research

- **Example of when you would use a WDM**: A mechanic receives a fault report from the pilot and uses the FIM to troubleshoot the fault. The fault isolation procedure leads the mechanic to the conclusion that there is a problem with a signal flow between two components. The mechanic needs to check the signal between the two components.

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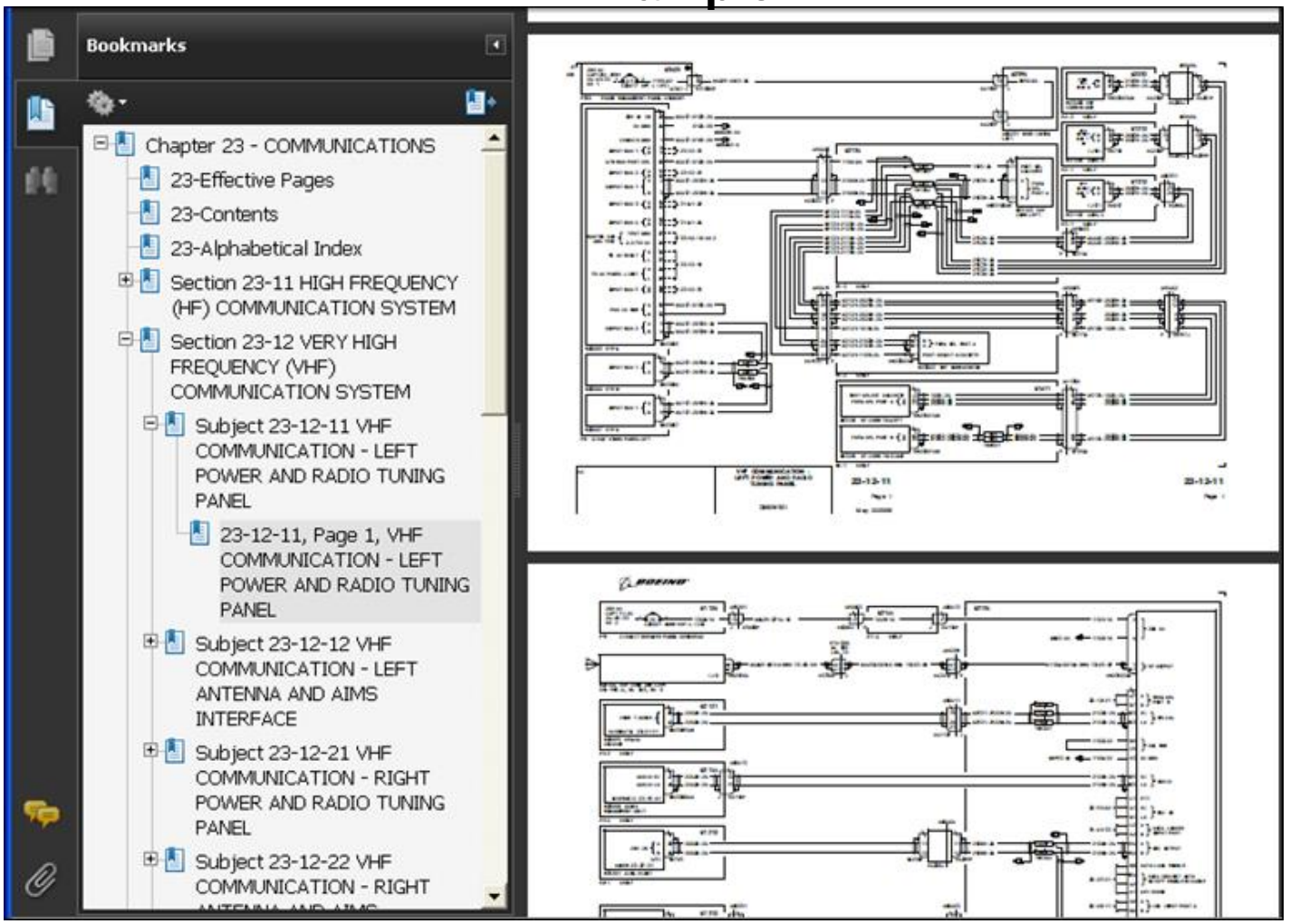
WDM Example



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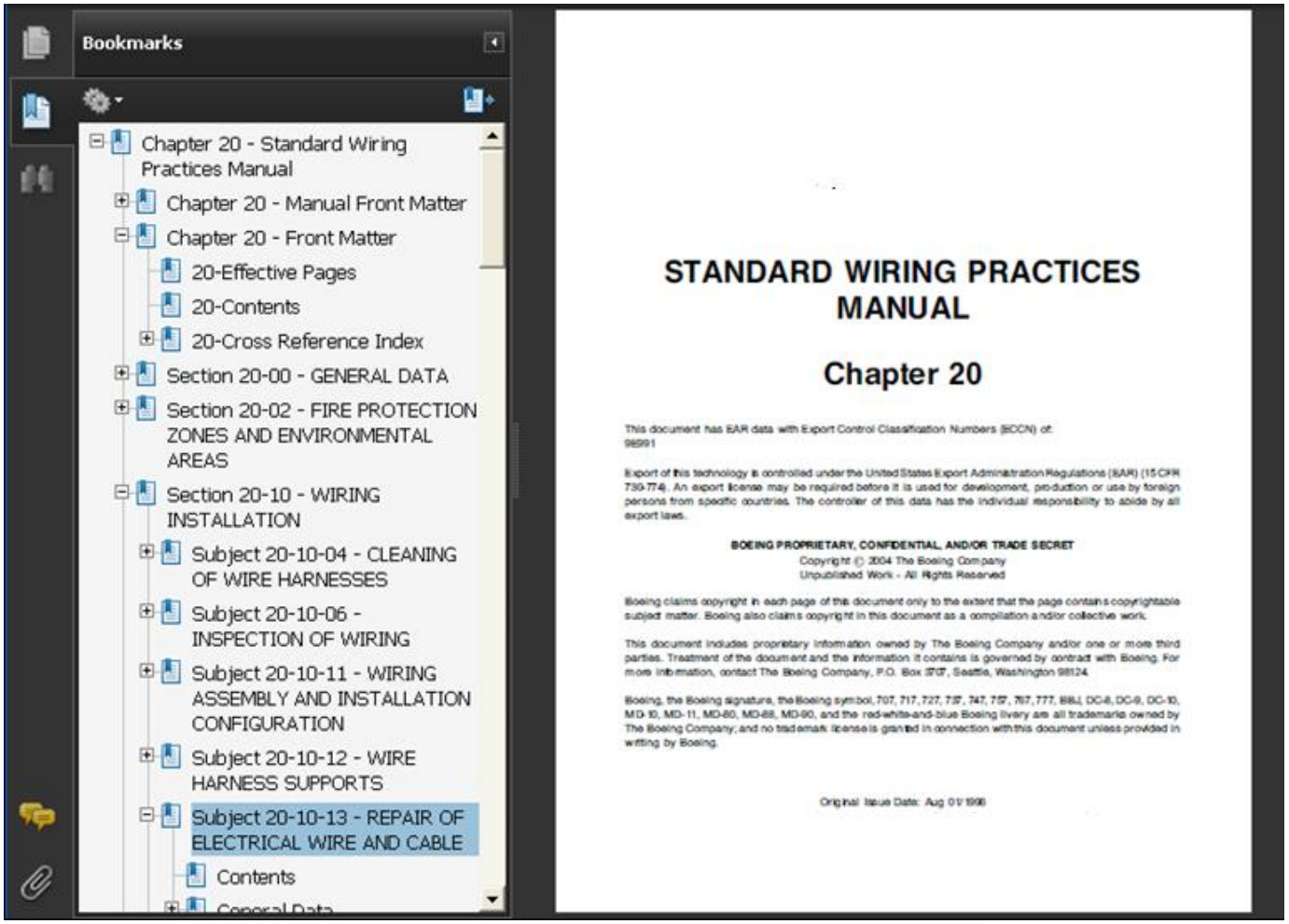
Standard Wiring Practices Manual



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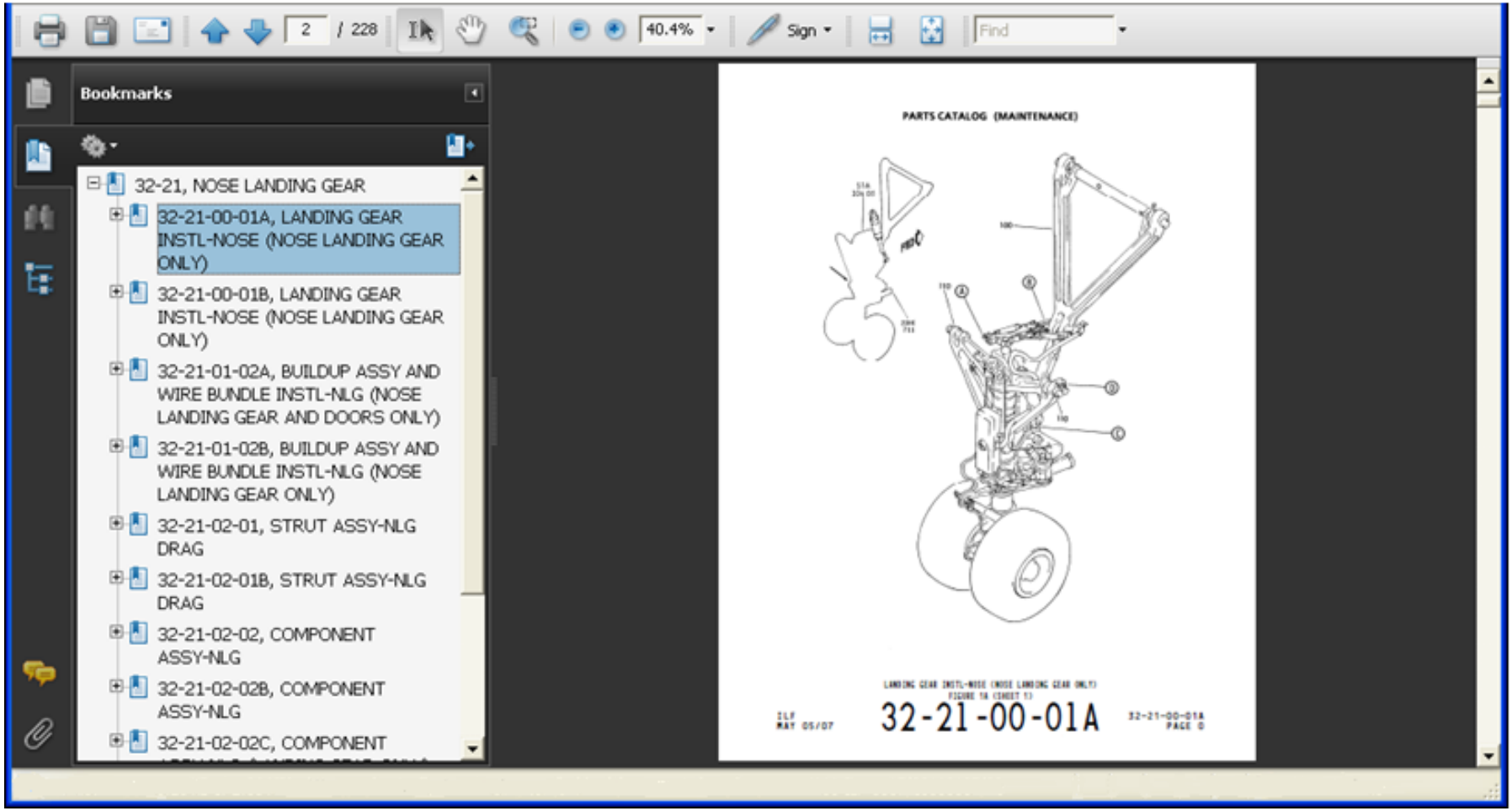
Illustrated Parts Catalog



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Systems Schematic Manual

- **What it's for:**
- The System Schematic Manual (SSM) is a collection of diagrams which define the airplane systems. The System Schematic Manual (SSM) was prepared to serve as a source of information to assist in understanding system function and to facilitate fault isolation to the Line Replaceable Unit (LRU) level.

- **Example of when to use an SSM**: A mechanic needs to find out which circuit breaker provides power to a particular component, and does not need to see information at the level of detail provided in a wiring diagram.

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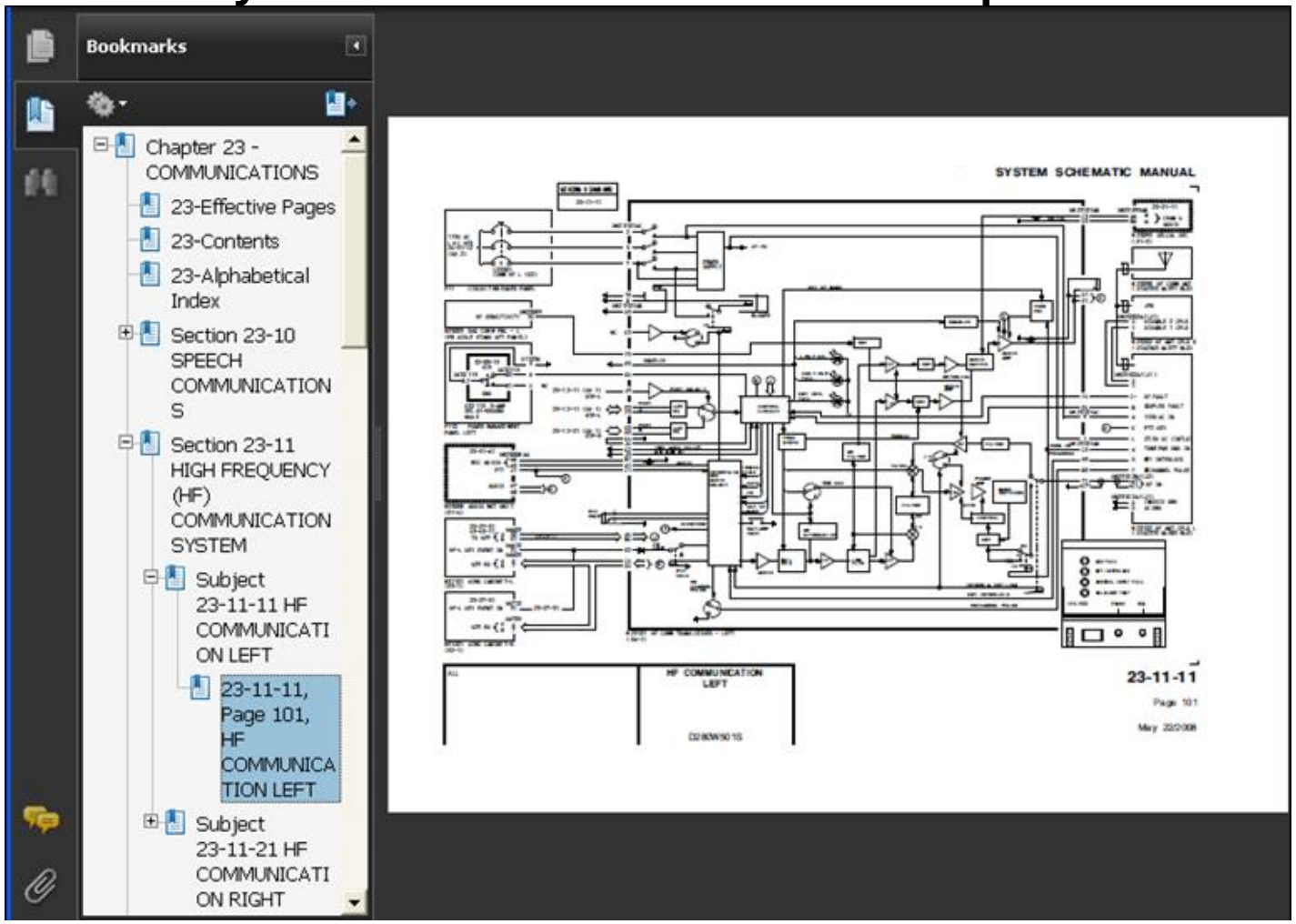
Systems Schematic Manual Examples



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Structures Repair Manual

- **What it's for:**
- This Structural Repair Manual gives general data and special instructions for the repair of the airplane structure. This manual gives general airplane data, usual procedures, and repair materials. This manual also includes material identification, allowable damage, and repair data for the airplane structure. Procedures usually done together with the structural repair (such as an airplane symmetry check or support of the airplane in the jigged position) are also given.

- **Example of when to use an SRM**: A catering truck crashes into the forward leading edge of the wing of an airplane, leaving a 6" gouge that is ¼" deep. The mechanic needs to determine whether or not the damage is within allowable limits to fly the airplane, or if a repair must be made.

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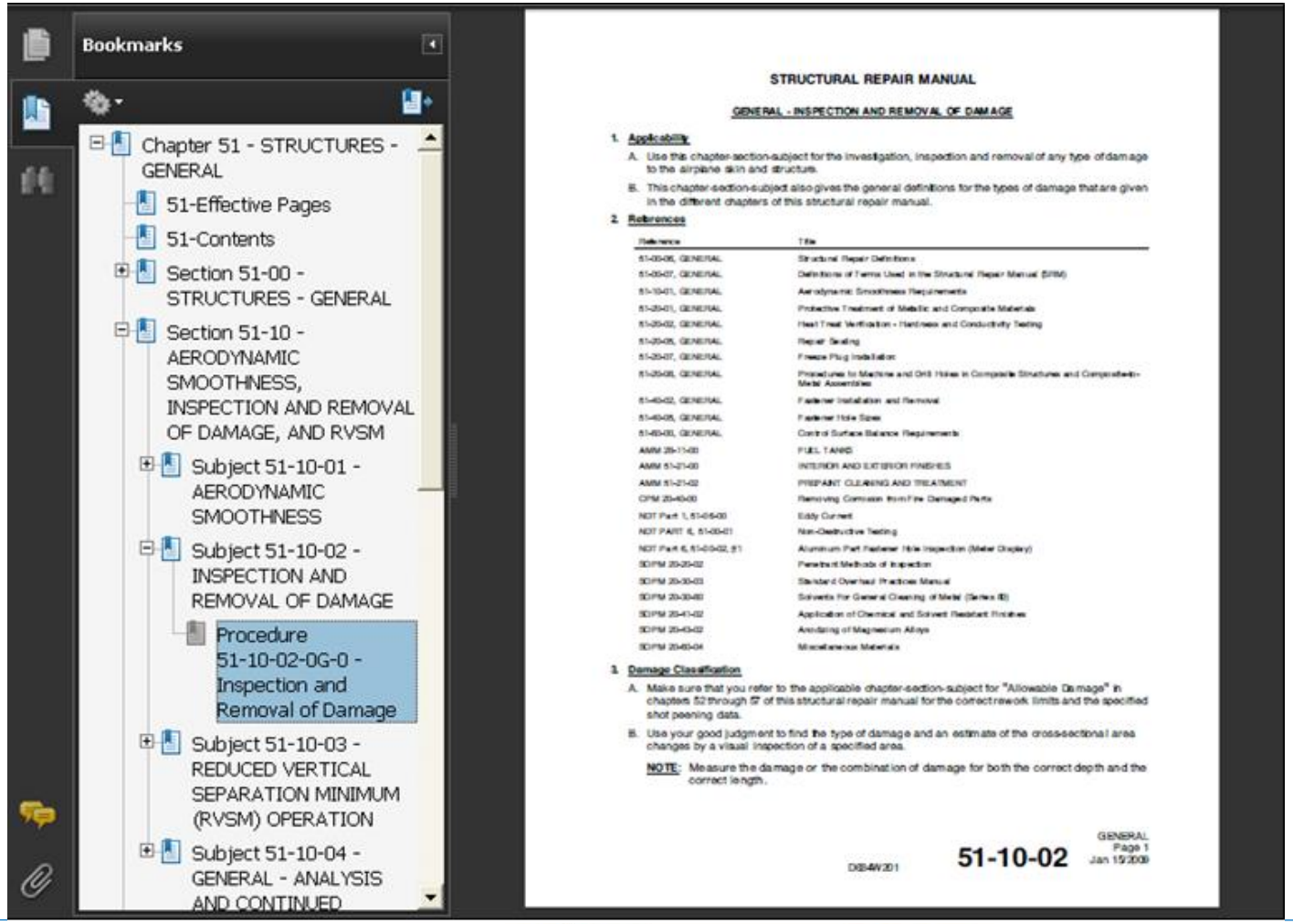
Structures Repair Manual Example



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Service Bulletins and Service Letters

- **What they're for:**
- Service Bulletins provide operators with FAA approved instructions for modification or inspection of in-service airplanes and Boeing-built components.
- Service Letters provide operators with a variety of technical information for delivered airplanes.

- **Example of Service Bulletin**: Boeing provides instructions to modify the video surveillance system from the Electronic Flight Bag to display on the flight deck.

- **Example of Service Letter**: Boeing informs customers of a change to the hardware of the Cabin Control Panel along with interchangeability information.

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Service Bulletin Example

Commercial Airplanes

Service Bulletin

Number:	777-23-0283	**Summary**
Original Issue:	March 17, 2009	
Revision 1:	May 13, 2009	
ATA System:	2375 3161	

SUBJECT: COMMUNICATIONS - Audio and Video Monitoring - Change of Flight Deck Entry Door Video Surveillance System (FDEVSS) Interface from Electronic Flight Bag (EFB) to Flight Deck Multi Function Display (MFD)

CONCURRENT REQUIREMENTS

None.

BACKGROUND

This service bulletin and a kit of parts were prepared to give instructions to change the Flight Deck Entry Door Video Surveillance System (FDEVSS) with video display on Electronic Flight Bag (EFB) to the Flight Deck Multi Function Display (MFD).

This change was requested by the operator.

ACTION (MC 2370MK7080)

In the Flight Compartment, do these changes:

- Group 1-10 airplanes:
  - On the Pilot's Main Instrument Panel, route and change wire bundle W1004.
  - On the M31038 Engine Indication and Crew Alerting System (EICAS) Display Select Panel, route and change wire bundle W1008.
  - On the P3 Forward Panel, change wire bundle W1002.
  - On the AF0202 disconnect bracket, change wire bundle W1052.
  - From AE0232 disconnect bracket to AF0202 disconnect bracket, route and change wire bundle W4207.

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Service Letter Example

Commercial Aviation Services

SERVICE LETTER

ATA: 2339-00
12 September 2008

SUBJECT: CABIN CONTROL PANEL (CCP) INTERCHANGEABILITY AND INTERMIXABILITY

MODEL: 777 Series

APPLICABILITY: All 777 airplanes with CCP P/N 285W0863 installed

REFERENCES:

a) Airplane Service Bulletin 777-23-0178
b) BAE Systems Component Service Bulletin 285W0863-23-01
c) BAE Systems Component Service Bulletin 285W0863-23-02
d) BAE Systems Component Service Bulletin 285W0863-23-03
e) BAE Systems Component Service Bulletin 285W0863-23-04
f) BAE Systems Component Service Bulletin 285W0863-23-05

SUMMARY:

This service letter informs operators of the changes made to the hardware of the Cabin Control Panel (CCP). This service letter also provides operators with interchangeability and intermixability information of all CCP and backlight sub-assembly delivered as of 31 July 2007 on 777 airplanes.

BACKGROUND:

The CCP hardware was changed to address the nuisance power cycles condition, insulator material compliance with FAA flammability requirements, and LCD obsolescence.

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Component Maintenance Manuals

- **What it's for:** Information required to check, repair, adjust, and test units or assemblies, normally performed away from the airplane because of the need for special equipment, are contained in the Boeing Component Maintenance Manual or vendors' component maintenance manual(s).

- **Example of when to use a CMM**: A mechanic removes a component that reports a failure. Further troubleshooting of the component is required to correct the fault.

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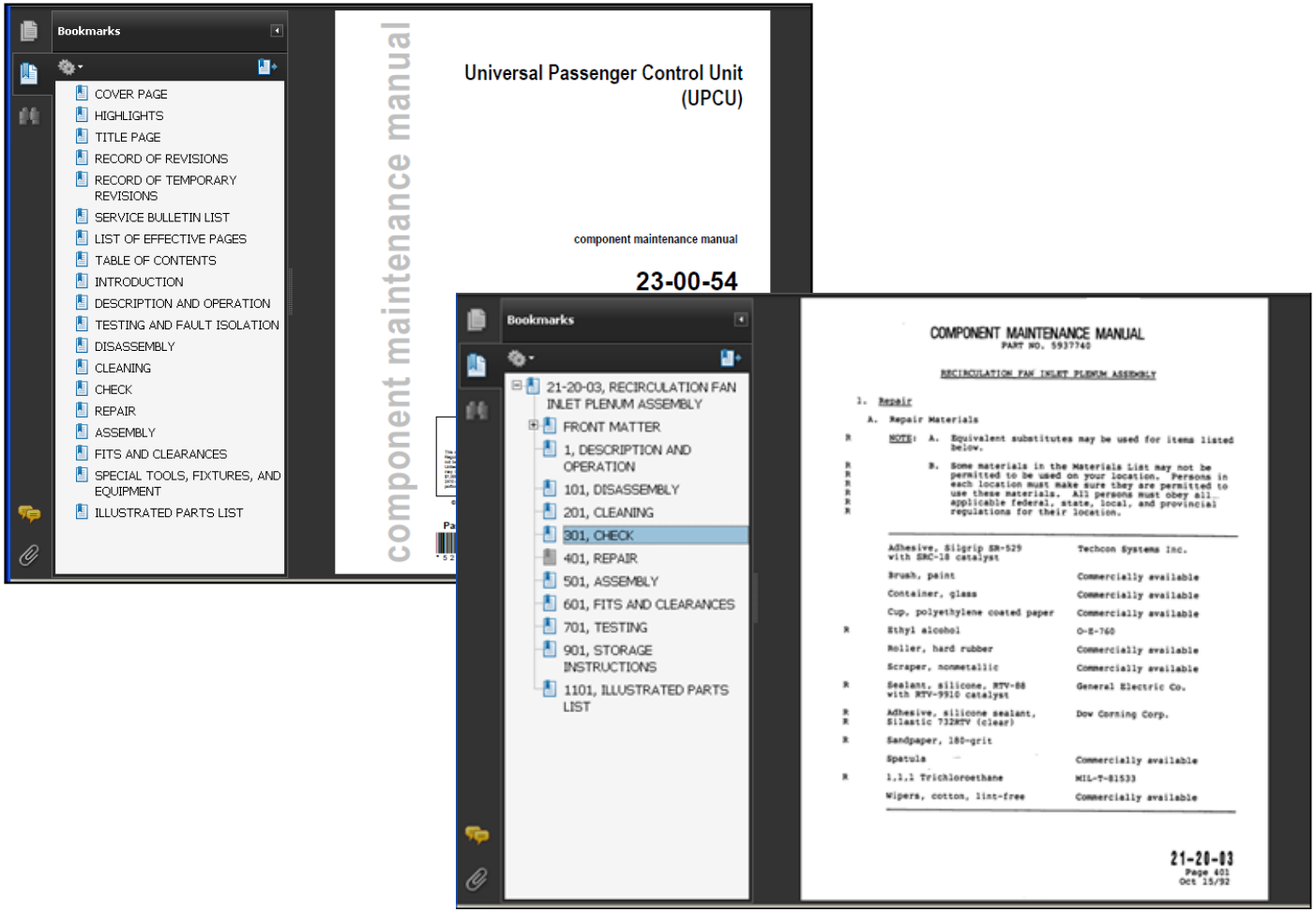
Component Maintenance Manuals Example



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- **Specifications for Maintenance Manuals**
  - **ATA – Air Transport Association (ISpec 2200)**
  - Specification for the creation and development of technical manuals for aerospace
  - **S1000D – Specification 1000D**
  - Specification for the creation of all technical manuals – not limited only to aerospace

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Decoder Ring for Maintenance Manuals

Emergency Locator Transmitter Antenna Installation

(ATA Ispec 2200)
23 - 24 - 02 - 400 - 801

CH SEC SUB PB TASK

(S1000D)
DMC-B787-A-23-24-02-00A-720A-A

DATA MODULE CH SEC SUB INFORMATION CODE CODE

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Specification Code Examples

ATA Specification

ATA Structure
AMM Description & Operation Pageblock
1-99 Description and Operation
AMM Fault Isolation Pageblock
101-199 Troubleshooting
AMM Maintenance Procedures Pageblocks
201-299 Maintenance Practices
301-399 Servicing
401-499 Removal/Installation
501-599 Adjustment/Test
601-699 Inspection/Check
701-799 Cleaning/Painting
801-899 Approved Repairs
WDM
Ch-Sec-Subj arrangement in separate manual
SSM
Ch-Sec-Subj arrangement in separate manual
IPC
Ch-Sec-Unit-Figure arrangement in separate manual

S1000D Specification

S1000D Primary Codes
Description & Operation
000 Function, data for plans and description
100 Operation
Fault Isolation
400 Fault reports and isolation procedures
Maintenance Procedures
200 Servicing
300 Examinations, tests, and checks
500 Disconnect, remove and disassemble procedures
600 Repairs and locally make procedures and data
700 Assemble, install and connect procedures
800 Storage procedures and data
Wiring
000 Function, data for plans and description
Schematics
000 Function, data for plans and description
Parts
900 Miscellaneous - IPD
Engineering Data
900 Miscellaneous – Service Bulletins

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- **Traditional maintenance manuals are revised and published per schedule. Some have quarterly revisions, others have semi-annual revisions, and others have ad-hoc revisions.**

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Temporary Revisions

- **What they're for:**
- To provide changed data to airlines that can not wait until the next published revision to the manual

- **Example of a TR**: a correction to a torque value for the installation of a component is discovered.

- **Example that would not result in a TR**: a simple clerical error that does not result in any compromise to safety or standard maintenance practices.

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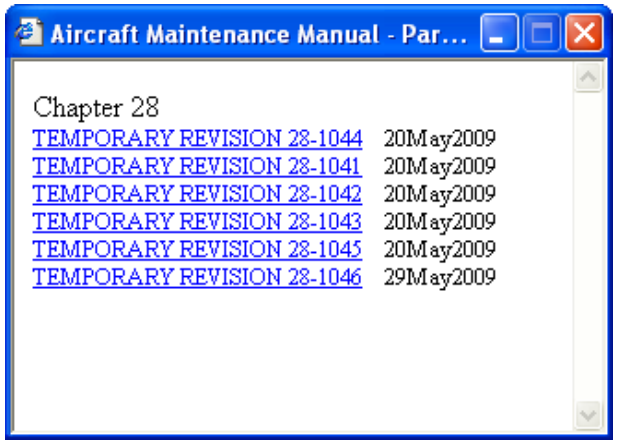
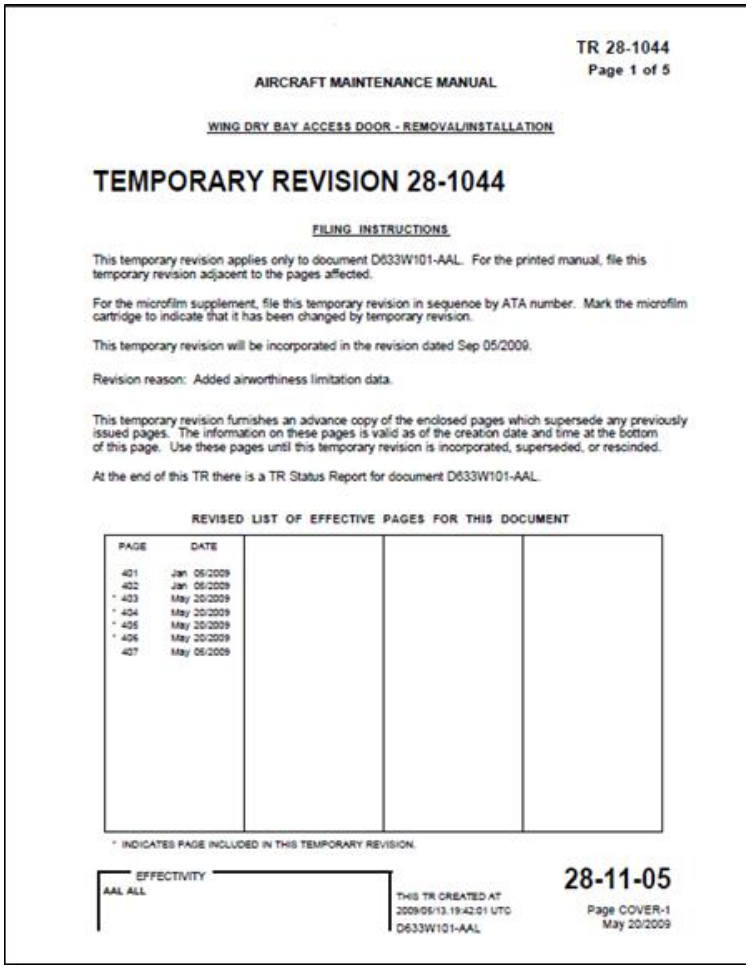
Temporary Revision Example





TR 28-1044
Page 1 of 5

AIRCRAFT MAINTENANCE MANUAL

WING DRY BAY ACCESS DOOR - REMOVAL/INSTALLATION

TEMPORARY REVISION 28-1044

FILING INSTRUCTIONS

This temporary revision applies only to document D633W101-AAL. For the printed manual, file this temporary revision adjacent to the pages affected.

For the microfilm supplement, file this temporary revision in sequence by ATA number. Mark the microfilm cartridge to indicate that it has been changed by temporary revision.

This temporary revision will be incorporated in the revision dated Sep 05/2009.

Revision reason: Added airworthiness limitation data.

This temporary revision furnishes an advance copy of the enclosed pages which supersede any previously issued pages. The information on these pages is valid as of the creation date and time at the bottom of this page. Use these pages until this temporary revision is incorporated, superseded, or rescinded.

At the end of this TR there is a TR Status Report for document D633W101-AAL.

REVISED LIST OF EFFECTIVE PAGES FOR THIS DOCUMENT

PAGE	DATE
401	Jan 05/2009
402	Jan 05/2009
* 403	May 20/2009
* 404	May 20/2009
* 405	May 20/2009
* 406	May 20/2009
407	May 05/2009

* INDICATES PAGE INCLUDED IN THIS TEMPORARY REVISION.

EFFECTIVITY
AAL ALL

THIS TR CREATED AT
2009/05/13.19:42:01 UTC
D633W101-AAL

28-11-05
Page COVER-1
May 20/2009

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Customer Maintenance Manual Changes

- **Customer Originated Change (COC)**
- **Publication Change Request (PCR)**

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Customer Originated Changes (COC)

- **What they are:**
- Changes or additions to Boeing data as requested by the customer. These changes are provided for a fee.

- **Example of a COC**: A customer purchases and installs a new In Flight Entertainment System that replaces the system that Boeing had installed. The airline wishes to keep all maintenance data for this new system together with existing Boeing maintenance data, and submits the data to Boeing for inclusion into the maintenance manual.

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Publication Change Request

- **What it is:**
- Corrections to Boeing provided data. Customers can send in a PCR if an error in the data is identified and Boeing will fix it free of charge.

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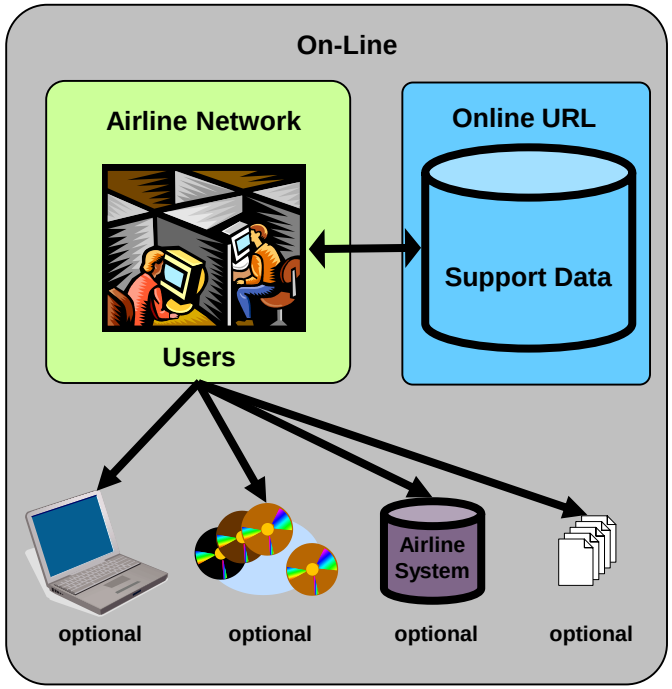
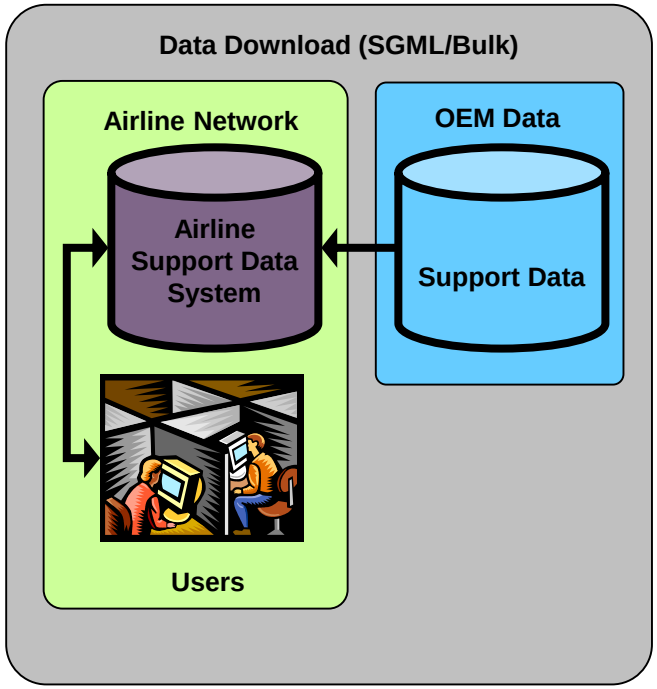
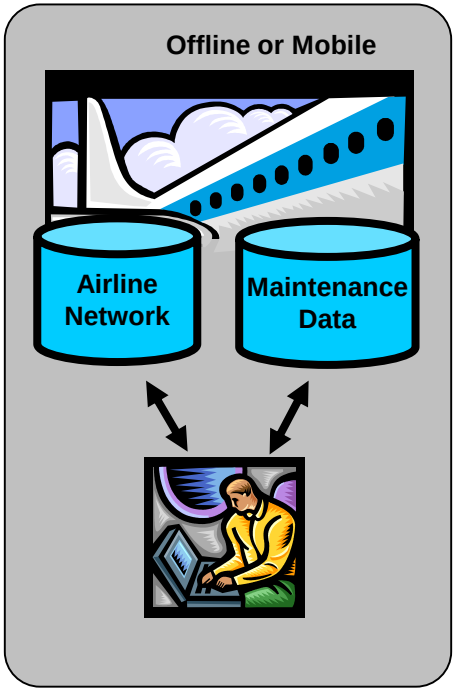
- **Methods for Accessing Maintenance Data**
  1) On-Line Application
  2) Data Download (SGML/Bulk)
  3) Offline or Mobile







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Empowering Airline Customers through Support Data

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