

## INNOVATION CONTEST # IC\_2018\_0122

## GE Aviation Assemblies Challenge: Ensuring Proper Assembly of B-Nut Fittings

**OPPORTUNITY:**

Propose a solution to ensure proper, leak-proof assembly of b-nut fittings on aircraft engines. Total prize pool of up to \$80,000 USD available in the form of initial cash prizes (of up to \$30,000 USD) and a discretionary pool of development funds (of up to \$50,000 USD).

Up to 3 respondents will receive an initial cash prize of **US \$10,000** each. Initial cash prize winners will be eligible to receive additional funding for a six (6) month period (from a development award prize pool of up to \$50,000 USD) ("Development Award") to continue further development and/or commercialization of winners' entry provided winning respondent enter into a mutually agreeable business relationship with Prize Sponsors which includes an agreed upon plan for guided funding.

**TIMELINE:**

Entries due no later than September 13, 2018 at 5:00 PM EDT  
Announcement of Winners end of October 2018

Visit the [Contest Website](#) to see [Official Contest Rules](#) and submit an entry.

**PROGRAM MANAGER:** Kevin Andrews, Ph.D.

**QUESTIONS:** Contact the Solution Provider Help Desk

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**CONTEST DESCRIPTION**

NineSigma, on behalf of **General Electric**, invites **proposals for technologies, processes or methods to ensure that B-nut fitting assemblies are properly assembled and leak-proof.**

**BACKGROUND**

B-nut assemblies are critical components of pressurized fluid and gas plumbing systems on aircraft engines. A b-nut assembly consists of tubing with a flared end that mates to a cone or ball shape on a threaded fitting, held together by a threaded b-nut. Proper and complete assembly ensures connections are leakproof and promotes efficient engine throughput at test.

A jet engine may have several hundred pressure connections that use b-nuts, often in layers of sub-assemblies. It is important to know that every b-nut assembly is proper because finding and fixing a leaking fitting buried in layers of other components is difficult and time-consuming.

Learn more about the b-nut, materials, triple torque process and more ([here](#)).

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## ENTRY REQUIREMENTS AND CRITERIA

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### Entry Requirements

The successful technology or solution must (**BUT SHOULD NOT DISCLOSE CONFIDENTIAL INFORMATION**):

- Provide confirmation that a b-nut assembly is assembled properly,
  - At time of assembly and at any time after initial assembly,
  - Preferably, offer visual confirmation,
  - Show that assembly will still function through multiple tightening cycles of the fastener,
  - Approach may include a system-level solution (i.e. method or process to test that an entire fluid circuit does not leak);
- Be easy to use;
- Be effective in tight spaces and for various sizes of fittings (reference background material [here](#));
- Be repeatable and reliable;
- Have a clear path for deployment in a manufacturing setting;
- Be cost effective for widescale deployment; and,
- Preferably, not require component design changes which would require re-certification of the aircraft engine design
  - Preferably, not be a solution that will change b-nut hardware.

### Evaluation Criteria

Your solution will be evaluated based on the following:

- Greater ease of use;
- Proof of effectiveness (or evidence that the solution could be effective),
  - e.g. No false negatives or positives;
- Quicker time to industrialization,
  - e.g. How quickly could your solution become standard operating practice or be commercialized;
- Greater ease of deployment (able to implement in many locations); and,
- Greater portability (to go with an individual who is moving around).

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## APPROACHES NOT OF INTEREST

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The following types of approaches are ineligible:

- Any approach where any material or mark is left on the engine after tightening.

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## HOW TO SUBMIT AN ENTRY

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You must complete and submit the online response form no later than September 13, 2018 at 5:00 PM EDT. You will be able to upload supplemental documents with your response.

Your non-confidential response must:

- Describe your approach and its working principle;
  - Discuss freedom to practice (or ability to pursue commercialization and testing with Sponsor),
- Describe the pathway to commercial scale including timing, estimated budget, and capacity for manufacture;
- Estimate unit cost of technology (if available);
- Describe your (or your team's) background and related experience in commercializing new technology;
- *[Optional]* Provide a private link to a short (2-5 minute) video presentation in which you pitch your approach and capabilities; and,
- Include supporting documents (illustrations, performance data, etc.; limit of 3, max of 10 MB).

If you require assistance to submit your response, please contact the Solution Provider Help Desk ([phd@ninesigma.com](mailto:phd@ninesigma.com)).

## **ABOUT THIS CONTEST**

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By submitting an Entry, you agree to be bound by GE's [Official Challenge Rules](#), which include but are not limited to the following requirements:

### **Confidentiality**

Respondents confirm that their Entry does not contain any confidential information.

### **Selection / Review Process**

Respondents acknowledge that GE reserves the sole and absolute right and discretion to award prizes as stated in the Challenge, including awarding initial cash prizes to less than 3 respondents or to no respondents if an insufficient number of eligible Entries meet the Judging Criteria.

The judging and award determination will be made by an internal GE team.

*See Official Rules for details at*

*[https://ninesights.ninesigma.com/apps/IMT/UploadedFiles/39/f\\_99a3ce2684159f1bf788f4e044320f1e/GE\\_Aviation\\_Assemblies\\_Challenge\\_Official\\_Rules.pdf?v=1527844310](https://ninesights.ninesigma.com/apps/IMT/UploadedFiles/39/f_99a3ce2684159f1bf788f4e044320f1e/GE_Aviation_Assemblies_Challenge_Official_Rules.pdf?v=1527844310)) Contest opens on June 7, 2018. Must submit at least one Entry by no later than September 13, 2018 at 5:00 pm EDT to be eligible. Must be 18 years of age or older to participate. Void where prohibited.*

### **Awards and Opportunities**

**Up to three initial cash prizes (of \$10,000 USD each) and a discretionary pool of development funds (of up to \$50,000 USD) will be awarded by GE as described below:**

Up to three (3) respondents will receive an initial cash prize of \$10,000 USD each.

Initial cash prize winners will be eligible to receive additional funding for a six (6) month period (from a total prize pool of up to \$50,000 USD) ("Development Award") to continue further development and/or commercialization of winner's Entry technology, provided winner enters into the Development Funding Business Relationship with Prize Sponsor including an agreed upon plan for guided funding. Upon completion of the six (6)-month funding period, Prize Sponsor may, at its own discretion and based on the merits of the proposed technology, explore further funding and/or business arrangements.

### **Additional Developmental Funding:**

Allocation of the additional development funding from the discretionary development pool of up to \$50,000 USD will be determined based upon, but not limited to, the following considerations: level of commercial readiness, nature of the technology, and experience and expertise.

An agreed upon plan to guide the development funding will be required. The agreed upon guided funding plan will need to define scope, co-development/commercialization objectives, co-development relationship, timeline and deliverables for the six (6)-month funding period, and will also require submission of a final report at the conclusion of the funding period. This final report must summarize results, compare outcomes to the initial proposed results, and, ideally, show proof of concept.

Upon completion of the 6-month funding period, Prize Sponsors may, at their own discretion and based on the merits of the proposed technology, explore funding further development and/or commercialization and/or purchase or licensing of the winning technology.