SUMMARY SHEET
Airworthiness Directive Implementation Aviation Rulemaking Committee
Service Information Working Group

Primary Report and Recommendation	Detailed Instructions (Task 2) Recommendation 1: (T2, R1, B7) Clarify Figures
Secondary Report and Recommendation	None
Assigned Members	Drew Helder (American Eagle Airlines) Chip Amidon (Boeing) Eduardo Cerdeira (Embraer) Maureen Moreland (FAA - ACO) Craig Fabian (ARSA) Ed Carter (Boeing)
Links to Other Working Groups	None

WORKING GROUP REVIEW OF ISSUE/PROBLEM

Service bulletins quite often contain detailed figures/illustrations to clarify the task being accomplished. However, the detail provided in the figures/illustrations may make it difficult to determine what parts of the figure/illustration are required for compliance when the service bulletin is required by an Airworthiness Directive (AD).

A solution is needed to make sure the intent of figures/illustrations in service bulletins is clear. This includes distinguishing between compliance requirements and information provided for reference only.

Methods to ensure clarity of the intent of figures/illustrations/drawings in service bulletins were discussed and developed. These methods and the accompanying guidance will better communicate the intent of the service bulletin information and, therefore, will reduce the amount of confusion between the air carriers, maintenance providers, and the FAA inspectors when trying to determine compliance with AD's. These methods and guidance will assist service bulletin authors by providing options to make the intent as clear as possible.

Recommendation Number 1 states "Service instructions must make clear whether a figure or drawing is the authoritative instruction …"For clarification purposes, and since the recommendation includes the term "drawing", the following definitions are provided and used in this summary sheet:

Illustration – A pictorial graphic

Figure – A part of a service document that includes an illustration, photograph, chart, graph, table, form, note, symbol, callout, text, or dimension (or any combination) that supports or clarifies the written instructions.

Drawing – A document created by a DAH Engineering department to define configuration. Drawings may include other engineering information such as specifications, dimensions, materials, and processes.

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Regulations and Guidance Identified for Review

Air Transport Association (ATA) Spec2200 "Information Standards for Aviation Maintenance"

S1000D – International Specification for Technical Publications

Working Group Proposal to Address the Recommendation(s)/Finding(s)

Twelve options were considered and three options were recommended for implementation. These three options are guidance on how to make the intent of the illustrations more clear. They set a standard on what methods can be used in illustrations in order to ensure clarity. They are:

- Shade/Cross Hatch Important Areas
- Use Phantom Lines for items in illustrations that are for reference only
- Use blow up illustrations (currently a standard practice)

The Service information Working Group is also recommending that an Advisory Circular be created to document the recommended solutions being developed as a part of AD Aviation Rulemaking Committee (ARC) activity. We recommend the guidance from this Summary Sheet be included in the proposed AC to describe the proposed changes to provide basic instructions to be used when creating illustrations. This guidance will also specify the need for dimensions and tolerances in the illustrations to remove ambiguity.

To resolve the issue of ambiguous terms in service instructions, each OEM should implement methods to prevent use of ambiguous terms in service documents. Methods include but are not limited to:

- Training – Provide training to authors of service documents to stress the impact of using ambiguous terms and the importance for providing clarity and accuracy.
- Tools – Such as computing tools or checklists to prevent or search for and eliminate the inclusion of ambiguous terms.
- Processes – Implement processes used during the authoring, review, validation, and approval of service documents that will prevent the use of ambiguous terms.

Additional flexibility is provided in the figures/illustrations/drawings by the proposal put forth by the Service Information Working Group, Critical Task Differentiation subteam (reference Summary Sheet for Critical Task Differentiation – T1, R2, B1 and T2, R1, B1).

ALTERNATIVES CONSIDERED

There were several alternatives considered, however, they were discarded since they would create more confusion and/or would be impractical. The alternatives considered were:

- Use RC coding (Required for Compliance) on accomplishment instructions that are contained in the figures. Using RC in figures with accomplishment instructions included was found to be impractical and would add more complexity for the DAH. This added complexity can be expected to extend and delay the process to release a service bulletin and would be cumbersome to the point where service bulletins would take an unacceptable amount of time to be released.

- Have separate illustrations – One illustration showing critical information and the second showing reference information. This was found impractical since it would require many more illustrations to be produced, add complexity and add confusion. It would also increase the SB size and it would be difficult to correlate illustrations.

- Use RC coding (Required for Compliance) on the illustration itself (circle important information on the illustration and label as RC). This was found to be impractical since it would add too much clutter to the illustrations and therefore, sacrifice clarity.

- Rely on the accomplishment instructions outside of the figures to describe the important information (the figure is reference only). This was found to be impractical since some DAH's include accomplishment instructions in the figures themselves. Also, some information included in the illustration is intended to be authoritative. For example, dimensions included in illustrations are typically considered authoritative.

- Use text on the illustration to describe the important information (state purpose of the illustration). This was found to be impractical since adding text would increase clutter and not provide the clarity needed. It was felt that other methods would provide better solutions and more clarity.

- Include general notes unique to each situation (e.g. structure shown is reference only, wire routing is recommended, electrical panels show typical configuration, etc.). This was found to be impractical since each SB author would create their own notes. It would be difficult to have continuity from one DAH to another and from one service bulletin to another. There would be too much variability.

- Include a generic general note to say the illustrations are graphical representations only and may not be exact unless otherwise specified. This recommendation was introduced in the proposal for general notes in service bulletins, which would make "clear whether an illustration or drawing is the authoritative instruction or only an aid, and including reasonable tolerances on

dimensions within illustrations or drawings". See the Summary Sheet prepared for Task 2, Recommendation 1, Bullet 4.

- Use of "refer to" and "in accordance with" in the Accomplishment Instruction steps. This recommendation is included in the proposal to differentiate critical steps from the flexible advisory instructions. See the Summary Sheet prepared for Task 2, Recommendation 1, Bullet 1.

- Use color coding to show unimportant information. This was found to be impractical since many maintenance stations do not have color printers. Service bulletins are scanned, copied, and faxed, and the distinctions between one color and another would be lost as would the specification of important information.

IMPLEMENTATION PLAN

The concepts and general guidelines developed by the working group will be recorded in this summary. A high level and detailed level report of the guidance material will be developed and sent to AFS-300 group and AIR-140 group. The SIWG is recommending the guidance be documented in an FAA Advisory Circular. However, AFS-300 and AIR-140, in coordination with the SIWG, will determine what type of FAA document is needed and then will publish the appropriate document. The Working group will also submit change requests to have the guidance material included in ATA Spec 2200 and S1000D documentation. Training will be accomplished by the affected organizations as needed. The concepts and general guidelines developed are to be incorporated into each DAH's internal documentation as policy for creating service bulletins. This is estimated to be accomplished by June 30, 2011.

ASSUMPTIONS/CONSTRAINTS

- Each DAH has a different method and format for creating service bulletins

- Each DAH has the capability to create illustrations using at least some, if not all ofthe methods and concepts proposed.

- The use of blow up illustrations is currently a standard practice.

- Each DAH follows the standards defined in industry specifications such as ATA Spec 2200 and S1000D.

ISSUES FOR WORKING GROUP CONSIDERATION

- Each DAH may not have the capability to create illustrations with all of the concepts proposed.

- Both ATA spec 2200 and S1000D allow for some flexibility on how each DAH implements the standards described and therefore, different formats of service bulletins result.

ISSUES FOR ARC CONSIDERATION

- Each DAH may not have the capability to create figures with all of the concepts proposed.
- Both ATA spec 2200 and S1000D allow for some flexibility on how each DAH implements the standards described and therefore, different formats of service bulletins result.
- Each stakeholder is responsible to create and provide training to employees in organizations affected by the change described in this summary sheet

FINDING NO. 1

The Team found that in some cases, service instructions were not sufficiently user-friendly and complete. These incomplete instructions resulted in widespread air carrier confusion because of the differences in the referenced service instructions and AD instructions. These deficiencies in service instructions have led to an increased demand for AMOCs and AD time extensions and/or exemptions. This has strained limited national aviation authority resources. The Team found that there is an opportunity for expanded use of the Fleet Team Emerging Issues (FTEI) process within the OEM industry. Use of this will ensure air carrier's review proposed mitigating actions and make user-friendly inputs to draft OEM service instructions.

RECOMMENDATION NO. 1.

Detailed instructions. Service instructions must make clear whether a figure or drawing is the authoritative instruction or only an installation aid. Service instruction text and drawings must be in agreement with each other to avoid subjective misinterpretation. In addition, service instructions should no longer contain ambiguous terms, such as "approximately", to define allowable tolerance ranges and performance criteria.

APPENDIXES

Appendix A. Detailed Description and Examples of Concepts to Clarify Illustrations

Shade/Cross Hatch Important Areas

This method is suggested to be used to show important areas such as areas to be inspected. This can also be used for other situations as long as the intent is communicated clearly. See Appendix B for further guidance. See Figure 1 for an example of the use of shading important areas.

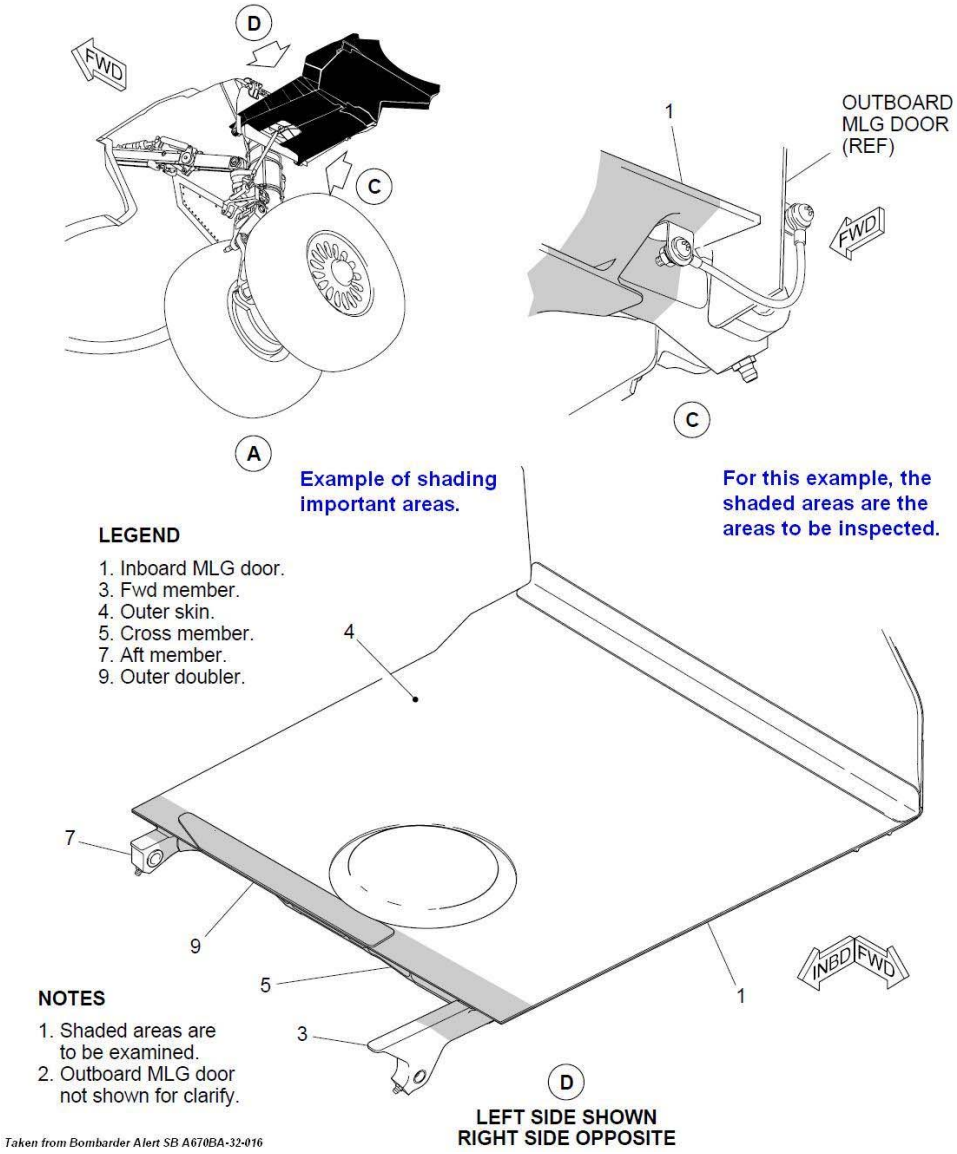

Figure 1: Example of the Use of Shading Important Areas

Use Phantom Lines

This method is to be used when other items are shown in the illustration for reference only to show location of part, etc. This method can be used for other situations as long as the intent is communicated clearly. See Appendix B for further guidance. See Figure 2 for an example of using phantom lines.

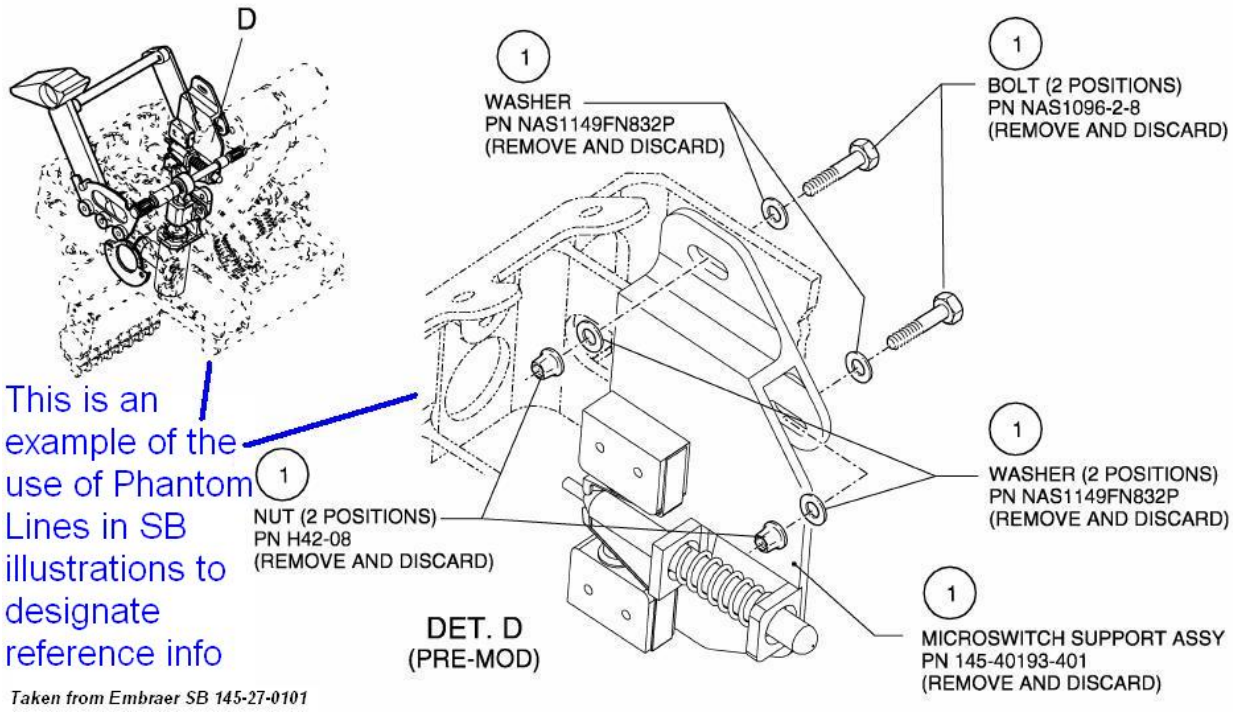

Figure 2: Example of the Use of Phantom Lines

Use Blow Ups of Illustrations

This method is to be used to provide emphasis on a certain part of an illustration. This can be used in other situations as applicable as long as the intent is communicated clearly. See Appendix B for further guidance. See Figure 3 for an example.

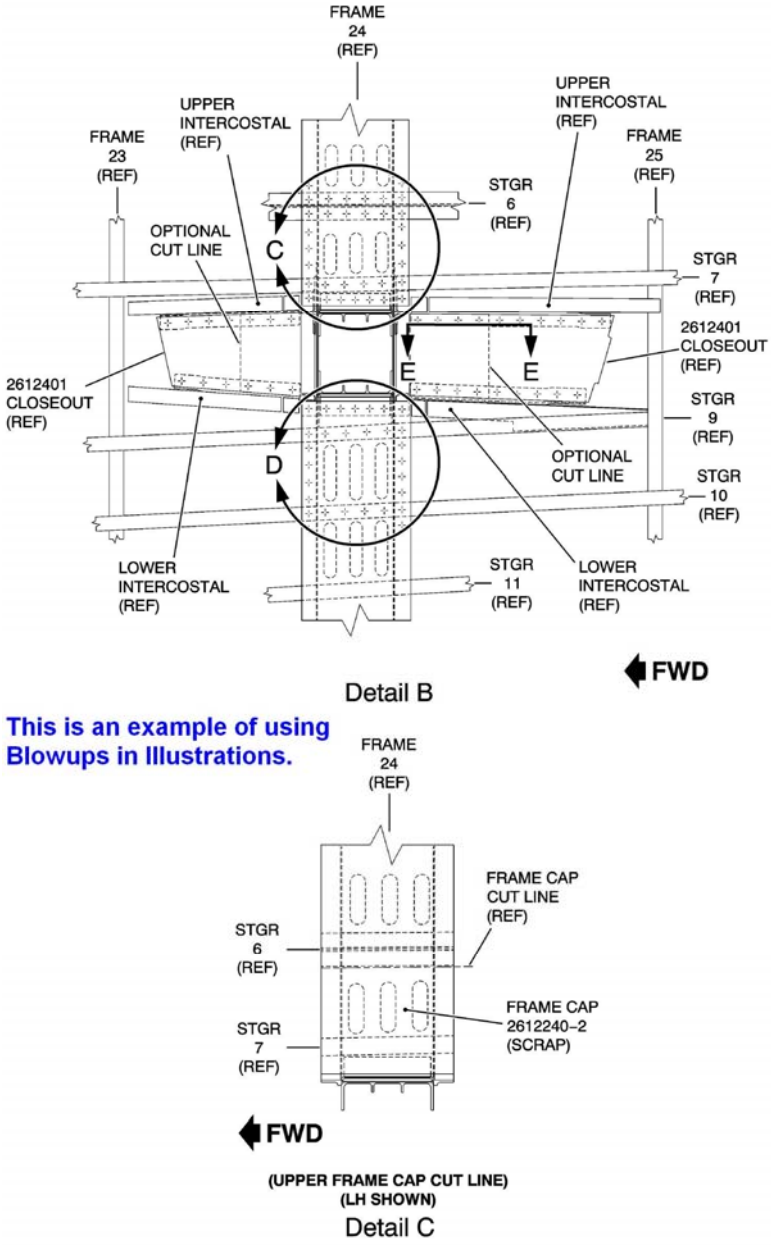

Figure 3: Example of the Use of Blow Ups in Figures

Appendix B. General Concepts and Guidelines to Ensure Clarity of Figures, Illustrations and Drawings in Service Bulletins

General Guidelines for Figures, Illustrations and Drawings

1. Illustrations in service instructions should incorporate the use of phantom, shading/cross hatching, and enlarged views to assist in distinguishing important information from reference only information.

2. It must be specified in the Service Bulletin whether a referenced drawing is authoritative or included for added information (this can be specified using “in accordance with…” or “refer to…”).

3. Include dimensions in order to clearly define locations, etc.

4. Provide tolerances for dimensions given. This can be done in the illustration itself, or in general notes in the service bulletin (e.g. “All dimensions given have a tolerance of +/- 5mm unless otherwise stated.”)

5. Service instruction text and any figures, illustrations or drawings must be in agreement with each other to avoid subjective misinterpretation.

6. General Notes contained in the service bulletin apply to the information contained in the figures and illustrations unless otherwise specified

7. If a discrepancy between the accomplishment instructions and the figures/illustrations exists, each discrepancy must be evaluated and corrected.