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# Creating a Digital Twin of Technical Documentation from Manufacturing to Aftermarket Services

## Digital Twin based on the S-Series IPS Specifications - S1000D and S2000M

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Abstract-No: **A#25**

# Challenges in Creating a Digital Document Thread

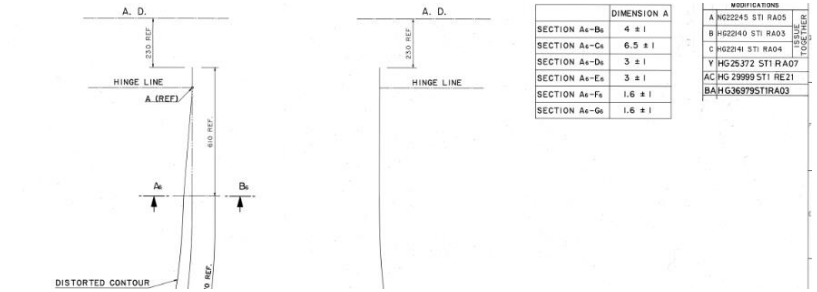
- **Lack of a coordinated approach to Document Authoring across Design, Manufacturing & Aftermarket Services**
  - Multiple Teams working in silos
  - No common template/schema
- **Diverse documents created at all stages of Product/Service Life-cycle**
  - Bill of Materials (BOMs)
  - Specifications – Service, Materials, Process,...
- **Imperative for documents to be compliant with regulatory authorities (Airworthiness)**

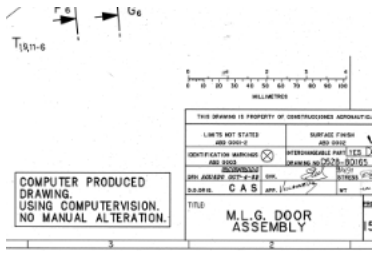
**Result: Inaccurate and outdated information for maintenance tasks**

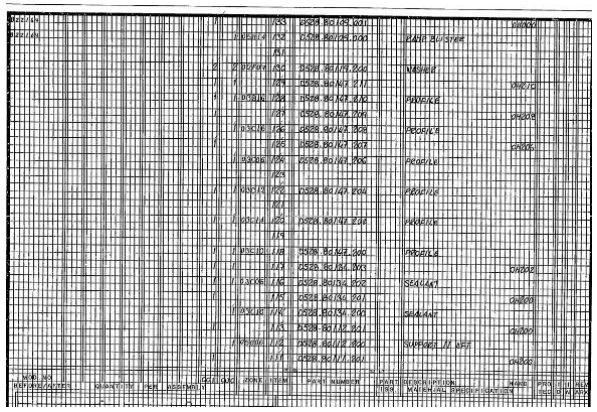
# Consequences of Inaccurate Aftermarket Data

- Extended downtime to resolve queries from maintenance crew
- Quality issues if wrong solution is applied
- Errors when managing spare parts inventory
- Non compliance with regulators

# Diverse Documents – Common Re-usable Information



2 MEANS TO BE EMPLOYED AND SHOPFLOOR/FACILITIES CONDITIONS

2.1 PRODUCTS AND MATERIALS

The structural fasteners are specified on the drawing.

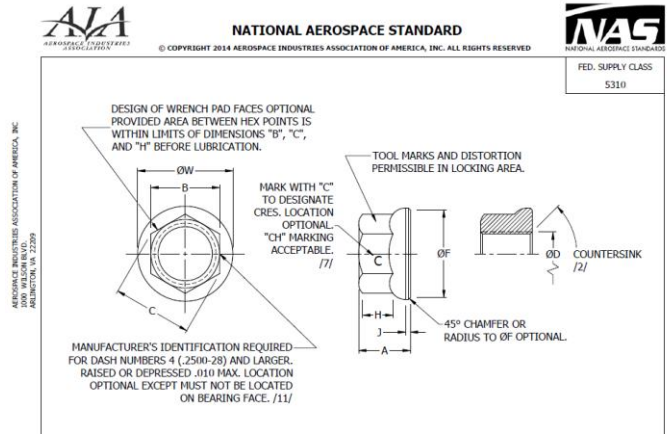
For marking of torque-tightening screwed connections:

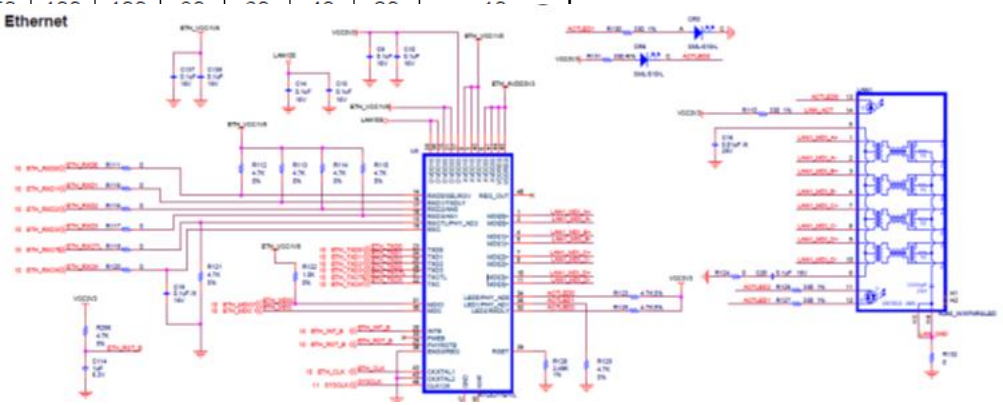
- Product following TN A 007 10050 (line ref: 182)

| | |
|---|---|
| LACKFABRIK BAEDER GMBH | Lackfabrik Baeder GMBH & CO |
| ORGANIC PRODUCTS CO. | TORQUE SEAL F 925 |
| PPG Aerospace | Base : 5540/9460<br>Hardener : 0701/9000 |

**Table 1: Tightening speed limitation**

| Bolt | Nut | Rotational speed (Revolutions Per Minute) / diameter code | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Material | Material | 2 | 3 | 3A | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 12 | 14 | 16 (and above) |
| Titanium | Steel | 150 | 275 | 275 | 275 | 250 | 180 | 140 | 100 | 80 | 60 | 40 | 20 | 10 |
| Titanium | Aluminium | 150 | 275 | 275 | 275 | 200 | 160 | 120 | 90 | 70 | 50 | 30 | 15 | 10 |
| Steel/Inconel | Steel/Inconel | 150 | 275 | 275 | 275 | 250 | 180 | 140 | 100 | 80 | 60 | 40 | 20 | 10 |
| Titanium | Titanium | 150 | 150 | 150 | 150 | 150 | 15 | | | | | | | |
| Inconel | Titanium | 150 | 150 | 150 | 150 | 150 | 15 | | | | | | | |



# Solution : create a standardized Data Repository from Design Stage

- **Standardized Data Repository based on the S- Series Specifications**
  - S2000M for Materials Management (BOMs, Specifications)
  - S1000D for Aftermarket documents
- **Digital Data from Documents re-used across the Product/Service Life-cycle**
- **Enhanced visibility across functions**
- **Improvement of data quality**
- **Reduction of costly delays and rework**

# Solution : create a standardized Data Repository from Design Stage

## Design

Increased Operational insights

Improved Designs

Improved serviceability

Improved customer satisfaction

## Digital Twins

Design Specifications

Change History

Service Bulletins

Maintenance Manuals

Illustrated Parts Catalogues

BOM

Maintenance Schedules

Repair Manuals

## Aftermarket

Improve Quality

Increase First-Time-Fix Rates

Reduce Turnaround Time

Minimize rework

Increase Availability

# Thank You

## for your attention!

# Questions?