



fastening system for aerospace structures



- Multi-purpose ST pin with choice of self-locking threaded or swaged collar
- Substantial weight savings
- Installs with existing widely available tooling
- Eliminates cost of multiple fastener inventories
- Eliminates cost of maintaining multiple tool systems
- Automatic, reliable minimum/maximum preload control
- High fatigue life
- Excellent for composite material joining
- Excellent sealing properties
- Visual inspection
- Standard finishes, materials, head styles
- $\frac{1}{16}$ -inch grip increments



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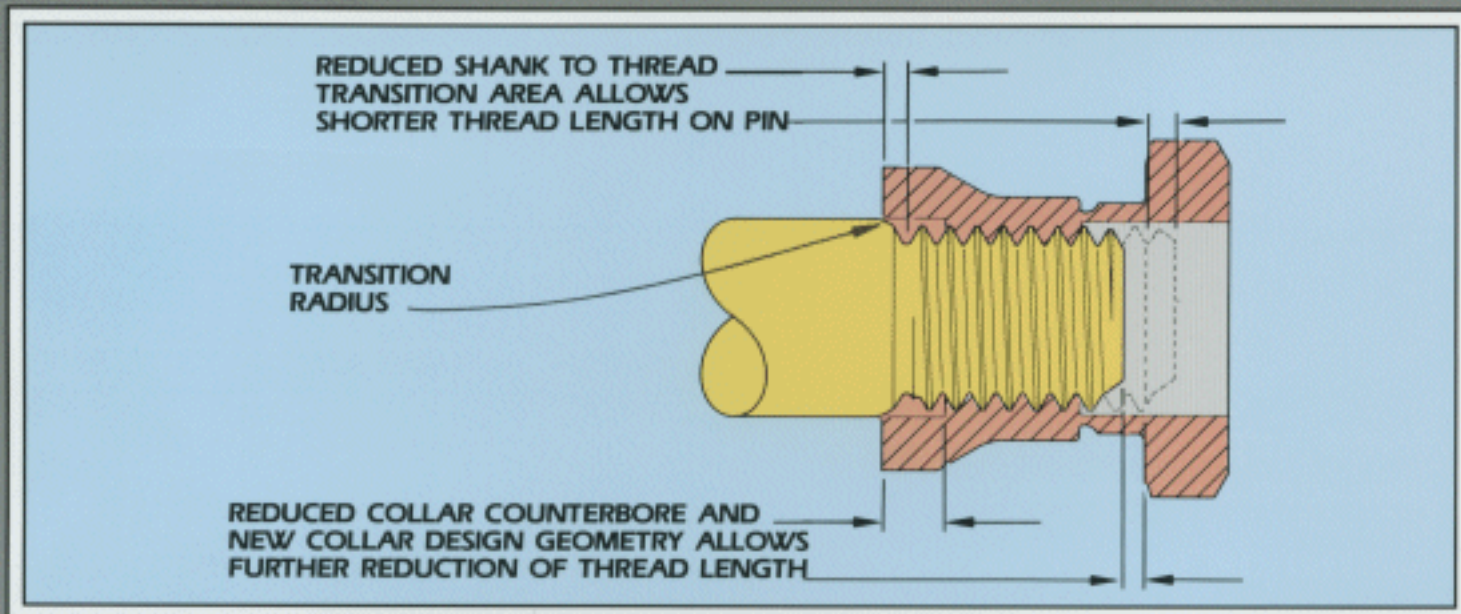
The Hi-Lite Fastening System is a new approach to high-performance fasteners. Into a single unified system, Hi-Lite combines performance benefits — which until now — were available only by using and stocking several very different fastening systems. This multiplicity of fastening systems is expensive for the user in terms of inventory cost as well as manufacturing and design complexity. By eliminating

the need for redundant systems, Hi-Lite can provide significant economies while delivering equal or superior performance.

Further, the Hi-Lite ST Fastening System can be easily installed with the user's existing HI-Lok or readily-available installation tooling.

Best of all, Hi-Lite offers substantial weight savings, too.

The Hi-Lite Fastening System offers a choice of solutions for the most demanding aerospace installation situations: threaded torque-control collars or swaged collars for high-volume Drivmatic assembly; low preload collars for crush-vulnerable composite or honeycomb assemblies; low profile collars for restricted access. All in one well-balanced high-performance system.



One Pin

The Hi-Lite Multi-Purpose ST Pin is the heart of the system. Based on an innovative design concept, the Hi-Lite ST Pin is exceptionally lightweight and strong. The pin has been precisely engineered by Hi-Shear to achieve highly efficient thread attachment and significantly reduced structural weight.

The key to the new Hi-Lite ST Pin is a shorter transition area between the shank and the first load-bearing thread. Conventional threaded fasteners have a longer runout area between shank and thread. This longer thread transition is used in conventional manufacturing technology to insure adequate fatigue performance. In the Hi-Lite ST Pin, the transition area is fully utilized. Hi-Shear's new design concept gives

high fatigue strength with a shorter shank-to-thread transition.

In addition, higher strength collar materials allow the pin threads to be shortened without sacrificing strength, providing further weight savings. The Hi-Lite ST is strength-equivalent but with a shorter, lighter pin.

The Hi-Lite ST Pin with automatic torque-control collar saves 13.2% weight on all shear-head fasteners in a typical airliner. This is a weighted average based on actual usage distribution. Weight savings on tension-head fasteners is less, but significant. (Shear-head fasteners account for more than 85% of aircraft structural joints.)

Unique Transition

The Hi-Lite® ST™ Pin is designed for clearance or interference fit applications. The shortened thread-to-shank transition area of the Hi-Lite Multi-Purpose ST Pin provides a contour that accommodates insertion of the pin through the prepared hole to normal interference levels.

Pin Head Styles

Tension versions of both 100° flush and protruding head styles have incorporated a greater head height and heat treat to achieve a strength level of 160,000 psi tensile minimum for titanium material pins.



100° FLUSH SHEAR



PROTRUDING SHEAR



130° FLUSH SHEAR



100° FLUSH TENSION



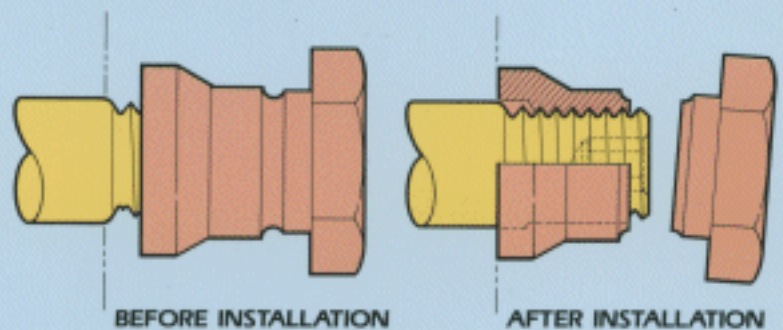
PROTRUDING TENSION

Matching Collar Styles

A choice of collars is available for the Hi-Lite Multi-Purpose ST Pin. They can be used interchangeably. This choice gives the Hi-Lite Fastening System a unique flexibility. Each collar has been carefully engineered to match the ST pin, and each pin/collar pair forms a carefully balanced unit.

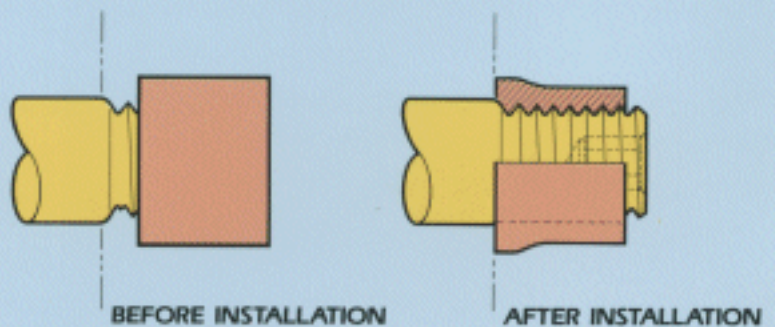
Hi-Lite® ST™ Collar

A threaded collar featuring automatic torque control to guarantee precise minimum/maximum preload range without need for calibrated torque-control tools. Offers the optimum strength: weight balance. Excellent for general use with high-volume Drivmatic automatic installation equipment or with hand tools. Use of the Hi-Lite ST collar/pin can immediately save hundreds of pounds in existing or new airliner designs. Sealing collars are available.



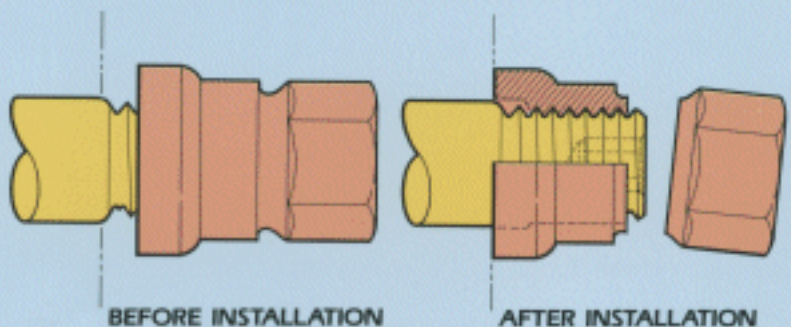
Hi-Lite® ST™ Swaged Collar

A swaged collar specialized for Drivmatic-type equipment already tooled for swaged collars. The Hi-Lite ST Swaged Collar has strength and reliability equal or superior to other commonly used swaged collars. It installs with existing swaged collar tooling with modified insert.



Hi-Lite® ST™ Forged Collar

A strong threaded collar with reduced profile to permit easy installation in restricted access areas. It has the automatic preload control and visual inspection advantages of all the threaded Hi-Lite ST collars. Uses existing installation tooling. Sealing collars are available.



Advantages

Weight Savings

The Hi-Lite ST system offers significant weight reductions compared to conventional threaded fasteners. Comparison Between Standard Hi-Lok® Pin/Collar (HL11/HL79) and Hi-Lite ST Pin/Collar (HST11/HST79)

<u>Diameter (1/32 Inch)</u>	<u>ΔW lbs per 1,000</u>	<u>Percent Saved</u>
6	0.32	8
8	1.06	12
10	2.55	16
12	4.42	16

Weighted Average 13.2% Saved Based on Actual Usage Distribution of Diameter and Grip Lengths.

Standard Pin Materials

- 6AL-4V Titanium
- Alloy Steel
- Stainless Steels
- Others, as Required by Customers

Locking Methods

- Standard Oval Lock
- HI-D-LOK® Chemical Lock

Standard Finishes

- Cetyl Alcohol Lube
- Hi-Kote 1® Aluminum Coating
- Hi-Kote 2® Solid Film Lube Coating
- ION VAPOR Deposited Aluminum
- Phosphate Fluoride Treatment
- TI-SHIELD™ III Anodized Finish
- Others, as Required by Customers

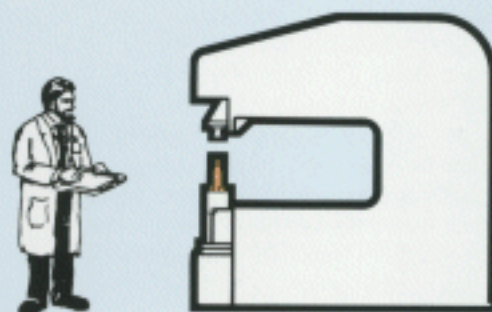
Product Specifications

The HI-LITE® Fastening System Meets or Exceeds All Existing HI-SHEAR HI-LOK® Product Specifications.

- HI-SHEAR Product Specification 342 (PINS)
- HI-SHEAR Product Specification 345 (COLLARS)

Tooling

HI-LITE® offers a choice of swaged or threaded collars on one pin with automatic riveting machinery.



HI-LITE® threaded collars install with standard existing HI-LOK tooling. No tooling changes required.

