

EL-BRUTUS FASTENER REMOVAL TOOL

Technical Operating Manual & Component Identification Guide

1. System Overview & Description

Aircraft panel fasteners frequently become stuck or corroded, creating significant challenges for maintenance technicians and leading to costly operational downtime. Standard extraction techniques often compromise surrounding structures or components.

The eL-Brutus™ Fastener Removal Tool provides a standardized, high-torque solution designed to safely remove stubborn or seized panel screws without damaging the underlying nut plate. By anchoring securely to an adjacent functional screw hole, the tool establishes a rigid, stabilized pivot framework. This alignment ensures maximum downward force and rotational torque are transferred perfectly inline with the axis of the seized fastener.

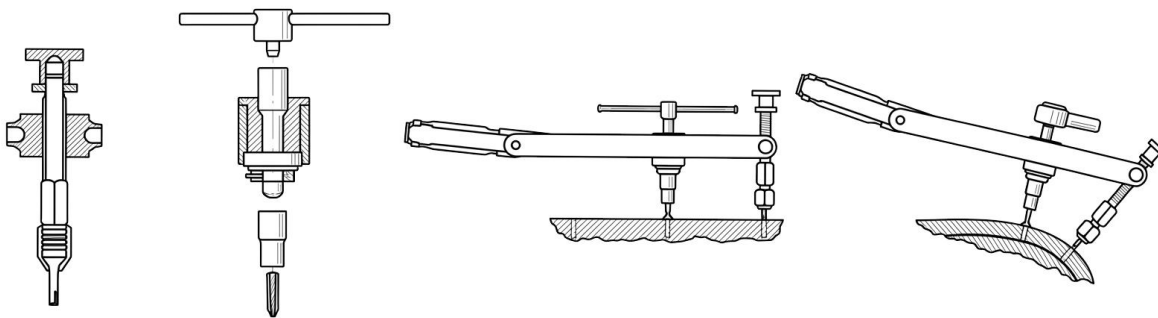
Model Specifications & Identification

The system is manufactured in two primary size configurations tailored to standard aerospace hardware:

- Small Fastener Model: Optimized for hardware sizes #8, #10, and 1/4-inch. (National Stock Number: NSN 5120-01-398-2869).
- Large Fastener Model: Optimized for hardware sizes ranging from 1/4-inch to 3/8-inch. (National Stock Number: NSN 5120-01-398-2868).

CRITICAL SAFETY WARNING:

Always exercise standard industrial and flight-line safety precautions when operating this tool. Use the system strictly for its intended purpose of panel fastener extraction. Ensure the tool framework is perfectly level and square relative to the workpiece prior to applying torque.



Step 1: Tool Anchoring & Initial Setup

1. Remove one fully operational fastener immediately adjacent to the targeted stuck/seized screw.
2. Detach the tool's pivoting chuck nut and place the removed operational screw inside it so that the threaded portion extends cleanly from the bottom of the chuck block.
3. Thread the screw back into its original nut plate through the pivoting chuck framework and hand-tighten until secure. This established point serves as the secure structural anchor for the tool.

4. Reinstall the main tool frame onto the pivoting chuck structure and tighten carefully to lock the assembly in position.

Step 2: Alignment & Apex Adjustment

5. Select the correct driver bit (adapter-apex) matching the drive configuration and size of the stuck fastener. Install the selected apex into the tool's sliding drive chuck.
6. Using the integrated sliding block assembly, guide the tool frame across to align the drive bit directly over the center of the stuck screw head.
7. Rotate the height adjustment screw until the entire tool frame sits completely level and parallel to the panel surface, ensuring the driver apex is deeply and cleanly seated into the recess of the damaged fastener.

Mechanical Advantage Note: Maximum structural stability and extraction force are optimized when the sliding block is adjusted as close as possible to the primary adjustment head assembly.

Step 3: Fastener Extraction Process

8. Rotate the screw anchoring knob 5 to 6 full turns to rigidly secure the framework and apply targeted downward locking pressure against the nut plate structure.
9. Apply steady downward pressure to the tool handle to keep the driver bit firmly engaged in the fastener head, preventing cam-out.
10. Attach a manual ratchet handle or a T-handle wrench to the 3/8-inch drive extension on the sliding chuck.
11. Begin turning the drive handle counter-clockwise to break the initial friction and loosen the stuck screw.

CAUTION: PREVENT NUT PLATE DAMAGE

CONTINUED HIGH PRESSURE CAN DAMAGE THE INTERNAL NUT PLATE. Once the stuck fastener breaks loose and moves freely, immediately back off and turn the screw only 2 to 3 additional turns. Release all downward handle lever pressure promptly. The fastener can then be completely backed out using standard light pressure.

3. Field Modification for Damaged Fastener Heads

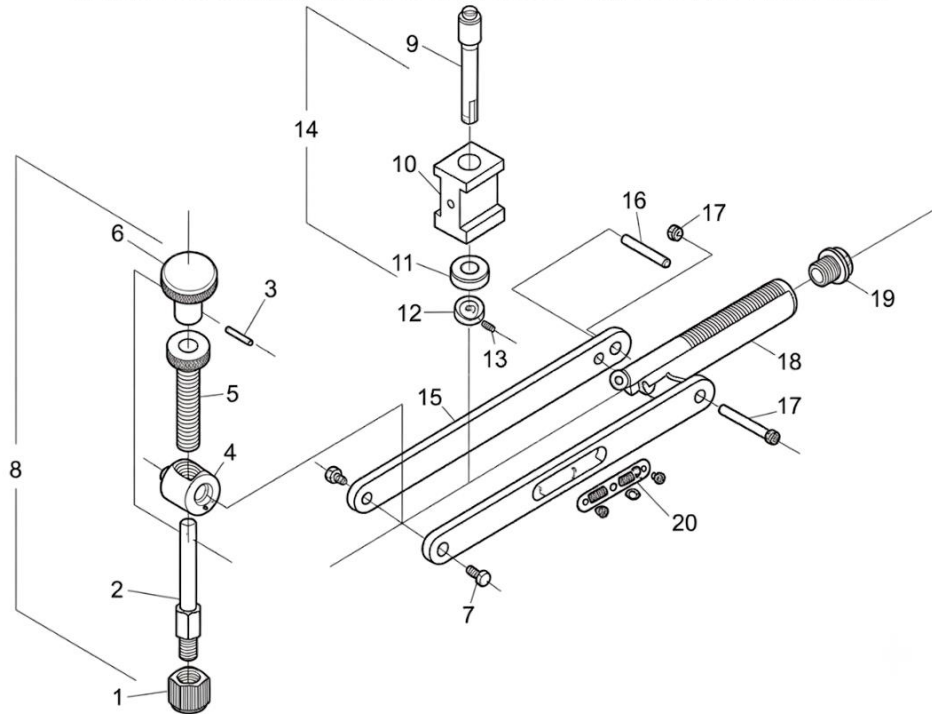
- **Severely Stripped Profiles:** If the internal recess of the screw head is compromised, the points of the driver apex can be precision-ground down by approximately 0.030 inches using a fine abrasive surface or concrete block. This modification allows the bit to seat deeper into the remaining structural metal of the fastener head. Alternately, use the next sequential larger apex size.
- **Final Removal Phase:** If the screw head breaks or strips out completely during the final stages of unthreading, clamping vice grips around the exposed head can be used to complete extraction once the initial bond is broken.

4. Component Identification & Spare Parts List

Refer to the Spare Parts List below. Note that some components are critical and should not be replaced if worn as they will degrade the integrity of the tool beyond safe limits.

Item No.	Component Description	Model #5 (#8-1/4")	Model #7 (1/4"-3/8")
1	Chucking Nut	A1-1	A2-1
2	Anchoring Bolt	A1-2	A2-2
3	Roll Pin	A1-3	A2-3
4	Swivel Nut	A1-4	A2-4
5	Height Adjustment Screw	A1-5	A2-5
6	Screw Anchoring Knob	A1-6	A2-6
7	Retaining Pin	A1-7	A2-7
8	Swivel Head Assembly	A1-8	A2-8
9	3/8" Drive Extension	A1-9	A2-9
10	Sliding Block	A1-10	A2-10
11	Pressure Bearing Thrust	A1-11	A2-11
12	Collar	A1-12	A2-12
13	Set Screw	A1-13	A2-13
14	Sliding Block Assembly	A1-14	A2-14
15	Sliding Bar	A1-15	A2-15
16	Rotating Pin Handle	A1-16	A2-16
17	Handle Rest Pin Assembly	A1-17	A2-17
18	Handle	A1-18	A2-18
19	Storage Compartment Knob	A1-19	A2-19
20	Data Plate & Rivets	A1-20	A2-20

eL BRUTUS SCREW EXTRACTION TOOL - EXPLODED PARTS VIEW



TB0052 – Fastener Removal Tool

Aircraft panel fasteners sometimes stick or corrode making them difficult for the maintenance technician to remove. Stuck fasteners are also costly in terms of aircraft out of commission. To combat this problem, many maintenance units fabricate their own tools to remove stuck fasteners. This solution temporarily solves their problems but does not provide a standardized tool for use Department of Defense (DOD)-wide. B&L International has recently designed a fastener removal tool called eL-Brutus™ (U.S. patent number 4,375,772) for removing screws, with any type head, from aircraft panels. B&L International makes the tool in two sizes: small for screws such as #8, #10, and ¼ inch and large for screws between ¼ and ¾ inch.

To use this fastener removal tool, remove one screw (preferably near the stuck screw) from the panel, remove the tool's pivoting chuck and place the screw inside so the threads stick out the end of the chuck. Put the screw back into its nutplate and tighten. Reinstall the pivoting chuck onto the tool and hand-tighten. Now that the screw has been reinstalled, the screw and pivoting chuck become a fixed point for the tool. Then, select the correct bit for the stuck screw and install the bit into the tool's sliding chuck. Next, adjust the sliding chuck and bit to the correct distance for the screw to be removed by inserting the bit into the stuck screw's slot and turning the height adjustment knob until the tool is level.

To remove the stuck screw, apply pressure to the screw head with the tool's handle and turn the sliding chuck and bit with a ratchet or T-handle. Once the stuck screw turns two or three

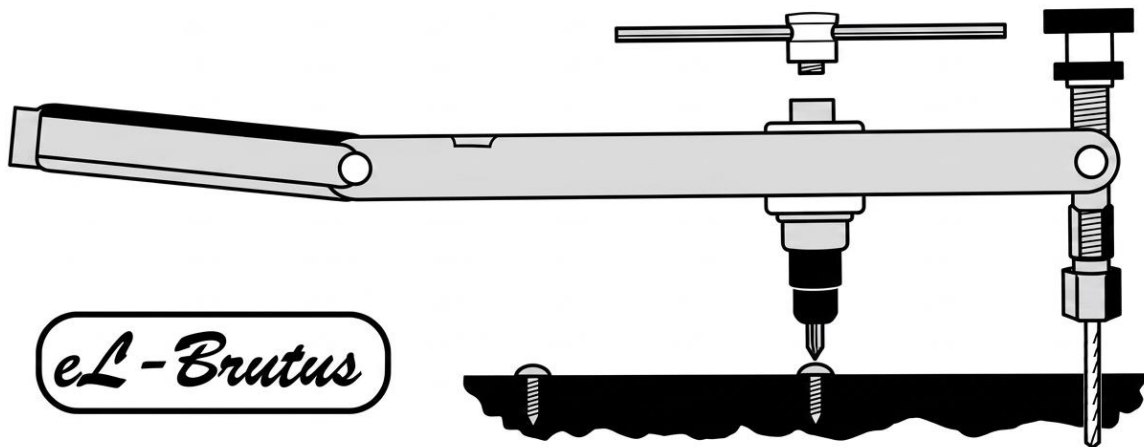
times, release pressure from the handle to prevent damaging the nutplate. When the stuck screw is loose, it should be removed by normal means. If the screw head is damaged, a larger bit may be used. After use, the fastener removal tool folds into a compact package for quick storage.

The FACTS (Fasteners, Actuators, Connectors, Tools and Subsystems) Program Office (see Just the FACTS!, TechTIP, TA 9118, 27 Feb 91, revised 13 April 1994) recently purchased 22 tools for testing at Little Rock AFB, AR; Mountain Home AFB, ID; Travis AFB, CA; Kirtland AFB, NM; and Eielson AFB, AK. Of 31 responses to a FACTS user survey, 20 respondents stated that the tool was either above average or superior to other fastener removal tools they have used, nine stated that the tool is about average, and two stated that it is below average. All respondents recommended the tool be listed in the GSA Standardization and Control of Industrial-Quality Tools (SCIT) catalog.

The General Services Agency (GSA) completed cataloging action for the tool and assigned the following National Stock Numbers (NSNs): 5120-01-398-2868 for the large tool and 5120-01-398-2869 for the small tool.

POC

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