



U.S. ARMY COMBAT CAPABILITIES DEVELOPMENT COMMAND GROUND VEHICLE SYSTEMS CENTER

REVISION OF SOCKET HEAD CAP SCREW
FEDERAL SPECIFICATION FF-S-86

4 AUGUST 2026

ALEKS ZLATESKI
U.S. ARMY DEVCOM GROUND VEHICLE SYSTEMS CENTER
STANDARDIZATION TEAM

BACKGROUND



Socket head cap screws serve a specific function. Stronger than grade 5 or grade 8 parts, these fasteners typically hold up to 180,000 pounds per square inch of cross-section. Since they are predominantly used in extremely high-load military applications, the Army, Navy and Air Force are critically concerned with the quality and reliability of these parts. In addition, the screw's head configuration allows them to be utilized in tight spaces where conventional wrenches or sockets are unable to reach.

Revision E of FF-S-86, published in 1987, was adopted as the most utilized document covering socket head cap screws for all U.S. aerospace manufacturers.

After Revision E and before Revision J, FF-S-86 underwent three revisions (F, G and H) in the span of 17 months.

Document Part Description	Dist Stmt	Document Date	Pages
Revision J	A	01-APR-2025	30
Revision H	A	07-JUN-2021	31
Revision G	A	27-JAN-2021	36
Revision F	A	07-JAN-2020	35
Revision E Notice 2 - Reactivation	A	22-FEB-2002	1
Revision E Notice 1 - Inactivation	A	04-DEC-2000	1
Revision E Amendment 4	A	16-JAN-1991	6
Revision E Amendment 3	A	09-JUL-1990	6
Revision E Amendment 1	A	05-AUG-1987	3
Revision E	A	29-MAY-1987	29

The supply chain for these parts was shutting down because most manufacturers refused to certify to Revisions F, G and H, while military users required parts to the latest revision.

FF-S-86 RELATIONSHIP TO NAS/NASM PUBLICATIONS



The following NAS/NASM part standards are covered by FF-S-86:

- | | |
|-------------|-------------|
| ▪ NAS1351 | • NASM21295 |
| ▪ NAS1352 | • NASM24667 |
| ▪ NAS9921 | • NASM24671 |
| ▪ NAS9922 | • NASM24672 |
| ▪ NASM16995 | • NASM24673 |
| ▪ NASM16996 | • NASM24674 |
| ▪ NASM21098 | • NASM24677 |
| ▪ NASM21262 | • NASM24678 |

Thus, the National Aerospace Standards Committee (NASC) and its members, which involve fastener manufacturers and distributors, were especially concerned with FF-S-86 following Rev E and before Rev J.

The alarm was such that the NASC discussed developing a replacement procurement specification for FF-S-86.

NASC DIALOGUE ON FF-S-86



235th NASC Meeting: CBS Fasteners and Parker Fasteners, along with other fastener manufacturers, sent a declaration letter to the Army (maintenance organization for FF-S-86) on needed changes to FF-S-86. Mr. Fielding and others on the committee suggested that the NASC develop a replacement procurement specification for FF-S-86. The group then briefly discussed the implications of introducing an alternative spec and transitioning relevant part standards away from FF-S-86. The SC noted that they will discuss further during future meetings and recommend a path forward.

236th NASC Meeting: Prior to the meeting, Mr. Phillips sent out a survey to the committee regarding the recommended path forward on FF-S-86. The results of the survey indicated that the committee was interested in either maintaining the document or creating a new spec under the NASC. However, both paths were noted to introduce new complications; maintaining FF-S-86 under the NASC would require unique expertise and concessions because of its broad implications, while creating a new spec would require mass updates to existing NASC standards. The group noted that regardless of which path is taken, the form/fit/function of FF-S-86 should not change.

Mr. Dorsch recommended forming a working group to collaborate with the Army team to update FF-S-86. He indicated that an Army representative responsible for maintaining the document would be willing to support the prospective working group. Several individuals (including representatives from Raytheon, CBS Fasteners, Safety Socket, Navy, and Air Force) volunteered to join the working group.

237th NASC Meeting: Since the 236th NASC Meeting, a cross-functional working group with stakeholders from government and industry met weekly to update FF-S-86. Many sections have already been updated, however more work is required to meet the needs of its users. The group is planning to distribute the draft document for additional comments in Summer of this year.

WSIT ANALYSIS OF FF-S-86



Weapon Systems (1,078)

National Stock Numbers (3,050)

Download Report

Specification Document Number[?]

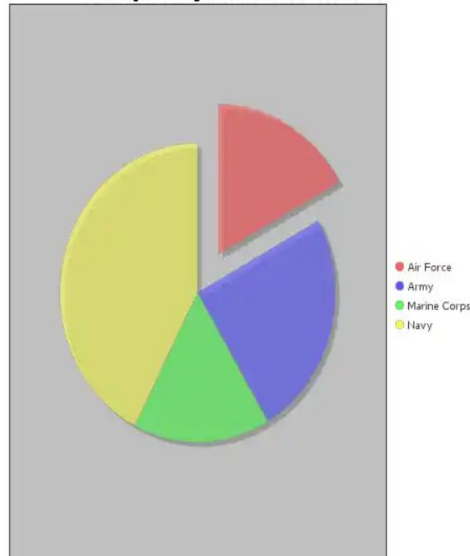
FF-S-86

Document Description[?]

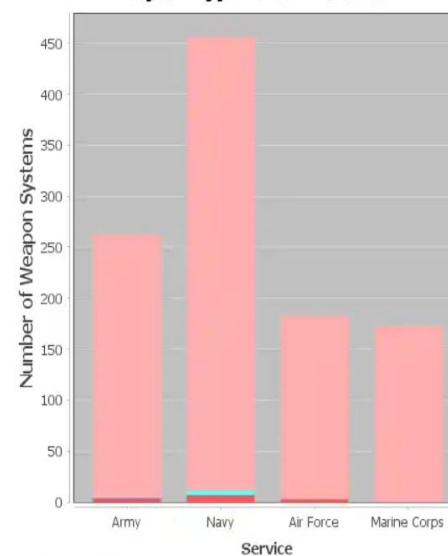
SCREW, CAP, SOCKET-HEAD

NOTE:

Weapon Systems Per Service



Weapon Types Per Service



Weapon System Designator Codes with the most NSNs related to FF-S-86:

- Z9N - AIRCRAFT, FA-18, A-D, E/F, G (GROWLER)
- 43N - F/A-18 HORNET
- 82N - AIRCRAFT LAUNCH & RECOVERY EQUIPMENT
- JAN - NIMITZ CLASS CVN
- 19F - AIRCRAFT, EAGLE F-15
- JDN - ARLEIGH BURKE CLASS DDG
- 26F - F-16 AIRCRAFT
- D3N - FORD CLASS CARRIERS
- S9N - TRIDENT LOAD LIST
- EZN - TICONDEROGA CLASS CG (47)

AIM OF REVISION J



- A major point of contention from fastener manufacturers was the removal of material grades 4037 and 302HQ from prior versions. 4037 is one of the most common materials used by the industry, as is 302HQ. Those were requested and added back in Revision J.
- Clean up numerous typos and bring it up to date with evolutions in materials, manufacturing techniques and quality control procedures.
- Fix requirements added after Rev E, such as grain size or microstructure requirements, that were not realistic to meet.
- The mechanical test methods and acceptance criteria tables were corrected to eliminate the potential of accepting material based on erroneously referenced mechanical property requirements. Table VIII was newly added to detail the mechanical properties.
- To reduce delays in certifying, revision J added alternate means of determining hardness on small diameter fasteners, addressed yield strength testing of machines specimens when testing full sized samples is not practicable, and allowed for specimen modifications when per plan products are too short for proper test equipment fit up.
- Make it more usable for part standards outside of those with a specific military purpose.

SOCKET HEAD CAP SCREW AS SEEN ON A REAPER DRONE



PARTICIPANTS OF FF-S-86 REV J



- Tom Adams – Tiodize
- Laurent Bourges – Lisi Group
- Cliff Carter – B&B Specialties
- Joe Casamatta – U.S. Army
- Dennis Dent – Airfasco
- Jim Dorsch – BAE Systems
- Rick Eppright – U.S. Navy
- Jim Erbs – Safety Socket
- Joe Finnegan – Safety Socket
- Paul French – Parker Fasteners
- David Goss – Camcar
- Walter Guth – General Dynamics Electric Boat
- Joe Hachadoorian – Central Wire
- Nathan Hughes – U.S. Air Force
- Tony Jacobsma – Boeing
- Connie Jacoby – ORKAL Industries
- James Jennings – U.S. Navy
- Linda Knisley – BAE Systems
- Nathaniel Luna – Long-Lok
- Greg Martinez – U.S. Army
- David Mayhew – B&B Specialties
- Brian O'Donnell – Dialogic Fasteners
- Jonathan Oalerts – B&B Specialties
- Van Phan – CBS Fasteners
- Nathan Phillips – AIA
- Tricia Quisenberry – Bisco Industries
- Tom Sanders – U.S. Army
- Ralf Schomaker – Airbus
- Michael Seibert – CBS Fasteners
- David Silverman – Dialogic Fasteners
- Matt Silverman – Dialogic Fasteners
- Tom Syrko – CBS Fasteners
- Mike Tanaka – U.S. Navy
- Troy Taylor – Industrial Forge
- Andy Tse – B&B Specialties
- Jack Watson – RTX
- Devin Wilson – Parker Fasteners
- Chloe Wolchko – AIA
- Melanie Yamauchi – U.S. Navy
- Aleksandar Zlateski – U.S. Army

QUESTIONS?