



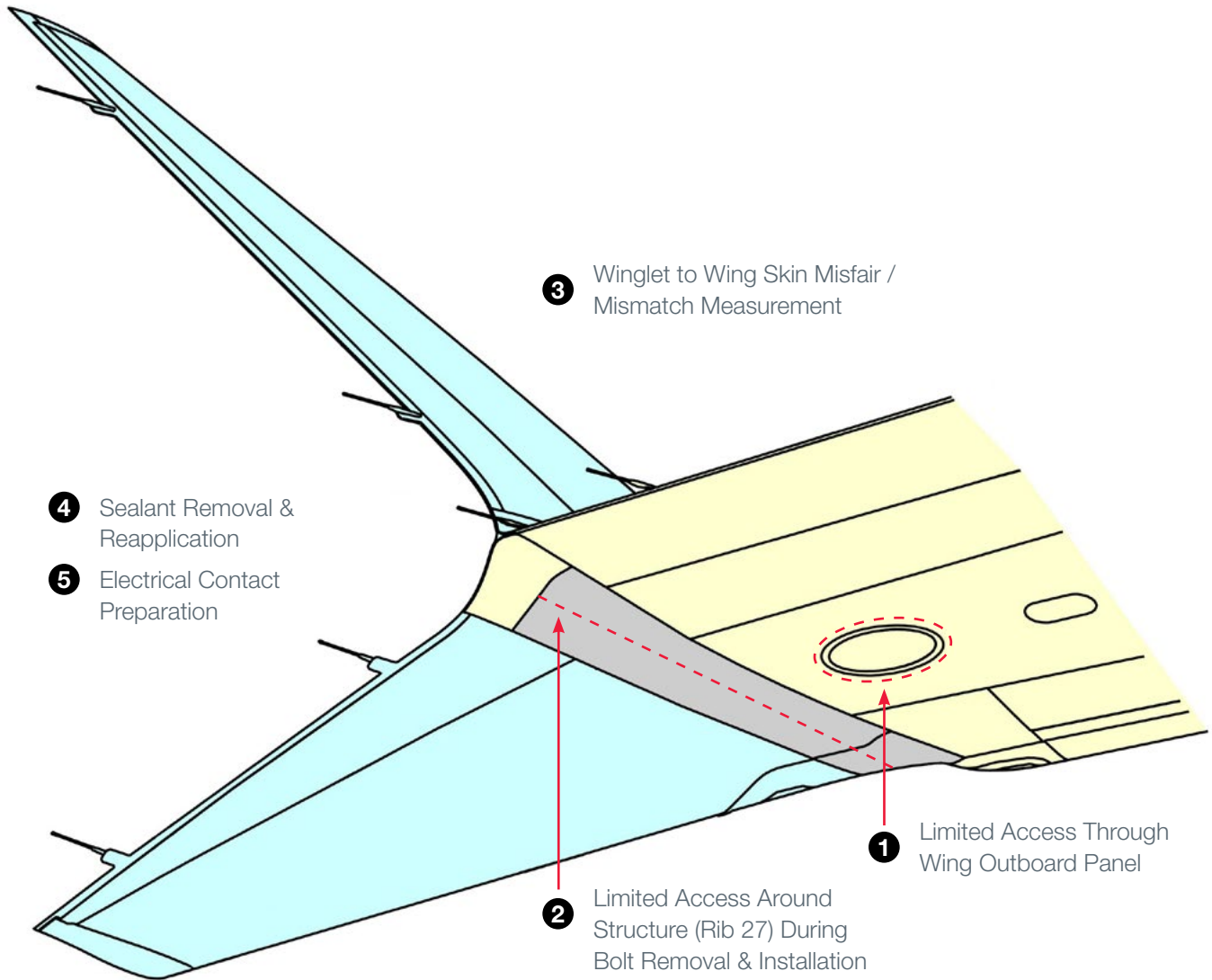
Winglet Replacement Tools

A guide for Boeing-designed specialized tools to remove and install winglets, lower labor 30% and eliminate quality errors.

737NG and MAX

Next-Generation 737 and 737 MAX

Boeing-designed tools address 5 critical maintenance challenges



1



ST2580-550A
Torque Wrench

2



ST991A-2-250
Fastener Removal

3



ST8770S
Mismatch Gauge

4



ST982LF-9
Sealant Scraper

5



ST913MA-1
Bonding Mandrel

Tool Highlights

The most frequently used Boeing-designed tools for winglet replacement.



ST2580-550A

Torque Wrench Adapter

Used with extensions to adapt a standard torque wrench to reach limited access aft winglet fasteners on 737 MAX aircraft. Integrated ratchet aids in quick installation.



ST2580-38B

Torque Wrench Adapter

Used with extensions to adapt a standard torque wrench to reach limited access winglet fasteners on Next-Generation 737 aircraft.



ST991A-2-250

Fastener Removal Tool

The tapered tip of this pry tool makes short work of removing installed fasteners. Plastisol coating helps avoid damage from incidental structure contact. Heat treated for optimal strength.



ST8770S

Mismatch Gauge

A quick check with this skin mismatch gauge will help you ensure a conforming winglet installation and minimal drag in flight. Convenient gradations for quickly identifying offset.



ST982N-6

Sealant Spatula

Apply sealant and trim perfect joint radii with this twin-tipped sealant spreading spatula. Available in brass and aluminum versions.



ST982L-9

Sealant Scraper

Remove sealant from unclad surfaces with this Boeing-approved scraper. Twin-tipped for extra long life, built to exacting Boeing standards.



ST982LF-9

Sealant Scraper

Remove sealant and contaminants from clad aluminum surfaces with this Boeing-approved scraper. Meets all requirements of BSS7384.



ST913MA-1

Bonding Mandrel

The lights and sensors in your aircraft's wingtips deserve a great connection. Make sure contact points are free of contamination with this abrasive cleaning mandrel.

Aircraft Maintenance Manual (AMM) and Specialized Tool Designations

Pacific Tool is a licensed manufacturer of Boeing-designed specialized production tools. Boeing designs these tools for original airplane production to decrease labor costs and reduce likelihood of quality errors. Pacific Tool will provide the tool stated in the AMM, or if no tool is required specifically by the AMM, Pacific Tool will match that **Task** and **Sub-task** to Boeing-designed tools used in production.



737-7/8/8200/9/10 AIRCRAFT MAINTENANCE MANUAL

WINGLET - REMOVAL/INSTALLATION

1. **General**

- A. The winglet assembly includes an upper blade and a lower blade. The lower blade can be removed separately from the upper blade.
- B. There are six tasks in this procedure.
 - (1) Winglet removal
 - (2) Winglet installation
 - (3) Winglet lower blade removal
 - (4) Winglet lower blade installation
 - (5) Alternate winglet removal
 - (6) Alternate winglet installation.
- C. The winglet procedures will remove and install the winglet in its entirety. The winglet lower blade procedures will only remove and install the lower blade. The alternate winglet procedures will remove the lower blade then the upper blade and install the upper blade then the lower blade.

TASK 57-31-21-000-801

2. **Winglet Removal**

(Figure 401 and Figure 402)

A. **General**

H. **Winglet Removal**

SUBTASK 57-31-21-000-001

- (1) Do this task: Winglet (AFT) Marker and Winglet Anti-Collision Lights - Disconnect the Electrical Connectors, TASK 33-43-10-020-801.

SUBTASK 57-31-21-020-011

- (2) Disconnect the forward bonding jumper [4] as follows (View C, Figure 401):
 - (a) Remove the nut [5] and washer [6] from the outboard rib of the wing.
 - (b) Remove the bonding jumper [4] from the lug on the wing rib.
 - (c) Store the nut [5] and washer [6] in a bag for the installation.

Tool Explanation and References

Torque Wrench Adapter

ST2580-550A FOR 737 **MAX ONLY**

ST2580-38B FOR 737 **NG ONLY**

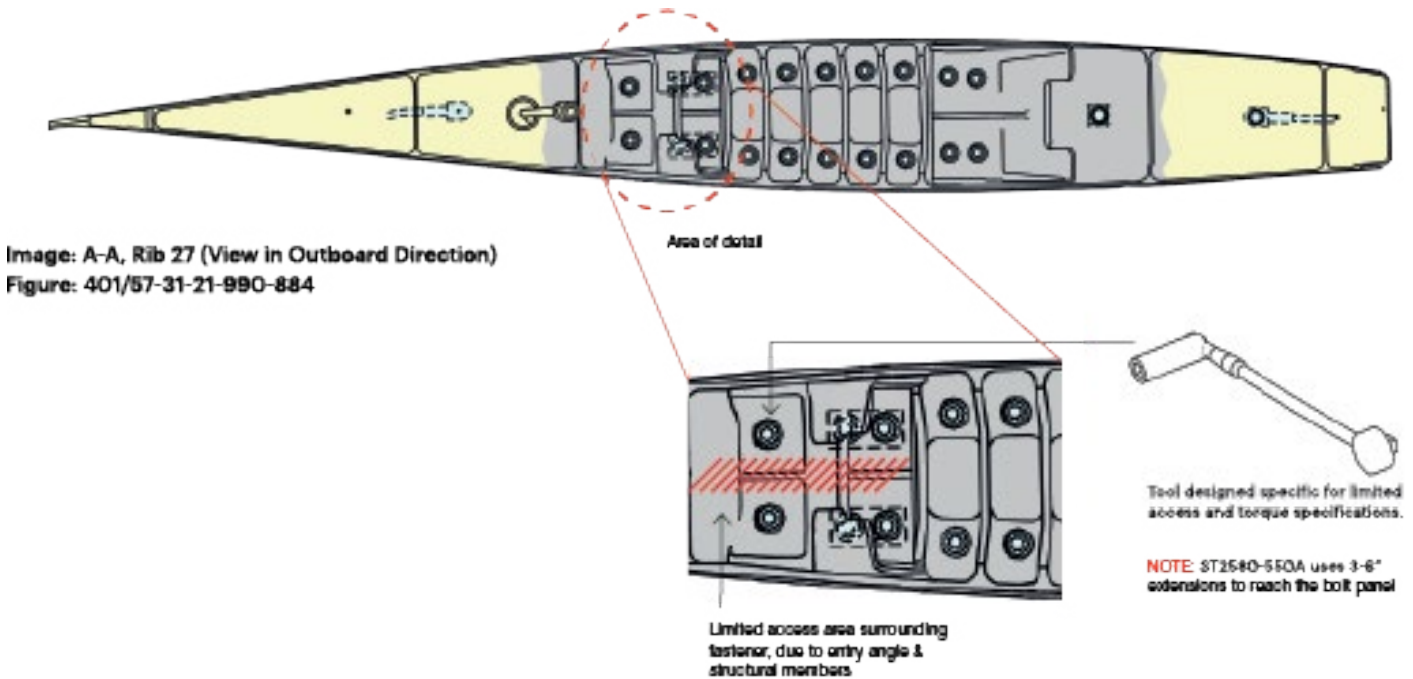


Image: A-A, Rib 27 (View in Outboard Direction)
Figure: 401/57-31-21-990-884

AMM Reference

TASK 57-31-21-000-801 (REMOVAL)

- SUBTASK 517-31-21-020-003
1./H./(12) – see below instructions per removal

TASK 57-31-21-400-801 (INSTALLATION)

- SUBTASK 57-31-21-420-005
3./H./(12)/(e) Tighten the bolts [[12], bolts [9], and bolts [7] in the order sequence (Table 402).

NOTE: A combination of 6 -inch extensions and low-profile swivel head sockets with the torque adapter, SPL-19986 (ST2580-550A) can tighten bolts to final torque.

See BSS7083 for additional information on torque procedures and tools for faster installation.

Tool Explanation and References

Fastener Removal Tool

ST991A-2-250

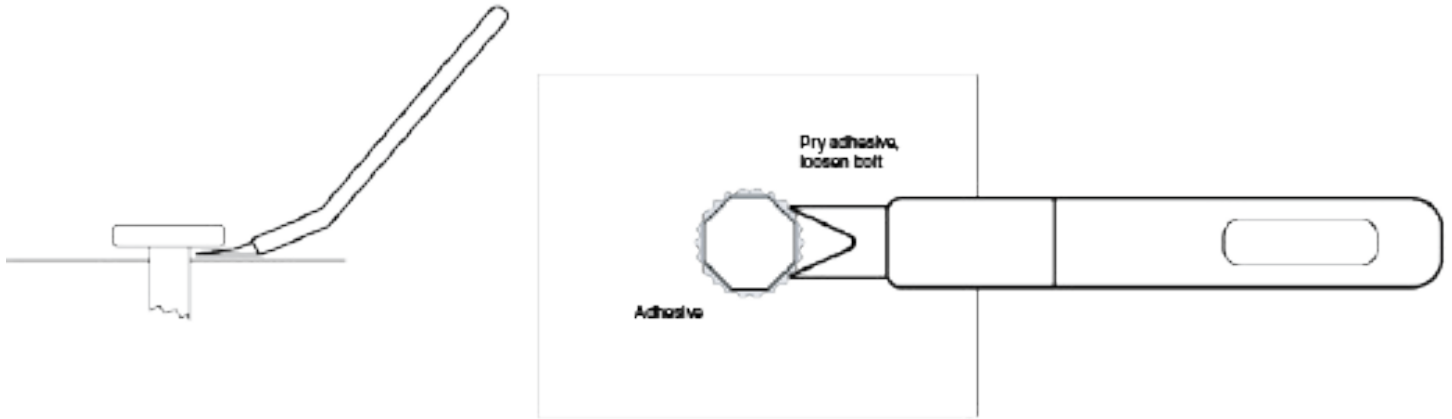


Image: A-A, Rib 27 (View in Outboard Direction)
Figure: 401/57-31-21-990-884

AMM Reference

TASK 57-31-21-000-801 (REMOVAL)

- SUBTASK 57-31-21-020-001, 57-31-21-100-001,

This AMM makes references to winglet bolt removals 23 times. The ST991-2-250 fastener tool can be used to assist in the removal of fasteners by removing adhesive and lifting fastener heads for easier extraction.

Tool Explanation and References

Mismatch Gauge

ST8770S

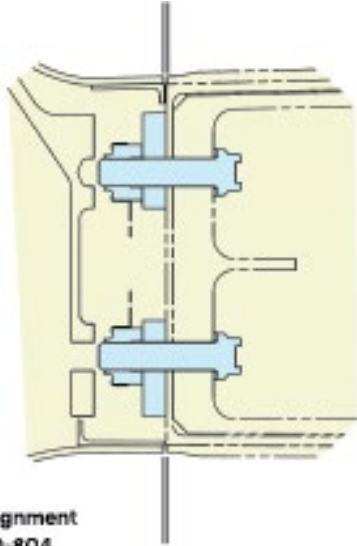


Image: E-E Misfair Alignment
Figure 401/57-21-990-804

AMM Reference

TASK 57-31-21-400-801 (INSTALLATION)

SUBTASK 57-31-21-420-005

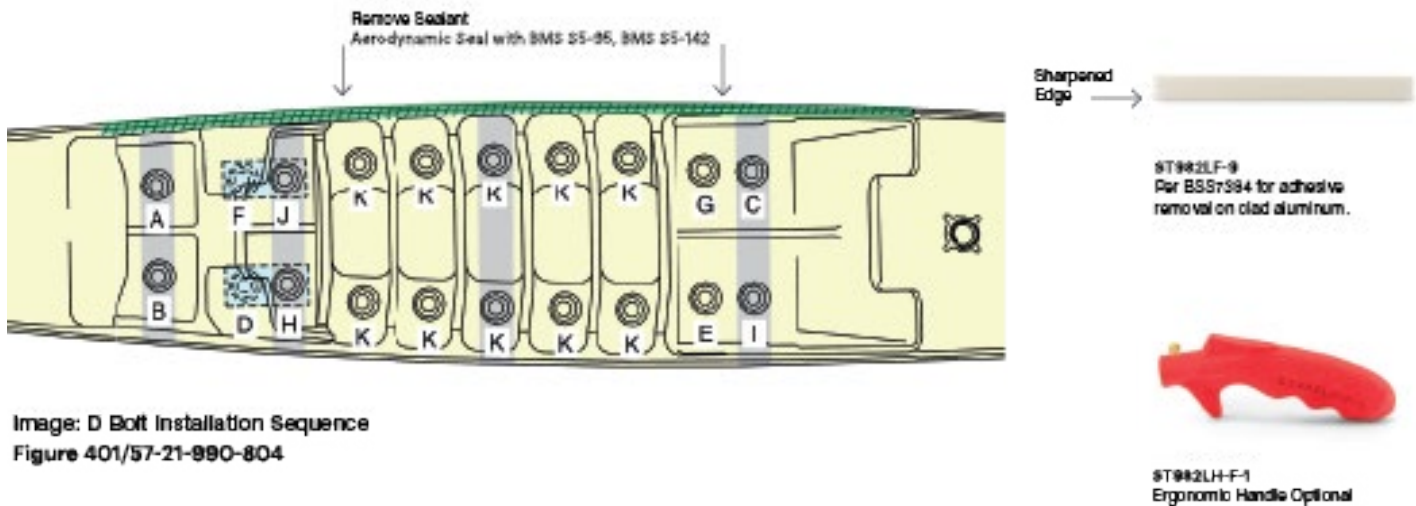
3./H/(16)/(a) – (d)

- (16) Make sure the misfair is in the limits (View A-A, Figure 401):
 - (a) Make sure that the aft 6.0+0.5 in. (152.4 +12.7 mm) of the winglet [1] is aligned with the upper wing surface to within 0.1200 in. (3.0480 mm).
 - (b) Make sure that the winglet [1] aligns with the upper and lower wing surface forward of the rear spar to within 0.06 in. (1.524 mm).
 - (c) Make sure that the winglet aligns with the upper and lower wing surface aft of the rear spar to within 0.10 in. (2.54 mm).
 - (d) Make sure that the space between the winglet [1] and upper and lower wing skin is in the limit of 0.075 +0.90 / -0.000 in (1.905 +2.286 / -0.000 mm).

Tool Explanation and References

Sealant Scraper

ST982LF-9
ST982LH-F-1



AMM Reference

TASK 57-31-21-000-801 (REMOVAL)

▪ SUBTASK 57-31-21-100-001

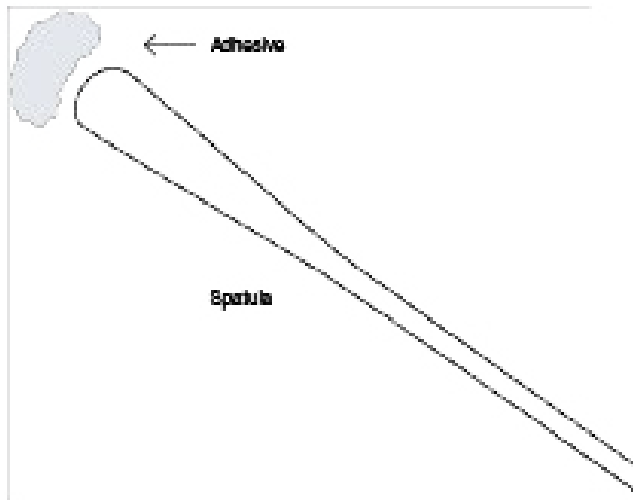
- 1./H./(3)/(a) Remove corrosion inhibiting material with a hard resin phenolic scraper STD-1064 (ST982LF-9) around the faying surfaces of rib 27 on the wing and winglet [1] root rib (view A-A, Figure 401).

Additional References – Per AMM, 63 references, basically removal of all sealants, corrosion material to use hard resin phenolic scraper or ST982LF-9 scraper.

Tool Explanation and References

Sealant Spatula

ST982N-6



Contoured shape, brass for better application

AMM Reference

TASK 57-31-21-400-801 (INSTALLATION)

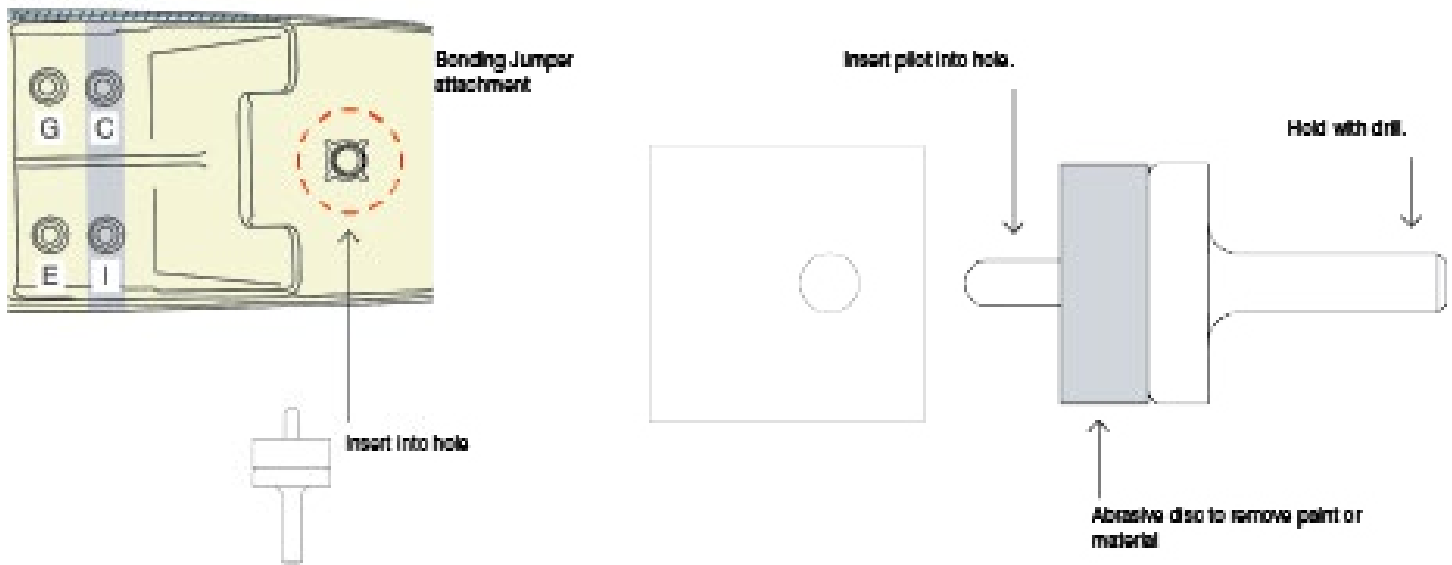
- SUBTASK 57-31-21-390-002

(21) Apply a seal to the external gap on the upper surface of the winglet [1] between point A and B with sealant, A00247 (View D, Figure 401).

Tool Explanation and References

Bonding Mandrel

ST913MA-1



AMM Reference

TASK 57-31-21-400-801 (INSTALLATION)

▪ SUBTASK 57-31-21-400-001

(13) Connect the aft bonding jumper [18] (View B, Figure 401).

(c) Use an intrinsically safe approved bonding meter, COM-1550, to make sure that the resistance from the terminal to the structure is not more than 0.0010 ohm (SWPM 20-20-10).

The ST913MA-1 bonding mandrel properly removes material for correct connection.

Find the Right Tool

Pacific Tool provides Boeing customers and maintenance the right tool from the 25,000 Boeing-designed specialized production tool catalog to lower labor costs and reduce quality errors.

Pacific Tool connects a Boeing-designed specialized tools for production with a repair and maintenance activities and provides references for the tool to maintenance documentation and Boeing production standards.

Pacific Tool was founded in 1966, guided by the principles of engineering innovation, technology, data and service. With over 50 years serving Boeing, as well as its suppliers and customers, Pacific Tool is recognized as a pioneer in specialized tooling across the disciplines of fastening systems, assembly, and automation. Pacific Tool is AS9100 and ISO9001 certified. Officially licensed by Boeing.

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