# Fundamentals
# M7
# MAINTENANCE PRACTICES

Rev.-ID: 1
Author: DiO
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©LTT Release: Jul. 22, 2013

## M7.5
## Engineering Drawings, Diagrams and Standards

EASA Part-66
CAT B1

# Training Manual

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**Lufthansa Technical Training**

Dept HAM US
Lufthansa Base Hamburg
Weg beim Jäger 193
22335 Hamburg
Germany

Tel: +49 (0)40 5070 2520
Fax: +49 (0)40 5070 4746
E-Mail: Customer-Service@LTT.DLH.DE

www.Lufthansa-Technical-Training.com

**Revision Identification:**

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- Dates and author's ID, which may be given at the base of the individual pages, are for information about the latest revision of that page(s) only.
- The LTT production process ensures that the Training Manual contains a complete set of all necessary pages in the latest finalized revision.

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# M7 MAINTENANCE PRACTICES

## M7.5 ENGINEERING DRAWINGS, DIAGRAMS AND STANDARDS

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# MAINTENANCE DOCUMENTATION ACCORDING ATA SPECIFICATION 100

## General Principles

For modification and maintenance of aircrafts and for development, modification, production and maintenance of aircraft parts and production equipment the compulsory documentation has to be used.

The publisher / originator of a document is responsible for its content.

**Publisher of documents can be:**

- Aircraft and aircraft parts design organizations,
- Aviation companies (owner),
- Aeronautical authority,
- Production equipment design organization,
- National and international organizations,

The engineering company is responsible for the procurement, approval, collection, distribution and revision of documents for itself and also for customers, if this is contracted.

The documentation has to be done in such a way that the user can check the revision status of the document.

**The user must ensure that he uses the valid document for the particular work task.**

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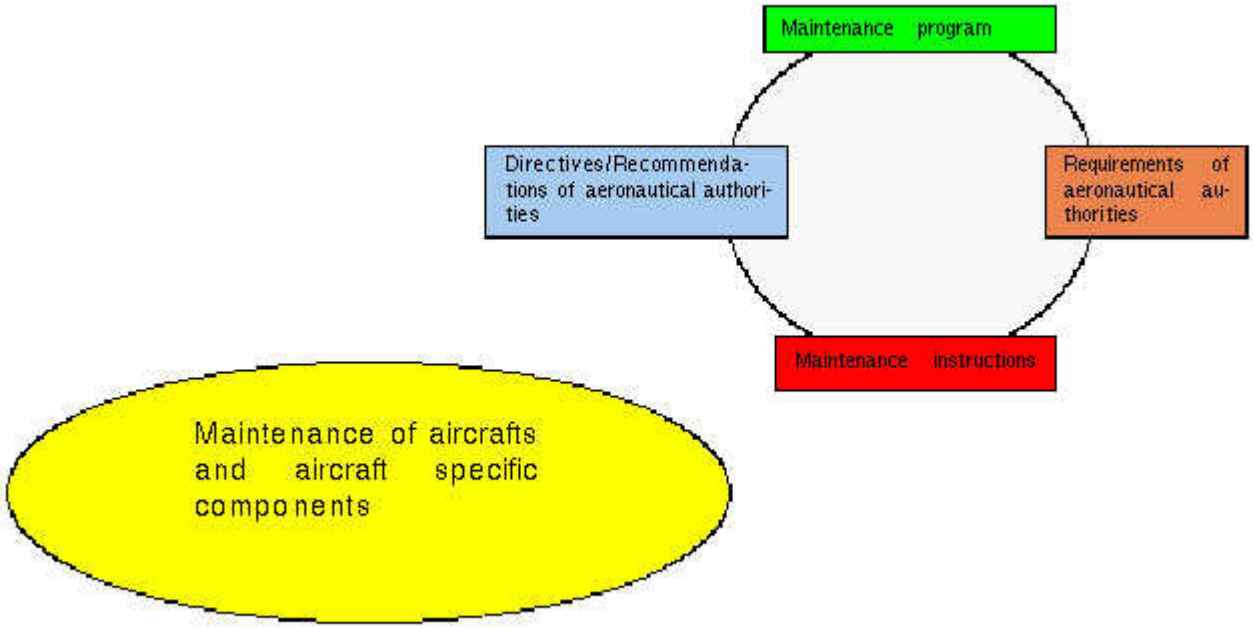


**Figure 1 General Principles of Maintenance Documentation**

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## Summary of relevant Technical Documentation

**1. Maintenance Programs:**

- Maintenance Schedule (MS)
- Component Operating & Storage Limits List (COSL)

**2. Maintenance Instructions:**

- Aircraft Maintenance Manual (AMM)
- Illustrated Parts Catalog (IPC)
- Wiring Diagram Manual (WDM)
- System Schematic Manual (SSM)
- Cross Reference Lists
- Electrical Standard Practices Manual (ESPM)
- Standard Wiring Practices Manual (SWPM)
- Component Maintenance Document Summary (CMDS)
- Component Maintenance Manual (CMM)
- Illustrated Parts List (IPL)
- Engine (Shop) Manual (EM)
- Structural Repair Manual (SRM)
- Flight Test Manual (FTM)
- Fault Isolation Manual (FIM) /Trouble Shooting Manual (TSM)
- Minimum Equipment List (MEL)
- Configuration Deviation List (CDL)
- MEL Maintenance Procedures (MMP)

**3. Directives/Recommendations of Design Organizations:**

- Service Information Letter (SIL)
- Service Letter (SL)
- Service Bulletin (SB)
- Engineering Bulletin (EB)

**4. Requirements of aeronautical authorities:**

- Component Specifications
- Life Limits
- Airworthiness Directives (LTA, AD, ...)
- Others ...

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**MS** - Maintenance Schedule



**AMM** - Aircraft Maintenance Manual

**IPC** - Illustrated Parts Catalog

**WDM** - Wiring Diagram Manual

**SSM** - System Schematic Manual

**SRM** - Structural Repair Manual

**COSL** - Component Operating & Storage Limits List



**CMDS** - Component Maintenance Document Summary

**CMM** - Component Maintenance Manual

**IPL** - Illustrated Parts List

**EM** - Engine (Shop) Manual

**SPM** - Standard Practices Manual

**Figure 2 The „most important“ Maintenance Manuals**

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## Revision Status of Documents

### REVIEW OF THE ACTUALITY OF TECHNICAL DOCUMENTS

**Revisions**

All technical documents underlie revisions.

These take place in periodical intervals. (ca. all 3–6 months)

Only the **actual** version is valid and **must** be used.

For the user this implies that he must inform himself **compulsory** about the actuality of the present document.

This review can be done by a request at the decentralized process support or in the intranet.

**Review**

It includes the following steps:

- 1. Review of the revision status of the document on actuality
- 2. Review of the availability of intermediate revisions (Temporary Revisions)
- 3. Review of the effectivity (owner reference, manufacturer reference)
- 4. Review of the validity of one document side (LEP)

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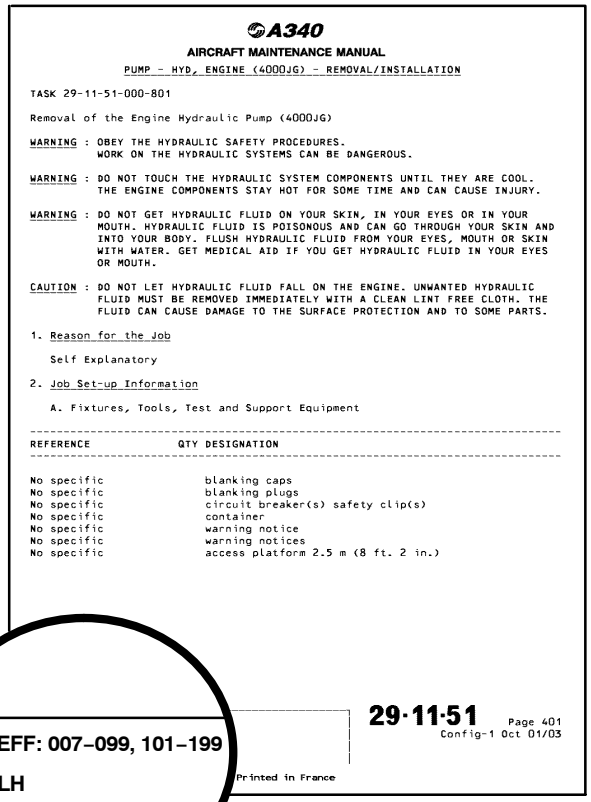
**Document revision status**



A340
AIRCRAFT MAINTENANCE MANUAL
PUMP - HYD, ENGINE (4000JG) - REMOVAL/INSTALLATION

TASK 29-11-51-000-801

Removal of the Engine Hydraulic Pump (4000JG)

WARNING : OBEY THE HYDRAULIC SAFETY PROCEDURES. WORK ON THE HYDRAULIC SYSTEMS CAN BE DANGEROUS.

WARNING : DO NOT TOUCH THE HYDRAULIC SYSTEM COMPONENTS UNTIL THEY ARE COOL. THE ENGINE COMPONENTS STAY HOT FOR SOME TIME AND CAN CAUSE INJURY.

WARNING : DO NOT GET HYDRAULIC FLUID ON YOUR SKIN, IN YOUR EYES OR IN YOUR MOUTH. HYDRAULIC FLUID IS POISONOUS AND CAN GO THROUGH YOUR SKIN AND INTO YOUR BODY. FLUSH HYDRAULIC FLUID FROM YOUR EYES, MOUTH OR SKIN WITH WATER. GET MEDICAL AID IF YOU GET HYDRAULIC FLUID IN YOUR EYES OR MOUTH.

CAUTION : DO NOT LET HYDRAULIC FLUID FALL ON THE ENGINE. UNWANTED HYDRAULIC FLUID MUST BE REMOVED IMMEDIATELY WITH A CLEAN LINT FREE CLOTH. THE FLUID CAN CAUSE DAMAGE TO THE SURFACE PROTECTION AND TO SOME PARTS.

1. Reason for the Job

Self Explanatory

2. Job Set-up Information

A. Fixtures, Tools, Test and Support Equipment

| REFERENCE | QTY | DESIGNATION |
|---|---|---|
| No specific | | blanking caps |
| No specific | | blanking plugs |
| No specific | | circuit breaker(s) safety clip(s) |
| No specific | | container |
| No specific | | warning notice |
| No specific | | warning notices |
| No specific | | access platform 2.5 m (8 ft. 2 in.) |

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DLH

Printed in France

29-11-51 Page 401
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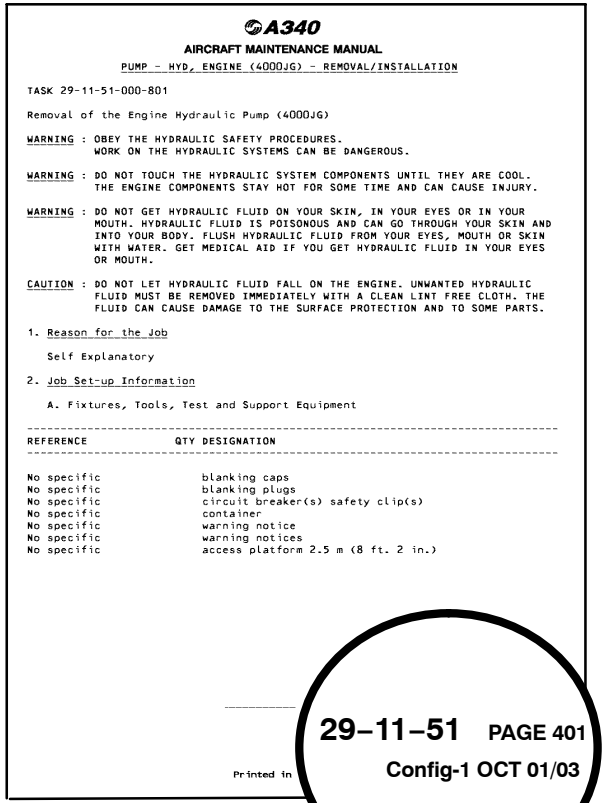

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| No specific | | container |
| No specific | | warning notice |
| No specific | | warning notices |
| No specific | | access platform 2.5 m (8 ft. 2 in.) |

Printed in

29-11-51 PAGE 401
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**1.**

**3.**

**Effectivity**

**4.**

**Page Effectivity**

**2.** **Temporary Revisions: Intranet or folder with yellow pages**

**Figure 3 Review of the Actuality of Documents**

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## Arrangement of Maintenance Documentation

### Manual Breakdown Arrangement

According to ATA Spec. 100 (new: ATA iSpec. 2200) all maintenance instructions are arranged consistently.

The aircraft is classified into 5 groups, to which again a differing number of ATA chapters are assigned.

- Aircraft General: ATA 00 up to ATA 12
- Airframe System: ATA 20 up to ATA 50
- Structure: ATA 51 up to ATA 57
- Power Plant: ATA 70 up to ATA80
- Reciprocating Engine: ATA 81 up to ATA 84

Due to this it is assured that information about a certain aircraft system can be found **generally** in the same ATA chapter, because all aircraft manufacturer did embrace the ATA Spec..

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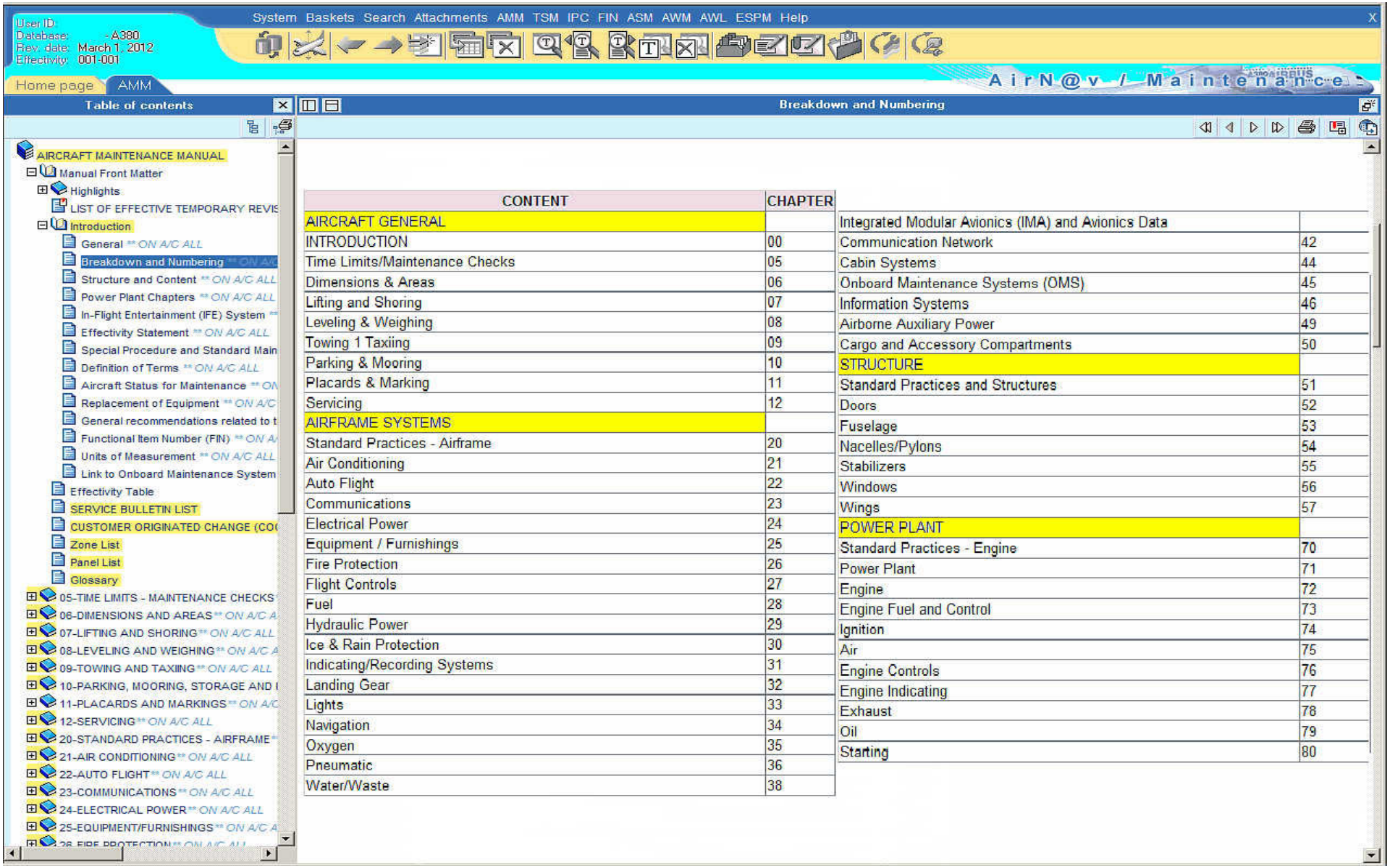


**Figure 4 Manual Breakdown Arrangement**

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**Chapter Breakdown Policy**

Every ATA chapter is divided into:

- Sections,
- Subsections and
- Subjects.

The sections classify the chapter into functional Groups.

The subsections classify the sections into equal system modules.

The subjects classify the subsections into individual members.

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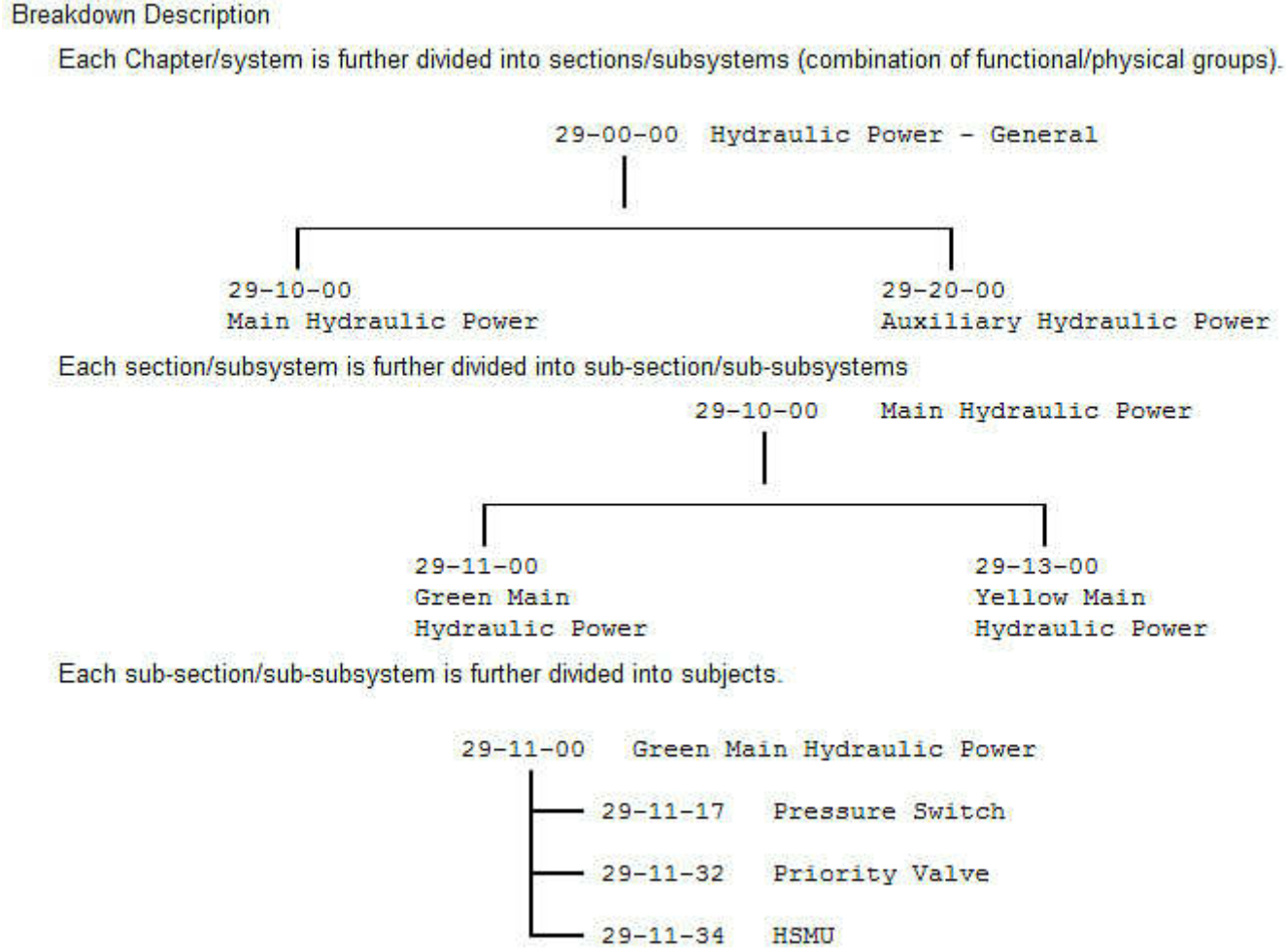


**Figure 5 Chapter Breakdown Policy**

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## Page Block Allocation

### Page Blocks

Inside the ATA chapters the page numbering is done via so called page blocks.

The breakdown inside the AMM's is done according to the following pattern:

- **Pages 001 - 099: Description and Operation (D/O)**
  - These pages contain a system description and give a review about the function, the operation, the control and the component location of the particular system.
- **Pages 101 - 199: Trouble Shooting (T/S), Fault Isolation (F/I)**
  - These pages have become an independent handbook, namely the Trouble Shooting Manual (TSM/Airbus) or the Fault Isolation Manual (FIM/Boeing).
- **Pages 201 - 299: Maintenance Practices (M/P)**
  - These pages describe general working practices at the aircraft, like e. g.:
    - the jacking up,
    - the leveling,
    - the external supply of the electric, pneumatic or hydraulic systems,
    - the opening and closing of engine cowlings, landing gear doors...
    - the application of safety devices, and so on.
- **Pages 301 - 399: Servicing (S)**
  - The servicing pages contain information about the filling of oil, fuel, hydraulic fluid..., but also the exchange of filters, magnet plugs, bulbs...
- **Pages 401 - 499: Removal/Installation (R/I), Deactivation/Reactivation (D/R) (AIRBUS)**
  - The removal / installation instruction contain the necessary information for the de- and installation or the exchange of a component. They are divided into a removal- and an installation procedure. If following adjustments is necessary they are normally also described in this pages.

    If these adjustments are extensive, a cross-reference to the page block 501 is given.

    The deactivation/reactivation instructions describe the necessary work tasks to keep an aircraft despite missing covering parts or restricted system functions in operation or to reset it into the original condition after repair/exchange of the component. The work tasks result from the requirements of the Master Minimum Equipment List (MMEL) or the Configuration Deviation List (CDL). A list of all procedures is located in the Manual Front Matter of the AMM (AIRBUS).
- **Pages 501 - 599: Adjustment/Test (A/T)**
  - These pages describe the component or system testing and the necessary adjustment. They are divided into:
    - Operational Tests: Function testing of a component with on board equipment.
    - Functional Tests: Extensive functional testing of a component with additional aids, measurement devices...
    - System Tests: Testing of the function of a system with all necessary adjustments and specified tolerances.
- **Pages 601 - 699: Inspection/Check (I/C)**
  - The inspection/check instruction is divided into inspections with and without a removal of the component. Further on it is differed between general visual, detailed and special detailed inspection.
- **Pages 701 - 799: Cleaning/Painting (C/P)**
  - Working tasks for cleaning and/or paint repair of components.
- **Pages 801 - 899: Approved Repairs (A/R)**
  - These pages contain repairs which are approved by aeronautical authorities but are not a part of the Component Maintenance Manual (CMM) or Structural Repair Manual (SRM).

    Temporary Repairs are not described here!

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| TOPICS | PAGE BLOCK |
|---|---|
| Description & Operation (D/O) | 001 - 099 |
| Trouble Shooting (T/S)<br>Fault Isolation, Component Location (F/I) | 101 - 199 |
| Maintenance Practice (MP) | 201 - 299 |
| Servicing (S) | 301 - 399 |
| Deactivation/Reactivation (D/R)<br>Removal/Installation (R/I) | 401 - 499 |
| Adjustment/Test (A/T) | 501 - 599 |
| Inspection/Check (I/C) | 601 - 699 |
| Cleaning/Painting (C/P) | 701 - 799 |
| Approved Repairs (AR) | 801 - 899 |

**Figure 6 Page Block Assignment AMM**

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## Revision Service

### General

The technical documentation underlies revisions. These take place periodically.

They assure the actuality of the document and contain all changes in the content caused by modifications, authority directives, etc.

Every revision is transferred into the **Record of Revisions**.

**Temporary Revisions** are sent to the aircraft owner, to advise the owner of changes in processes and content and to supply him with the necessary information until the next revision.

### Listing

Revisions are indicated as follows::

- Air N@V: Revised ATA Chapters are highlighted yellow.
- PMA: „Revisions“ is shown above the Table of Contents. With a click the revised Chapters will be shown.
- PMA: Another option is to click on „Documents“ in the upper bar; this will open another tap, where you can find „Revision Highlights“. Activate this tab will open another window with all Revisions.

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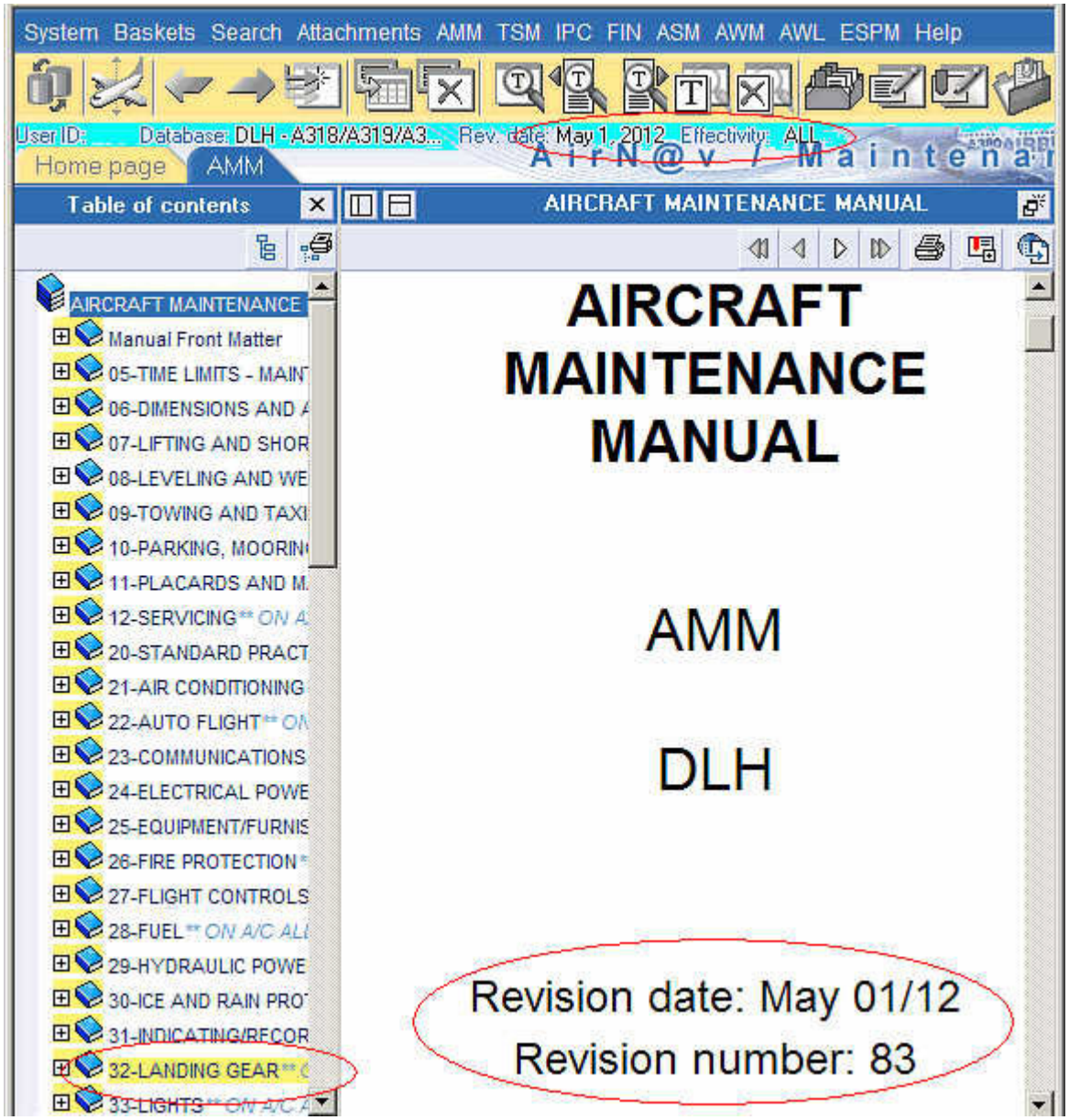


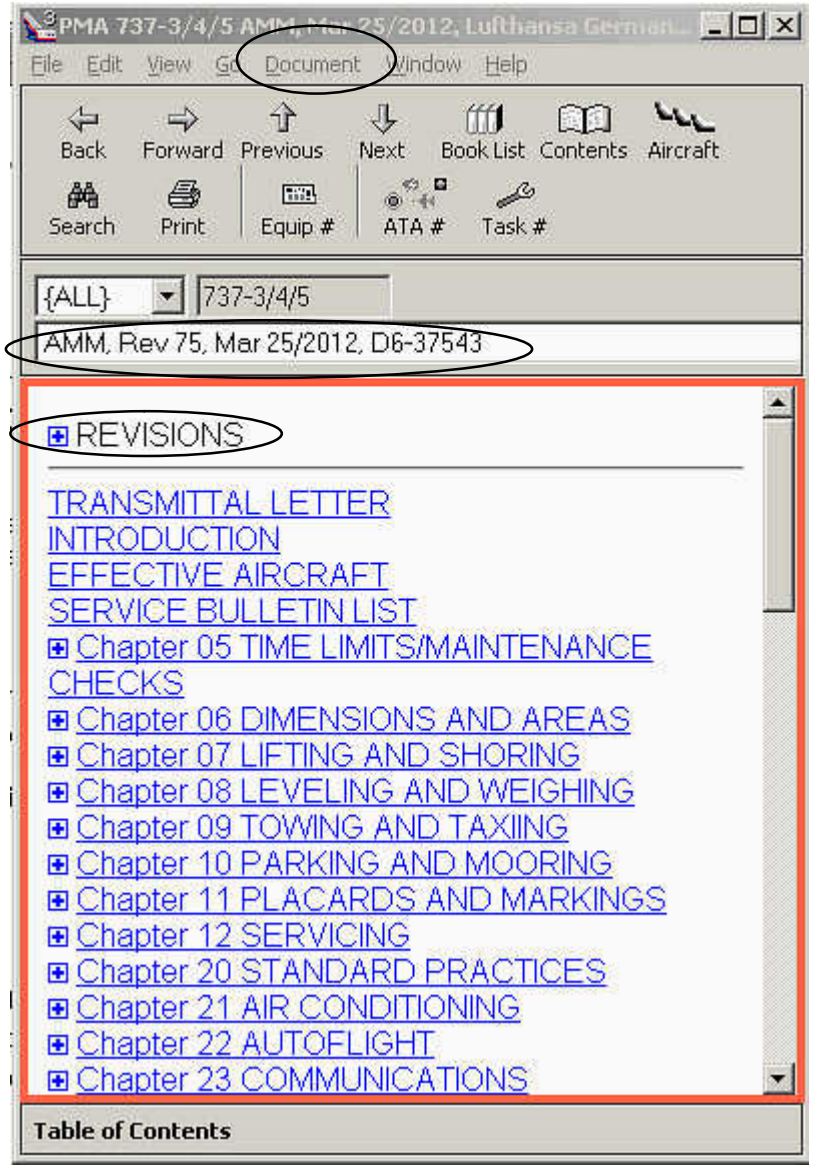


**Figure 7 Revisions**

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## Effectivity

### General

Maintenance documents are restricted in their effectivity in principle.

It is made a difference between type reference and owner reference.

### Type Reference

It is differed, if the particular document is made only for a special aircraft type, like the AMM, IPC, FIM.

### Owner Reference

In the case of a owner reference it is differed, if the maintenance document is made for a special customer.

Ist dies der Fall, so wird die Unterlage dementsprechend gekennzeichnet.

- AIRBUS: The Owner code is printed on the cover sheet and on every page of the document.
- BOEING: The particular owner and aircrafts are printed in the list of effective airplanes.

### Customer Serial-No. and Manufacturer Serial-No.

Other restrictions according to the modification level (inside the fleet of the aircraft owner) are described by the Effectivity code. It relates to the Customer Serial-No. (CSN) (AIRBUS) or to SB restrictions, component dash numbers or Customer Serial-No. (BOEING). Different modification levels inside one fleet can change a work task massively (Fig. 14).

If the maintenance document is universally valid, like e. g. the SRM, the effectivity restriction relates always to the Manufacturer-Serial-No. (MSN).

The Cross-Reference-Table (AIRBUS) or the List of Effective Airplanes (BOEING) provides the determination of the CSN & MSN, which is connected to the aircraft registration and can be found in the Introduction/Front Matter of the particular maintenance document.

If work tasks are changed massively, the registration is made by a marking number, which is located on the right side directly under the ATA chapter.

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AMM : TA-A380 RevDate: 01.09.2011

Effectivity Cross Reference Table RevCompare: Mode 1

**Fleet No./MSN Cross-reference table**

| Airline | Customer Fleet Serial Number | Version Rank | Model | MSN | Registration |
|---|---|---|---|---|---|
| DLH | 001 | DLH01 00001 | 380-841 | 0038 | D-AIMA |
| DLH | 002 | DLH01 00002 | 380-841 | 0041 | D-AIMB |
| DLH | 003 | DLH01 00003 | 380-841 | 0044 | D-AIMC |
| DLH | 004 | DLH01 00004 | 380-841 | 0048 | D-AIMD |
| DLH | 005 | DLH01 00005 | 380-841 | 0061 | D-AIME |
| DLH | 006 | DLH01 00006 | 380-841 | 0066 | D-AIMF |
| DLH | 007 | DLH01 00007 | 380-841 | 0069 | D-AIMG |
| DLH | 008 | DLH01 00008 | 380-841 | 0070 | D-AIMH |
| DLH | 009 | DLH01 00009 | 380-841 | 0072 | D-AIMI |
| DLH | 010 | DLH01 00010 | 380-841 | 0073 | D-AIMJ |

BOEING

737-3/4/5
Maintenance Manual

This manual is applicable to the aircraft in this list:

DLH
MODEL 737-530

| Customer Effectivity Code | Line Number | Variable Number | Manufacturing Serial Number | Registration Number |
|---|---|---|---|---|
| DLH 003 | 1272 | PQ053 | 23524 | 922 |
| DLH 006 | 1285 | PQ056 | 23527 | VP-BBN |
| DLH 007 | 1290 | PQ057 | 23528 | N35LX |
| DLH 010 | 1307 | PQ060 | 23531 | D-ABXL |
| DLH 011 | 1433 | PQ061 | 23871 | D-ABXM |
| DLH 012 | 1447 | PQ062 | 23872 | D-ABXN |
| DLH 013 | 1489 | PQ063 | 23873 | D-ABXO |
| DLH 014 | 1495 | PQ064 | 23874 | D-ABXP |
| DLH 015 | 1500 | PQ065 | 23875 | D-ABXR |
| DLH 016 | 1656 | PQ066 | 24280 | D-ABXS |
| DLH 017 | 1664 | PQ067 | 24281 | D-ABXT |
| DLH 018 | 1671 | PQ068 | 24282 | D-ABXU |

**Figure 8 Effectivity Table Airbus/Boeing**

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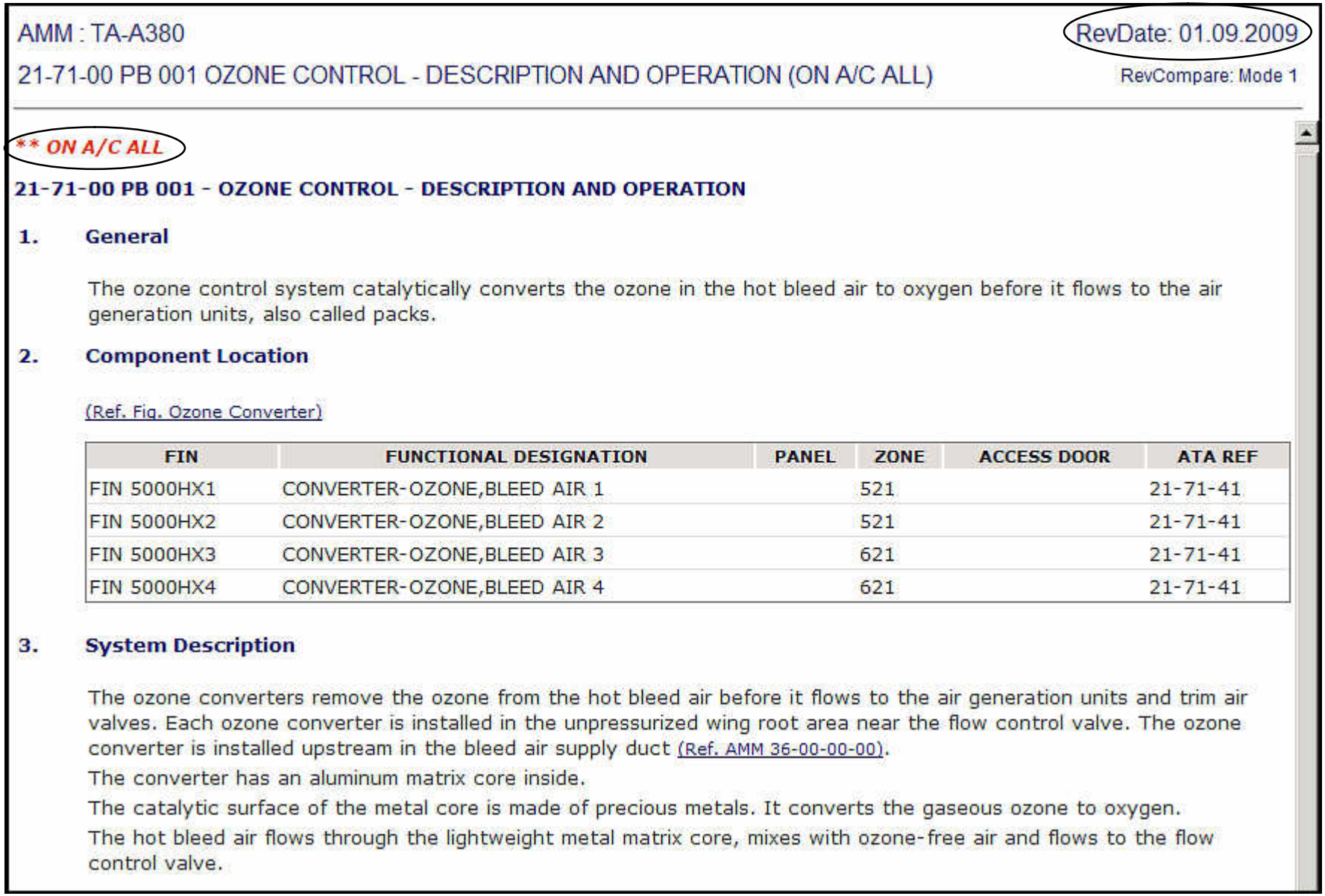

AMM : TA-A380

RevDate: 01.09.2009

21-71-00 PB 001 OZONE CONTROL - DESCRIPTION AND OPERATION (ON A/C ALL)

RevCompare: Mode 1

** ON A/C ALL

**21-71-00 PB 001 - OZONE CONTROL - DESCRIPTION AND OPERATION**

**1. General**

The ozone control system catalytically converts the ozone in the hot bleed air to oxygen before it flows to the air generation units, also called packs.

**2. Component Location**

(Ref. Fig. Ozone Converter)

| FIN | FUNCTIONAL DESIGNATION | PANEL | ZONE | ACCESS DOOR | ATA REF |
|---|---|---|---|---|---|
| FIN 5000HX1 | CONVERTER-OZONE,BLEED AIR 1 | | 521 | | 21-71-41 |
| FIN 5000HX2 | CONVERTER-OZONE,BLEED AIR 2 | | 521 | | 21-71-41 |
| FIN 5000HX3 | CONVERTER-OZONE,BLEED AIR 3 | | 621 | | 21-71-41 |
| FIN 5000HX4 | CONVERTER-OZONE,BLEED AIR 4 | | 621 | | 21-71-41 |

**3. System Description**

The ozone converters remove the ozone from the hot bleed air before it flows to the air generation units and trim air valves. Each ozone converter is installed in the unpressurized wing root area near the flow control valve. The ozone converter is installed upstream in the bleed air supply duct (Ref. AMM 36-00-00-00).

The converter has an aluminum matrix core inside.

The catalytic surface of the metal core is made of precious metals. It converts the gaseous ozone to oxygen.

The hot bleed air flows through the lightweight metal matrix core, mixes with ozone-free air and flows to the flow control valve.

**Figure 9 Effectivity Declaration Airbus**

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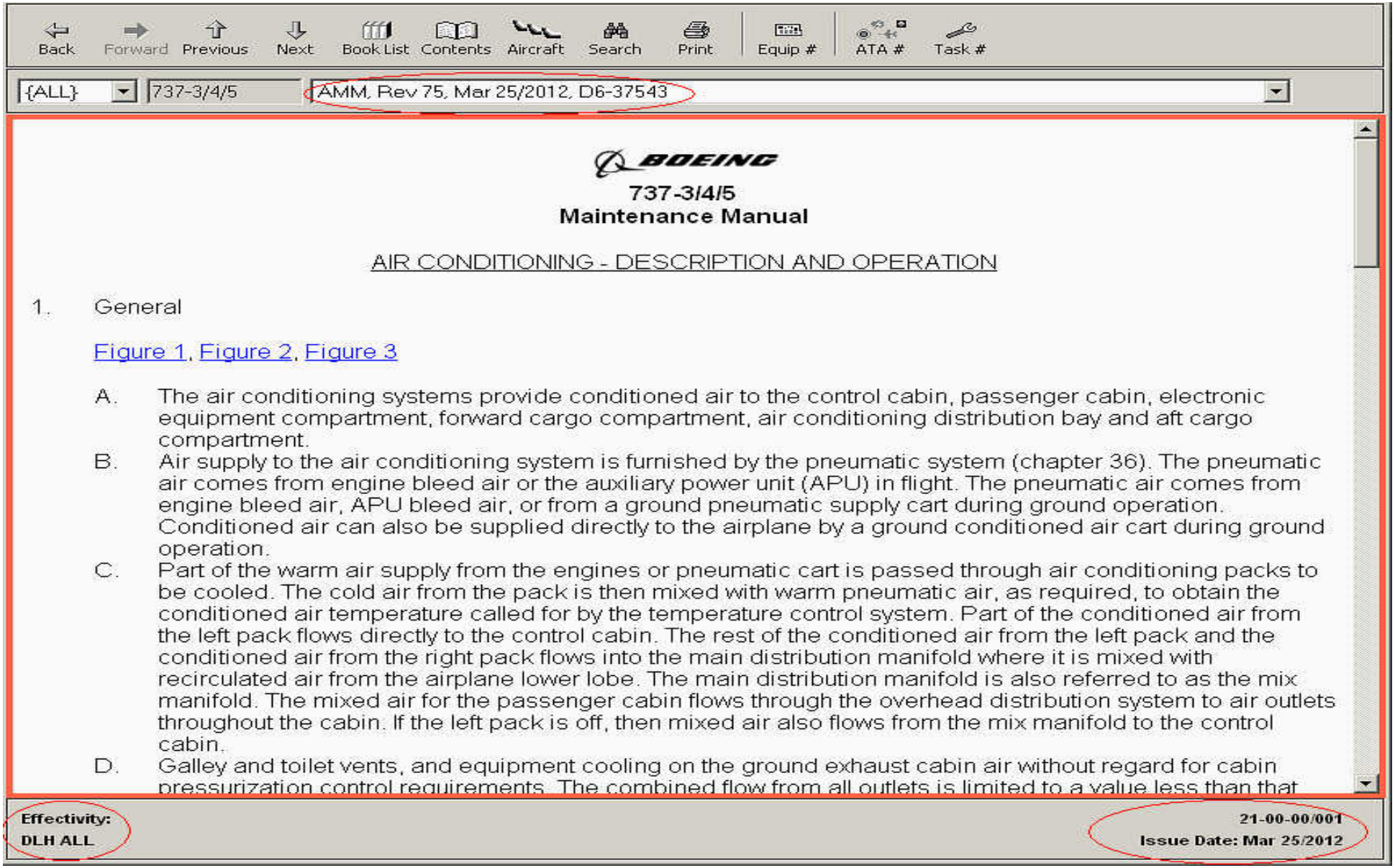


**Figure 10 Effectivity Declaration Boeing**

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## Aircraft Maintenance Manual (AMM)

### General

The Aircraft Maintenance Manual contains system descriptions and working tasks (tasks & subtasks) for the accomplishment of maintenance actions at an aircraft.

### Effectivity

The AMM is a type referenced and sometimes a owner referenced document.

### Classification

The classification is done according to ATASpec.100/iSpec. 2200.

**ATTENTION:** Working tasks according to a aircraft system are listed in the particular system chapters.

Working tasks with a general character (standard practices) are located in the chapter 20 (airframe) and 70 (engine).

It has to be noticed that these working tasks have an obligatory character; this means that they **must** be applied, even if there is no explicit reference in the system chapters!!!

### Manufacturer Reference

In the following pages a description of the information contained in the AMM is made.

These refer mainly to the manufacturer AIRBUS, but they can be found (perhaps with a slightly different name) at the manufacturer BOEING.

If there are major differences it will be noticed explicitly.

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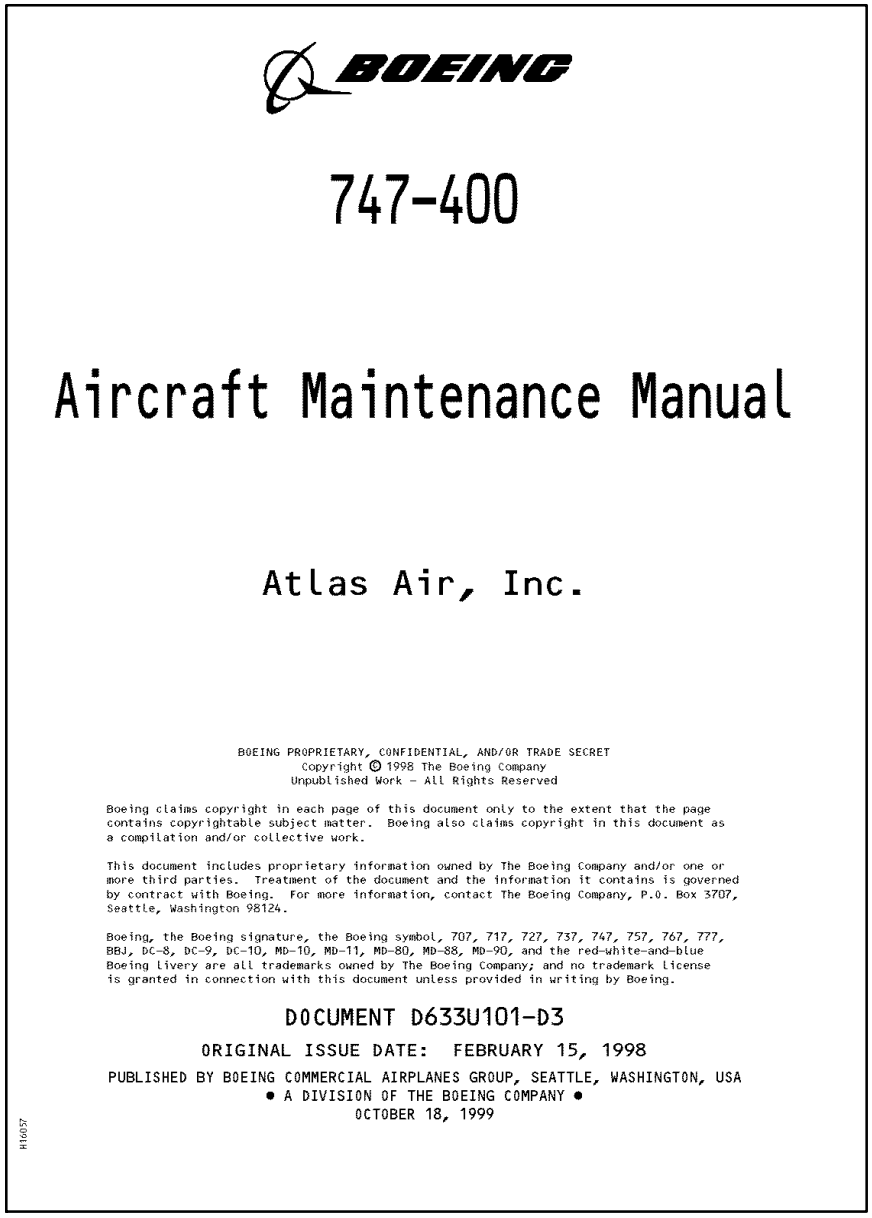

BOEING

747-400

Aircraft Maintenance Manual

Atlas Air, Inc.

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OCTOBER 18, 1999

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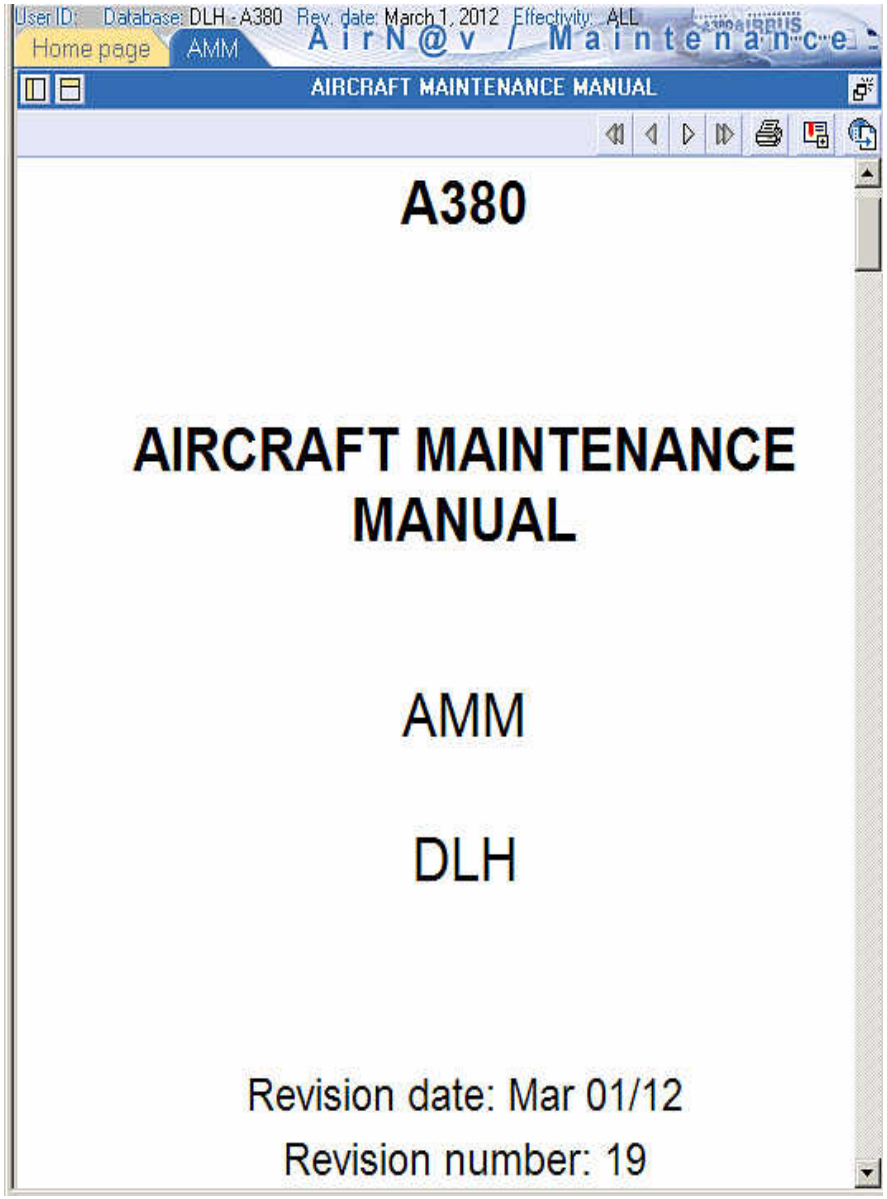


**Figure 11 AMM Cover Sheet**

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## How to use the Manual

### Structure of the Manual

There are the following lists at the beginning of the AMM:

- List of Chapters
- Record of Revisions
- List of Temporary Revisions
- Service Bulletin List
- Deactivation/Reactivation Index (AIRBUS)

At the beginning of every chapter further lists can be found:

- Highlights (HL)
- List of Effective Pages (LEP)
- Table of Contents (TOC)

Every chapter is divided into:

- Chapter
- Section
- Subject

The particular Page Blocks are related to every section/subject arrangement.

### Locating of a Work Task

To locate a work task in the AMM these methods are possible:

- 1) Starting at the table of content (TOC)
- 2) Searching of a referenced task number

### Starting at the Table of Content

The table of content is the abstract of the particular chapter and permits a relative easy access to the searched work task.

The 1st step is always the checking of the revision status of the document, like it has been explained in the chapter before, which means the actuality of the document has to be ascertained.

The next step is the selection of the applicable ATA-Chapters. The information can be searched in the list of chapters, if necessary.

After that the continuative section has to be searched in the correct chapter.

The 4th step is the search of the particular component (Subject).

Under the subject every work task that concerns the component (related to page blocks) is listed.

Here the denomination of the right pages for the looked for work task can be found.

A possible effectivity restriction, the review of the effectivity of the page in the list of effective pages (LEP) and the review of a possible temporary revision (T/R, yellow page), has to be regarded.

**Example:**

The hydraulic pump of the green hydraulic system at the engine 1 of the D-AIGO is defect and has to be exchanged.

**Procedure:**

- Review of the revision status of the A340 AMM with the help of the IBO mask (actuality of documents).
- Determination of the applicable ATA chapter (29).
- Determination of the correct section (29-11).
- Determination of the subjects (29-11-51).
- Use the removal/installation page block. Here the denomination of the page can be found (Removal PB 401, Installation PB 409).

Here it catches the eye that there are two possibilities to accomplish the procedure (Configuration 1 und 2). So:

- Determination of the CSN of the D-AIGO in the CSN/MSN cross-reference-table (CSN 104).
- Select the right configuration (Config.1).
- After picking the correct work task, it is imperatively necessary, to check for further effectivity restrictions, page effectivity and temporary revisions (T/R's/yellow pages).

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| Version Rank | | Model | MSN | Registration | Customization and Fleet Serial Number | |
|---|---|---|---|---|---|---|
| DLH02 | 00001 | 340-311 | 0020 | D-AIGA | DLH | 051 |
| DLH02 | 00002 | 340-311 | 0024 | D-AIGB | DLH | 052 |
| DLH02 | 00003 | 340-311 | 0027 | D-AIGC | DLH | 053 |
| DLH02 | 00004 | 340-311 | 0028 | D-AIGD | DLH | 054 |
| DLH02 | 00005 | 340-311 | 0035 | D-AIGF | DLH | 055 |
| DLH02 | 00006 | 340-311 | 0052 | D-AIGH | DLH | 056 |
| DLH02 | 00007 | 340-311 | 0053 | D-AIGI | DLH | 057 |
| DLH02 | 00008 | 340-311 | 0056 | D-AIGK | DLH | 058 |
| DLH03 | 00001 | 340-313 | 0135 | D-AIGL | DLH | 101 |
| DLH03 | 00002 | 340-313 | 0158 | D-AIGM | DLH | 102 |
| DLH03 | 00003 | 340-313 | 0213 | D-AIGN | DLH | 103 |
| DLH03 | 00004 | 340-313 | 0233 | D-AIGO | DLH | 104 |

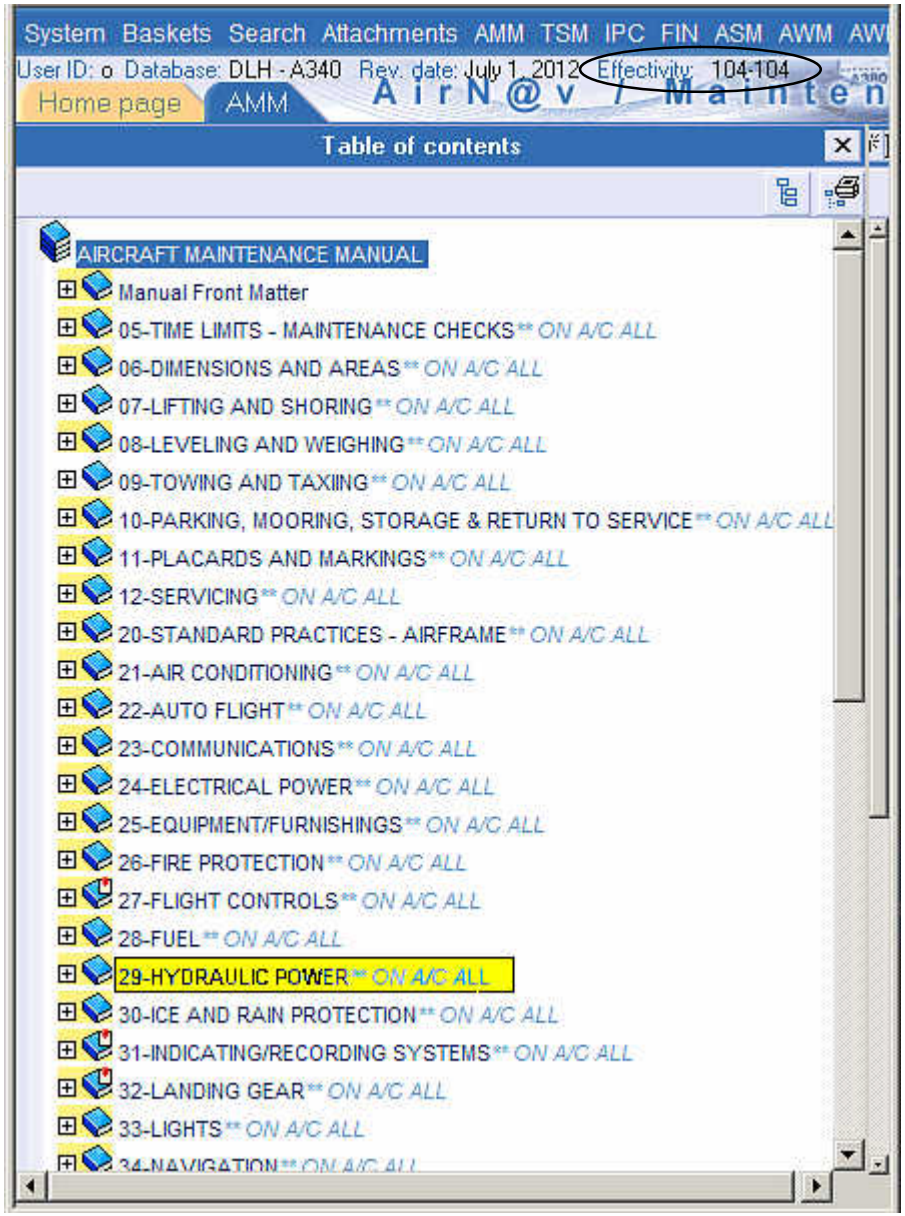


**Figure 12 CSN-ATA-Chapter**

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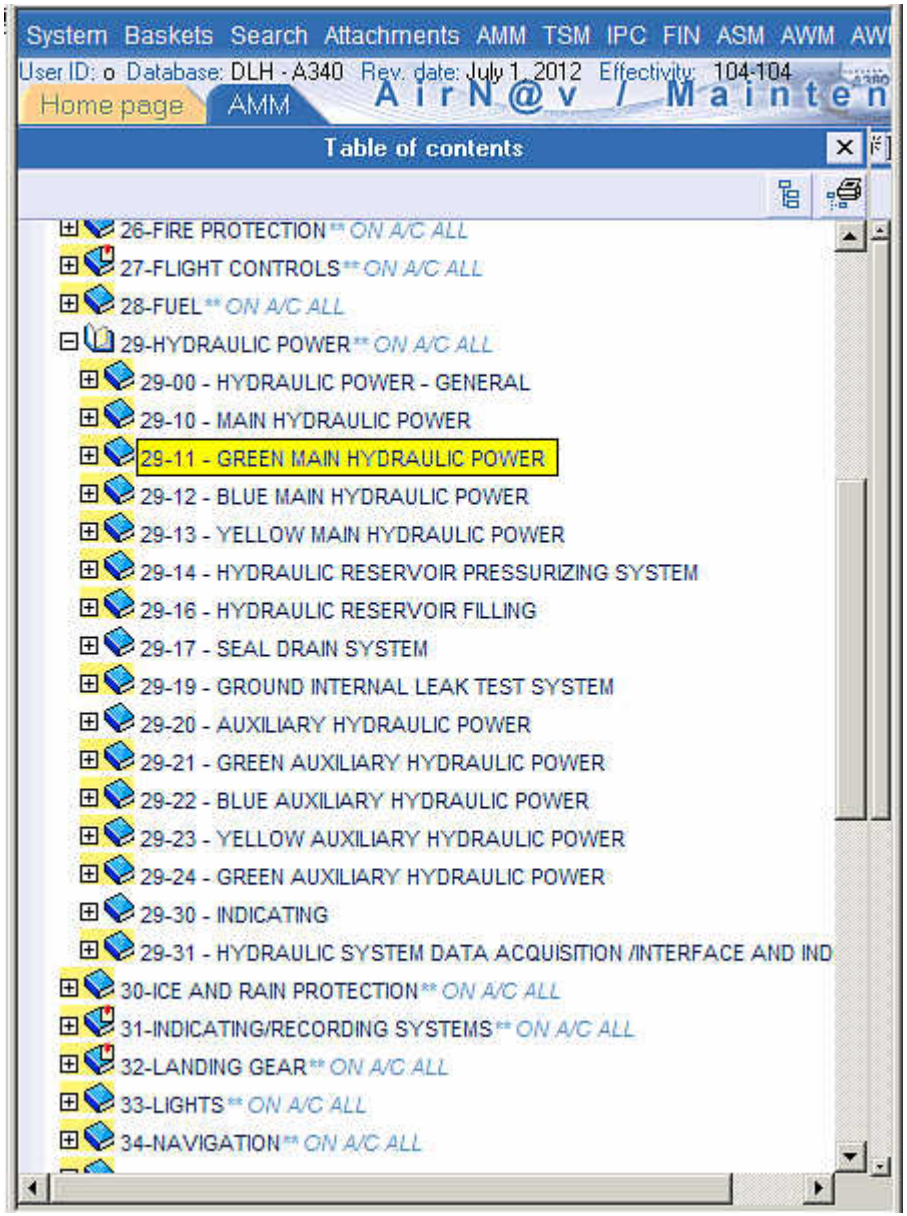


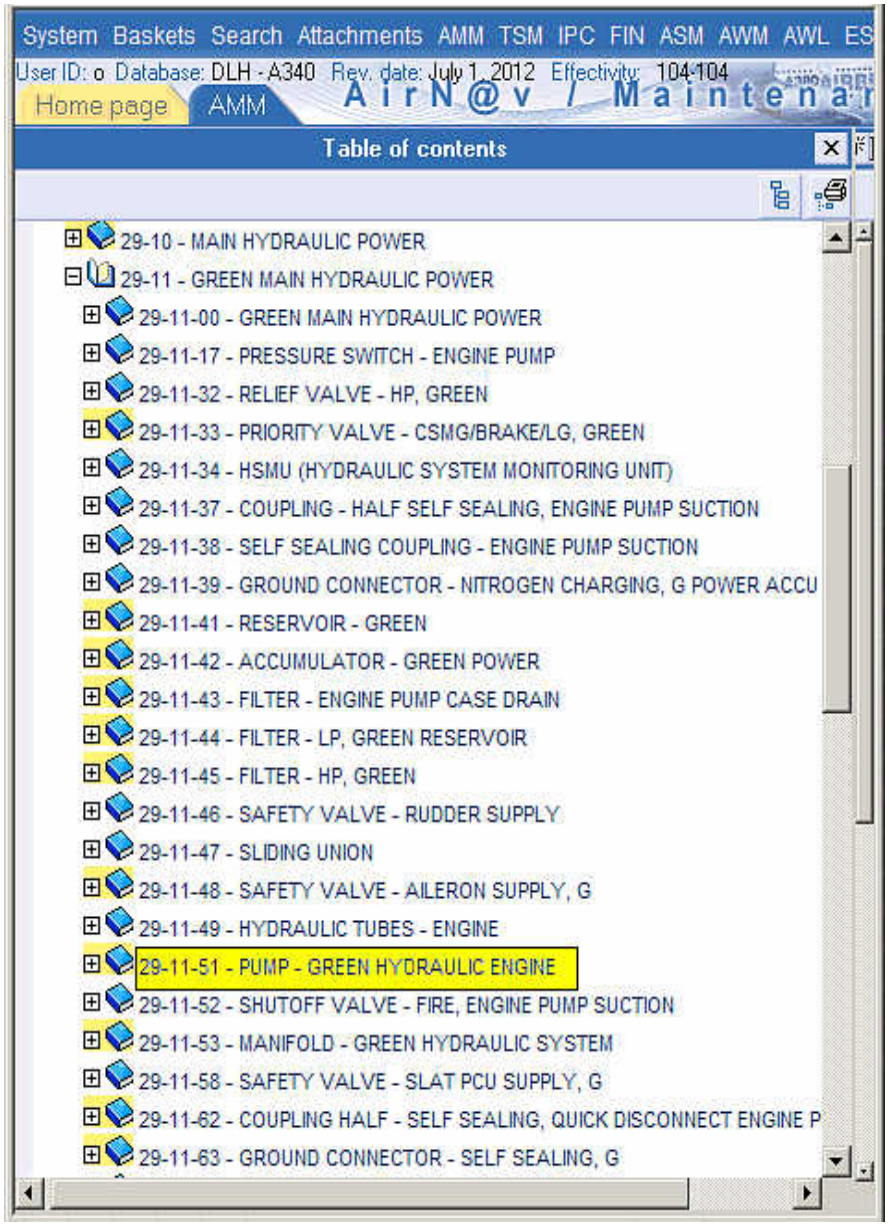


**Figure 13 Section-Subject**

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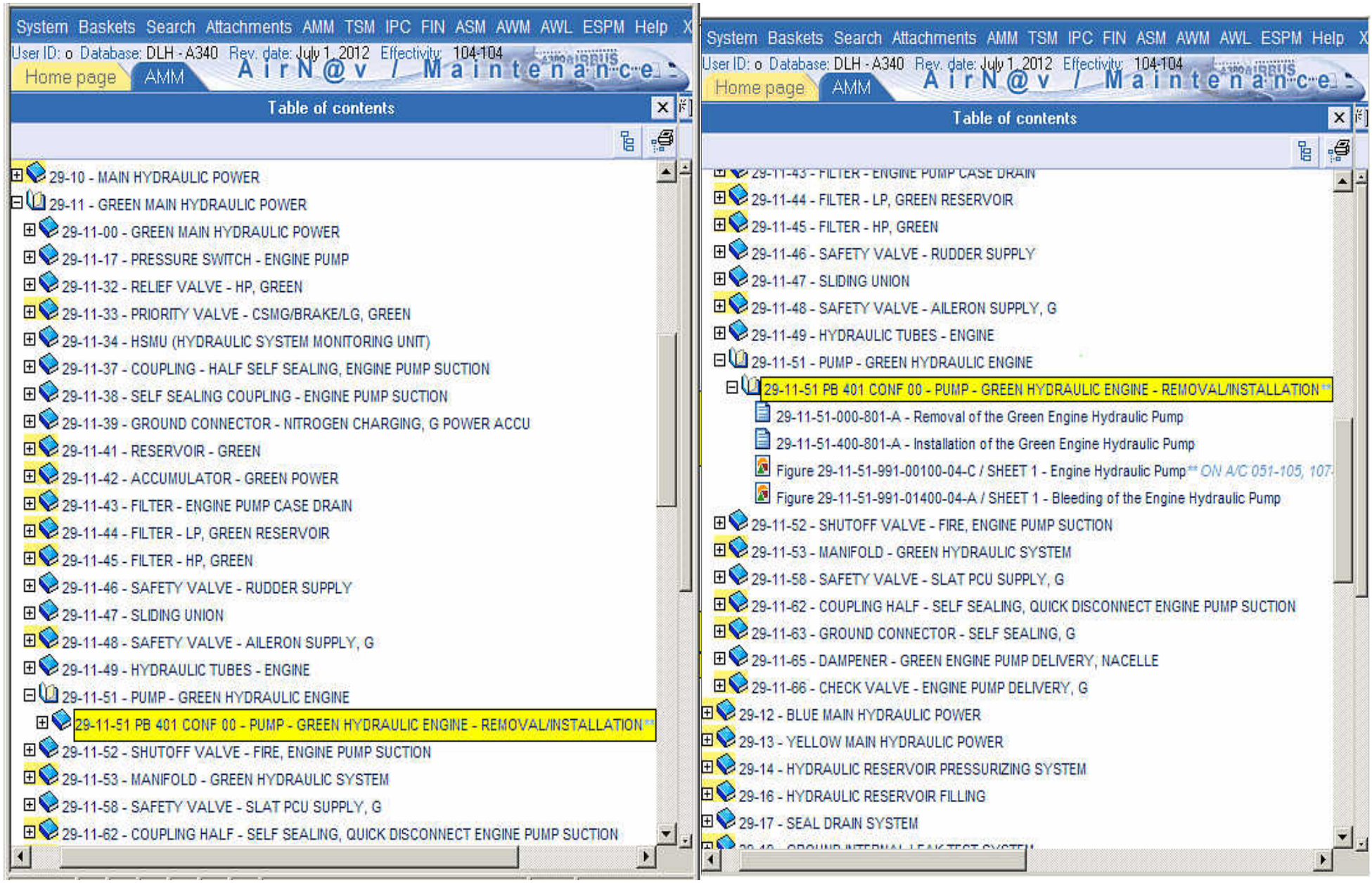


**Figure 14 Work Task**

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## Structure of a Work Task

### General

Every work task is divided into individual paragraphs. The content of these is explained in the following text.

### Arrangement

- Title of the work task
- TASK-Number
- Title of the TASK
- Important advices
- Reason for the job
- Job set-up Information
- Job set-up
- Procedure
- Close-up

**Detailed Information:**

- **Title of the work task**
  - It is the title of the Task followed by the FIN Number (s) if applicable.
- **TASK-Number**
  - To every work task a singular TASK number is assigned.
- **Title of the TASK**
  - Every TASK number has an own caption.
- **Important advices**
  - There are 3 categories of advices:

    **WARNING:** WARNING NOTICES, WHICH, WHEN THEY ARE NOT FOLLOWED, CAN CAUSE BAD INJURIES OR THE DEATH OF PEOPLE.

    **CAUTION:** WARNING NOTICES, WHICH, WHEN THEY ARE NOT FOLLOWED, CAN CAUSE DAMAGING OF THE AIRCRAFT OR TEST EQUIPMENT.

    **NOTE:** Notices which contain information to make a work step simpler or additional information.
- **Reason for the Job (AIRBUS)**
  - Here a cross-reference to the underlying document, like e. g. the MMEL, the CDL or the MPD is given. Otherwise a note “Self Explanatory“ appears.
- **Job Set-Up Information**
  - This information is used for the work preparation and gives advices to:
    - Fixtures, tools, test and support equipment:

      Special advices concerning safety devices, tools, test- and other equipment.
    - Expendable Parts:

      Cross-references to the IPC for an easy location of the required replacement parts.
    - Referenced Information:

      Referencing to all additionally necessary work tasks.
- **Job Set-Up**
  - This information is used for work preparation at the aircraft. It can contain:
    - Specifications of the system configuration,
    - Safety instruction,
    - Starting of the electrical system,
    - Configuration of the circuit breaker,
    - Advices for the entrance to the working area...
- **Procedure**
  - The actual working procedure with the aid of drawings (Figures) with numerical identification of individual parts.
- **Close-Up**
  - Resetting the aircraft in its original condition.
  - If necessary advices to work steps that have to follow.

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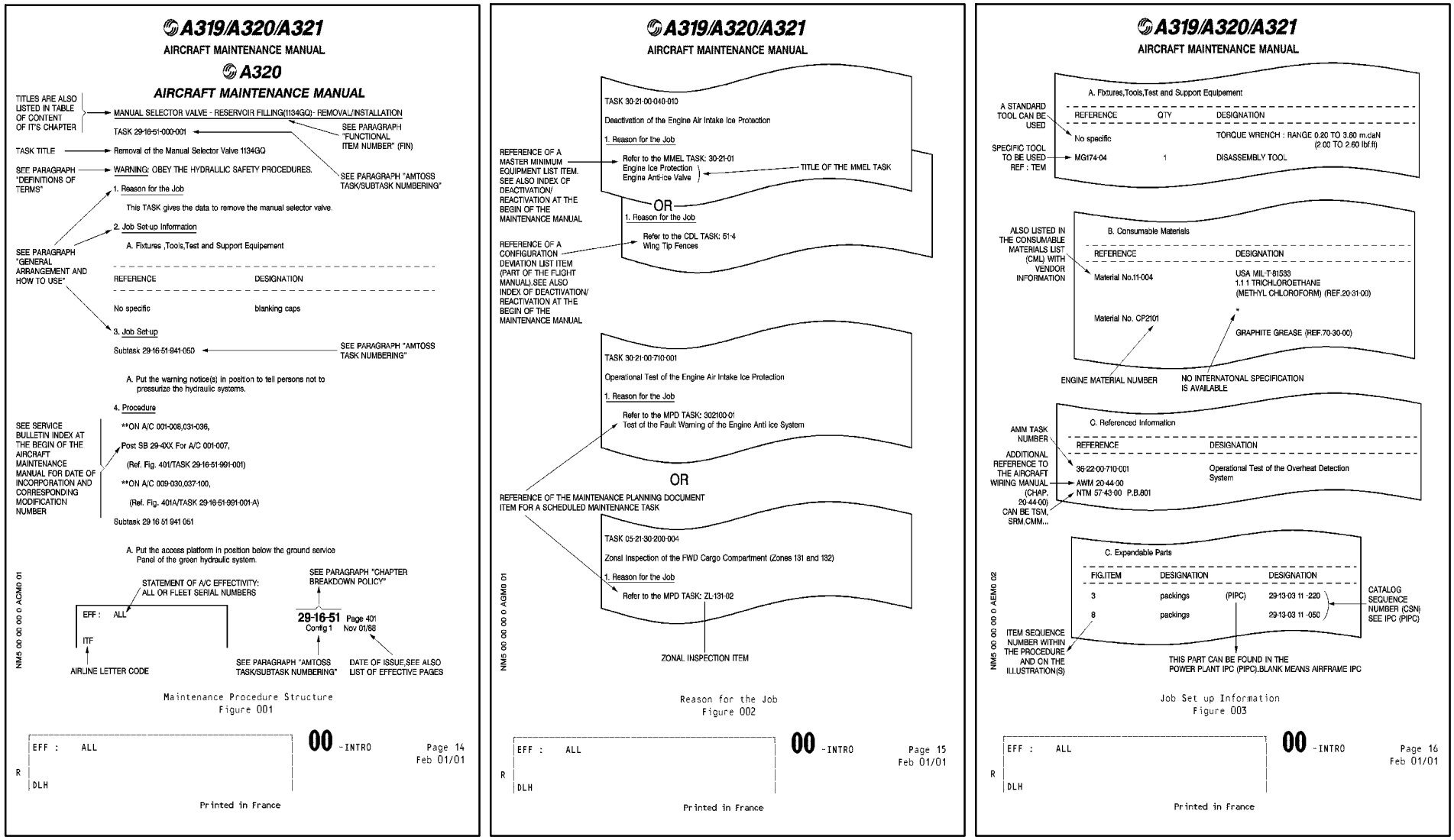


**Figure 15 Structure of a Work Task**

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## Illustrated Parts Catalog (IPC)

### General

The illustrated parts catalog (IPC) contains figures, which depict all parts, classified according to ATA chapters that belong to an aircraft type via explosion views.

Detailed parts lists are related to the figures, in which the component data is arranged.

### Effectivity

The IPC is a type- and mostly an owner referenced document.

**ATTENTION:** The figures inside the IPC cover **all** versions of an aircraft type.
The parts lists are **owner referenced**.

So it is possible that in the figures parts are depicted, which are **not** in the part lists.

### Structure

The structure is made according to ATA iSpec. 2200.

### Manufacturer Reference

The following pages contain explanations about the information shown in the IPC. These refer mainly to the manufacturer AIRBUS, but they can be found (perhaps with a slightly different name) at the manufacturer BOEING.

If there are major differences it will be noticed explicitly.

### Important Info to find out correct Part Numbers to a specific Effectivity! (Airbus)

In the IPC the correct part number information can be found only via the Next Higher Assy (NHA). This change is introduced to fit A320 data to the A380 and A330/A340 families and can‘t be changed by Customer.

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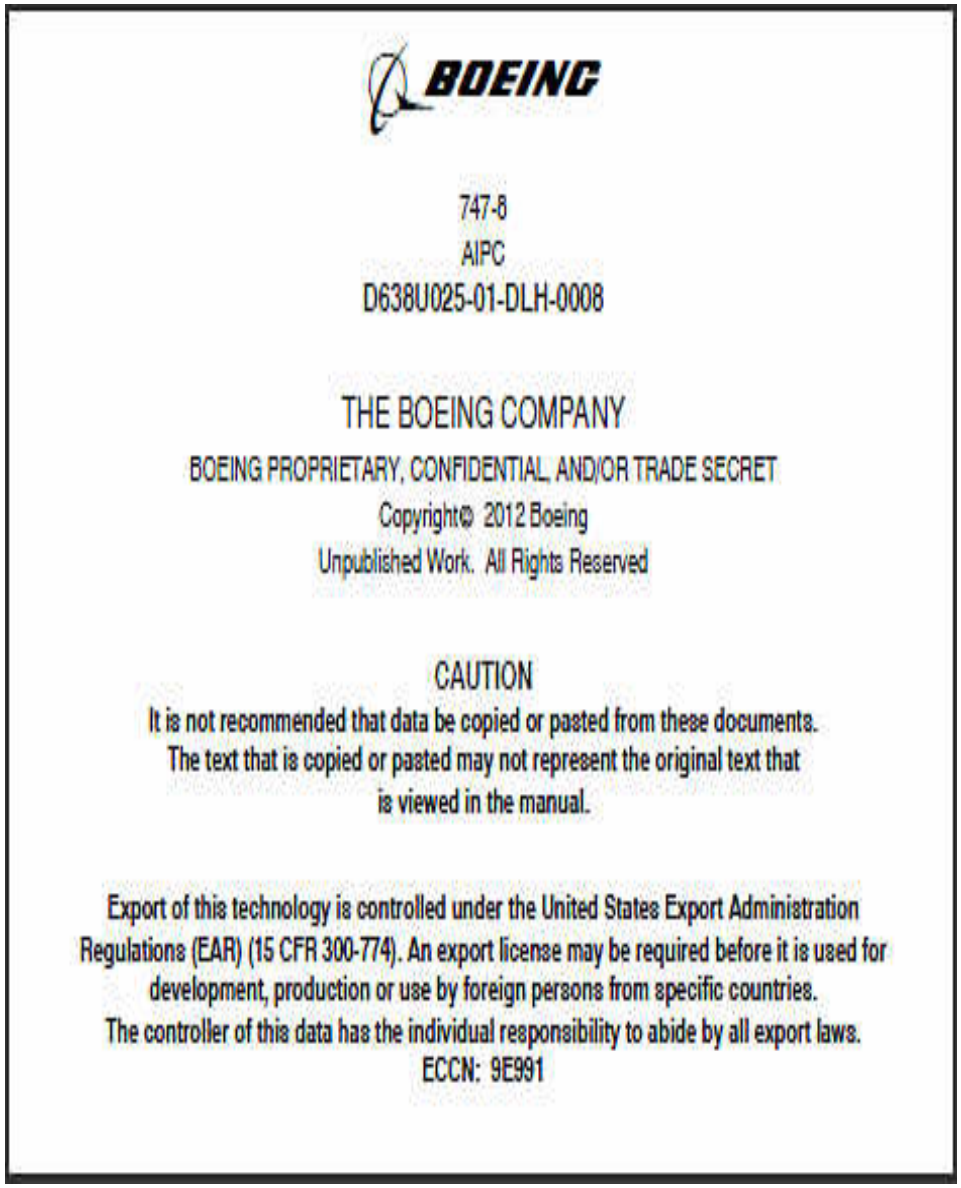

BOEING

747-8
AIPC
D638U025-01-DLH-0008

THE BOEING COMPANY

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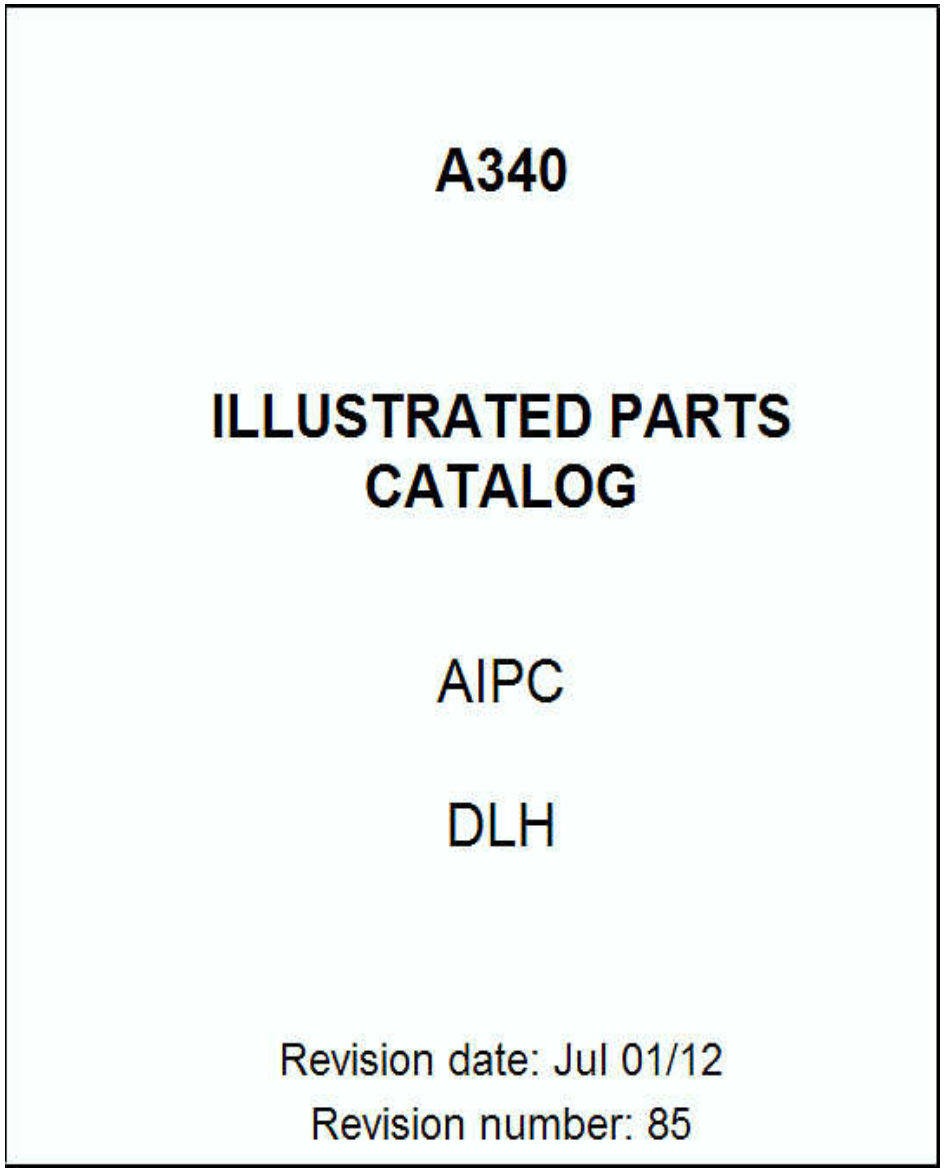

A340

ILLUSTRATED PARTS CATALOG

AIPC

DLH

Revision date: Jul 01/12
Revision number: 85

**Figure 16 IPC Title Page**

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## How to use the IPC

### Finding of the needed Component Information

These are 3 options for finding component related data in IPC:

- **Alphanumeric/Numeric Index**
  - When the part number is known the information regarding the ATA chapter, the figure and the part number can be found in the alphanumeric or numeric index, in which is directly referred to the figure and the item number.
- **Table of Content**
  - When the part number is not known the necessary information (ATA chapter, figure and item number) can be derived from the table of content, which means that a system knowledge is **imperatively** necessary.
- **Additional Cross Reference Table (AIRBUS)**
  - When the functional item number (FIN) is known the necessary information regarding the ATA chapter, the figure and the part number can be found in the additional cross reference table, in which directly is related to the figure and item number.

### Structure of Chapters in the IPC

In the IPC the structure of the AMM is carried over, both the chapter and the section structure.

The subject numbering is assigned by the location in the aircraft. The exact breakup can be found in the introduction of the particular IPC.

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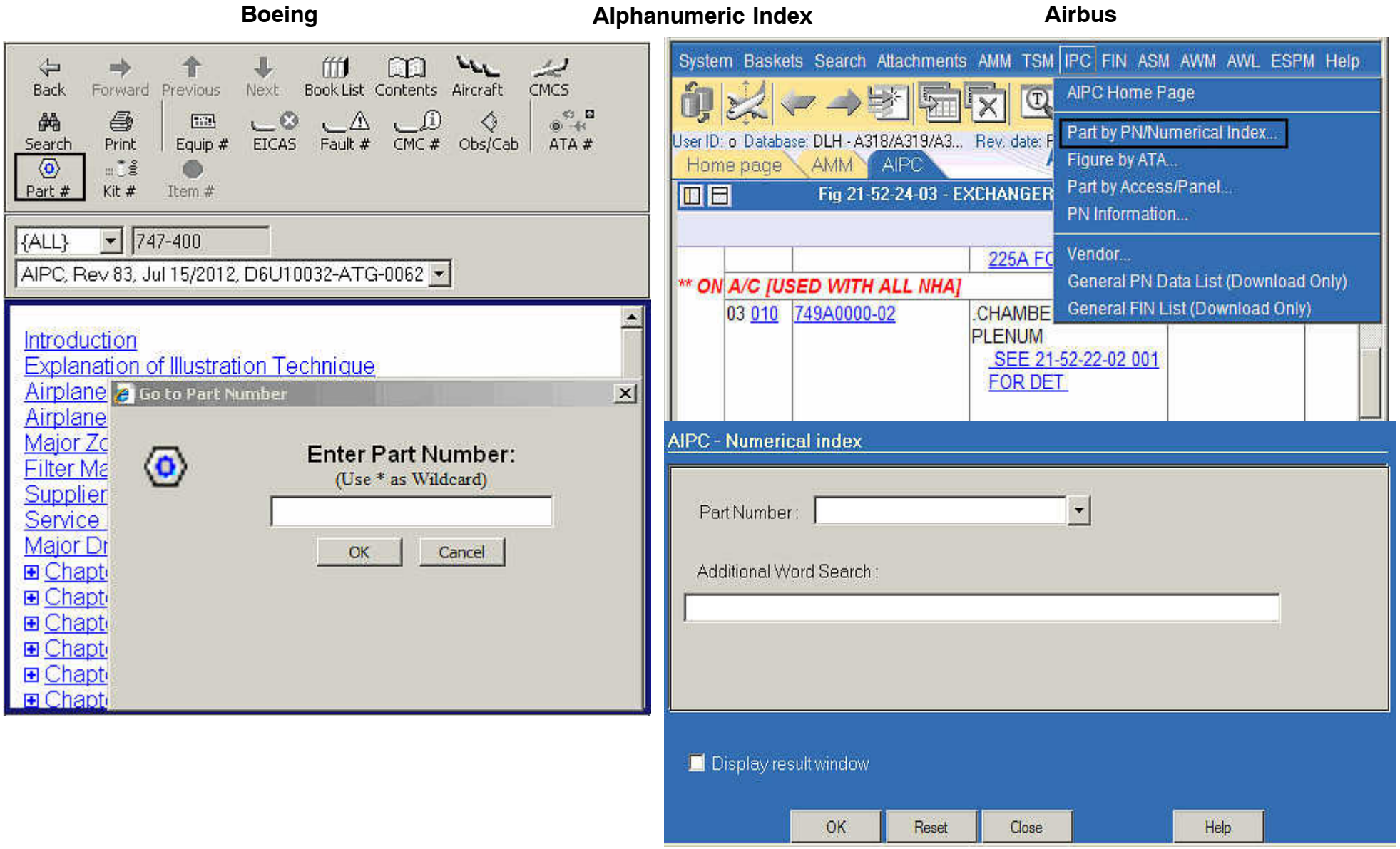


**Figure 17 IPC Search - Alphanumeric Index**



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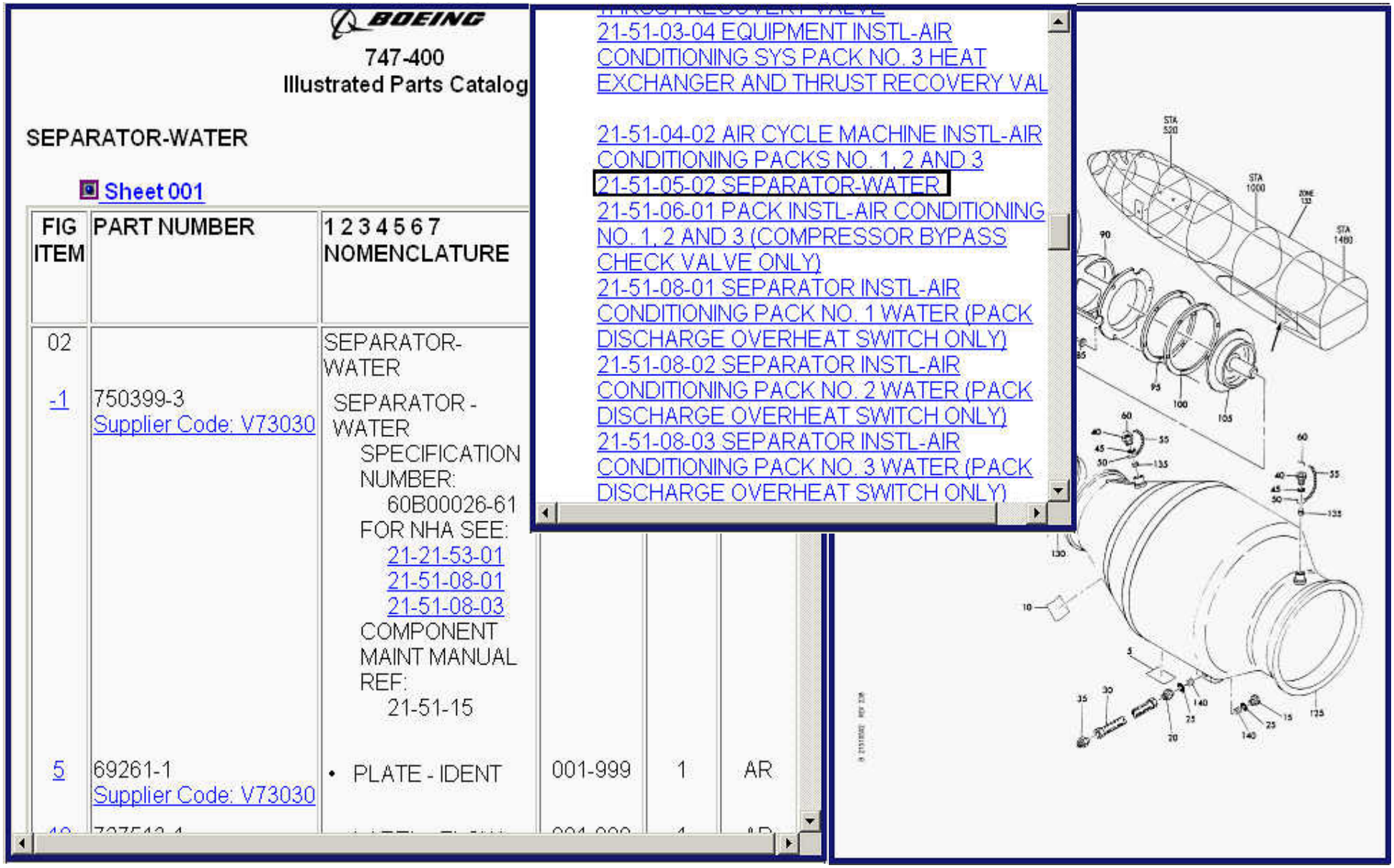


**Figure 18 IPC-Search - Table of Content Boeing**

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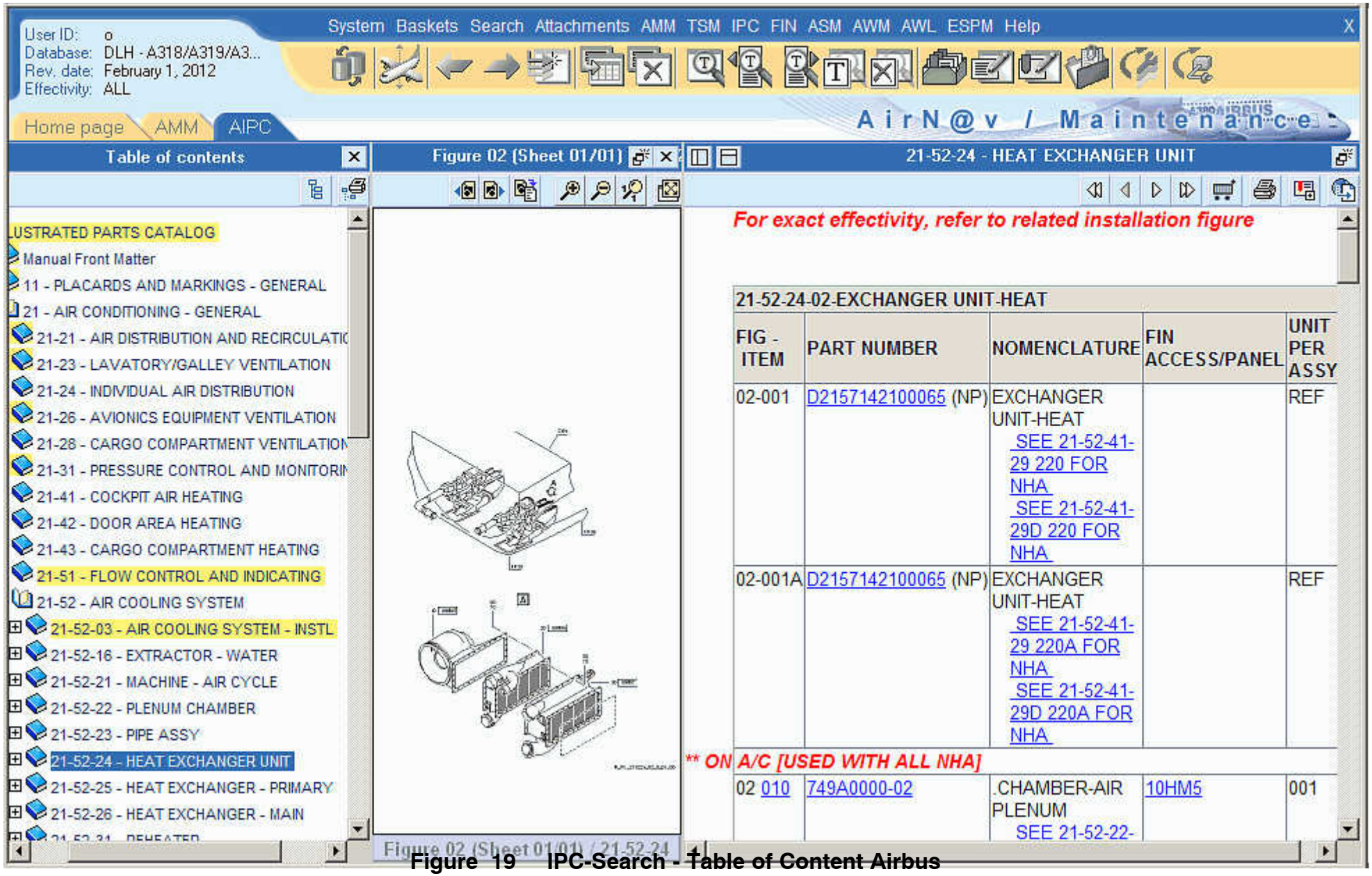


**Figure 19 IPC-Search - Table of Content Airbus**

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## Component Maintenance Manual (CMM)

The Component Maintenance Manual is the maintenance instruction for aircraft components. It has the form of a portfolio.

**Content:**

The CMM is the instruction, published and approved by the manufacturer, for the maintenance of a component type.

- It describes working and testing procedures and contains bills of material with the corresponding figures, which depict the component in their disassembly order.
- Temporary revisions arranged as ”yellow pages” in the handbook.

**Effectivity:**

- The component maintenance manual has an effectivity for a component (part no.).
- Different modification states of one component are marked by changed part numbers/ dash numbers.

  When the maintenance instruction is applied the part number and dash number of the component has to be conform to the manual.

**Structure:**

The component maintenance manual is assigned to the particular ATA chapter of the component application

The handbook is structured in several parts.

Structuring Example:

- Introduction
- Description and Operation
- Testing and Fault Isolation
- Disassembly
- Cleaning
- Check
- Repair
- Assembly and Storage
- Fits and Clearances
- Special Tools, Fixtures and Equipment
- Illustrated Parts List
- Vendors List

The Prefix contains amongst others:

  - Record of Revisions
  - Record of Temporary Revisions
  - Service Bulletin List
  - List of Effective Pages
  - Table of Contents

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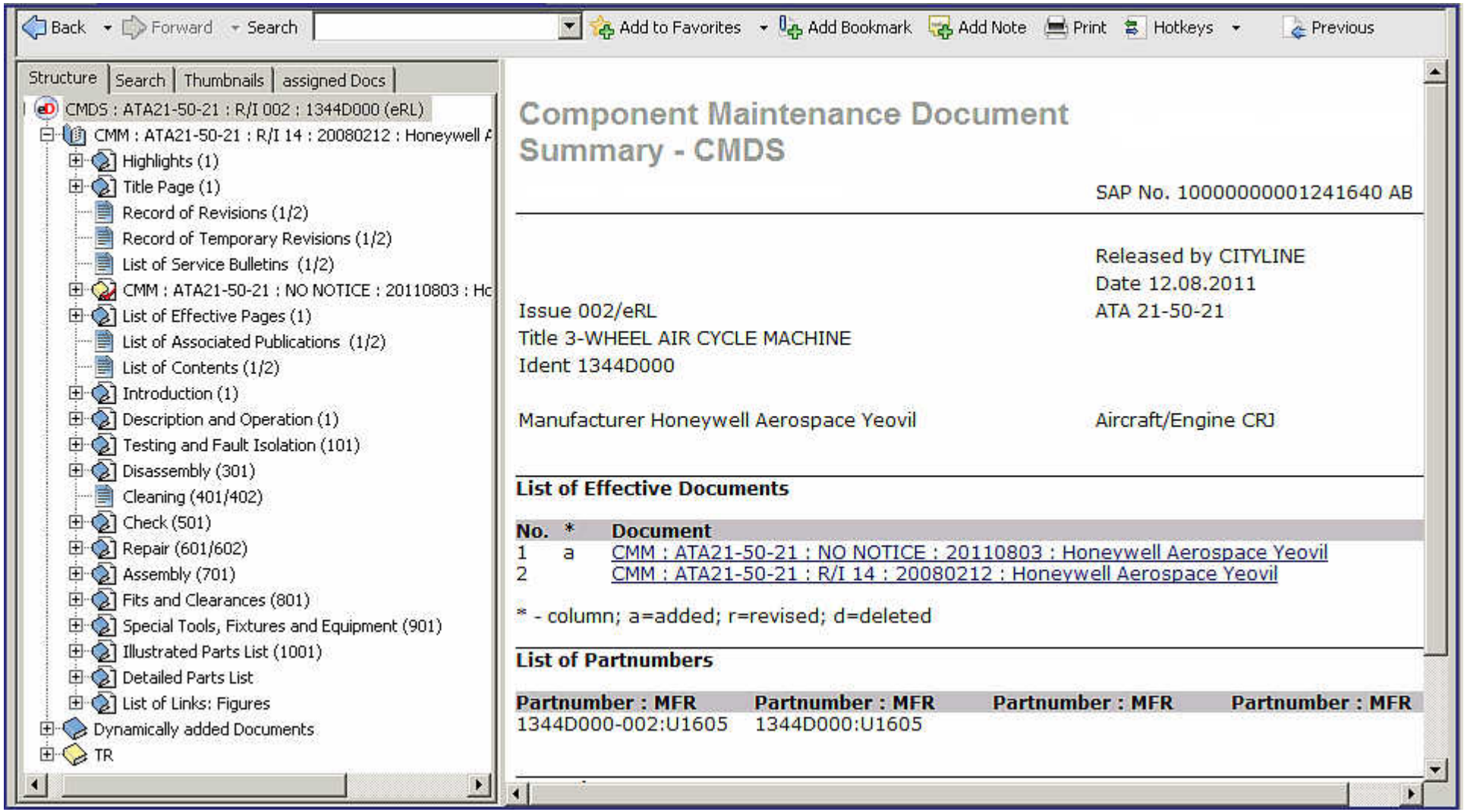


**Figure 20 Component Maintenance Manual**

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## Illustrated Parts List (IPL)

The illustration shows the component parts in a disassembly order.
In a bill of material detailed parts data is given.

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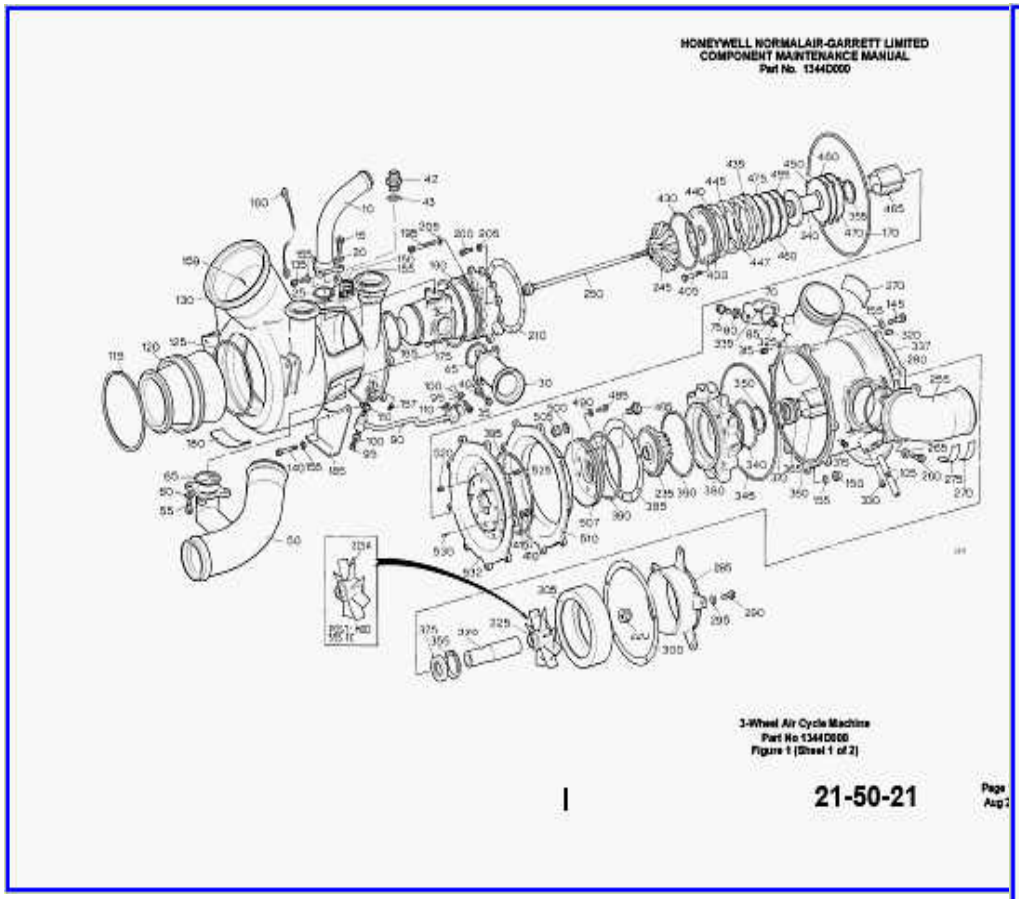


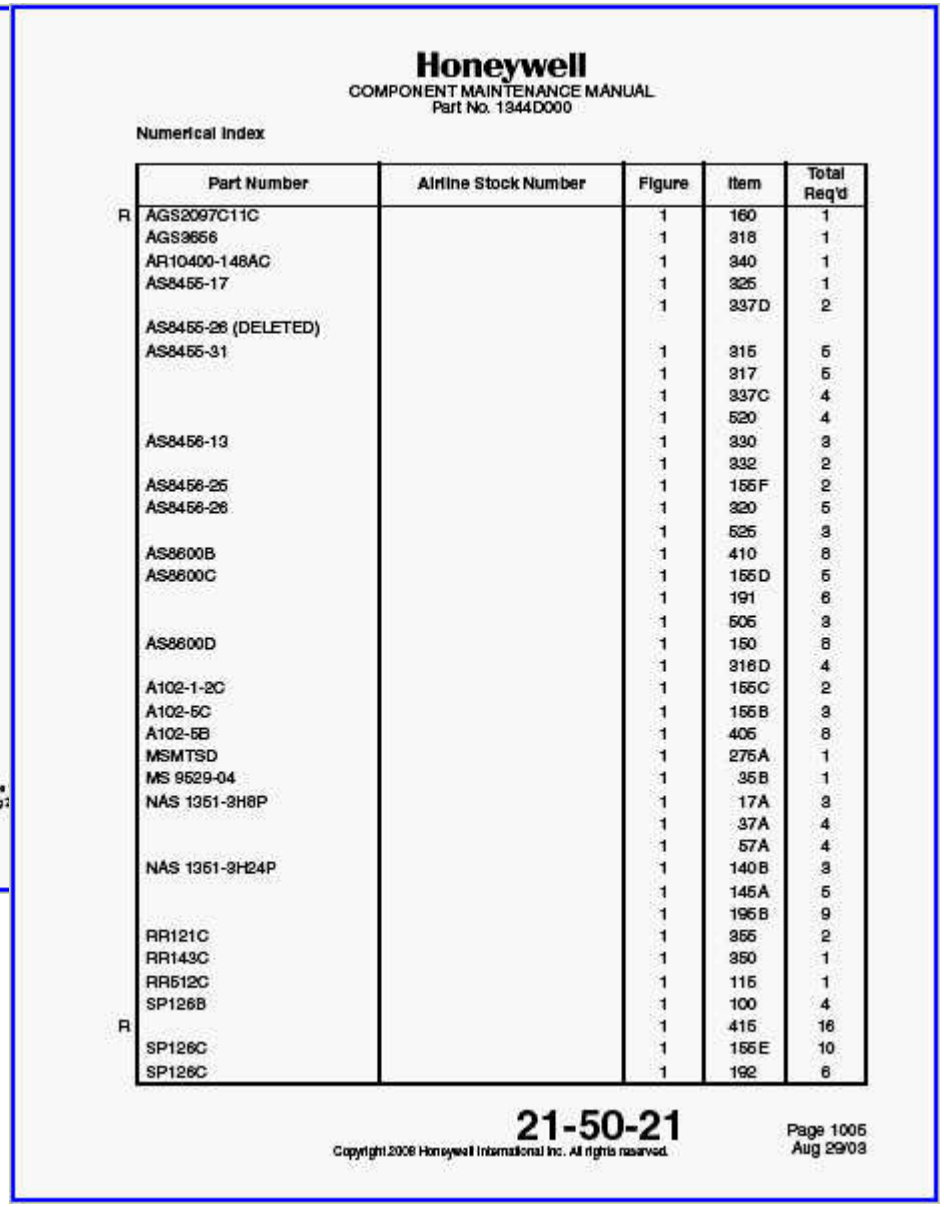

**Honeywell**
COMPONENT MAINTENANCE MANUAL
Part No. 1344D000

Numerical Index

| | Part Number | Airline Stock Number | Figure | Item | Total Req'd |
|---|---|---|---|---|---|
| R | AGS2097C11C | | 1 | 160 | 1 |
| | AGS3656 | | 1 | 318 | 1 |
| | AR10400-148AC | | 1 | 340 | 1 |
| | AS8455-17 | | 1 | 325 | 1 |
| | | | 1 | 337D | 2 |
| | AS8455-26 (DELETED) | | | | |
| | AS8455-31 | | 1 | 315 | 5 |
| | | | 1 | 317 | 5 |
| | | | 1 | 337C | 4 |
| | | | 1 | 520 | 4 |
| | AS8456-13 | | 1 | 330 | 3 |
| | | | 1 | 332 | 2 |
| | AS8456-25 | | 1 | 155F | 2 |
| | AS8456-26 | | 1 | 320 | 5 |
| | | | 1 | 525 | 3 |
| | AS8600B | | 1 | 410 | 8 |
| | AS8600C | | 1 | 155D | 5 |
| | | | 1 | 191 | 6 |
| | | | 1 | 505 | 3 |
| | AS8600D | | 1 | 150 | 8 |
| | | | 1 | 316D | 4 |
| | A102-1-2C | | 1 | 155C | 2 |
| | A102-5C | | 1 | 155B | 3 |
| | A102-5B | | 1 | 405 | 8 |
| | MSMTSD | | 1 | 275A | 1 |
| | MS 9529-04 | | 1 | 35B | 1 |
| | NAS 1351-3H8P | | 1 | 17A | 3 |
| | | | 1 | 37A | 4 |
| | | | 1 | 57A | 4 |
| | NAS 1351-3H24P | | 1 | 140B | 3 |
| | | | 1 | 145A | 5 |
| | | | 1 | 195B | 9 |
| | RR121C | | 1 | 355 | 2 |
| | RR143C | | 1 | 350 | 1 |
| | RR512C | | 1 | 115 | 1 |
| | SP126B | | 1 | 100 | 4 |
| R | | | 1 | 415 | 16 |
| | SP126C | | 1 | 155E | 10 |
| | SP126C | | 1 | 192 | 6 |

21-50-21

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Aug 29/03

**Figure 21 Illustrated Parts List**

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## Trouble Shooting Manual (TSM)

### General

The TSM contains information about the systematically identification, isolation and correction of faults.

The troubleshooting might be started because of:

- warnings of the centralized maintenance system,
- fault reports,
- or observation of malfunctions.

The content of the TSM was in former time part of the AMM, page block 101 ff., but has grown to so much, that it has become an individual handbook.

### Effectivity

The TSM is a aircraft type and owner referenced document.

### Structure

The structure is according to ATA iSpec. 2200.

### Procedure

For fault isolation and correction references are given to tasks in other handbooks (AMM, WDM...).

### Type of Fault

In the TSM it is made a difference between to types of faults:

- **Monitored Faults:**
  - ECAM warnings,
  - EFIS flags,
  - LOCAL warnings und
  - CMS/CFDS fault messages.
- **Non-Monitored Faults:**
  - Crew or Maintenance OBSERVATIONS.

This type of faults are used as an access to the TSM, that means depending on whether which faults are detected the access to the search of the right trouble shooting procedure is different.

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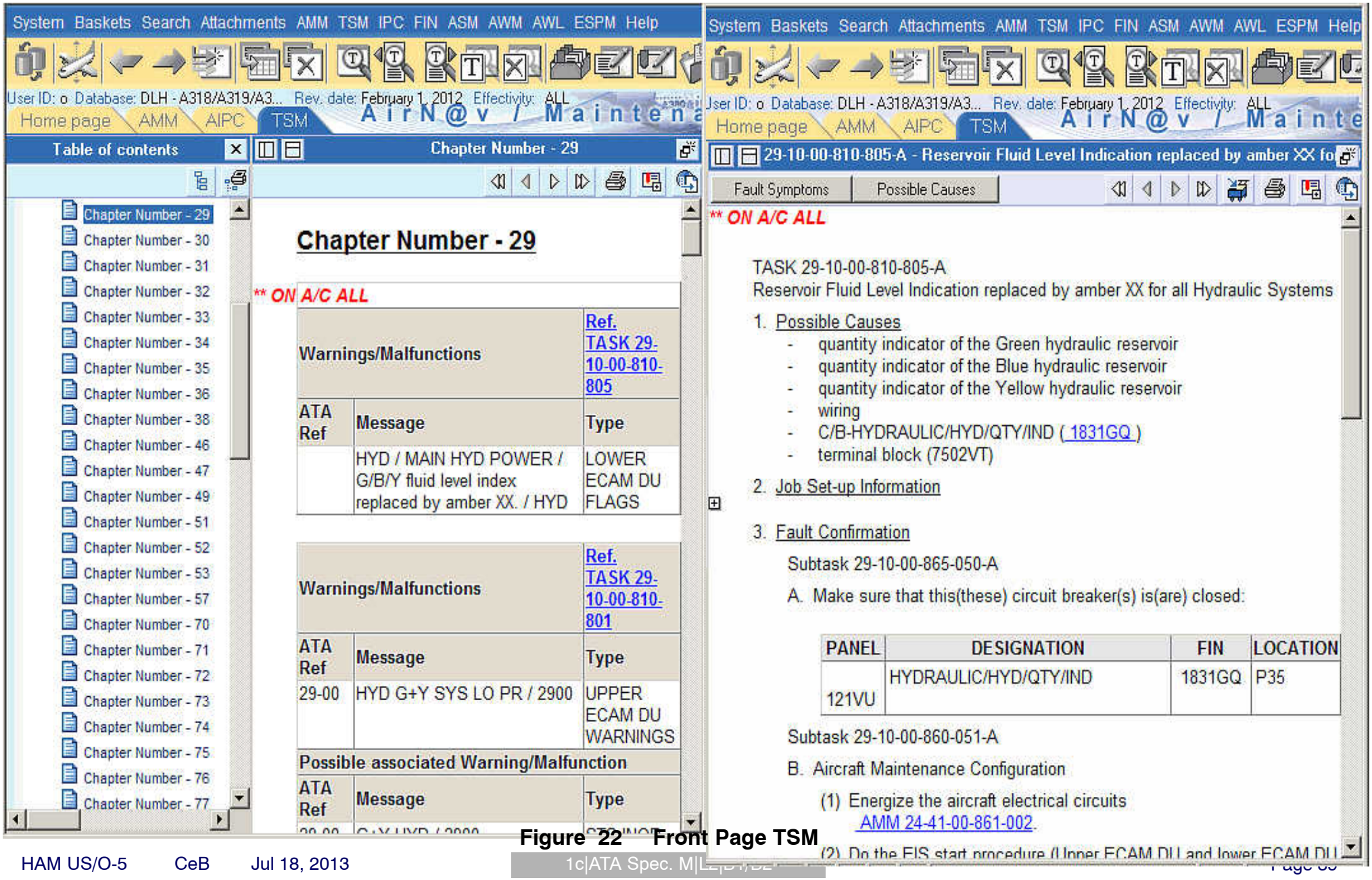


**Figure 22 Front Page TSM**

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## Fault Isolation Manual (FIM)

### General

The FIM contains procedures for the systematically identification, isolation and correction of faults.

The fault isolation manual is the access document to the fault reporting manual (FRM), which supports the crew with methods for fault identification and reporting.

### Effectivity

The FIM is a type and mostly an owner referenced document.

### Structure

The structure is according to ATA Spec.100.

### Procedure

For fault isolation and correction references to work tasks in other handbooks (AMM, WDM...) are given.

This is done via a denomination of the ATA chapter/section/subsection and the particular page block (only AMM).

### Structure of a Fault Isolation Procedure

### General

Every fault isolation procedure is divided into individual paragraphs.

### Arrangement

- Fault Identification
- Possible Causes
- Job Set-Up Information
- Fault Confirmation
- Fault Isolation
- Close–up
- **Fault Identification**
  - Title of the work task
- **Possible Causes**
  - This list contains every part that may have caused the fault.
  - These are tested and/or changed during the fault isolation procedure.
  - Here no details about the electrical system are given, only references to the aircraft wiring.
- **Job Set-Up Information**
  - In this list, like in the AMM, references to additionally required work tasks are given (cross-references to AMM, WDM, ...).
- **Fault Confirmation**
  - During fault confirmation there are two possibilities:
    - **Permanent Fault:**

      The conducted test results that the system is **not OK**. The fault isolation procedure is performed.
    - **Intermittent Fault:**

      The conducted test results that the system is **OK**.
    - In this case the aircraft (following the allowance of the TSM) can be dispatched.
    - However the particular system must be watched very well on the further flights.
    - If the same fault appears altogether three times, without a confirmation at ground, the fault isolation procedure is carried out and the particular parts are changed.
- **Fault Isolation**
  - The fault isolation contains the isolation of the defect component/wiring and the correction of the fault.
  - For wiring checks measurement values, connector and pin numbers are listed.
- **Close-Up**
  - It is necessary to bring the aircraft back to its original state, after the fault isolation and correction process. This is done via here listed procedures.

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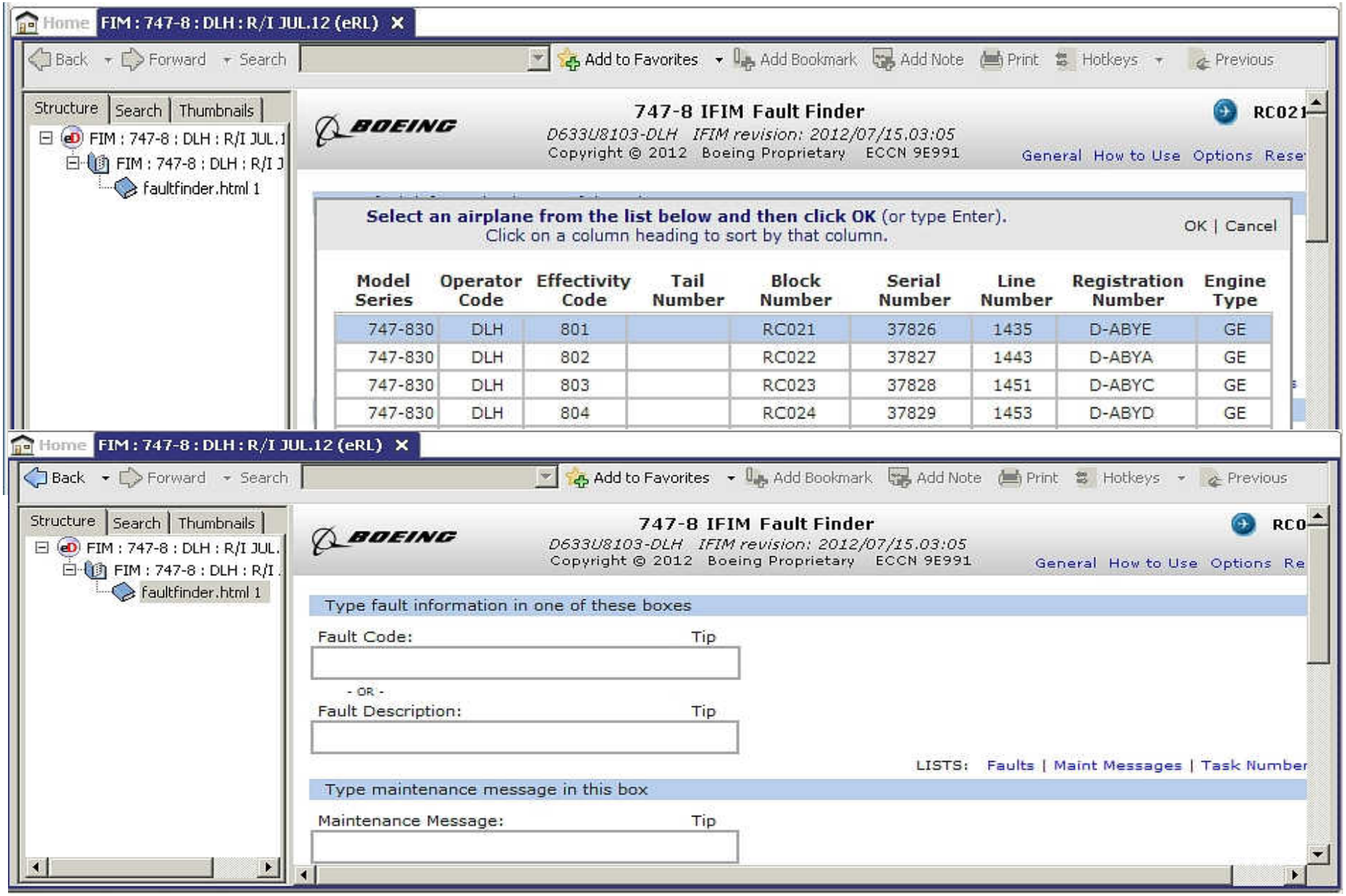


**Figure 23 IFIM Fault Finder**

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## Structure Repair Manual (SRM)

**Content:**

The structure repair manual contains work tasks for judging structural damages

For structural damages which appear quite often it contains approved repairs.

It contains the following topics:

- Identification of structural damages (P/N, material, thickness...)
- Allowable damages (dents, scratches, cracks...)
- Approved structure repairs
- Description of general procedures
- Material information

**Effectivity:**

It is aircraft type referenced and normally not owner referenced.

**Structure:**

The structure is according to ATA-Spec 100 and divided into the following chapters:

- 51 - Structure General
- 52 - Doors
- 53 - Fuselage
- 54 - Nacelle/Pylon
- 55 - Stabilizers
- 56 - Windows
- 57 - Wings

**The chapter 51 contains general content:**

- Structural assembly, sections, Measurement plans...
- Primary- and Secondary structure
- Tolerances for aerodynamic passages
- Damage classification generally
- Defect reporting
- Description of working and repair procedures
- Corrosions detection, corrosion protection
- Sealing
- Heat treatment (rivets...)
- Cold straining / surface strengthening (e. g. flap peening...)
- Hardness test
- Materials - metallic/non-metallic
- Fasteners, Fastener Installation

**The chapters 52 to 57 have an identical structure** (new types)

They are divided into three page blocks:

- Pages 1... 99 Structure Identification
- Pages 101...199 Allowable Damage
- Pages 201... Repairs

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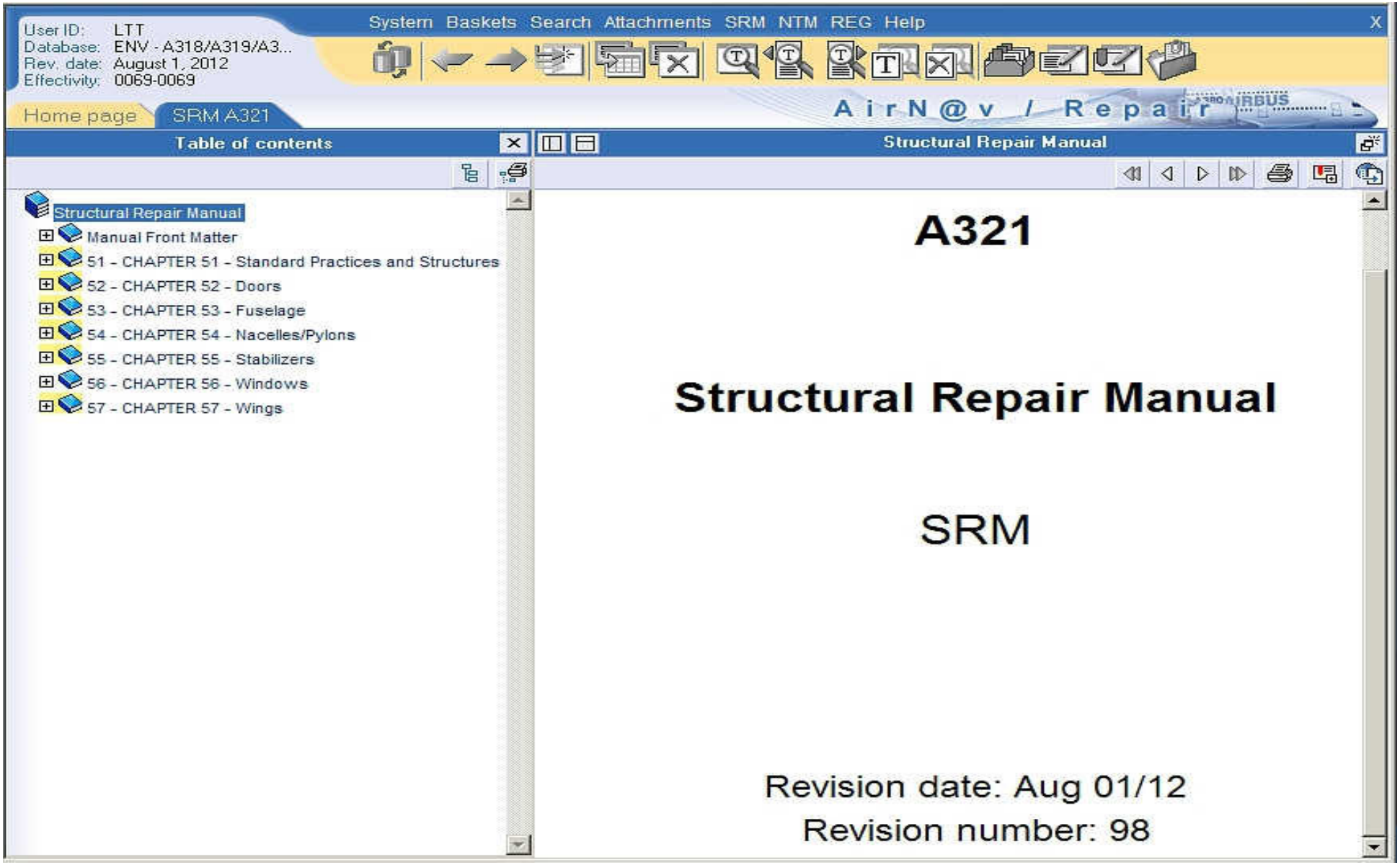


**Figure 24 SRM - General Part**

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**Manual Usage:**

1. Determination of the damage - place, type, size...
   - Damage types see chapter 51 -
2. Determination of the relevant ATA chapter
   - Airbus - with index in the introduction -
3. Structure identification
   - Identifying type and thickness of the damaged part -
4. Judging the damage
   - With the part ”allowable damage” (Searching via table of content)
5. Definition of the repair procedure

When using the individual handbook parts the effectivity has always to be considered.

If the SRM contains no adequate procedure, the manufacturer has to be contacted.

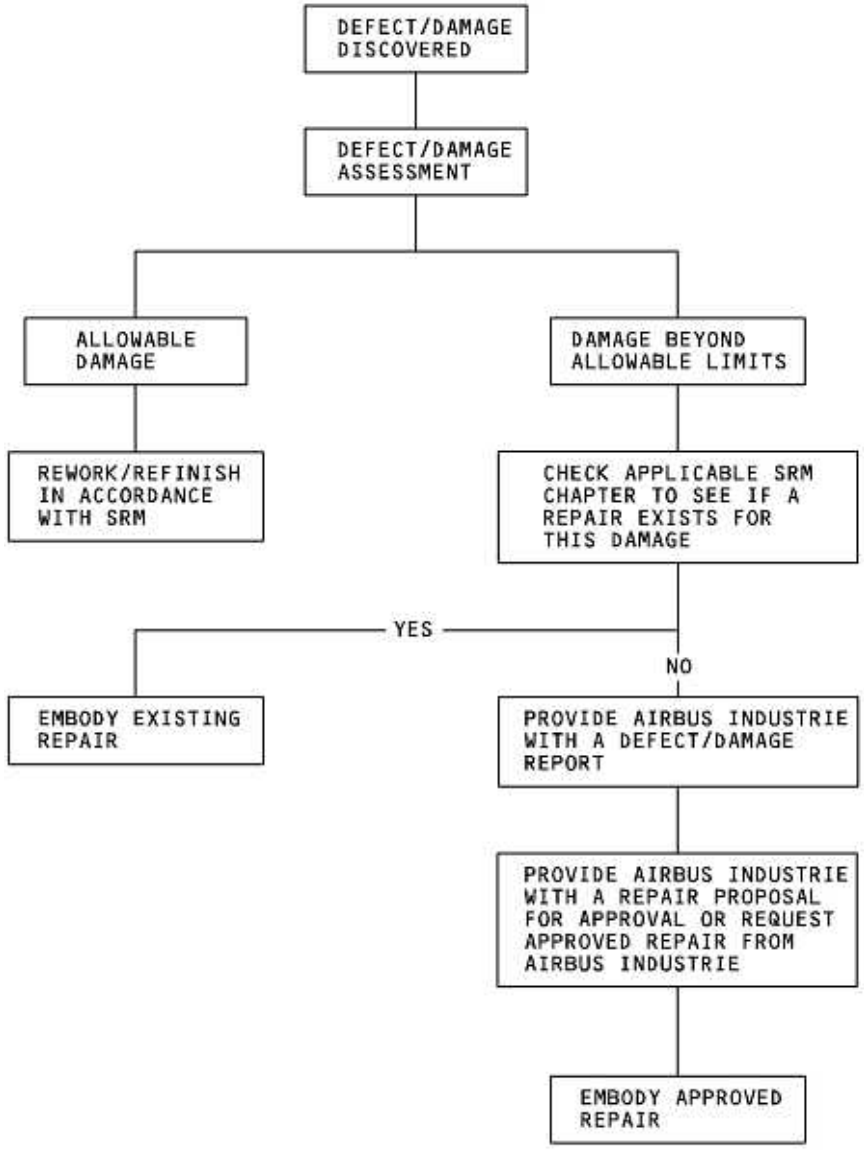


**Figure 25 SRM - Manual Usage (1)**

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**Introduction contains amongst others:**

- Alphanumeric Index (Airbus)
  - Component P/N ➧ ATA, FIG-No., Configuration, Item -
- Table of revisions
- Description about structure, content and application of the manual
- Airplane effectivity list

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A320
STRUCTURAL REPAIR MANUAL

ALPHANUMERICAL INDEX LIST - INTRODUCTION

1. Purpose

This document which supplements the SRM will be updated with each revision of the SRM. It is intended to:

- supply a list of all PNs (Partnumber) in the SRM
- give reference to ATA - Reference, Figure Number, Configuration, Item where the PN is incorporated.

2. How to use

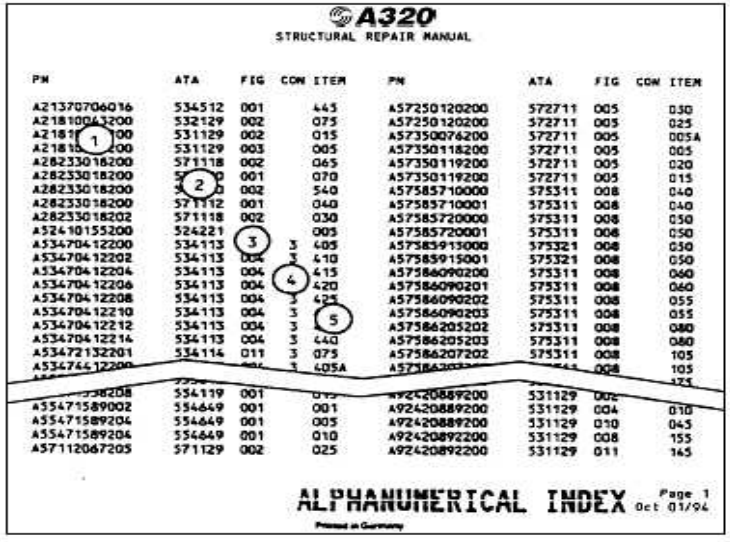
1 PN in alphanumerical order

2 ATA Reference

3 Figure Number

4 Configuration

5 Item in related Figure

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A320
STRUCTURAL REPAIR MANUAL

| PN | ATA | FIG | CON | ITEM | PN | ATA | FIG | CON | ITEM |
|---|---|---|---|---|---|---|---|---|---|
| A21270393000 | 533114 | 006 | | 001 | A54611463204 | 545211 | 002 | 2 | 025A |
| A21270393000 | 533129 | 008 | | 105 | A54611463204 | 545211 | 007 | 1 | 070 |
| A21270520000 | 533114 | 006 | | 020 | A54611463204 | 545211 | 007 | 2 | 070 |
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| A21270520000 | 533129 | 008 | | 055 | A55371593000 | 553119 | 001 | 1 | 140 |
| A21270520000 | 533129 | 008 | | 060 | A55371593000 | 553219 | 001 | | 005 |
| A21270520000 | 534114 | 003 | 3 | 025 | A55371593000 | 553411 | 001 | | 025 |
| A21270520000 | 534114 | 004 | 3 | 050 | A55371652226 | 553642 | 001 | | 085 |
| A21270520000 | 534114 | 005 | 3 | 100 | A55371652226 | 553642 | 002 | | 100 |
| A21270520000 | 534114 | 006 | 3 | 135 | A55471558208 | 554119 | 001 | | 015 |
| A21270520000 | 534114 | 007 | 3 | 350 | A55471589002 | 554649 | 001 | | 001 |
| A21270520000 | 534114 | 008 | 3 | 165 | A55471589006 | 554649 | 001 | | 001A |
| A21270520000 | 534114 | 009 | 3 | 095 | A55471589204 | 554649 | 001 | | 005 |
| A21270520000 | 534114 | 009 | 3 | 205 | A55471589208 | 554649 | 001 | | 005A |
| A21270520000 | 534114 | 010 | 3 | 145 | A57112067205 | 571113 | 003 | | 005 |
| A21270520000 | 534114 | 011 | 3 | 240 | A57151196200 | 572113 | 007 | | 275 |
| A21270520000 | 534114 | 012 | 3 | 050 | A57350076200 | 572711 | 005 | | 005A |
| A21279295004 | 533114 | 001 | | 045 | A57350076200 | 572711 | 007 | | 005 |
| A21279295068 | 533114 | 001 | | 045A | A57350076202 | 572711 | 007 | | 005A |
| A21370706016 | 533114 | 001 | | 050 | A57350112200 | 572711 | 005 | | 020 |
| A21370706016 | 534300 | 005 | | 070 | A57350113004 | 572711 | 005 | | 010 |
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| A21810043200 | 532129 | 002 | | 075 | A57350119200 | 572711 | 005 | | 015 |
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| A28233018202 | 571129 | 001 | | 080 | A57843699200 | 574521 | 002 | | 185 |
| A28233018202 | 571129 | 002 | | 130 | A57843699200 | 574621 | 002 | | 205 |
| A28233018203 | 571129 | 002 | | 165B | A75215033200 | 545211 | 002 | 1 | 015A |
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| A52410155200 | 524221 | 001 | | 005 | A92320736200 | 531129 | 007 | | 235 |
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| A53610395201 | 531112 | 009 | | 150 | A92420180201 | 531129 | 001 | | 180 |
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| A53610397201 | 531112 | 009 | | 155 | A92420180201 | 531129 | 014 | | 145 |
| A53970624200 | 535129 | 003 | | 110 | A92420180201 | 531129 | 014 | | 295 |
| A53970651000 | 535129 | 003 | | 105 | A92420180201 | 531129 | 015 | | 010 |
| A54611137202 | 545121 | 001 | 1 | 010 | A92420844200 | 531129 | 015 | | 175 |
| A54611137202 | 545121 | 001 | 2 | 010 | A92420889200 | 531129 | 002 | | 030 |
| A54611463200 | 545211 | 002 | 1 | 020A | A92420889200 | 531129 | 004 | | 010 |
| A54611463200 | 545211 | 002 | 2 | 020A | A92420889200 | 531129 | 010 | | 045 |
| A54611463202 | 545211 | 002 | 1 | 030A | A92420889200 | 531129 | 014 | | 280 |
| A54611463202 | 545211 | 002 | 2 | 030A | A92420892200 | 531129 | 008 | | 155 |
| A54611463202 | 545211 | 007 | 1 | 065 | A92420892200 | 531129 | 011 | | 145 |
| A54611463202 | 545211 | 007 | 2 | 065 | A92420893200 | 531129 | 005 | | 040 |
| A54611463204 | 545211 | 002 | 1 | 025A | A92420893200 | 531129 | 007 | | 080 |

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**Figure 26 SRM Alphanumerical Index**

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## MEL, CDL, General

**EU OPS –> MEL/CDL**

**Operations Manual, Part A**

General/Basic:

Contains principles in company policy, as well as **type-independent** instructions and procedures.

**Operations Manual, Part B**

Aeroplane Operating Matters (AOM) :

Contains **type-specific** instructions and procedures, as well as the MEL (minimum equipment list) and the CDL (configuration deviation list). The operations manual, part B consists out of 12 different chapters, allocated into 5 folders.

Every folder contains additionally the chapter 0 (introduction) with the general information about the content of the folder.

(The exception is the folder with the chapter10 and 11 - flight safety manual).

The chapter 8: CDL and chapter 9: MEL, which are very important for us, are both combined in one folder.

**Advice:**

Also the chapter 1 contains important information for the maintenance.

In 1.20 system-limitations are described.

If in the AMM no limiting (min./max.) measurement values are listed, the system limitations (e. g.: min. crew oxygen pressure for dispatch or eng. starter operation time limits) can be read in chapter 1.20.

**Operations Manual, Part C**

Route and Aerodrome Instruction and Information:

Contains maps for navigation and flight procedures.

**Operations Manual, Part D**

Training:

Contains all training instructions.

## Minimum Equipment List

**General**

In a passenger aircraft generally all safety-relevant systems must always operate correctly.

Therefore the aircraft owners are obliged to correct every technical objection at the next maintenance station.

If a correction of the objection is due to technical or organizational reasons not at once possible, the MEL is used, to assure a safe continuing flight.

The Minimum Equipment List MEL is a list developed by the engineering of the aircraft manufacturer, which contains the aircraft components or -systems that may be defect for a certain time (e. g. 3 days) or a certain area of application (e. g. only outside icing conditions).

The sample for the owner-referenced MEL is the by the aircraft manufacturer developed Master Minimum Equipment List MMEL.

The MMEL and also the MEL are official documents, which are checked and approved by the aeronautical authorities (in Germany: LBA).

In the MEL the owner attests the accordance of its “own“ MEL with the MMEL.

However the owner can construct a more restrictive MEL than the manufacturer and e. g. increase minimum number of portable fire extinguishers required.

**Content**

The MEL is located as a hardcopy (paper) in its actual revision aboard every aircraft.

Additionally it is located in the office of the maintenance, whereas the user/maintenance (local agreement) is responsible for the revision.

So before use: **MEL – check the REVISION STATUS!**

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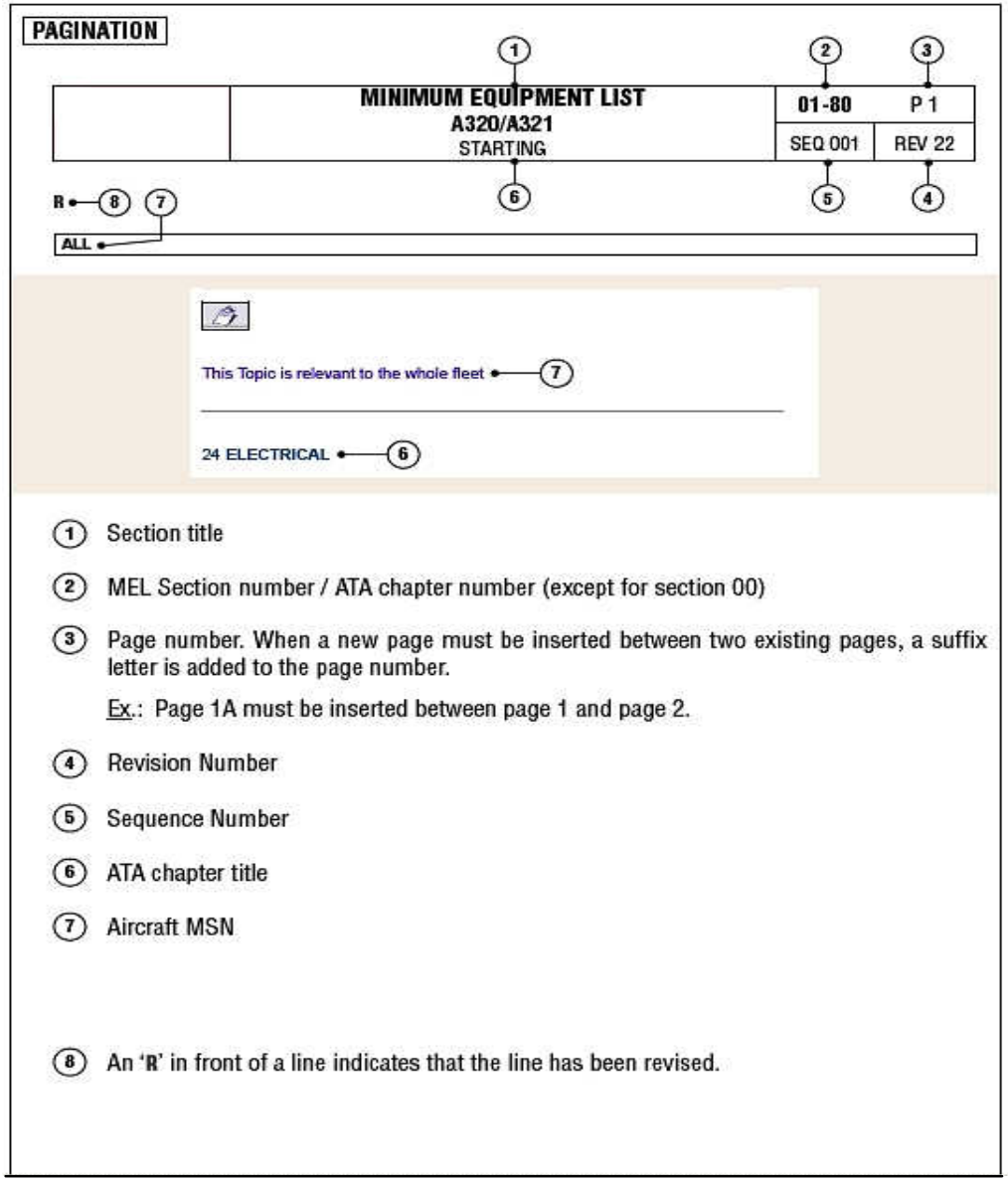


**Figure 27 MEL**

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**GENERAL**

A "R" in the margin indicates a change, addition or deletion in the adjacent text for the current revision of that page only. The "R" is dropped at the next revision of that page.

| 1. SYSTEM & SEQUENCE NUMBERS | 2 RECTIFICATION INTERVAL CAT | 3 NUMBER INSTALLED | 4 NUMBER REQUIRED FOR DISPATCH | 5 REMARKS OR EXCEPTIONS |
|---|---|---|---|---|
| ① ITEM | ② | ③ | ④ | ⑤ |

20-01 AC Main Generation (IDG, GCU, Line Contactor)

This Topic is relevant for the whole fleet

24 ELECTRICAL
24-20 AC GENERATION
20-01 AC Main Generation (IDG; GCU, Line Contactor) ①

| Remark number | ② Rectification Interval | ③ Nbr Installed | ④ Nbr Required |
|---|---|---|---|
| | C | 2 | 1 |
| Ops Procedure ..... | Consult | | |
| Maintenance Procedure ..... | Consult | | |

⑤ R

Inop Item Selection ☐

Except for ER operations one may be inoperative provided:

1. APU and AC auxiliary generation are operative and used throughout the flight, and
2. APU fuel pump is operative, and

...

**① COLUMN 1: "ITEM"**

It lists the equipment, components, systems or functions, for which dispatch conditions apply. System numbers are based on Air Transport Association (ATA) specification number 100. "(If Installed)" in the ITEM column indicates that the listed item is not applicable to all models or configurations. An inoperative item must not be removed from the aircraft, unless the associated REMARKS or EXCEPTIONS column of the MEL, or the associated maintenance procedure (if applicable), indicates that this item must be removed.

*Note: One single computer may include several functions. The corresponding MEL entry is either the computer itself if fully inoperative or each function separately. If several functions are inoperative, reference must be made to each one.*

**② COLUMN 2 : "RECTIFICATION INTERVAL"**

It indicates, for a given item, the rectification interval category. The category of each item is determined according to the requirements specified below:

Category A

No standard interval is specified, however, items in this category shall be rectified in accordance with the conditions stated in the REMARKS OR EXCEPTIONS column 5 of the MEL. Where a time period is specified it shall start at 00:01 on the calendar day following the day of discovery.

Category B

Items in this category shall be rectified within three (3) consecutive calendar days, excluding the day of discovery.
For example, if it were recorded at 10 a.m. on January 26th, the three day interval would begin at midnight the 26th and end at midnight the 29th.

Category C

Items in this category shall be rectified within ten (10) consecutive calendar days, excluding the day of discovery.
For example, if it were recorded at 10 a.m. on January 26th, the 10 day interval would begin at midnight the 26th and end at midnight February 5th.

Category D

Items in this category shall be rectified within one hundred and twenty (120) consecutive calendar days, excluding the day of discovery.

Rectification Interval Extension

Subject to the approval of the Authority, the operator may use a procedure for the extension of the applicable Rectification Intervals B, C, and D, for the same duration as specified in the MEL, provided:

- A description of specific duties and responsibilities for controlling extensions is established by the operator and accepted by the Authority, and
- The operator only grants a one time extension of the applicable Rectification Interval, and
- The Authority is notified of any extension granted within a timescale acceptable to the Authority, and
- Rectification is accomplished at the earliest opportunity.

**Figure 28 MEL**

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**③ COLUMN 3 : "NUMBER INSTALLED"**

It indicates, for a given item, the quantity of equipment, components, systems or functions, installed on the airplane.
This quantity reflects the airplane type certificated configuration and, therefore required for all flight conditions, unless otherwise indicated in column 4 in conjunction with exceptions or remarks listed in column 5, if necessary.
A "Dash" symbol indicates that a variable quantity is installed.

**④ COLUMN 4 : "NUMBER REQUIRED FOR DISPATCH"**

It indicates, for a given item, the minimum quantity of equipment, components, systems or functions which must be operative for dispatch, under the conditions listed in column 5 (if any). A "Dash" symbol indicates that a variable quantity is required for dispatch.

**⑤ COLUMN 5 : "REMARKS OR EXCEPTIONS"**

Asterisk

* Asterisk or a placarding action within the dispatch condition requires inoperative equipment, component, system or function to be placarded in the cockpit to inform crewmembers of the equipment condition. Unless otherwise specified herein, placard wording and location will be determined by the operator.
The operator should determine the personnel (maintenance and/or flight crew) authorized to placard items.

Operational Procedure

(o) Symbol or Consult button indicate a requirement for a specific operational procedure, which must be accomplished when operating with the listed item inoperative.
Purpose of the operational procedure might be:

- To require the flight crew to perform action(s),
- To provide limitations or performance penalties,
- To provide useful information to the crew.

The operational procedure must be applied, before each flight, unless a periodicity is clearly specified in the REMARKS OR EXCEPTIONS column of the MEL. When a periodicity is defined, operational procedure must be applied before the first flight under the relevant MEL item and must be repeated at the defined interval.
In all cases, the operational procedure must be known by the flight crew before each flight.
The aircraft in MEL condition should be considered (including the (o) procedure) according to the flight phase.

Maintenance Procedure

(m) Symbol or Consult button indicates a requirement for a specific maintenance procedure which must be accomplished when operating with the listed item inoperative. If no periodicity is defined in the REMARKS OR EXCEPTIONS column of the MEL, maintenance action is a one time action to be accomplished before the first flight under relevant MEL item (eg, a deactivation procedure).
Otherwise, this is a repetitive action. In this case, periodicity of the maintenance procedure is defined in the REMARKS OR EXCEPTIONS column of the relevant MEL item.
When a periodicity is defined, maintenance procedure must be applied before the first flight under the relevant MEL item and must be repeated at the defined interval.
Normally these procedures are accomplished by maintenance personnel; however, if approved by national authorities, other personnel may be qualified and authorized to perform certain functions. Procedures requiring specialized knowledge or skill, or requiring the use of tools or test equipment should be accomplished by maintenance personnel.

The satisfactory accomplishment of all maintenance procedures, regardless who performs them, is the responsibility of the operator.

*Note: Both symbols (o) and (m) used singulary, or in combination, require the appropriate procedures to be established, published, and complied with, if flight is accomplished with one item inoperative.*

Flight personnel is not considered as maintenance personnel; however, certain procedures may also be performed by flight crews, provided such items do fall under the normal flight crew activities and are coordinated with the MCC/CAMO, such as:

- Positioning of circuit breakers
- Performance of switchings
- Indication readings
- Operational checks

Exceptions

Different possibilities may be considered for an item. Each possibility is named "exception". Exceptions are identified by letters a), b), c) ... and separated by "or". Operators shall choose and apply only one exception when several exceptions are proposed for a given item.
Within one exception, several conditions may be required.
They will be identified by 1), 2), 3) ... Operators shall comply with all the conditions of the given exception joined by an "and".

**Figure 29 MEL**

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**MEL (cont)**

The MEL contains only the components and systems, which are important for the airworthiness of the aircraft, and mentions, with possible actions and/or temporal limitations, which of the components and systems are allowed to be defect under certain conditions in an passenger or training operation.

Obviously necessary equipment for the airworthiness of an aircraft, like e. g. airfoils, flight control surfaces, landing gear, engines etc. have naturally to be always present.

Equipment, which has no influence on the safety, like e. g. galley equipment or components for the passenger comfort, is not listed and is not stringently required.

**CAUTION:** ALL ITEMS, WHICH HAVE AN EFFECT ON THE AIRWORTHINESS OF AN AIRCRAFT AND ARE NOT LISTED IN THE M E L, MUST BE WORKING!

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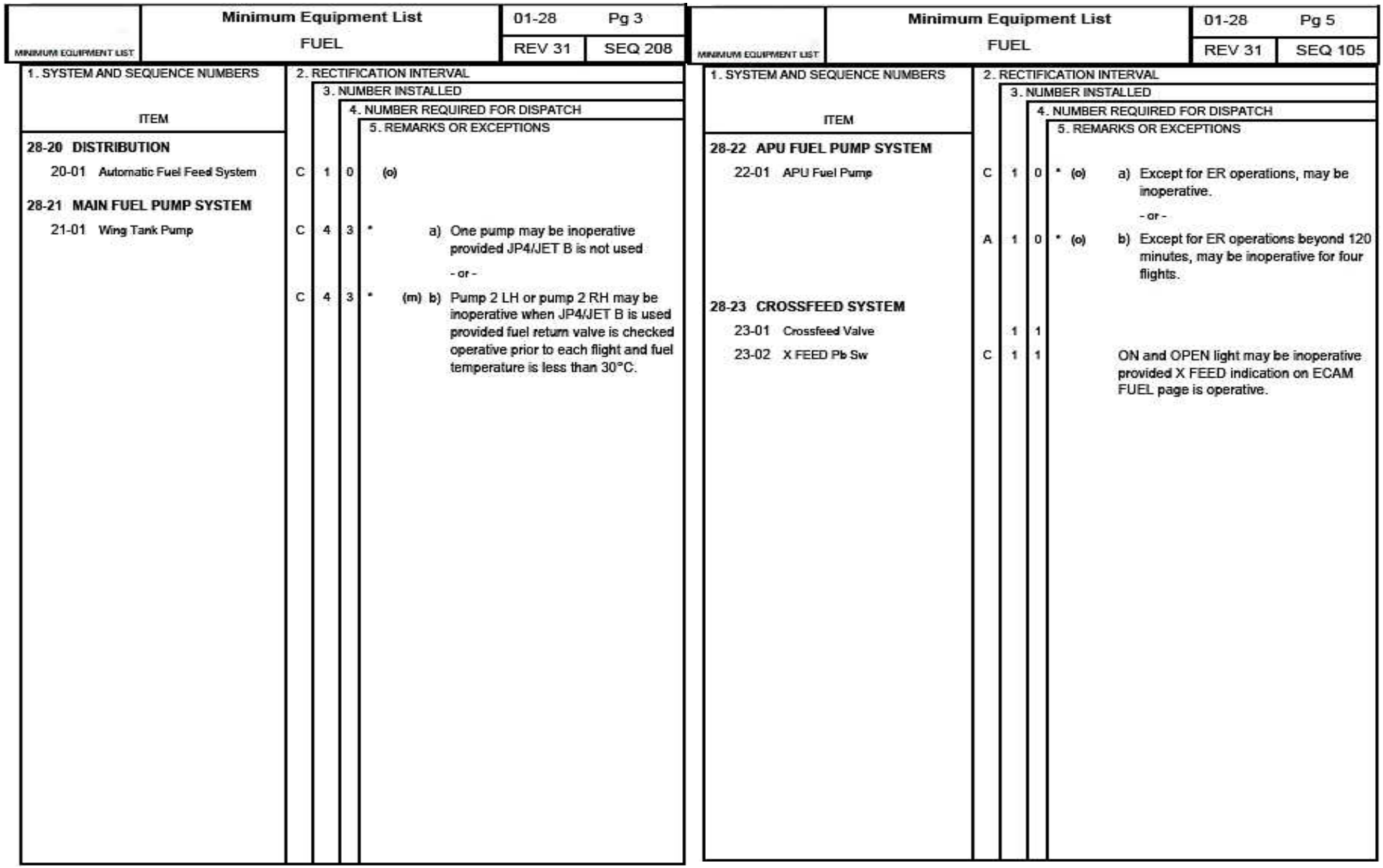

MINIMUM EQUIPMENT LIST | Minimum Equipment List FUEL | 01-28 Pg 3 | REV 31 | SEQ 208

| 1. SYSTEM AND SEQUENCE NUMBERS ITEM | 2. RECTIFICATION INTERVAL | 3. NUMBER INSTALLED | 4. NUMBER REQUIRED FOR DISPATCH | | 5. REMARKS OR EXCEPTIONS |
|---|---|---|---|---|---|
| **28-20 DISTRIBUTION** | | | | | |
| 20-01 Automatic Fuel Feed System | C | 1 | 0 | (o) | |
| **28-21 MAIN FUEL PUMP SYSTEM** | | | | | |
| 21-01 Wing Tank Pump | C | 4 | 3 | * | a) One pump may be inoperative provided JP4/JET B is not used |
| | | | | | - or - |
| | C | 4 | 3 | * (m) | b) Pump 2 LH or pump 2 RH may be inoperative when JP4/JET B is used provided fuel return valve is checked operative prior to each flight and fuel temperature is less than 30°C. |

MINIMUM EQUIPMENT LIST | Minimum Equipment List FUEL | 01-28 Pg 5 | REV 31 | SEQ 105

| 1. SYSTEM AND SEQUENCE NUMBERS ITEM | 2. RECTIFICATION INTERVAL | 3. NUMBER INSTALLED | 4. NUMBER REQUIRED FOR DISPATCH | | 5. REMARKS OR EXCEPTIONS |
|---|---|---|---|---|---|
| **28-22 APU FUEL PUMP SYSTEM** | | | | | |
| 22-01 APU Fuel Pump | C | 1 | 0 | * (o) | a) Except for ER operations, may be inoperative. |
| | | | | | - or - |
| | A | 1 | 0 | * (o) | b) Except for ER operations beyond 120 minutes, may be inoperative for four flights. |
| **28-23 CROSSFEED SYSTEM** | | | | | |
| 23-01 Crossfeed Valve | | 1 | 1 | | |
| 23-02 X FEED Pb Sw | C | 1 | 1 | | ON and OPEN light may be inoperative provided X FEED indication on ECAM FUEL page is operative. |

**Figure 30 MEL**

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## Configuration Deviation List

### General Information

The CDL is very similar to the MEL.

However it does not deal with the functioning of components or systems, but it describes which components of the secondary structure/attachment parts may be missing under certain conditions.

It can be read in the appendix of the OM-B Chapter 1 “Limitations“.

### Every part that is listed in the CDL must be present!

Necessary repairs must be accomplished at the next airport (if this repair can be carried out according to the instructions in the manuals).

This must be done this way, since further objections can cause a “grounding“ of the aircraft, which means the aircraft may not be used anymore. Also CDL items can cause a maintenance procedure (MMP) and are listed in column 3.

### Page Structure General

The pages in the CDL have a nearly identical structure as the pages of the MEL.

But it results from the instruction:

**“Repair as soon as possible“**.

Additionally missing parts normally cause higher fuel consumption and/or performance limitations, so that also under economical considerations a contemporary repair is making sense.

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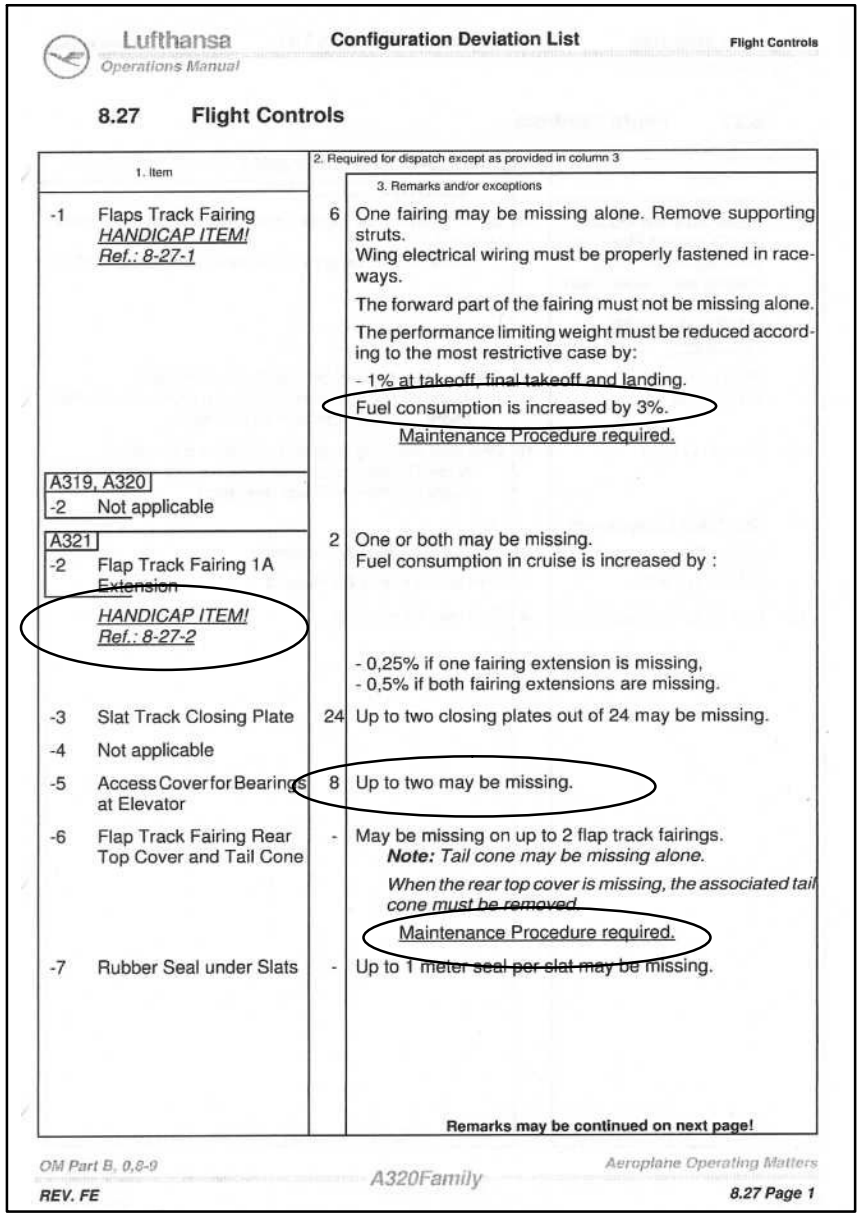


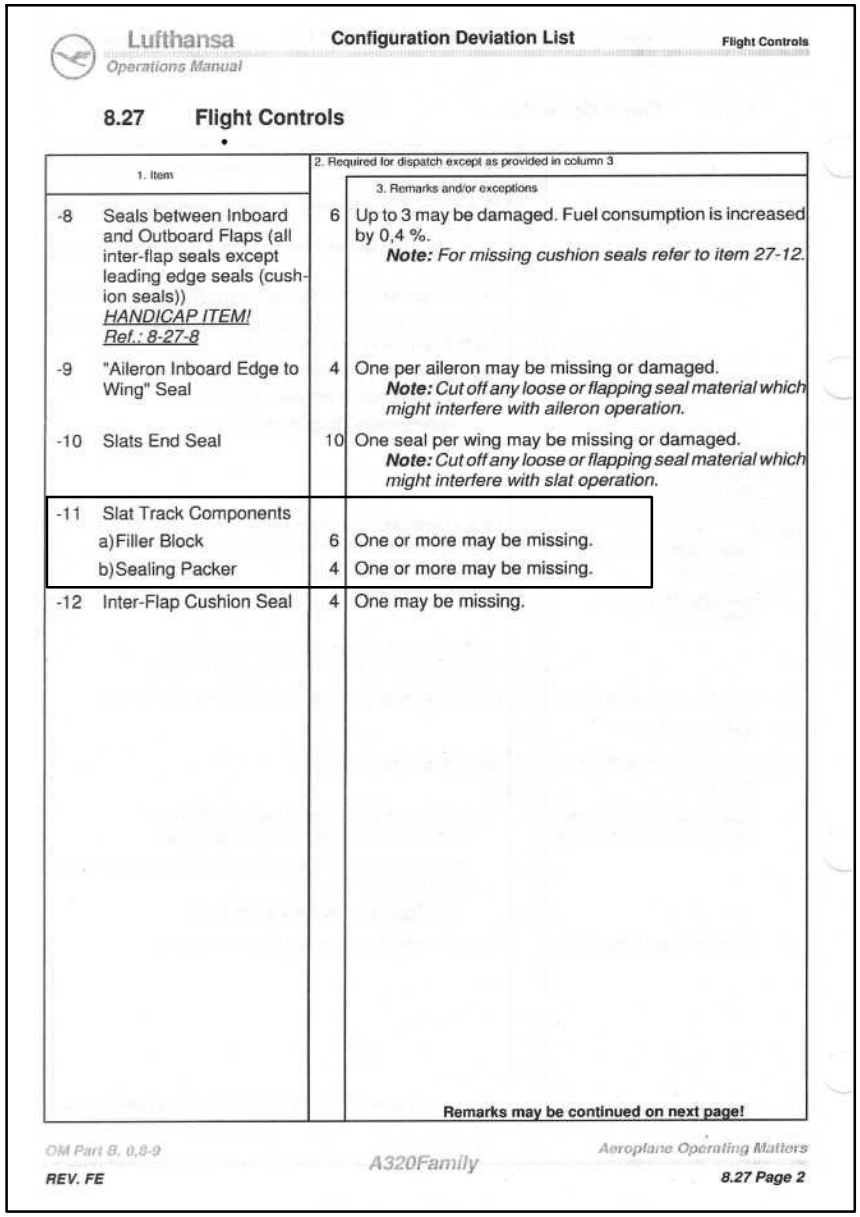
Lufthansa Operations Manual — Configuration Deviation List — Flight Controls

8.27 Flight Controls

| 1. Item | 2. Required for dispatch except as provided in column 3 | 3. Remarks and/or exceptions |
|---|---|---|
| -1 Flaps Track Fairing *HANDICAP ITEM!* *Ref.: 8-27-1* | 6 | One fairing may be missing alone. Remove supporting struts. Wing electrical wiring must be properly fastened in raceways. The forward part of the fairing must not be missing alone. The performance limiting weight must be reduced according to the most restrictive case by: - 1% at takeoff, final takeoff and landing. Fuel consumption is increased by 3%. Maintenance Procedure required. |
| A319, A320 -2 Not applicable | | |
| A321 -2 Flap Track Fairing 1A Extension *HANDICAP ITEM!* *Ref.: 8-27-2* | 2 | One or both may be missing. Fuel consumption in cruise is increased by : - 0,25% if one fairing extension is missing, - 0,5% if both fairing extensions are missing. |
| -3 Slat Track Closing Plate | 24 | Up to two closing plates out of 24 may be missing. |
| -4 Not applicable | | |
| -5 Access Cover for Bearings at Elevator | 8 | Up to two may be missing. |
| -6 Flap Track Fairing Rear Top Cover and Tail Cone | - | May be missing on up to 2 flap track fairings. ***Note:*** *Tail cone may be missing alone.* *When the rear top cover is missing, the associated tail cone must be removed.* Maintenance Procedure required. |
| -7 Rubber Seal under Slats | - | Up to 1 meter seal per slat may be missing. |

Remarks may be continued on next page!

OM Part B, 0,8-9 — A320Family — Aeroplane Operating Matters
REV. FE — 8.27 Page 1



Lufthansa Operations Manual — Configuration Deviation List — Flight Controls

8.27 Flight Controls

| 1. Item | 2. Required for dispatch except as provided in column 3 | 3. Remarks and/or exceptions |
|---|---|---|
| -8 Seals between Inboard and Outboard Flaps (all inter-flap seals except leading edge seals (cushion seals)) *HANDICAP ITEM!* *Ref.: 8-27-8* | 6 | Up to 3 may be damaged. Fuel consumption is increased by 0,4 %. ***Note:*** *For missing cushion seals refer to item 27-12.* |
| -9 "Aileron Inboard Edge to Wing" Seal | 4 | One per aileron may be missing or damaged. ***Note:*** *Cut off any loose or flapping seal material which might interfere with aileron operation.* |
| -10 Slats End Seal | 10 | One seal per wing may be missing or damaged. ***Note:*** *Cut off any loose or flapping seal material which might interfere with slat operation.* |
| -11 Slat Track Components | | |
| a) Filler Block | 6 | One or more may be missing. |
| b) Sealing Packer | 4 | One or more may be missing. |
| -12 Inter-Flap Cushion Seal | 4 | One may be missing. |

Remarks may be continued on next page!

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**Figure 31 Configuration Deviation List**

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