

The Boeing 737 Technical Guide



“The most practical and comprehensive guide to the Boeing 737 available today.”

This book takes you right from the original concept that lead Boeing to design the 737 through its 50 year evolution, in language that is easily understood. It looks at each system in turn, supported by over 500 high resolution photographs, diagrams and schematics, placing each system component in context. It collates information from many different sources and combines over 20 years of the authors own flying experiences to lead the reader through the 737 from radome to tail-cone. This book takes you beyond the flight deck on a grand tour of the worlds' most prolific airliner in a way that is as relevant to the type rating candidate as it is to a company Fleet Technical Captain. To complete the picture, the book also contains Pilots notes, a detailed guide to airtesting and the accident history of the type, which serve to make this book the most practical and comprehensive technical guide to the 737 available today.

So, after ten years work, the website and all the supporting information that went into its' creation, is now available in print. If you have found the website useful but would like the bigger picture, go to www.b737.org.uk to order your copy.

The guide is updated annually so you know that when you buy a copy it is up to date.

Format Options

The standard printed version is a softback, 8" x 10" book containing 396 full colour pages.

The book has also been translated into Chinese and can be ordered via WeChat.

All versions have identical content, far surpassing that found on the website.



The EPUB is available through iBooks.



The 737 Technical Guide is available in printed, electronic and in English and Chinese

Containing:

- Detailed, plain English system explanations.
- Over 500 hi-res photos, of aircraft panels, components and points of interest
- Listings of all FMC, FCC & CDS software updates.
- System schematic diagrams.
- Electrical schematics and bus-bar listings.
- Summary of all 737 accidents to date.



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History and Development

History & Developments

To set the scene, the evolution of the 737 is described from its conception in 1958 right through to the MAX replacement, not due until at least 2025.

In between, every series and version thereof (43 in total) including many unique one-offs are described with their significant differences.

737-800SFP

The Short Field Performance improvement package was developed in 2005/6 to allow GOL airlines to operate their 737-800s into the 1,465m (4,800ft) Santos Dumont airport. The modifications enable weight increases of approx 4,700kg (10,000lbs) for landing and 1,700kg (3,750lbs) for take-off from short runways. It includes the following changes:

- Flight spoilers are capable of 60 degree deflection on touchdown by addition of increased stroke actuators. This compares to the current 33/38 degrees and reduces stopping distances by improving braking capability.
- Slats are sealed for take-off to flap position 15 (compared to the current 10) to allow the wing to generate more lift at lower rotation angles. Autoslat function available from flap 1 to 25.
- Flap load relief function active from flap 10 or greater.
- Two-position tailskid that extends an extra 127mm (5ins) for landing protection. This allows greater angles of attack to be safely flown thereby reducing Vref and hence landing distance.
- Main gear camber (splay) reduced by 1 degree to increase uniformity of braking across all MLG tyres.
- Reduction of engine idle-thrust delay time from 5s to 2s to shorten landing roll.
- FMC & FCC software revisions.



737-800SFP prototype. Notice the extended tailskid and trailing static cone.

Photo: Brian Lockett, Goleta Air & Space Museum

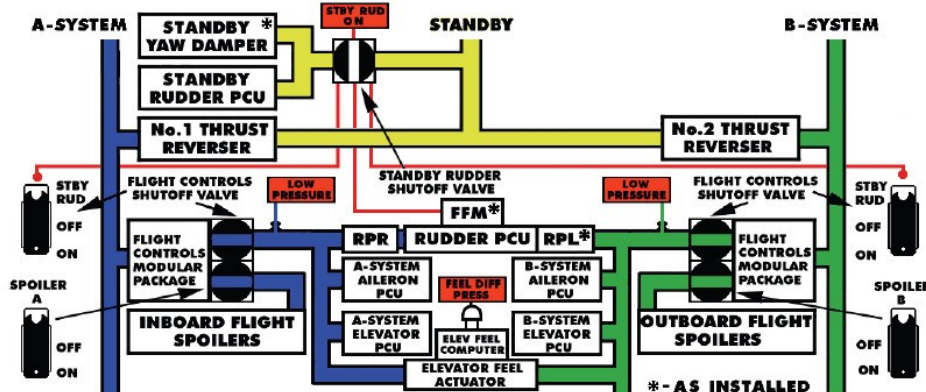
The SFP package has now become an option on all 737-800s (known as 737-800SFPs) and standard on the 737-900ER. Some of the features may also be fitted to the 600/700 series. The first SFP was delivered 31st June 2006. To date over 250 aircraft have been ordered with this package as either factory build or retrofit.

Systems

The bulk of the book is devoted to system descriptions. These are short, easy to understand, plain English explanations, covering all aspects of the aircraft inside and out.

Rudder Pressure Limiter (Not NGs)

This is effectively the B system equivalent of the RPR, except that it is physically part of the main rudder PCU rather than upstream of it. Hydraulic system B pressure is reduced within the main PCU from 3000 to 2200psi it has the same activation criteria as the RPR.



Schematics are used where necessary to illustrate complex systems.

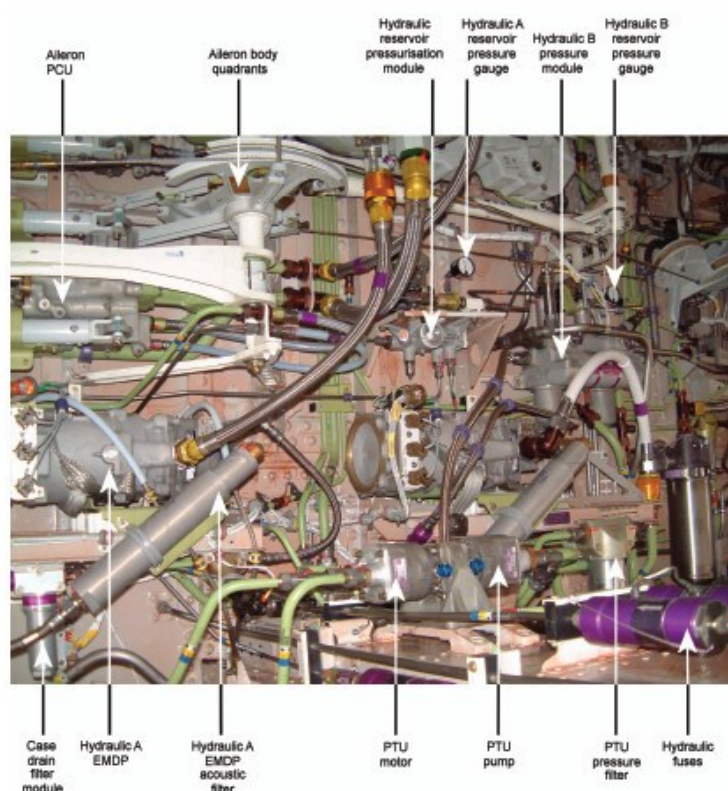
NGs

The NGs do not have an RPR or RPL, but two Load Limiters instead (Shown as "CONTROL VALVE"s in the FCOM schematics). At speeds above approximately 135kts, hydraulic system A pressure (Pre-RSEP), hydraulic system A and B pressure (Post-RSEP) to the rudder PCU is reduced to 1450psi (Pre-RSEP) / 2200psi (Post-RSEP). They both reduce rudder output force by 25% at blowdown speed. The NGs also gained the FFM and separate input rods, control valves and actuators of the RSEP package.

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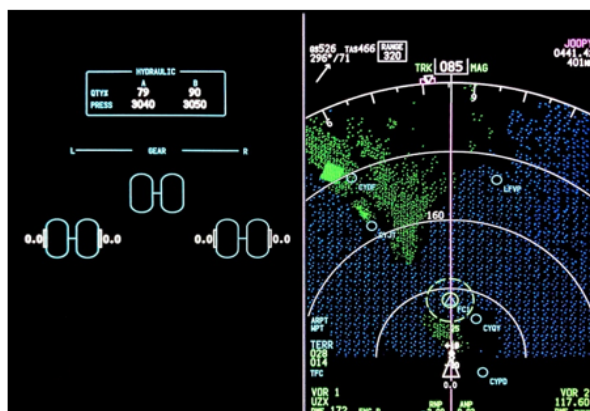
Key to the books accessibility is its extensive use of photographs.



Most of the panels, flight instruments and DU display options that have ever been fitted to the 737 are depicted in this book.

ND with Systems

This display is reached by pressing SYS on the MFD selector. It shows Hydraulic qty & pressure and Brake temp and tyre pressure (not shown in this photo). The Brake temps range from 0-9.9 and above 4.9 is considered hot. The individual tyre pressures will display amber (abnormal) with either a pressure below 100psi or a difference between two main gear tyres of 25% or a difference between two nose gear tyres of 12%. These conditions will also illuminate the associated BRAKE TEMP or TIRE PRESSURE caption. There is also an option to display the flight control surface position indicator with the other systems here.



ND with INFO

This display is reached by pressing INFO on the MFD selector. The F/Qs ND changes to half-size and the N1 /Speed Ref are displayed inboard of the ND.

This performs exactly the same functions as the Speed Reference Selector on the NG. You cycle between the fields (shown as diamonds) and enter values in the blue boxes using the SELECTOR knob on the forward aisle stand.

737 MAX ND - Half sized ND with Info



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Airtesting

This chapter is quite unique in aircraft guides. The author uses his considerable experience in the field of airworthiness flight testing to write authoritatively about this little documented and fascinating subject.

Again it is well illustrated and filled with lots of previously unpublished material. For those involved in airtesting the book is worth getting just for this chapter.

Airtesting

Spoiler Float

This test is done to ensure that if hydraulic pressure is lost, the spoilers do not float up such that they could cause loss of airspeed, pitch or roll. The AMM states "When hydraulic pressure is lost, springs should reset the spoiler extension check valve to prevent spoiler float." (AMM 27-61-00)



Spoiler float - Classic - CAA method



Spoiler float - NG - FAA method

On the CAA schedule this is done clean, in the climb to FL350 at 280/M0.74; On others it is done with flap 40 at FL170. For the CAA method, set the speedbrake to flight detent and then switch off spoilers A & B. Check for any roll and that the spoiler float is both symmetrical and not excessive. The amount of spoiler float should be recorded by the observer, but as you can see from the photo this can be difficult to judge at a distance. **Ensure that you put the speedbrake lever down again before switching the spoilers back on.** Note that for the flap 40 method, the speedbrake lever should be left down for this test.

THE BOEING 737 TECHNICAL GUIDE

Author Chris Brady
Orders: www.b737.org.uk

What a pleasant surprise this book has turned out to be. If you look past the title and its 'phone-book' size, it's quite a good read.

Having recently qualified on the 737, the Log board thought I was the right person for the job and 'volunteered' me for it. At first, I must say I was reluctant, as my brain was already saturated with more 737 information than I cared for.

However, with a simulator check looming and after asking a few questions that couldn't be answered on the flight deck, I decided to see what Mr Brady knew. My, he does know his aircraft. My questions were comprehensively answered in a well laid-out and presented manner. Produced in a similar style to any normal manual, it is easy to navigate and supported with many useful photographs, just a shame they're not in colour. The size is a disadvantage, as unlike the smaller cockpit companion, it is quite a weight to carry in your flight bag.

From listing all the flight computer software updates from 1986, to a complete electrical schematic including all services taken from each bus, it does at times go into too much detail for my liking. But I guess that shows the amount of research that must have gone into producing this publication.

Definitely one to be kept on the bookshelf at home. It is bound to answer many a question you may have at the back of your mind, or dare I say it, posed from a whipper-snapper first officer!

John Richards



Reviews

The book has had favourable reviews in most of the worlds English speaking aviation publications. It has even attracted accolades from Boeing test pilots.

Comments include:

"The benumbing effects of a technical manual are difficult for a writer to mitigate but Chris Brady has created an interesting reading experience with "The Boeing 737 Technical Guide." Captain Brady, a Boeing 737 maintenance test pilot for Europe's easyJet Airlines, not only beautifully describes the technical aspects of each model of the 737 but a chronicle of the aircraft as well.

At the conclusion of the manual the reader will not only have enjoyed their journey through a very interesting book but also have a good understanding of the technical operation of the 737, "large" aircraft systems design, and a thorough knowledge of the history of the world's best selling airliner."

Airways Magazine

"You are to be commended on the what is the finest book on any aircraft that I have seen. I am amazed by the depth of knowledge this book contains. I only wish I had it when I went to training on the 737 at US Airways!"

Capt H, JetBlue Airways