

Installation Procedure for the Basler BT- 67 UWB Antenna Assemblies (UWB-ICE-AWI)

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1 INTRODUCTION

This document details the method of installing the ultrawideband (UWB) ice array from two separate states. The first state is with the pylons attached to the arrays (recommended to minimize steps in field and cable routing) and the second state is with the pylons not attached to the arrays (which might be preferred for shipping in alternate shorter crates).

Handling the arrays is best enabled by supporting the lower surface, but be aware the lower surface is the antenna element and thus should be protected from abrasion and scratching as such damage could affect antenna performance. If lifting with a forklift, the forks should be wrapped, and the forks should extend chordwise across the array (note there is a full length forward and aft spar at the forward and aft end of the upper surface ground plane, with the fasteners line evident for placement). If lifting by hand, it is best from each end, lifting with forearms cradling the lower surface. Alternately, 4' lifting slings are provided to carry from mid-span locations. There are ribs at each end and between each antenna element, again with fastener lines on the upper ground plane making the location evident. The center array with pylons but no leading edge fairings is approximately 445 lbs, and the wing arrays with pylons but no aerofairings are approximately 415 lbs each.

When torquing the fasteners the values listed in Table 1-1 plus what is needed to overcome friction should be used. Note that fasteners with a composite material directly underneath the fastener head must have a washer both under the fastener head and under the nut to reduce the through-thickness compression on the composite when torquing the fastener. Additionally before torquing to the specification ensure that the washer or fastener head is seated properly. Bonded nutplates are used in a few locations, and these are noted in the installation steps. Added care in handling these bolt locations is recommended.

Table 1-1: Specified Fastener Torques

Fastener	Specified Torque (in-lbs)
MS27039-1-XX, NAS623-3-X, NAS6203-XX	20-25
NAS6204-XX	50-70
NAS6205-XX, NAS6605-XX	70-90

2 INSTALLATION PROCEDURE WITH PYLONS ATTACHED TO ARRAYS

2.1 Fuselage Array

1. Attach the upper fuselage pylon lugs (UWB-ICE-04-505 and UWB-ICE-04-506) to the aircraft using NAS6203-11 fasteners.
 - a. Note each lug is stamped P5 or P6 denoting Polar 5 or Polar 6 installation. Additionally each lug is stamped FWD 1 to FWD 4 or AFT 1 to AFT 4, with 1 being the port-most side continuing sequentially to the starboard-most side.
 - b. Torque each fastener to its designated torque value from Table 1-1.
2. Attach provided lug adapters (2" plate washer) and spring hooks to the inboard forward and aft EM-bird mounts. (Figure 2-1).
3. Support array ~32" off the ground such that it rests a few inches below the lower fuselage using two Nansen sleds or several sawhorses. In the ideal height, the aft lugs should be just within the clevises in the resting position. Lay two 2" wide x 25' long ratchet straps below the array, cradling the array from the lower surface at the EM-bird mount wing stations, and attach each clip end of the strap to the above spring hooks (Figure 2-1) Use of a protective pad below the array is recommended to minimize abrasion of the exposed lower surface antennas. Advance the ratchet straps to be snug, but not yet lifting the array. Manually lift the trailing edge as required to insert long an3 bolts as temporary shear pins in one fastener position of each aft upper lug connections. Once the shear pins are in place, advance the ratchet straps to slowly raise/rotate the array into the forward upper pylon lugs. Position additional long an3 bolts into one fastener position of each aft upper lug connections.



Figure 2-1: Fuselage shoulder bolts, clips and straps at EM-bird mounts

4. Attach the fuselage array pylons to the upper pylon lugs (UWB-ICE-04-505 and UWB-ICE-04-506) using NAS6204-14 fasteners for the aft lugs (UWB-ICE-04-506) and NAS6204-8 fasteners for the forward lugs. This may require a drift pin, and you will be removing the prior an3 fasteners as you replace them with the appropriate NAS6204 fastener.
 - a. The aft fuselage pylon lugs (UWB-ICE-04-506) have shims that need to be placed within the clevis before installing the fasteners; the shims are marked in the same manner as the aft lugs.
 - b. Torque each fastener to its designated torque value from Table 1-1.
5. Attach the fuselage pylon leading edge (UWB-ICE-04-401) to the fuselage pylons using MS27039-1-12, MS27039-1-11, and MS27039-1-9 fasteners as per Figure 2-2.
 - a. Note each leading edge is labeled to match fuselage pylon 1 to fuselage pylon 4, so ensure you are using the appropriate leading edge for each pylon.
 - b. Note the MS27039-1-09 fastener goes into a bonded nutplate; therefore added care should be taken to ensure the fastener threads properly and is not over-torqued.
 - c. Torque each fastener to its designated torque value from Table 1-1.

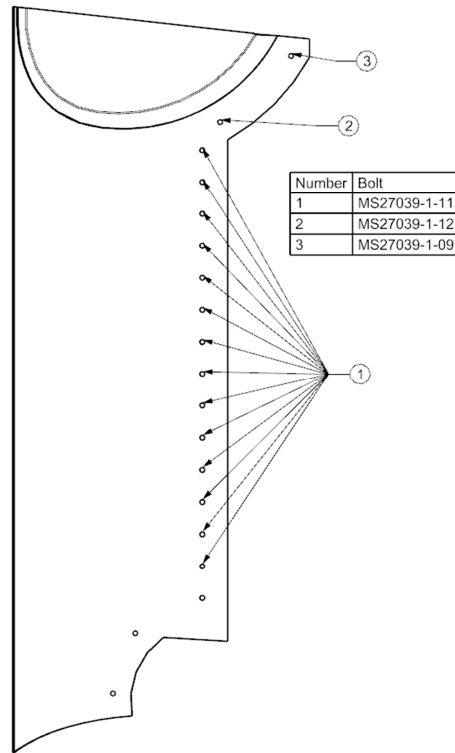


Figure 2-2: Fuselage Pylon Leading Edge Fastener Placement

6. Remove the ratchet straps and all related eyebolts and adapters.
7. Attach the forward fuselage lug covers (UWB-ICE-04-501) to the fuselage pylons using MS27039-1-13, MS27039-1-12, and MS27039-1-10 fasteners as per Figure 2-3.
 - a. Note each fuselage pylon lug cover is labeled by fuselage pylon 1-4 and either forward or aft, and either left (port) side or right (starboard) side. Ensure you are using the appropriate lug cover for each pylon location.
 - b. Note the MS27039-1-10 fasteners go into bonded nutplates; therefore added care should be taken to ensure the fastener threads properly and is not over-torqued.
 - c. Torque each fastener to its designated torque value from Table 1-1.

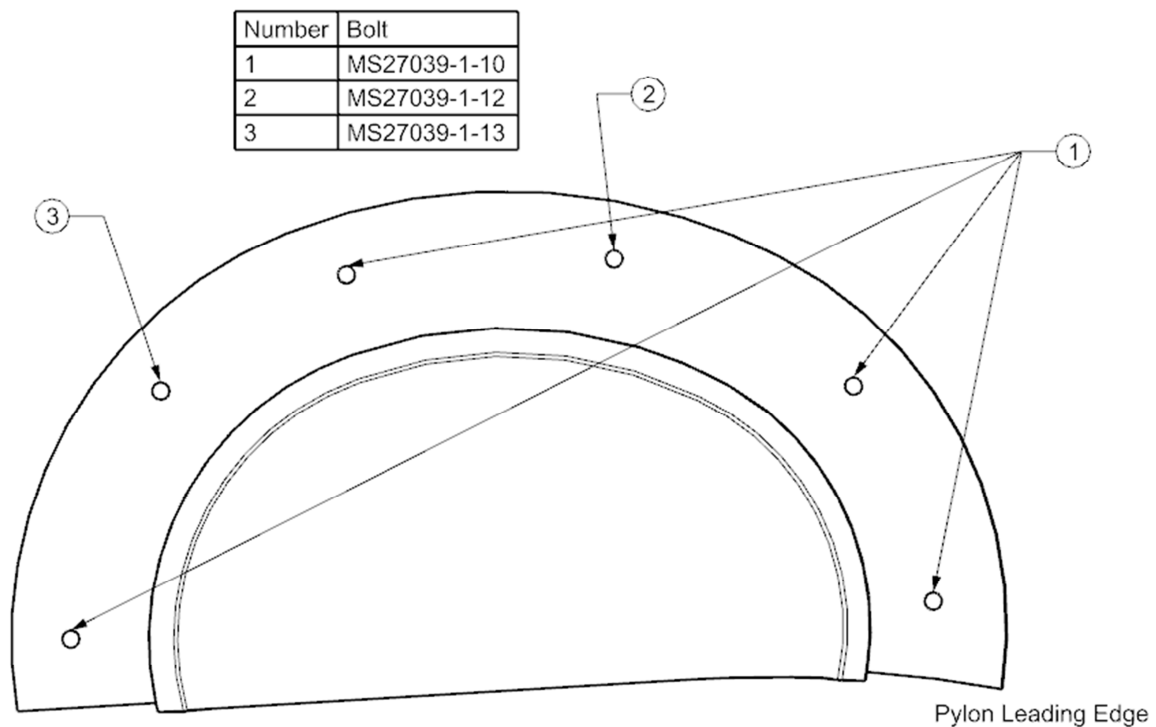


Figure 2-3: Fuselage Pylon Forward Lug Cover Fastener Placement

Note due to the missing nutplates in fuselage pylon 1, CR3213-6-5 rivets are installed as the MS27039-1-11 fasteners in that location as required.

Treat edges and gaps with RTV or aluminum tape as appropriate.

2.2 Port Array

1. Attach the port wing pylon forward upper lugs (UWB-ICE-06-502, UWB-ICE-07-502, and UWB-ICE-08-502) and port wing pylon upper aft lugs (UWB-ICE-06-501, UWB-ICE-07-501, and UWB-ICE-08-501) using the fasteners and locations shown in Figure 2-4, with the exception of temporarily leaving out the most outboard bolt on each of UWB-ICE-06-502, and the most inboard bolts on UWB-07-501, UWB-07-502 and UWB-ICE-08-501.
 - a. Note a lug is composed of two separate parts which will need to be placed separately.
 - b. Note each lug is stamped P5 or P6 denoting Polar 5 or Polar 6 installation, with its drawing number which can be seen in Figure 2-4, and by O or I indicating if it was the inboard or outboard side of the pair (e.g. P6 08-501 I).
 - c. Torque each fastener to its designated torque value from Table 1-1.

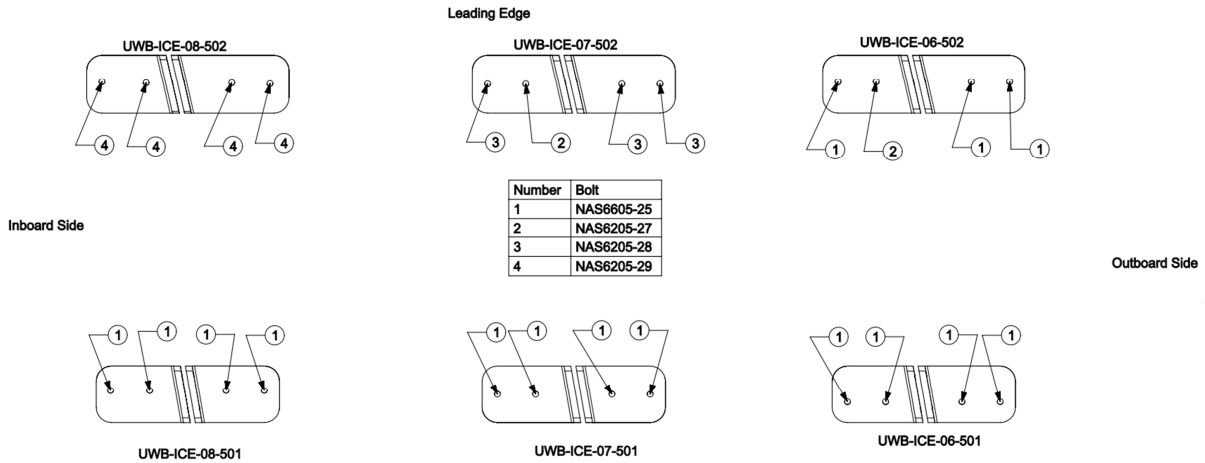


Figure 2-4: Port Wing Upper Pylon Lug Fastener Placement

2. Attach the provided threaded rod/hex extension/shoulder eyebolt assembly to the most outboard location of UWB-06-502 and the most inboard locations on each of UWB-ICE-07-501, UWB-ICE-07-502, and UWB-ICE-08-501 (Figure 2-5).



Figure 2-5: Shoulder Bolt Locations (note starboard wing shown)

3. Attach provided spring hooks to the above forward and aft eyebolts. The middle pylon has one spring hook per shoulder eyebolt, and the inboard and outboard pylon each have two spring hooks per shoulder eyebolt.
4. Support array ~45" off the ground such that it rests a few inches below the wing using two Nansen sleds, the shipping container, or several sawhorses. In the ideal height, the

inboard aft lugs should be a few inches below the clevises in the resting position. Lay the two provided 1" wide double ratchet straps below the array with the red 15' strap outboard and the orange 13' strap inboard, cradling the array from the lower surface at the outboard and inboard pylon wing stations, and attach each clip end of the strap to the above spring hooks (Figure 2-6). Use of a protective pad below the array is recommended to minimize abrasion of the exposed lower surface antennas. The provided 4' lifting slings must be used on the inboard side to ensure the array cannot fall from the ratchet straps (loop one end of the 4' sling around the strap below the array and the other end of the 4' sling through the aft ratchet strap above the array). Place a third 2" wide x 25' long ratchet strap at the center pylon, and attach each clip end of the strap to the above spring hooks; this is the safety strap.



Figure 2-6: Wing Straps for Inboard, Mid and Outboard Pylons

5. Advance the inboard and outboard ratchet straps to raise the array into the upper pylon lugs. This will likely require four persons: two to advance the ratchet straps and two to stabilize the arrays from swinging while guiding the pylon rib lugs into the upper pylon clevises. Because of the high pitch and dihedral angle small adjustments in advancement from the leading or trailing edge side will be required to adjust the array yaw and fore/aft position while advancing the height. Periodically ratchet the center safety strap, not to lift the array but rather to reduce any drop if one of the outboard straps fails or slips. When close, minor manual adjustments may be made, to include local lifting of the array to insert the provided long an3 bolts into one fastener location on each of the upper clevises. You will likely insert the aft pins, then further advance the ratchet straps to elevate the array sufficiently to enable installation of the forward temporary pins.
6. Attach the port wing array pylons to the wing pylon upper lugs from step 1 using NAS6204-16 fasteners. This may require a drift pin, and you will be removing the prior an3 fasteners as you replace them with the appropriate NAS6204 fastener.
 - a. The inboard forward port pylon lugs (UWB-ICE-08-502) have shims that need to be placed within the clevis before installing the fasteners; the shims are marked in the same manner as the lugs. Additionally due to these shims this lug uses NAS6204-18 fasteners.

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- b. Note due to the drilling operation the fasteners in the upper aft lug (UWB-ICE-07-501) of the center port pylon need conical adjustment washers and therefore use NAS6204-19 fasteners.
 - c. Also note that in order to attach the pylons one of the two parts of a lug might need to be loosened/removed and then reinstalled to enable the bolts to advance in the wing array pylons.
 - d. Torque each fastener to its designated torque value from Table 1-1.
 7. Remove the center ratchets straps and related eyebolts, and install the outermost bolts on each of UWB-ICE-07-501, UWB-ICE-07-502, per Figure 2-3, using torque values from Table 1-1.
 - a. It is important to remove only the center ratchet straps at this time and not the load bearing inboard and outboard straps. Note the fasteners in the upper aerofairings are shared fasteners with the pylon torque box, and thus until they are installed the upper pylon ribs are connected to the torque box by only a bonded joint on one skin. It is unwise to support the array weight in only this fashion. One or two temporary fasteners may also be used along the upper pylon joint to prevent rotation of the pylon rib, but these will need to be removed prior to installation of aerofairings. The procedures delineated below are to ensure only one aerofairing at a time is being connected to the final fasteners.
 8. Place the forward half of the center wing pylon aerodynamic fairings (UWB-ICE-07-701) onto center wing array pylon. Care should be exercised to avoid over-prying the open end of each fairing as this could cause a delamination of the leading edge. Then place the forward aerodynamic fairing braces (UWB-ICE-07-702, UWB-ICE-07-703) into location and attach one side of the brace to the aerodynamic fairings using MS27039-1-10 fasteners. The forward braces must be located before the aft braces are positioned.
 - a. Note each brace and aerodynamic fairing is labeled for the inboard, center, or outboard pylon, if it is on the port or starboard array, and if it is forward or aft.
 - b. Note during installation and deinstallation of the aerodynamic fairings care must be taken to not excessively spring them open at the open end as that can cause delaminations.
 - c. Note the MS27039-1-10 fasteners go into bonded nutplates; therefore added care should be taken to ensure the fastener threads properly and is not over-torqued.
 - d. Torque each fastener to its designated torque value from Table 1-1.
 9. Slide the aerodynamic fairing forward such that the aft aerodynamic fairing brace can be put into place. Then slide the fairing back into position and finish securing the braces with MS27039-10 fasteners.
 - a. Note each brace and aerodynamic fairing is labeled for the inboard, center, or outboard pylon, if it is on the port or starboard array, and if it is forward or aft.

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- b. Note during installation and deinstallation of the aerodynamic fairings care must be taken to not excessively spring them open at the open end as that can cause delaminations.
 - c. Note the MS27039-1-10 fasteners go into bonded nutplates; therefore added care should be taken to ensure the fastener threads properly and is not over-torqued.
 - d. Torque each fastener to its designated torque value from Table 1-1.
 10. Attach the forward half of the aerodynamic fairing of step 8/9 to the wing array pylon using MS27039-1-14 fasteners as can be seen in Figure 2-8.
 - a. Torque each fastener to its designated torque value from Table 1-1.
 11. Remove the outboard ratchets straps and related eyebolt, and install the outboard bolt on UWB-ICE-06-502, per Figure 2-3, using torque values from Table 1-1.
 12. Place the forward half of the outboard wing pylon aerodynamic fairings (UWB-ICE-06-701) onto outboard wing array pylon. Care should be exercised to avoid over-prying the open end of each fairing as this could cause a delamination of the leading edge. Then place the forward aerodynamic fairing braces (UWB-ICE-06-702, UWB-ICE-06-703) into location and attach one side of the brace to the aerodynamic fairings using MS27039-1-10 fasteners. The forward braces must be located before the aft braces are positioned.
 - a. Note each brace and aerodynamic fairing is labeled for the inboard, center, or outboard pylon, if it is on the port or starboard array, and if it is forward or aft.
 - b. Note during installation and deinstallation of the aerodynamic fairings care must be taken to not excessively spring them open at the open end as that can cause delaminations.
 - c. Note the MS27039-1-10 fasteners go into bonded nutplates; therefore added care should be taken to ensure the fastener threads properly and is not over-torqued.
 - d. Torque each fastener to its designated torque value from Table 1-1.
 13. Slide the aerodynamic fairing forward such that the aft aerodynamic fairing brace can be put into place. Then slide the fairing back into position and finish securing the braces with MS27039-10 fasteners.
 - a. Note each brace and aerodynamic fairing is labeled for the inboard, center, or outboard pylon, if it is on the port or starboard array, and if it is forward or aft.
 - b. Note during installation and deinstallation of the aerodynamic fairings care must be taken to not excessively spring them open at the open end as that can cause delaminations.
 - c. Note the MS27039-1-10 fasteners go into bonded nutplates; therefore added care should be taken to ensure the fastener threads properly and is not over-torqued.
 - d. Torque each fastener to its designated torque value from Table 1-1.
 14. Attach the forward half of the aerodynamic fairing of step 12/13 to the wing array pylons using MS27039-1-14 fasteners as can be seen in Figure 2-9.
 - a. Torque each fastener to its designated torque value from Table 1-1.

15. Remove the inboard ratchets straps and related eyebolts, and install the inboard bolt on UWB-ICE-08-501 per Figure 2-3, using torque values from Table 1-1.
16. Place the forward half of the inboard wing pylon aerodynamic fairings (UWB-ICE-08-701) onto inboard wing array pylon. Care should be exercised to avoid over-prying the open end of each fairing as this could cause a delamination of the leading edge. Then place the forward aerodynamic fairing braces (UWB-ICE-08-702, UWB-ICE-08-703) into location and attach one side of the brace to the aerodynamic fairings using MS27039-1-10 fasteners. The forward braces must be located before the aft braces are positioned.
 - a. Note each brace and aerodynamic fairing is labeled for the inboard, center, or outboard pylon, if it is on the port or starboard array, and if it is forward or aft.
 - b. Note during installation and deinstallation of the aerodynamic fairings care must be taken to not excessively spring them open at the open end as that can cause delaminations.
 - c. Note the MS27039-1-10 fasteners go into bonded nutplates; therefore added care should be taken to ensure the fastener threads properly and is not over-torqued.
 - d. Torque each fastener to its designated torque value from Table 1-1.
17. Slide the aerodynamic fairing forward such that the aft aerodynamic fairing brace can be put into place. Then slide the fairing back into position and finish securing the braces with MS27039-10 fasteners.
 - a. Note each brace and aerodynamic fairing is labeled for the inboard, center, or outboard pylon, if it is on the port or starboard array, and if it is forward or aft.
 - b. Note during installation and deinstallation of the aerodynamic fairings care must be taken to not excessively spring them open at the open end as that can cause delaminations.
 - c. Note the MS27039-1-10 fasteners go into bonded nutplates; therefore added care should be taken to ensure the fastener threads properly and is not over-torqued.
 - d. Torque each fastener to its designated torque value from Table 1-1.
18. Attach the forward half of the aerodynamic fairing of step 16/17 to the wing array pylons using MS27039-1-14 fasteners as can be seen in Figure 2-7.
 - a. Torque each fastener to its designated torque value from Table 1-1.
19. Place the aft half of the wing pylon aerodynamic fairings (UWB-ICE-06-701, UWB-ICE-07-701, and UWB-ICE-08-701) on the wing array pylons. Care should be exercised to avoid over-prying the open end of each fairing as this could cause a delamination of the trailing edge. Attach the aft half of the aerodynamic fairings to the aerodynamic fairing braces using MS27039-1-10 fasteners.
 - a. Note during installation and deinstallation of the aerodynamic fairings care must be taken to not excessively spring them open at the open end as that can cause delaminations.

- b. Note the MS27039-1-10 fasteners go into bonded nutplates; therefore added care should be taken to ensure the fastener threads properly and is not over-torqued.
 - c. Torque each fastener to its designated torque value from Table 1-1.
20. Attach the aft half of the aerodynamic fairings to the wing array pylons using MS27039-1-14 and NAS623-3-4 fasteners as per Figure 2-7, Figure 2-8, and Figure 2-9.
- a. Note on the starboard side of the outboard wing pylon the aerodynamic fairing is thinner, therefore NAS623-3-3 fasteners are used.
 - b. Additional note that due to the helicoils in some locations a NAS623-3-4 fastener will not fully sit with a thin washer, therefore try if a thin washer will allow the fastener to sit and if that still does not work a NAS623-3-3 fastener should be used.
 - c. The NAS623-3-X fasteners go into helicoils; therefore there is no angular adjustment so the fasteners must go in exact. Previous bolts may be loosened slightly if required to reposition (though if this is required proper torques must again be checked).
 - d. Torque each fastener to its designated torque value from Table 1-1.

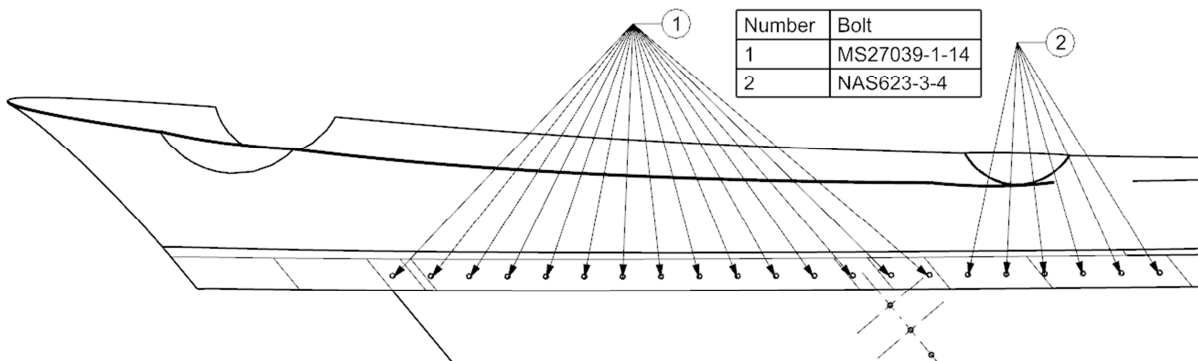


Figure 2-7: Inboard Wing Pylon Aerodynamic Fairing Fastener Placement

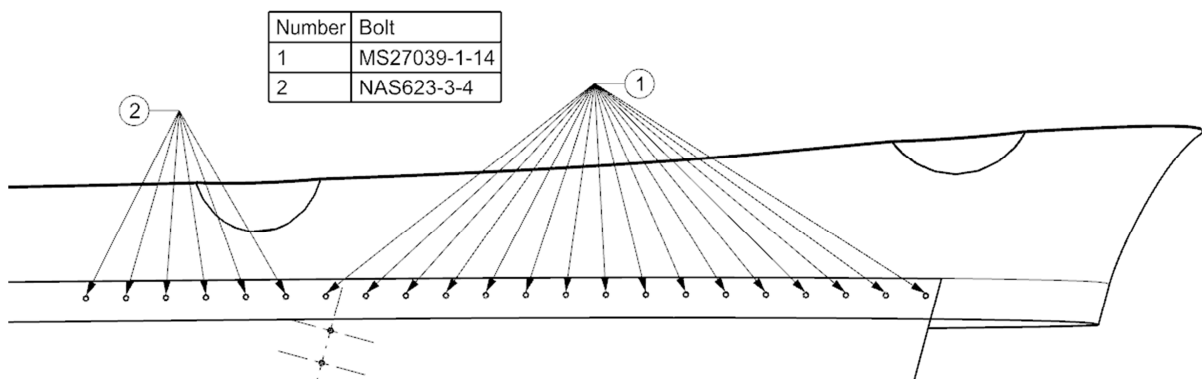


Figure 2-8: Center Wing Pylon Aerodynamic Fairing Fastener Placement

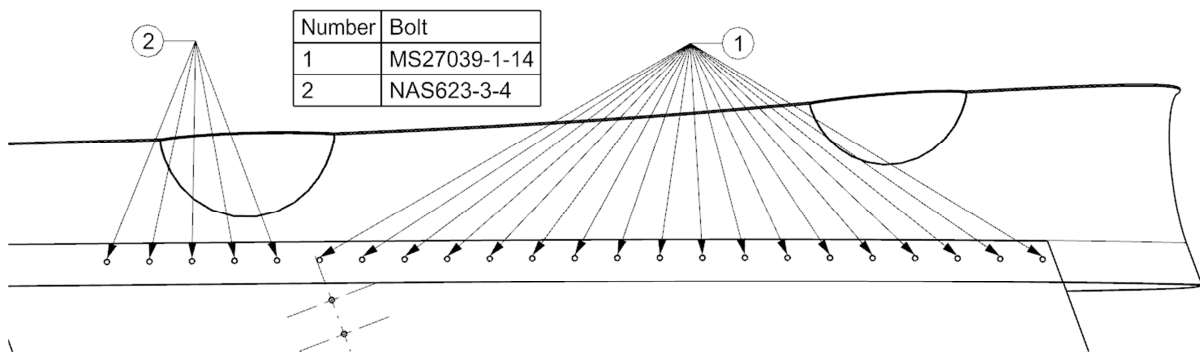


Figure 2-9: Outboard Wing Pylon Aerodynamic Fairing Fastener Placement

Treat edges and gaps with RTV or aluminum tape as appropriate.

2.3 Starboard Array

1. Attach the starboard wing pylon forward upper lugs (UWB-ICE-06-504, UWB-ICE-07-504, and UWB-ICE-08-504) and starboard wing pylon upper aft lugs (UWB-ICE-06-503, UWB-ICE-07-503, and UWB-ICE-08-503) using the fasteners and locations shown in Figure 2-10, with the exception of temporarily leaving out the most outboard bolt on UWB-ICE-06-504 and the most inboard bolts on UWB-07-503, UWB-07-504 and UWB-ICE-08-503.
 - a. Note a lug is composed of two separate parts which will need to be placed separately.
 - b. Note each lug is stamped P5 or P6 denoting Polar 5 or Polar 6 installation, with its drawing number which can be seen in Figure 2-10, and by O or I indicating if it was the inboard or outboard side of the pair (e.g. P6 08-504 I).

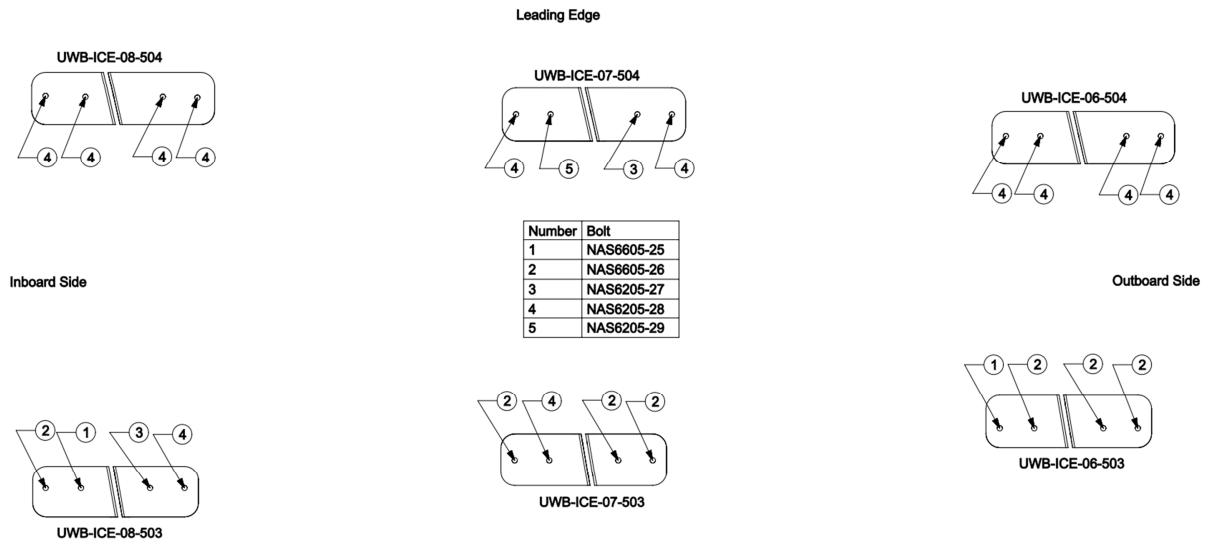


Figure 2-10: Starboard Wing Upper Pylon Lugs Fastener Placement

2. Attach the provided threaded rod/hex extension/shoulder eyebolt assembly to the most outboard location of UWB-06-504 and the most inboard locations on each of UWB-ICE-07-503, UWB-ICE-07-504 and UWB-ICE-08-503 (Figure 2-5).
3. Attach provided spring hooks to the above forward and aft eyebolts. The middle pylon has one spring hook per shoulder eyebolt, and the inboard and outboard pylon each have two spring hooks per shoulder eyebolt.
4. Support array ~45" off the ground such that it rests a few inches below the wing using two Nansen sleds, the shipping container, or several sawhorses. In the ideal height, the inboard aft lugs should be a few inches below the clevises in the resting position. Lay the two provided 1" wide double ratchet straps below the array with the red 15' strap outboard and the orange 13' strap inboard, cradling the array from the lower surface at the outboard and inboard pylon wing stations, and attach each clip end of the strap to the above spring hooks (Figure 2-6). Use of a protective pad below the array is recommended to minimize abrasion of the exposed lower surface antennas. The provided 4' lifting slings must be used on the inboard side to ensure the array cannot fall from the ratchet straps (loop one end of the 4' sling around the strap below the array and the other end of the 4' sling through the aft ratchet strap above the array). Place a third 2" wide x 25' long ratchet strap at the center pylon, and attach each clip end of the strap to the above spring hooks; this is the safety strap.
5. Advance the inboard and outboard ratchet straps to raise the array into the upper pylon lugs. This will likely require four persons: two to advance the ratchet straps and two to stabilize the arrays from swinging while guiding the pylon rib lugs into the upper pylon clevises. Because of the high pitch and dihedral angle small adjustments in advancement from the leading or trailing edge side will be required to adjust the array yaw and fore/aft position while advancing the height. Periodically ratchet the center

safety strap, not to lift the array but rather to reduce any drop if one of the outboard straps fails or slips. When close, minor manual adjustments may be made, to include local lifting of the array to insert the provided long an3 bolts into one fastener location on each of the upper clevises. You will likely insert the aft pins, then further advance the ratchet straps to elevate the array sufficiently to enable installation of the forward temporary pins.

6. Attach the starboard wing array pylons to the wing pylon upper lugs from step 1 using NAS6204-16 fasteners. This may require a drift pin, and you will be removing the prior an3 fasteners as you replace them with the appropriate NAS6204 fastener.
 - a. The inboard aft starboard pylon lugs (UWB-ICE-08-503) have shims that need to be placed within the clevis before installing the fasteners; the shims are marked in the same manner as the lugs. These shims cause the fasteners needed in this lug to be longer; therefore NAS6204-18 fasteners are used.
 - b. Note that in order to attach the wing pylons one of the two parts of a lug might need to be loosened/removed and then reinstalled to enable the bolts to advance in the wing array pylons.
 - c. Torque each fastener to its designated torque value from Table 1-1.
7. Remove the center ratchets straps and related eyebolts, and install the outermost bolts on each of UWB-ICE-07-503, UWB-ICE-07-504, per Figure 2-7, using torque values from Table 1-1.
 - a. It is important to remove only the center ratchet straps at this time and not the load bearing inboard and outboard straps. Note the fasteners in the upper aerofairings are shared fasteners with the pylon torque box, and thus until they are installed the upper pylon ribs are connected to the torque box by only a bonded joint on one skin. It is unwise to support the array weight in only this fashion. One or two temporary fasteners may also be used along the upper pylon joint to prevent rotation of the pylon rib, but these will need to be removed prior to installation of aerofairings. The procedures delineated below are to ensure only one aerofairing at a time is being connected to the final fasteners.
8. Place the forward half of the wing center pylon aerodynamic fairings (UWB-ICE-07-701) onto center wing array pylons. Care should be exercised to avoid over-prying the open end of each fairing as this could cause a delamination of the leading edge. Then place the forward aerodynamic fairing braces (UWB-ICE-07-702, UWB-ICE-07-703) into location and attach one side of the brace to the aerodynamic fairings using MS27039-1-10 fasteners. The forward braces must be located before the aft braces are positioned.
 - a. Note each brace and aerodynamic fairing is labeled for the inboard, center, or outboard pylon, if it is on the port or starboard array, and if it is forward or aft.

-
- b. Note during installation and deinstallation of the aerodynamic fairings care must be taken to not excessively spring them open at the open end as that can cause delaminations.
 - c. Note the MS27039-1-10 fasteners go into bonded nutplates; therefore added care should be taken to ensure the fastener threads properly and is not over-torqued.
 - d. Torque each fastener to its designated torque value from Table 1-1.
 - e.
 9. Slide the aerodynamic fairing forward such that the aft aerodynamic fairing brace can be put into place. Then slide the fairing back into position and finish securing the braces with MS27039-10 fasteners.
 - a. Note each brace and aerodynamic fairing is labeled for the inboard, center, or outboard pylon, if it is on the port or starboard array, and if it is forward or aft.
 - b. Note during installation and deinstallation of the aerodynamic fairings care must be taken to not excessively spring them open at the open end as that can cause delaminations.
 - c. Note the MS27039-1-10 fasteners go into bonded nutplates; therefore added care should be taken to ensure the fastener threads properly and is not over-torqued.
 - d. Torque each fastener to its designated torque value from Table 1-1.
 10. Attach the forward half of the aerodynamic fairing of step 8/9 to the wing array pylons using MS27039-1-14 fasteners as seen in Figure 2-12.
 - a. Torque each fastener to its designated torque value from Table 1-1.
 11. Remove the outboard ratchets straps and related eyebolts, and install the outboard bolt on UWB-ICE-06-504, per Figure 2-7, using torque values from Table 1-1.
 12. Place the forward half of the outboard wing pylon aerodynamic fairings (UWB-ICE-06-701) onto outboard wing array pylons. Care should be exercised to avoid over-prying the open end of each fairing as this could cause a delamination of the leading edge. Then place the forward aerodynamic fairing braces (UWB-ICE-06-702, UWB-ICE-06-703) into location and attach one side of the brace to the aerodynamic fairings using MS27039-1-10 fasteners. The forward braces must be located before the aft braces are positioned.
 - a. Note each brace and aerodynamic fairing is labeled for the inboard, center, or outboard pylon, if it is on the port or starboard array, and if it is forward or aft.
 - b. Note during installation and deinstallation of the aerodynamic fairings care must be taken to not excessively spring them open at the open end as that can cause delaminations.
 - c. Note the MS27039-1-10 fasteners go into bonded nutplates; therefore added care should be taken to ensure the fastener threads properly and is not over-torqued.
 - d. Torque each fastener to its designated torque value from Table 1-1.

13. Slide the aerodynamic fairing forward such that the aft aerodynamic fairing brace can be put into place. Then slide the fairing back into position and finish securing the braces with MS27039-10 fasteners.
 - a. Note each brace and aerodynamic fairing is labeled for the inboard, center, or outboard pylon, if it is on the port or starboard array, and if it is forward or aft.
 - b. Note during installation and deinstallation of the aerodynamic fairings care must be taken to not excessively spring them open at the open end as that can cause delaminations.
 - c. Note the MS27039-1-10 fasteners go into bonded nutplates; therefore added care should be taken to ensure the fastener threads properly and is not over-torqued.
 - d. Torque each fastener to its designated torque value from Table 1-1.
14. Attach the forward half of the aerodynamic fairing of step 12/13 to the wing array pylons using MS27039-1-14 fasteners as seen in Figure 2-13.
 - a. Torque each fastener to its designated torque value from Table 1-1.
15. Remove the inboard ratchets straps and related eyebolts, and install the outermost bolts on each of UWB-ICE-08-503 and UWB-ICE-08-504 per Figure 2-7, using torque values from Table 1-1.
16. Place the forward half of the inboard wing pylon aerodynamic fairings (UWB-ICE-08-701) onto inboard wing array pylon. Care should be exercised to avoid over-prying the open end of each fairing as this could cause a delamination of the leading edge. Then place the forward aerodynamic fairing braces (UWB-ICE-08-702, UWB-ICE-08-703) into location and attach one side of the brace to the aerodynamic fairings using MS27039-1-10 fasteners. The forward braces must be located before the aft braces are positioned.
 - a. Note each brace and aerodynamic fairing is labeled for the inboard, center, or outboard pylon, if it is on the port or starboard array, and if it is forward or aft.
 - b. Note during installation and deinstallation of the aerodynamic fairings care must be taken to not excessively spring them open at the open end as that can cause delaminations.
 - c. Note the MS27039-1-10 fasteners go into bonded nutplates; therefore added care should be taken to ensure the fastener threads properly and is not over-torqued.
 - d. Torque each fastener to its designated torque value from Table 1-1.
17. Slide the aerodynamic fairing forward such that the aft aerodynamic fairing brace can be put into place. Then slide the fairing back into position and finish securing the braces with MS27039-10 fasteners.
 - a. Note each brace and aerodynamic fairing is labeled for the inboard, center, or outboard pylon, if it is on the port or starboard array, and if it is forward or aft.
 - b. Note during installation and deinstallation of the aerodynamic fairings care must be taken to not excessively spring them open at the open end as that can cause delaminations.

- c. Note the MS27039-1-10 fasteners go into bonded nutplates; therefore added care should be taken to ensure the fastener threads properly and is not over-torqued.
 - d. Torque each fastener to its designated torque value from Table 1-1.
18. Attach the forward half of the aerodynamic fairing of step 16/17 to the wing array pylon using MS27039-1-14 fasteners as seen in Figure 2-11.
- a. Torque each fastener to its designated torque value from Table 1-1.
19. Place the aft half of the wing pylon aerodynamic fairings (UWB-ICE-06-701, UWB-ICE-07-701, and UWB-ICE-08-701) on the wing array pylons. Care should be exercised to avoid over-prying the open end of each fairing as this could cause a delamination of the trailing edge. Attach the aft half of the aerodynamic fairings to the aerodynamic fairing braces using MS27039-1-10 fasteners.
- a. Note during installation and deinstallation of the aerodynamic fairings care must be taken to not excessively spring them open at the open end as that can cause delaminations.
 - b. Note the MS27039-1-10 fasteners go into bonded nutplates; therefore added care should be taken to ensure the fastener threads properly and is not over-torqued.
 - c. Torque each fastener to its designated torque value from Table 1-1.
20. Attach the aft half of the aerodynamic fairings to the wing array pylons using MS27039-1-14 and NAS623-3-4 fasteners per Figure 2-11, Figure 2-12, and Figure 2-13.
- a. The NAS623-3-4 fasteners go into helicoils; therefore there is no angular adjustment so the fasteners must go in exact. Previous bolts may be loosened slightly if required to reposition (though if this is required proper torques must again be checked).
 - b. Additional note that due to the helicoils in some locations a NAS623-3-4 fastener will not fully sit with a thin washer, therefore try if a thin washer will allow the fastener to sit and if that still does not work a NAS623-3-3 fastener should be used.
 - c. Torque each fastener to its designated torque value from Table 1-1.

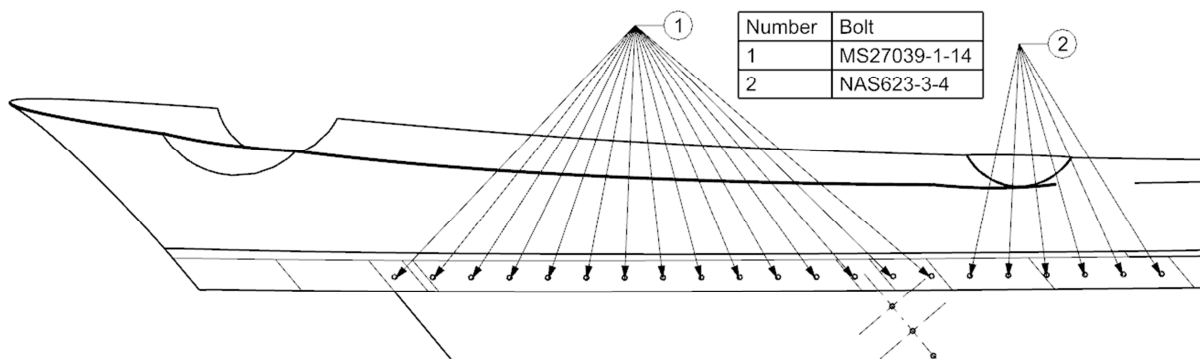


Figure 2-11: Inboard Wing Pylon Aerodynamic Fairing Fastener Placement

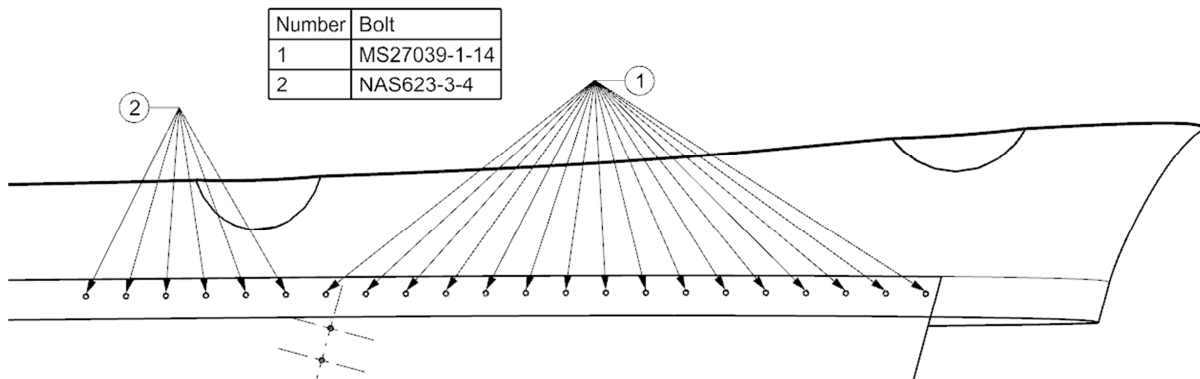


Figure 2-12: Center Wing Pylon Aerodynamic Fairing Fastener Placement

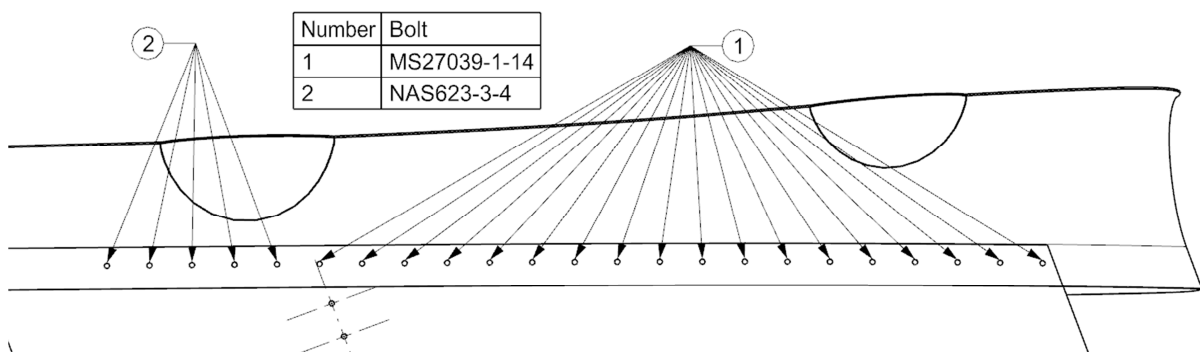


Figure 2-13: Outboard Wing Pylon Aerodynamic Fairing Fastener Placement

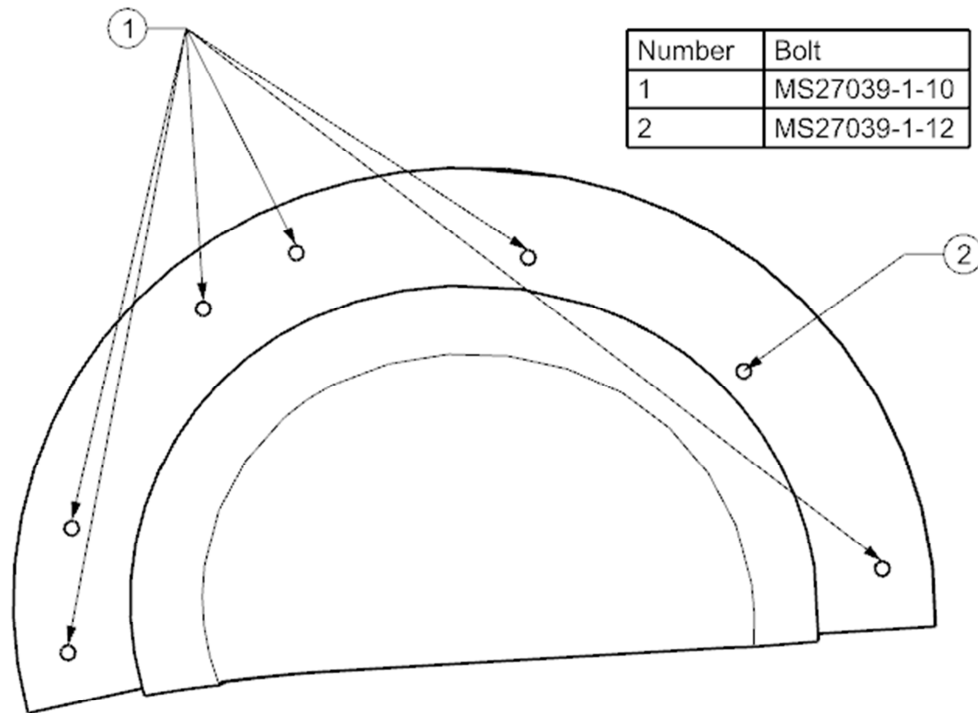
Treat edges and gaps with RTV or aluminum tape as appropriate.

3 INSTALLATION PROCEDURE WITH PYLONS NOT ATTACHED TO ARRAYS

3.1 Fuselage Array

1. Attach the fuselage pylons to the fuselage array using NAS6204-8 fasteners through the lower lugs attached to the fuselage array.
 - a. Note for this step cables may need to be routed through fuselage pylon 3. If so, this will require the hatch on pylon 3 to be off to route the cables and tie them down. The fasteners used to attach the hatch, once cable routing is complete, are MS27039-1-10 fasteners.
 - b. Torque each fastener to its designated torque value from Table 1-1
2. Complete steps 1-7 of Section 2.1.
3. Attach the aft fuselage lug covers (UWB-ICE-04-502) to fuselage pylons using MS27039-1-12 and MS27039-1-10 fasteners per Figure 3-1.

- a. Note each fuselage pylon lug cover is labeled by fuselage pylon 1-4 and either forward or aft, and either left (port) side or right (starboard) side. Ensure you are using the appropriate lug cover for each pylon location.
- b. Note the MS27039-1-10 fasteners go into bonded nutplates; therefore added care should be taken to ensure the fastener threads properly and is not over-torqued.
- c. Torque each fastener to its designated torque value from Table 1-1.



Trailing Edge

Figure 3-1: Fuselage Pylon Aft Lug Cover Fastener Placement

Treat edges and gaps with RTV or aluminum tape as appropriate.

3.2 Port Array

1. Attach the port wing pylons to the port wing array using NAS6204-11 fasteners.
 - a. Note for this step cables may need to be routed through the center pylon. If so, this will require one of the skins to be detached to route and tie down the cables. The fasteners used to reattach the skin, once the cables have been routed and tied down, are MS27039-1-11, MS27039-10, and NAS623-3-3 fasteners. The MS27039-1-11 fasteners are used along the bottom line of fasteners, the NAS 623-3-3 fasteners are used at the trailing edge, and the MS27039-1-10 are used along the aft spar.
 - b. Torque each fastener to its designated torque value from Table 1-1.

2. Attach the wing pylon leading edges (UWB-ICE-06-401, UWB-ICE-07-401, and UWB-ICE-08-401) to the port wing array pylons using MS27039-1-12 fasteners in the locations specified in Figure 3-2, Figure 3-3, and Figure 3-4.
 - a. Torque each fastener to its designated torque value from Table 1-1.

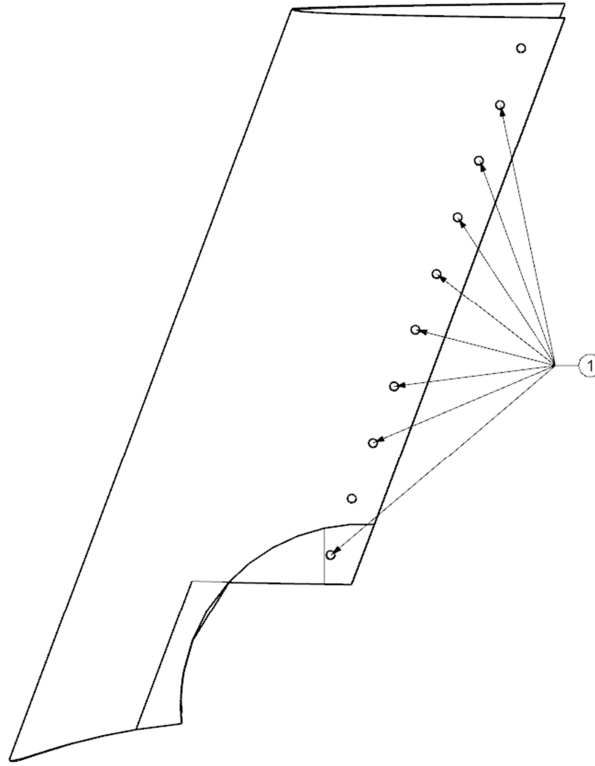


Figure 3-2: Outboard Wing Pylon Leading Edge Fastener Placement

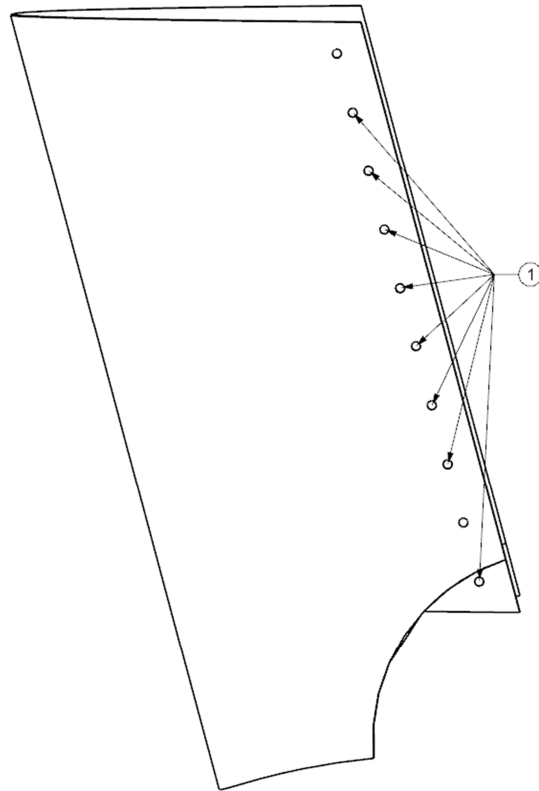


Figure 3-3: Center Wing Pylon Leading Edge Fastener Placement

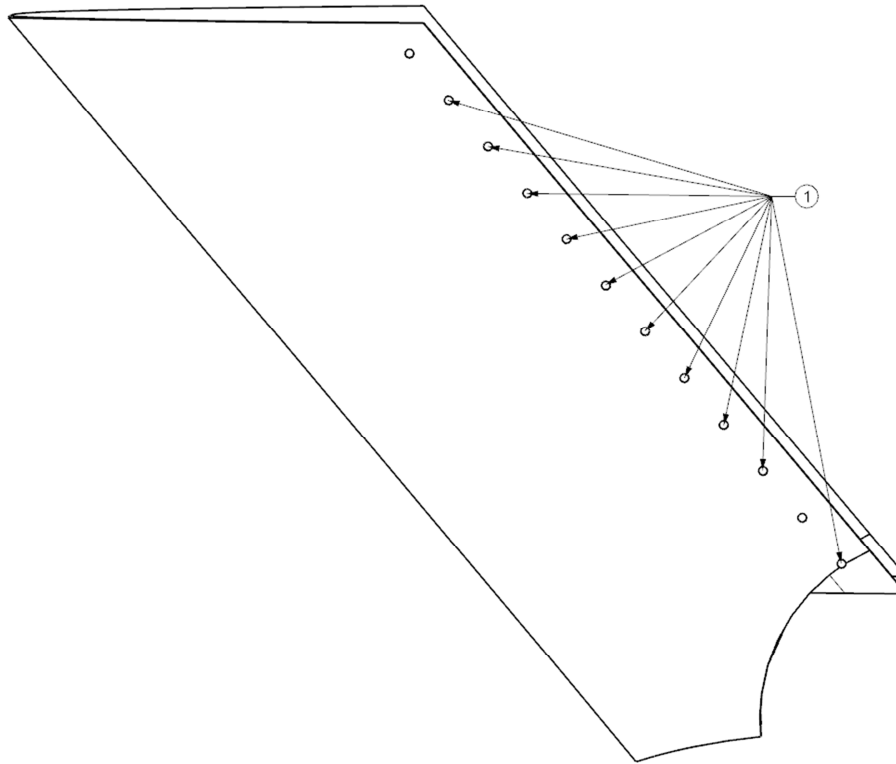


Figure 3-4: Inboard Wing Pylon Leading Edge Fastener Placement

3. Attach the forward wing pylon lug covers (UWB-ICE-06-104, UWB-ICE-07-104, UWB-ICE-08-104, UWB-ICE-06-105, UWB-ICE-07-105, and UWB-ICE-08-105) to the wing array pylons using MS27039-1-14, MS27039-1-13, and MS27039-1-10 fasteners as per Figure 3-5, Figure 3-6, and Figure 3-7.
 - a. Note the MS27039-1-10 fasteners go into bonded nutplates; therefore added care should be taken to ensure the fastener threads properly and is not over-torqued.
 - b. Torque each fastener to its designated torque value from Table 1-1.

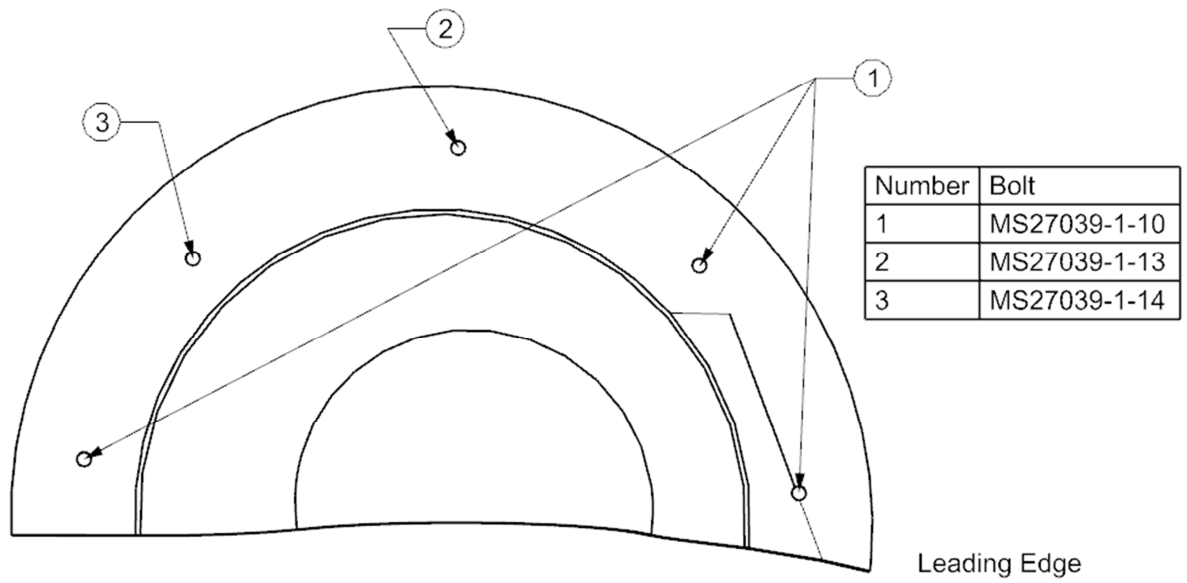


Figure 3-5: Outboard Wing Pylon Forward Lug Cover Fastener Placement

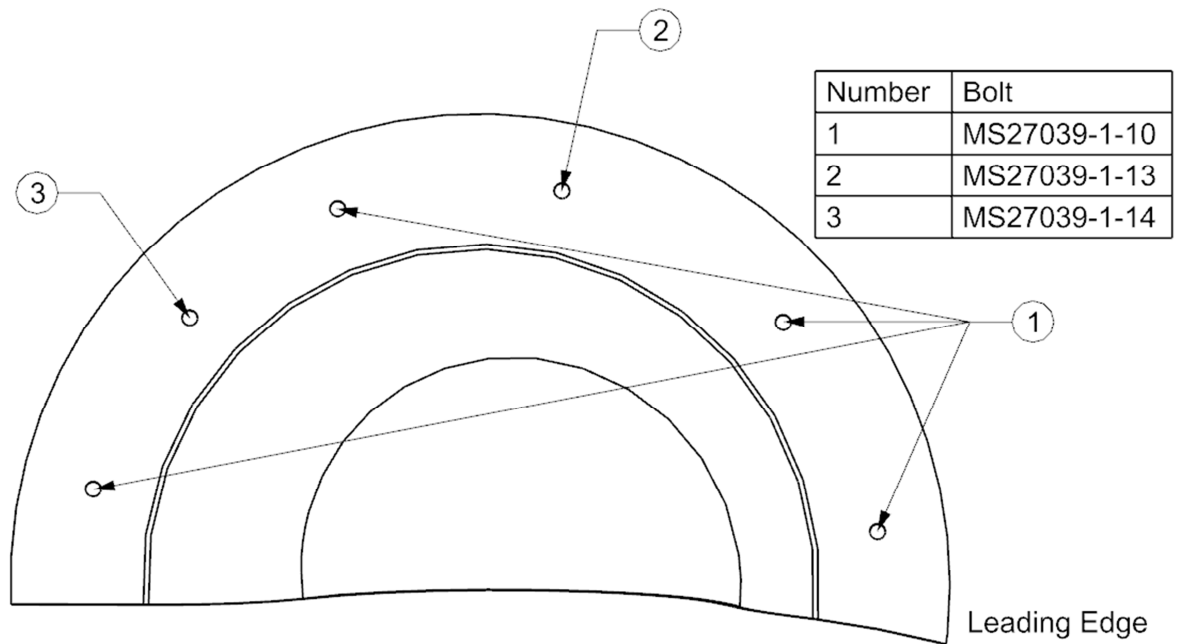


Figure 3-6: Center Wing Pylon Forward Lug Cover Fastener Placement

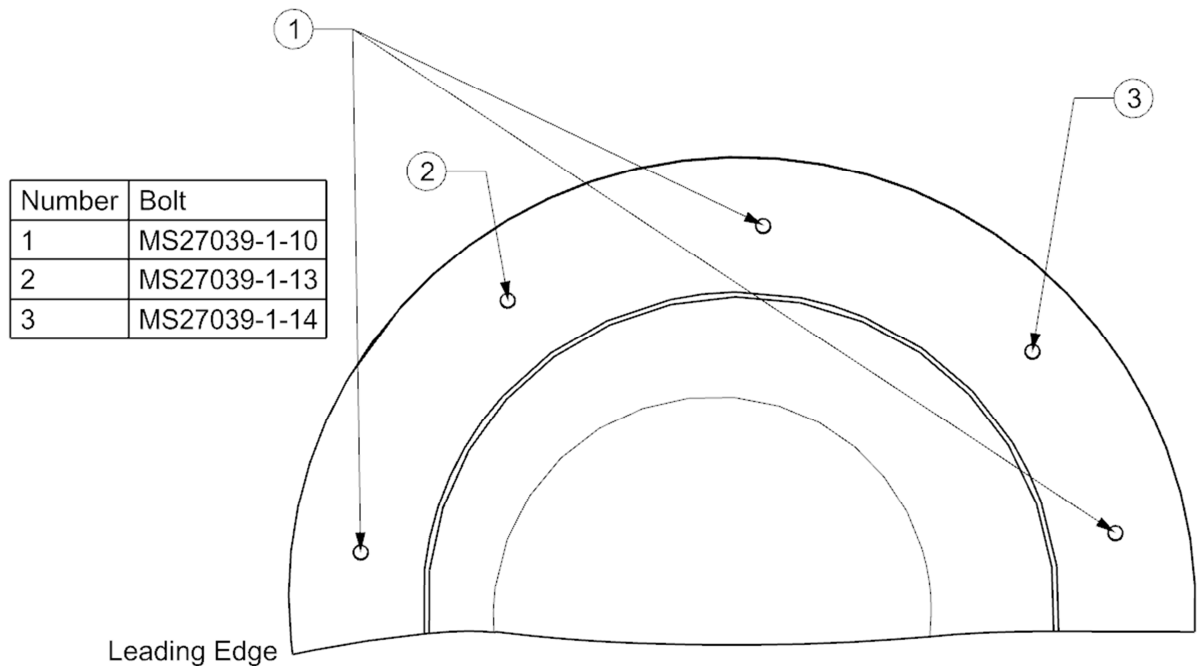


Figure 3-7: Inboard Wing Pylon Forward Lug Cover Fastener Placement

4. Attach the aft wing pylon lug covers (UWB-ICE-06-104, UWB-ICE-07-104, UWB-ICE-08-104, UWB-ICE-06-105, UWB-ICE-07-105, and UWB-ICE-08-105) to the wing array pylons using MS27039-1-12 and NAS623-3-3 fasteners as per Figure 3-8, Figure 3-9, and Figure 3-10.
 - a. Note the NAS623-3-3 fasteners go into bonded nutplates; therefore added care should be taken to ensure the fastener threads properly and is not over-torqued.
 - b. Torque each fastener to its designated torque value from Table 1-1.

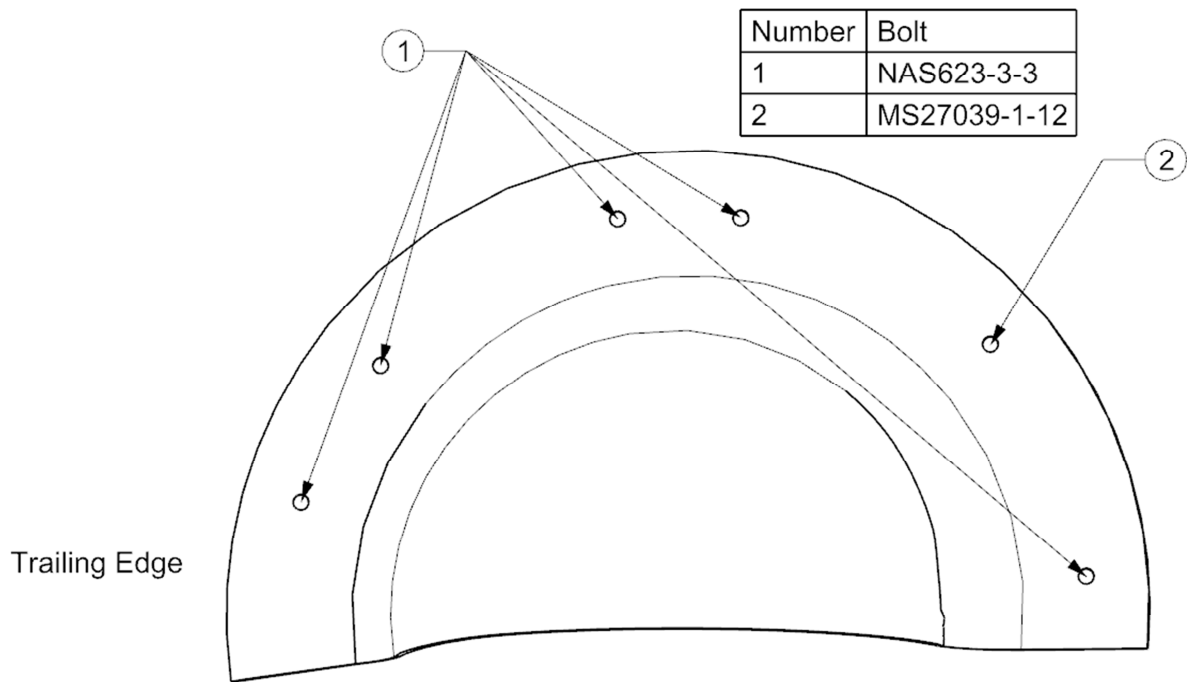


Figure 3-8: Outboard Wing Pylon Aft Lug Cover Fastener Placement

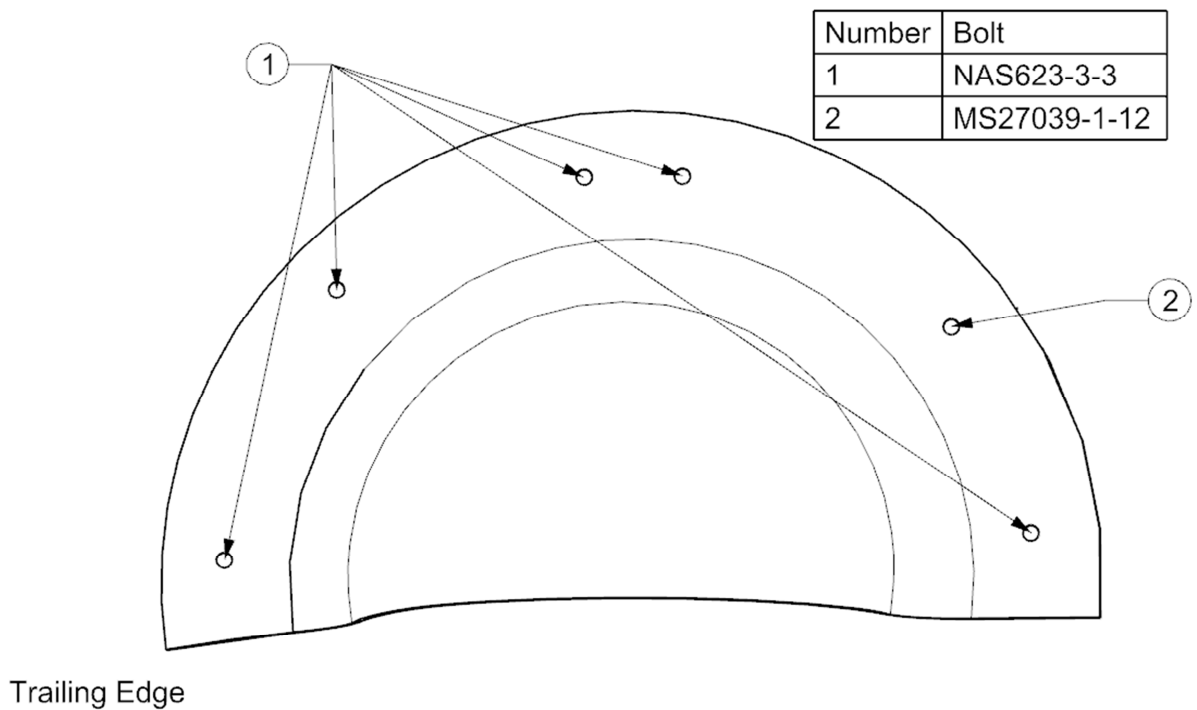


Figure 3-9: Center Wing Pylon Aft Lug Cover Fastener Placement

Number	Bolt
1	NAS623-3-3
2	MS27039-1-12

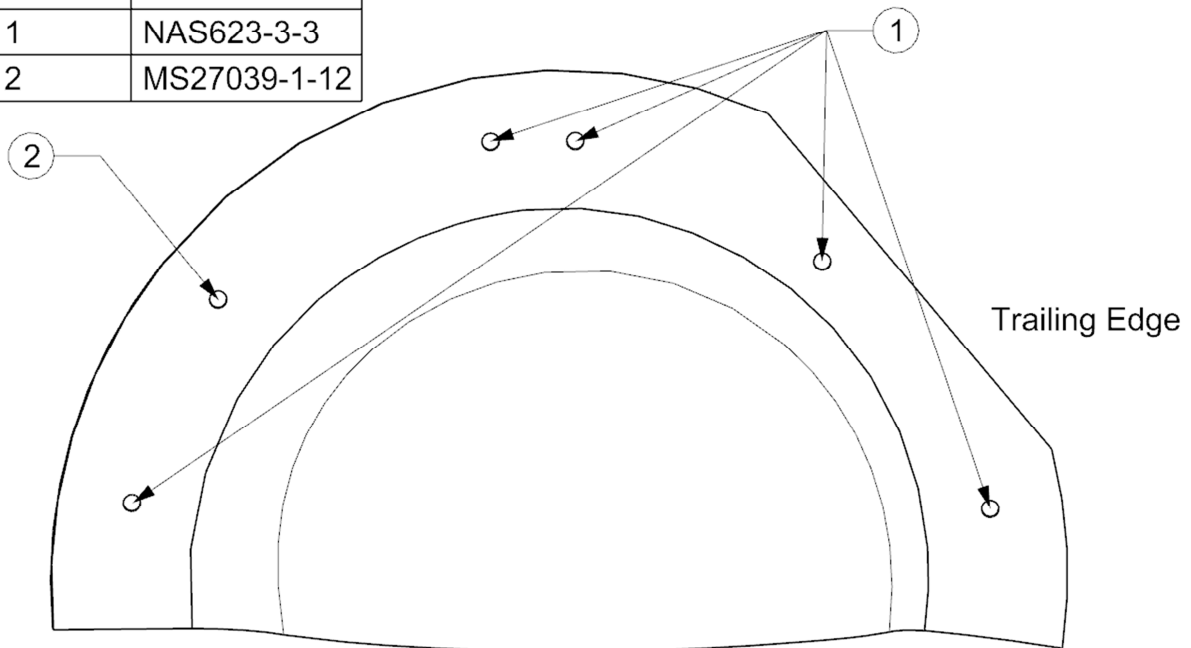


Figure 3-10: Inboard Wing Pylon Aft Lug Cover Fastener Placement

5. Complete steps 1-20 of Section 2.2.

Treat edges and gaps with RTV or aluminum tape as appropriate.

3.3 Starboard Array

1. Attach the starboard wing pylons to the port wing array using NAS6204-11 fasteners.
 - a. Note for this step cables may need to be routed through the center pylon. If so, this will require one of the skins to be detached to route and tie down the cables. The fasteners used to reattach the skin, once the cables have been routed and tied down, are MS27039-1-11, MS27039-1-10, and NAS623-3-3 fasteners. The MS27039-1-11 fasteners are used along the bottom line of fasteners, the NAS 623-3-3 fasteners are used at the trailing edge, and the MS27039-1-10 are used along the aft spar.
 - b. Torque each fastener to its designated torque value from Table 1-1.
2. Attach wing pylon leading edges (UWB-ICE-06-401, UWB-ICE-07-401, and UWB-ICE-08-401) to the starboard wing array pylons using MS27039-1-12 fasteners in the locations specified in Figure 3-11, Figure 3-12, and Figure 3-13.
 - a. Torque each fastener to its designated torque value from Table 1-1.

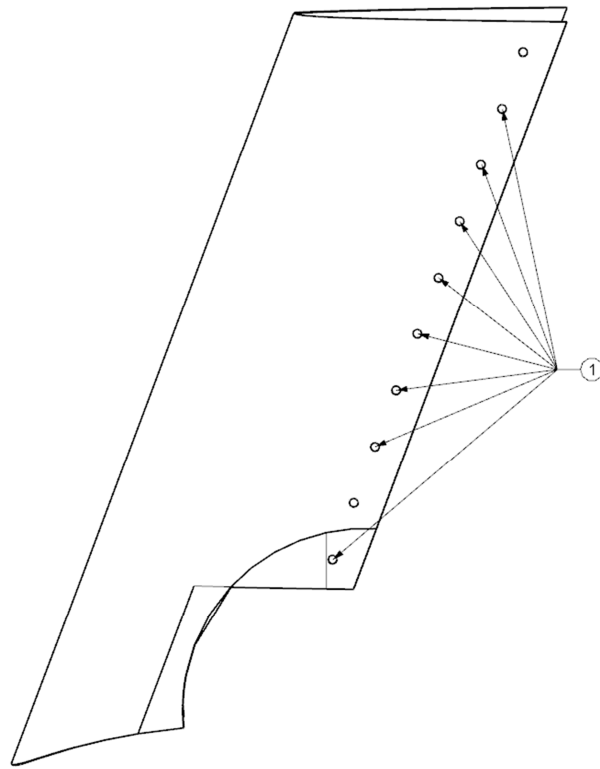


Figure 3-11: Outboard Wing Pylon Leading Edge Fastener Placement

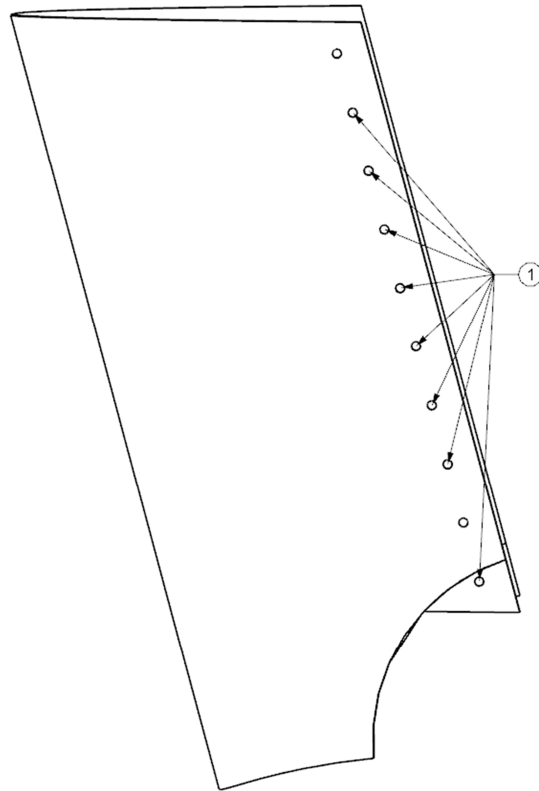


Figure 3-12: Center Wing Pylon Leading Edge Fastener Placement

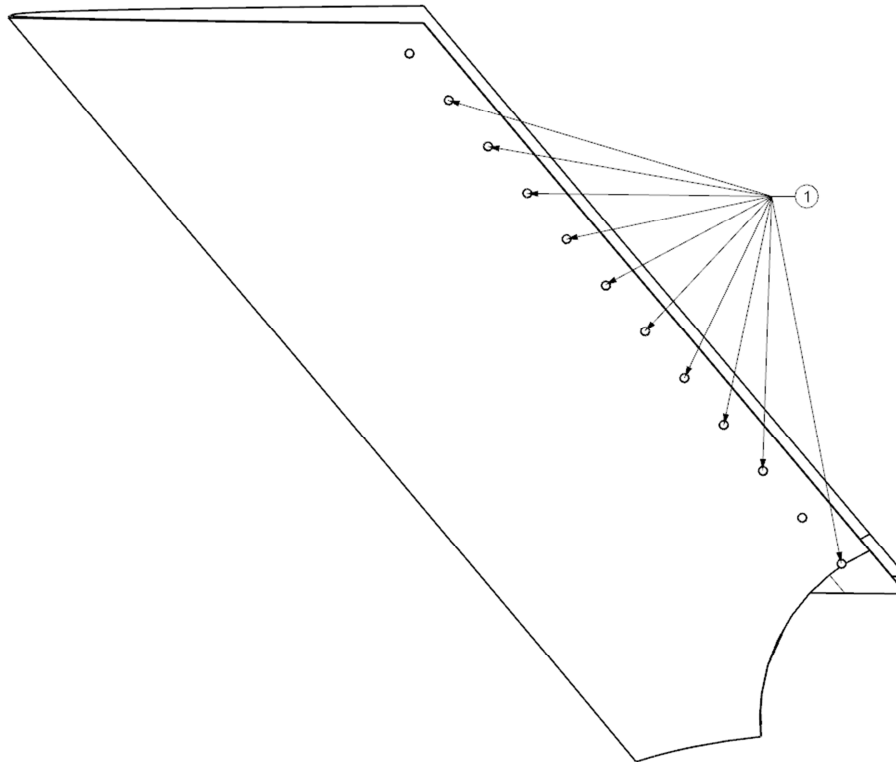


Figure 3-13: Inboard Wing Pylon Leading Edge Fastener Placement

3. Attach forward wing pylon lug covers (UWB-ICE-06-104, UWB-ICE-07-104, UWB-ICE-08-104, UWB-ICE-06-105, UWB-ICE-07-105, and UWB-ICE-08-105) to the wing array pylons using MS27039-1-14, MS27039-1-13, and MS27039-1-10 fasteners as per Figure 3-14, Figure 3-15, and Figure 3-16.
 - a. Note on the outboard pylon starboard side the lug cover is an aluminum sheet, which follows the contours of the pylon. It is attached with MS27039-1-11 fasteners where the sheet meets existing fastener lines and MS27039-1-09 fasteners in the other 3 locations.
 - b. Note the MS27039-1-10 and the MS27039-1-09 fasteners go into bonded nutplates; therefore added care should be taken to ensure the fastener threads properly and is not over-torqued.
 - c. Torque each fastener to its designated torque value from Table 1-1.

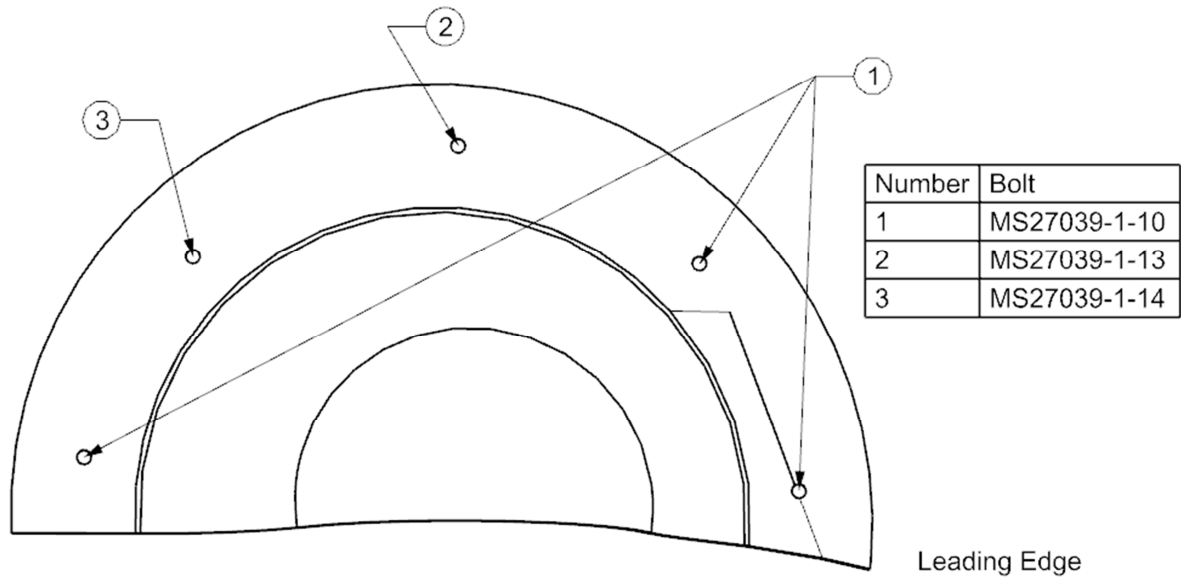


Figure 3-14: Outboard Wing Pylon Forward Lug Cover Fastener Placement

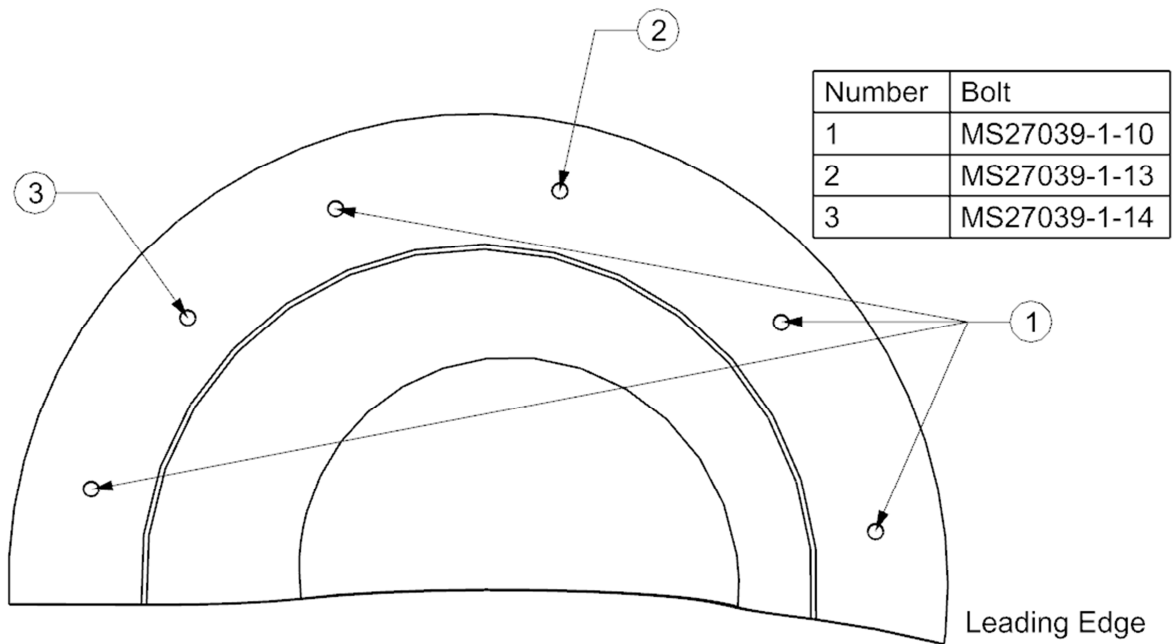


Figure 3-15: Center Wing Pylon Forward Lug Cover Fastener Placement

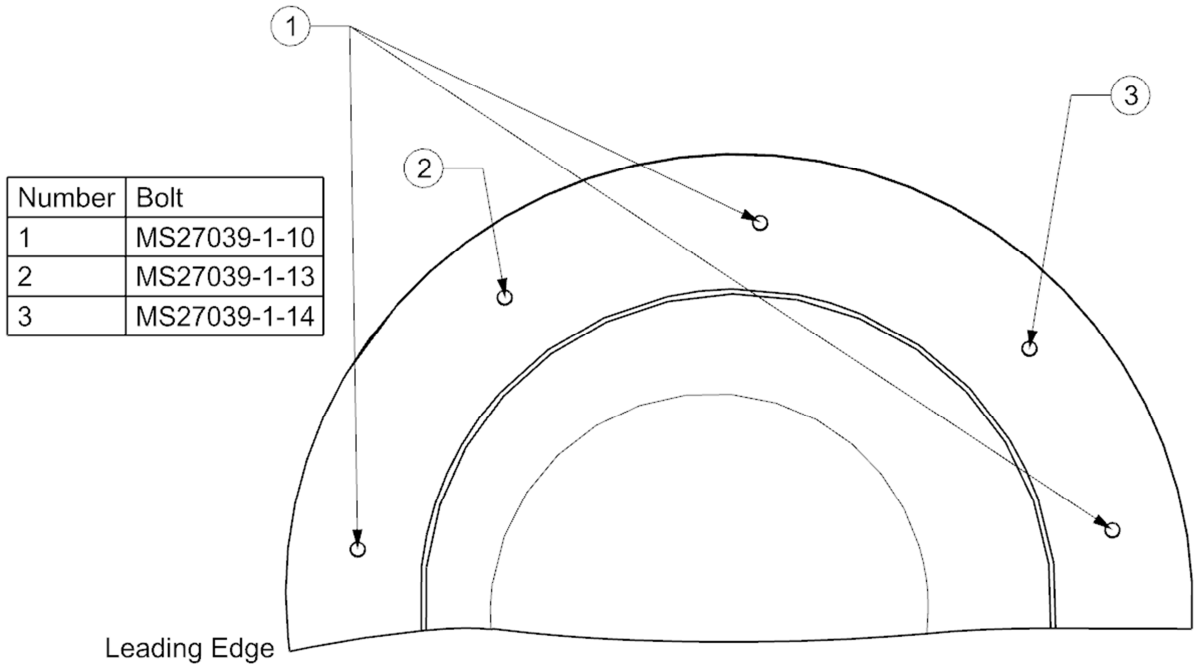


Figure 3-16: Inboard Wing Pylon Forward Lug Cover Fastener Placement

4. Attach the aft wing pylon lug covers (UWB-ICE-06-104, UWB-ICE-07-104, UWB-ICE-08-104, UWB-ICE-06-105, UWB-ICE-07-105, and UWB-ICE-08-105) to the wing array pylons using MS27039-1-12 and NAS623-3-3 fasteners as per Figure 3-17, Figure 3-18, and Figure 3-19.
 - a. Note the NAS623-3-3 fasteners go into bonded nutplates; therefore added care should be taken to ensure the fastener threads properly and is not over-torqued.
 - b. Torque each fastener to its designated torque value from Table 1-1.

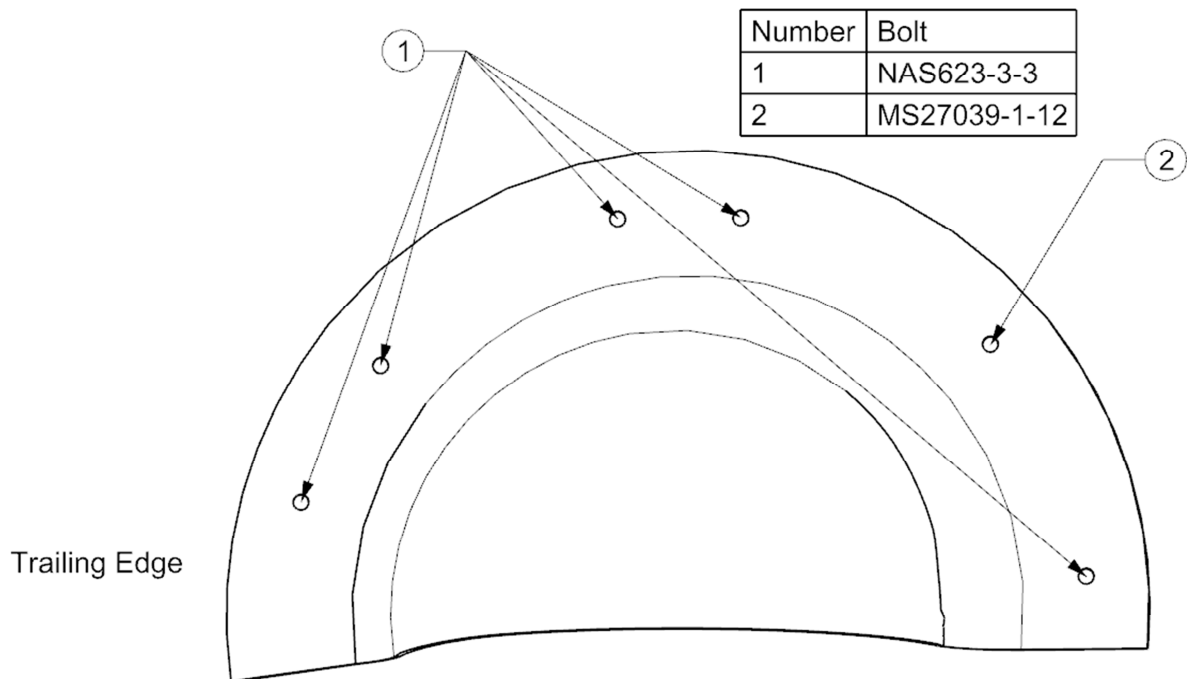


Figure 3-17: Outboard Wing Pylon Aft Lug Cover Fastener Placement

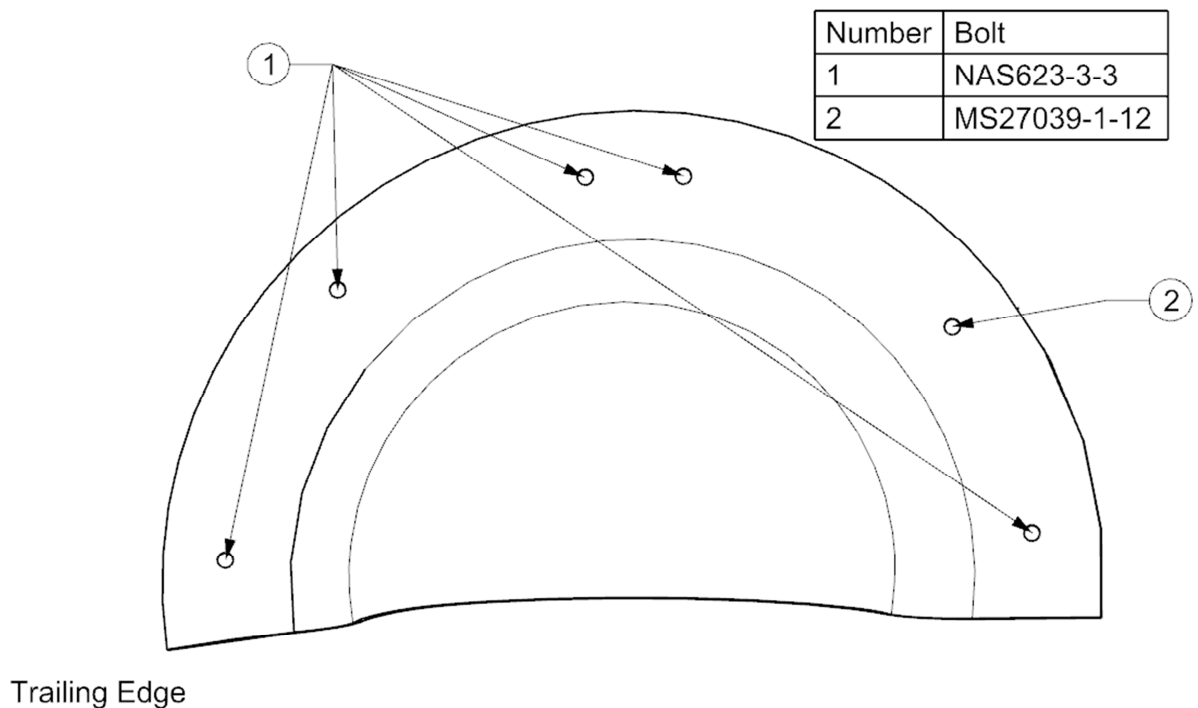


Figure 3-18: Center Wing Pylon Aft Lug Cover Fastener Placement

Number	Bolt
1	NAS623-3-3
2	MS27039-1-12

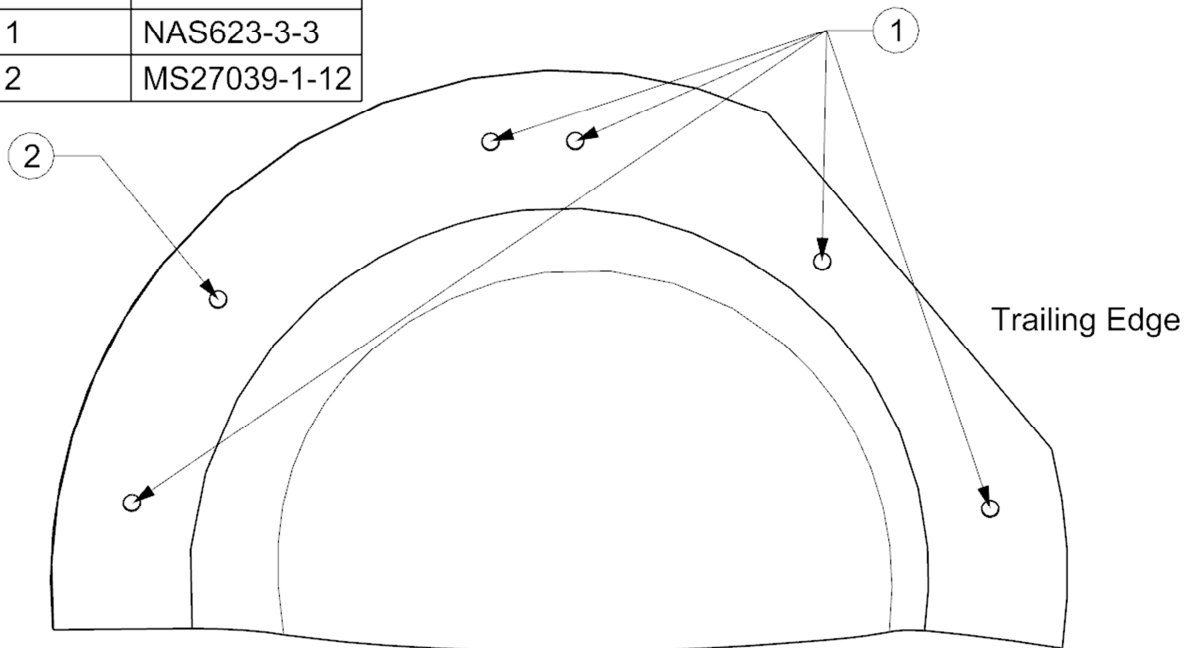


Figure 3-19: Inboard Wing Pylon Aft Lug Cover Fastener Placement

5. Complete steps 1-20 of Section 2.3.

Treat edges and gaps with RTV or aluminum tape as appropriate.

4 REMOVAL PROCEDURES

Generally speaking, the procedures of Sections 2 and 3 are performed in reverse. On the wing pylons recall that the fasteners in the upper aerofairings are shared fasteners with the pylon torque box, and thus until they are installed the upper pylon ribs are connected to the torque box by only a bonded joint on one skin. It is unwise to support the array weight in only this fashion, so do not remove every aerofairing at the same time (forward aerofairings are key here; each aft fairing could be removed). If the sequential strapping procedure is not followed in reverse as presented then one or two temporary fasteners must be used along the upper pylon joint to prevent rotation of the pylon rib. This would still necessitate removing one forward aerofairing at a time such that the array is still fully supported by the other two pylons. The pylon straps may be slowly friction slipped to lower the array, with persons at each end to stabilize it and bear the end lowering weight.