



B737CL and B737NG Airdata System Design Differences

9/29/2016

13-15 September 2016
Yaghoob Ebrahimi



FAA



Federal Aviation
Administration

Boeing 737

- **Derived from the B707 and B727 technologies**
- **Narrow-body/single aisle airliner**
- **Developed into a family of 10+ models/derivatives**
- **Capacity of 85-220 passengers**
- **Boeing's only single aisle airplane produced today**
- **The best selling airliner with 13533 firm orders (July 2016)**

The history of the B737 development(Cont'd)

737-100

- **First Flight: April 9, 1967**

737-200

- **First Flight: August 8, 1967**
- **737-200 Advanced followed in 1971**

B737CL:

- **B737-300 First Flight February 24, 1984**
- **The -400 and -500 followed**

B737NG:

- **B737-700 First Flight February 9, 1997**
- **The -600, -800, -900 and -900ER followed**

Images of the B737CL and B737NG cockpit

B737CL

B737CL cockpit



B737NG

B737NG cockpit resembles B777



Pitot and static systems of aircraft

- The Pitot-static system is used to determine and display
 - ✦ Airspeed
 - ✦ Mach number
 - ✦ Altitude
 - ✦ Altitude trend
- Large Pitot-static system errors can be hazardous

Pitot and static systems of aircraft

- General system types used by Boeing

Model	Airdata System Type
707	FlushStatic (Not RVSM qualified by Boeing)
727	Flush Static
737-100/-200/-300/-400/-500	Pitot-static (737-100 Not RVSM qualified by Boeing)
737-NG	Flush Static
737-700C	Pitot-static
737-MAX	Flush Static
747-100/-200/-300/-SR/-SP	Pitot-static (5inch)
747-400	Pitot-static (5inch/10inch)
747-8	Pitot-static (10inch)
757	Flush Static
767	Pitot-static
777	Flush Static
787	Flush Static

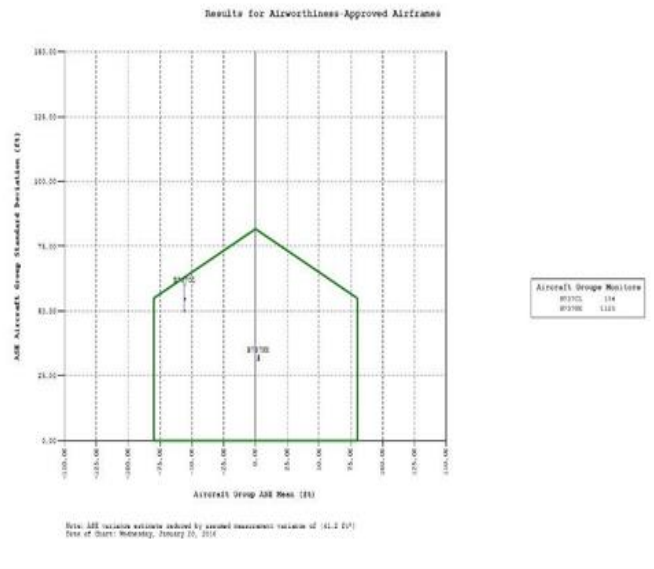
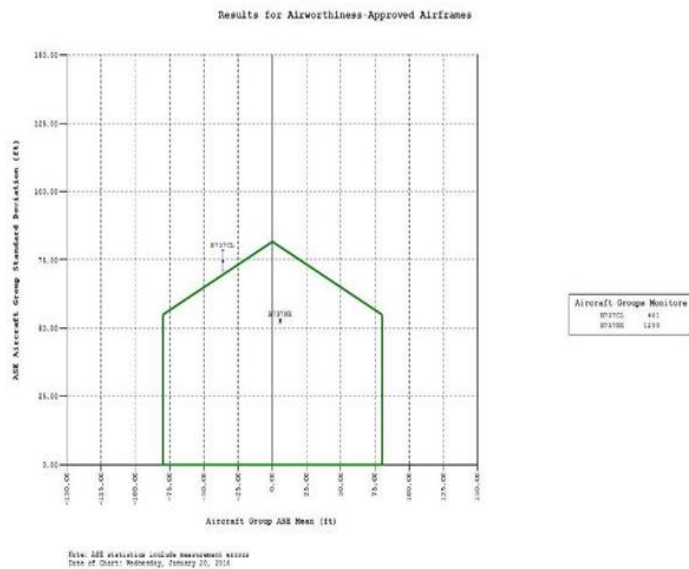
Boeing Airplane Models ASERs

- **B733** **1**
- **B737** **16**
- **B738** **2**
- **B744** **3**
- **B744-10** **6**
- **B763** **7**
- **B747-LCF** **1**
- **B757** **1**

Pitot and static systems of aircraft

- Must understand the details at the time of design to better understand system selection
 - ✦ Configuration features and details
 - ✦ Future anticipated derivatives
 - ✦ Flight envelope
 - ✦ Corrections/type of corrections needed
 - ✦ Technology available
 - ✦ Certification demands
 - ✦ Cost/reliability

B737CL Exhibits Larger ASE Average & SD vs. B737NG Reflects Older vs Newer Design and Build Requirements and Some Shortcomings In The Ability to Monitor In Service



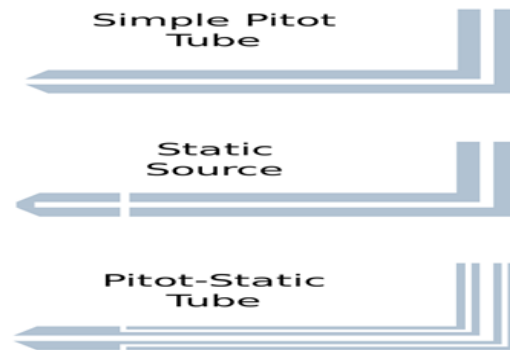
- AGHME Monitored data for 1/1/2011 to 1/1/2016 (5 Years))

- AGHME Monitored data for 1/1/2015 to 1/1/2016 (1 Year)



Pitot and static systems of aircraft (Cont'd)

Different types/combinations of pitot-static systems



Pitot and static systems of aircraft (Cont'd)

Different types/combinations of Pitot-static systems

Pitot-Static Probe

737CL



Pitot with Flush Static

737NG



Pitot and static systems of the B737CL vs. B737NG

B737CL

- 4 Pitot-Static(P/S) Probes
- 2 Alternate Flush Static Ports

B737NG

- 3 Pitot Probes
- 4 Flush Static Ports
- 2 Alternate Flush Static Ports
- 2 Alpha Vanes

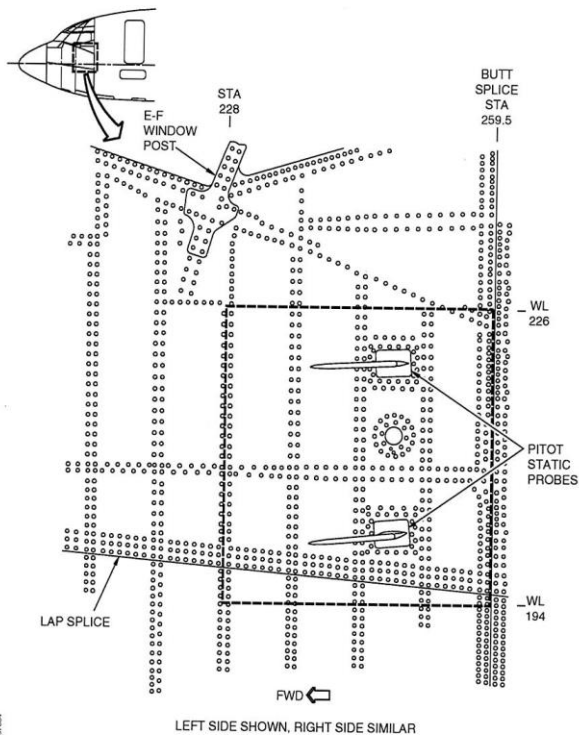
Service Letter

(Skin Quality and Condition)

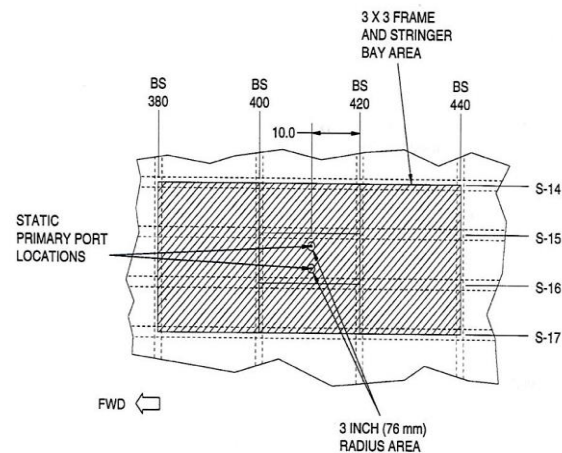
B737CL B737NG

ATTACHMENT II To: 737-SL-02-014-B
30 June 2004
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ATTACHMENT II To: 737-SL-02-017-G
2 July 2004
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RVSM FLUSH STATIC PORT AREA



CRITICAL AREA ADJACENT TO THE PRIMARY STATIC PORTS

Approximate Number of B737CL & NG Operating in North America

- The monitored data statistics of the FAA AGHME sites are summarized, 2010 through 2016
 - Note: The Atlantic City and Portland sites were excluded.

Model	2010 - 2012	2012 - 2014	2014 - 2016
B737CL	386	358	238
B737NG	650	893	1187

737 Service Letters

- 737-200
 - ✦ 737-SL-02-015
 - 08 Aug 1996
 - Currently in revision
- 737-CL
 - ✦ 737-SL-02-014
 - 30 June 2004
 - Currently in revision
- 737NG
 - ✦ 737-SL-02-017
 - 12 July 2016

737 Service Letters

B737CL

Initial in-service airworthiness

In support of B737CL qualification for RVSM Boeing released SB 737-53-1180 to assist the operators in qualifying and maintaining their in-service B737CL prior to line number 2755. Upon the incorporation of the SB and the airplane flight manual revision document individual airplane are qualified for the RVSM airspace. Airplanes delivered after position number 2754 are RVSM qualified.

B737NG

Initial in-service airworthiness

The airplane flight manual documents the eligibility of B737-600/-700/-800/-900/BBJ/-700C airplane type in RVSM airspace.

The referenced documents: MPD, AMM and SRM provide the necessary data to maintain airworthiness compliance with the RVSM requirements.



ASE – Primary Error Sources

- Pitot-static Probes
 - ✦ Deterioration – erosion / corrosion
- Pressure Transducer
 - ✦ ADC
 - ✦ ADM
 - ✦ Failures or instability with time

737 Recent Service Bulletins

B737CL

737-200, 737-200C, 737-300, 737-400, and 737-500

737-34-2454

NAVIGATION - Air Data System - Altimetry System Test

B737NG

737-600, 737-700, 737-700C, 737-800, 737-900 and 737-900ER

737-34-2642

NAVIGATION - Air Data System - Altimetry System Test