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SURFACE VEHICLE STANDARD

SAE J2295

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SHIP SYSTEMS AND EQUIPMENT—FASTENERS—PART NUMBERS

1. Scope—This SAE Standard provides part numbers for the identification of fasteners for ship systems and equipment. This document lists some of the more common industry standards that have associated part numbering systems. In addition, this document provides part numbers for screws and nuts to American Society for Testing and Materials (ASTM) fastener standards covering materials most often used in ship systems and equipment.

1.1 Purpose—The purpose of this document is to assist the designer and other personnel in providing standard part numbers for the most commonly used fasteners for ship systems and equipment. A part identification number (PIN) is normally required for all military applications and provides a useful means of communicating fastener requirements to suppliers and manufacturers in a very succinct manner.

1.2 Fastener Part Numbers—This document provides a part numbering system which can be used to identify hex head cap screws and hex nuts to many fastener standards issued by the ASTM. The part identification number (PIN) system identifies material, material strength, thread configuration, fastener length, marking requirements along with the applicable ASTM fastener specification. In addition, Appendices A and B list industry and military fastener standards with part or identifying numbers (PINs) for metric and inch series fasteners, respectively, which may be used in ship systems and equipment.

2. References

2.1 Applicable Documents—The following documents form a part of this standard to the extent specified herein. The latest issue of the documents shall be used except in those cases where an invitation for bid or procurement contract specifically identifies the issues in effect on a particular date.

2.1.1 SAE PUBLICATIONS—Available from SAE, 400 Commonwealth Drive, Warrendale, Pa 15096-0001.

SAE AMS 2485—Black Oxide Coating
SAE AMS 2487—Anodic Treatment of Titanium and Titanium Alloys
SAE AS1701—Lubricant, Solid, Dry Film
SAE J2270—Ship Systems and Equipment—Fasteners—Test, Inspection and Installation Requirements
SAE J2271—Ship Systems and Equipment—Part Standard for Studs—Continuous and Double End (Inch Series)
SAE J2271M—Ship Systems and Equipment—Part Standard for Studs—Continuous and Double End (Metric Series)
SAE J2280—Ship Systems and Equipment—Fasteners—Selection and Identification Requirements

2.1.2 AEROSPACE INDUSTRIES ASSOCIATION OF AMERICA, INC. PUBLICATIONS—Available from the Aerospace Industries Association of America, Inc., 1250 Eye Street NW, Washington, DC 20005.

NAS 1149—Washer, Flat
NAS 1351—Screw, Cap, Socket Head, UNRF-3A Threads
NAS 1352—Screw, Cap, Socket Head, UNRC-3A Threads
NAS 1283—Fasteners, Male, Threaded, Self-locking

2.1.3 ASME PUBLICATIONS—Available from the American Society of Mechanical Engineers, 345 East 47th Street, New York, NY 10017.

ASME B1.1—Unified Inch Screw Thread
ASME B1.13M—Metric Screw Threads - M Profile
ASME B18.2.1—Square and Hex Bolts and Screws Inch Series
ASME B18.2.2—Square and Hex Nuts (Inch Series)
ASME B18.2.3.1M—Metric Hex Cap Screws
ASME B18.2.3.3M—Metric Heavy Hex Screws
ASME B18.2.3.7M—Metric Heavy Hex Structural Bolts
ASME B18.2.4.1M—Metric Hex Nuts, Style 1
ASME B18.2.4.2M—Metric Hex Nuts, Style 2
ASME B18.2.4.5M—Metric Hex Jam Nuts
ASME B18.2.4.6M—Metric Heavy Hex Nuts
ASME B18.3—Socket, Cap, Shoulder and Set Screws - Inch
ASME B18.3.1M—Socket Head Cap Screws - Metric

2.1.4 ASTM PUBLICATIONS—Available from the American Society for Testing and Materials, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959.

ASTM A 153—Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
ASTM A 193/A193M—Alloy Steel and Stainless Steel Bolting Materials for High-Temperature Service
ASTM A 194/A194M—Carbon and Alloy Steel Nuts for Bolts for High-Pressure and High-Temperature Service
ASTM A 307—Carbon Steel Bolts and Studs, 60,000 Psi Tensile Strength
ASTM A 325—Structural Bolts, Steel Heat Treated, 120/105 ksi Minimum Tensile Strength
ASTM A 325M—High-Strength Bolts for Structural Steel Joints [Metric]
ASTM A 354—Quenched and Tempered Alloy Steel Bolts, Studs and Other Externally Threaded Fasteners
ASTM A 449—Quenched and Tempered Steel Bolts and Studs
ASTM A 453/A 453M—Bolting Materials, High-Temperature, 50 to 120 ksi [345 to 827 MPa] Yield Strength, with Expansion Coefficients Comparable to Austenitic Steels
ASTM A 490—Heat-Treated Steel Structural Bolts, 150 ksi Minimum Tensile
ASTM A 490M—High Strength Steel Bolts, Classes 10.9 and 10.9.3 for Structural Steel Joints (Metric)
ASTM A 563—Carbon and Alloy Steel Nuts
ASTM A 563M—Carbon and Alloy Steel Nuts [Metric]
ASTM A 574—Alloy Steel Socket Head Cap Screws
ASTM A 574M—Alloy Steel Socket Head Cap Screws [Metric]
ASTM B 446—Standard Specification for Nickel-Chromium-Molybdenum-Columbium Alloy (UNS N06625), Rod and Bar
ASTM B 633—Electrodeposited Coatings of Zinc on Iron and Steel, Standard Specification For
ASTM B 637—Precipitation Hardening Nickel Alloy Bars, Forgings, and Forging Stock for High Temperature Service
ASTM B 695—Coatings of Zinc Mechanically Deposited on Iron and Steel, Standard Specification For

ASTM B 805—Stand Specification for Precipitation Hardening Nickel Alloys (UNS N07716 and N07725), Bar and Wire
ASTM F 467—Nonferrous Nuts for General Use
ASTM F 467M—Nonferrous Nuts for General Use [Metric]
ASTM F 468—Nonferrous Bolts, Hex Capscrews and Studs for General Use
ASTM F 468M—Nonferrous Bolts, Hex Capscrews and Studs for General Use [Metric]
ASTM F 568—Carbon and Alloy Steel Externally Threaded Metric Fasteners
ASTM F 593—Stainless Steel Bolts, Hex Cap Screws and Studs
ASTM F 594—Stainless Steel Nuts
ASTM F 738M—Stainless Steel Metric Bolts, Screws, and Studs
ASTM F 835—Alloy Steel Socket Button and Flat Countersunk Head Cap Screws
ASTM F 835M—Alloy Steel Socket Button and Flat Countersunk Head Cap Screws [Metric]
ASTM F 836M—Stainless Steel Metric Nuts
ASTM F 837—Stainless Steel Socket Head Cap Screws
ASTM F 837M—Stainless Steel Socket Head Cap Screws [Metric]
ASTM F 879—Stainless Steel Socket Button and Flat Countersunk Head Cap Screws
ASTM F 879M—Stainless Steel Socket Button and Flat Countersunk Head Cap Screws [Metric]

2.1.5 U.S. GOVERNMENT PUBLICATIONS—Available from Standardization Documents Order Desk, Building 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.

2.1.5.1 Federal Specifications

FF-S-85—Screw, Cap, Slotted and Hexagon Head
FF-S-86—Screw, Cap, Socket Head
QQ-N-286—Nickel-Copper-Aluminum Alloy, Wrought

2.1.5.2—Department of Defense Publications

DODISS—Index of Specifications and Standards

3. Fastener Part or Identifying Numbers

3.1 Sources of Part or Identifying Numbers (PINs)—Part numbers have been established by both industry and the military. Nongovernment standard bodies which have issued fastener standards with part or identifying numbers include:

a. American Society for Mechanical Engineering (ASME)
b. Aerospace Industries Association (AIA) issues National Aerospace Standards (NA & NAS)
c. Society of Automotive Engineers (SAE)

The Association for Testing and Materials (ASTM) has issued many fastener standards, but generally has not established part or identifying numbers for fasteners to these standards. The Industrial Fastener Institute has issued a part number system which has not been favorably received due to its complexity and the number of characters required to describe a particular fastener.

3.1.1 FEDERAL AND MILITARY SPECIFICATIONS AND STANDARDS WITH PINS—Fastener standardization documents previously issued by the U.S. Government fall into two general categories: General specifications and part standards. Under acquisition reform, military specifications are being reidentified as performance or detail specifications. More recently a third category, Commercial Item Descriptions, has also been issued. The general specifications are either Federal Specifications or Military specifications while the part standards include MS sheet form standards, specification sheets and some recently issued Commercial Item Descriptions (CIDs). The part standards identify the configuration (thread, diameter, length, etc.), material including coating if applicable, and almost always refer to a general specification for detail material, processing and test requirements. The part standards provide the part or identifying numbers (PINs). Since PINs are required for military applications, Federal and Military Specifications for Fasteners usually require that fasteners for military applications be in accordance with a part standard. For example, for Federal Specification FF-S-86 covering socket head cap screws there are two NAS part standards and approximately 20 military standards referenced. As PINs are developed for industry standards, the military standards are being canceled in favor of the industry standards.

3.1.2 WHERE TO FIND PINS—Appendices A (metric) and B (Inch series) of this document identify many fastener documents with PINs that are often used for ship systems and equipment. To identify other fastener documents with PINs one must review the applicable part standards. This can be done by one of the methods listed below. However, PIN's have not been established for many of the fastener materials needed for shipbuilding. Accordingly, this document establishes part numbers for cap screws and nuts of materials most likely to be used for ship systems and equipment. See 3.2 for part numbers established by this document.

3.1.2.1 Commercially Available Indexes of Standards—There are commercial sources for locator indexes for military and industry standards with the standards being available by subscription in microfilm, microfiche and computer formats. Computer searches for standards by key words can be conducted in several minutes or less.

3.1.2.2 Department of Defense Index of Specifications and Standards (DODISS)—The DODISS is updated frequently and is approved for public release. It lists military publications and those industry standards which have been adopted by DoD. The DODISS comes in the following three parts:

a. Part I - Alphabetical Listing
b. Part II - Numerical Listing
c. Part III - Listing by Federal Supply Code

The use of the listing by Federal Supply Code is particularly recommended since some specifications may be missed by an alphabetical search where the part standard is titled "Steel nut..." rather than "Nut, Steel ...". Applicable Federal Supply Codes for fasteners are listed in Table 1:

TABLE 1—APPLICABLE FEDERAL SUPPLY CODES

FSC	Item
5305	Screws (Plain & Self-locking)
5306	Bolts
5307	Studs
5310	Nuts & Washers
5340	Threaded Inserts

NOTE—Screws and Bolts are often used interchangeably and it is best to check both categories.

3.1.2.3 Non-Government Standard Body Indexes—Each industry organization publishing fastener standards has one or more indexes covering the standards. Contact the organizations listed in Section 2 for details.

3.1.3 MULTIPLE SOURCES FOR EQUIVALENT FASTENERS—With several industry standard bodies and the military issuing part standards with numbers there are sometimes multiple sources for essentially equivalent fasteners. It is beyond the scope of this document to recommend one over another. Often the Defense Logistic Agency (DLA) will support more than one part number with the same National Stock Number. For example, many hex head cap screws initially procured under MS numbers to FF-S-85 are now procured to ASME B18.2.1. Cancellation notices for the MS part standards cross reference the replacement ASME B18.2.1 part numbers. DLA activities can identify currently stocked parts which may be a factor in selecting which part standard to use for military procurements. See SAE J2280 for guidance.

3.2 Part Or Identifying Numbers (PINs) For Selected ASTM Fasteners—PINs are provided herein for the ASTM cap screws and nuts from which designers, shipbuilders and repair activities should select these types of fasteners. Part numbers are provided for only those fastener configurations and materials most likely to be needed for ship systems and equipment. Industry or military standards with part numbers already exist for many types of fasteners and therefore part numbers to cover similar ASTM fasteners have usually not been developed.

3.2.1 PINS FOR SELECTED SCREWS AND BOLTS TO ASTM STANDARDS—Figure 1 provides a part number system for preferred hex and socket head screws and bolts in accordance with selected ASTM product standards. Figure 2 is a listing of the standards with the preferred materials identified. The part number consists of a number of fields in the following order as identified in Figure 1:

a. ASTM product standard
b. Thread form
c. Thread class
d. Type of fastener
e. Nominal Size (diameter)
f. Special Features: Self-locking, coatings
g. Nominal length
h. A letter/number designating the PIN suffix for the selected material as obtained from Figure 2. (This suffix usually consists of the mechanical property marking for the material except that the portion of the mechanical property marking containing the number of the fastener standard is not included.)

3.2.2 PINS FOR NUTS TO SELECTED ASTM STANDARDS—Figure 3 provides a part number system for preferred hex nuts in accordance with selected ASTM product standards. Figure 4 lists the standards with the preferred materials identified. The part number consists of a number of fields in the following order as identified in Figure 3:

a. ASTM product standard
b. Thread form
c. Thread class
d. Type of nut: Hex, Heavy Hex or Jam
e. Nominal Size (diameter)
f. A letter/number designating the PIN suffix for the selected material as obtained from Figure 4. (This suffix usually consists of the mechanical property marking for the material except that the portion of the mechanical property marking containing the number of the fastener standard is not included.)

A449 C 2 H 8 LZ 20 TI

PIN Suffix for the ASTM Standard to designate the material. (Select applicable designation from Figure 2. If applicable designator starts with a number, use dash prefix.)

Nominal Length (See 3.3.1)
Metric mm (use two digits below 100 mm)
Inches 16ths of an inch (See Note 1)

Special Features (Includes Coatings)
- = No special features or coatings (See Note 2)
L = Locking element (May be combined with coating designator, use "L" before coating designator; i.e. "LZ") (See Note 3)
B = Black Oxide
Z = Zinc Electroplate (See Note 4)
G = Zinc - Hot-Dipped or Mechanically Deposited (See Note 5)
H = Hot-Dip Zinc Coating - ASTM A 153 (See Note 5)
M = Mechanically Deposited Zinc Coating - ASTM B 695 (See Note 5)

Nominal Size (Diameter) (See 3.3.2)
Metric mm (use two digits below 100mm)
Inches 16ths of an inch (See Note 1)

Type of Fastener (See Note 6 for limitations)
B = Heavy Hex Structural Bolt (See Note 7)
R = Regular Hex Cap Screw
H = Heavy Hex Cap Screw
S = Socket Head Cap Screw -
F = Socket Flat (82 degrees countersunk) Head Cap Screw

Thread Class
2 = 2A (ASME B1.1)
3 = 3A (ASME B1.1)
4 = 4h6h (metric) (ASME B1.13M)
6 = 6g (metric) (ASME B1.13M)
9 = Oversize for zinc coating (See 3.4.1)

Thread Form
C = UNC/UNRC (ASME B1.1)
F = UNF/UNRF (ASME B1.1)
U = 8UN/8UNR (ASME B1.1)
M = Metric (ASME B1.13M)

Product Standard Number (See list below and Table 1)
(Use Prefix letter and Number without a space and ignore the "M" suffix for metric as the "Thread Form" designator above identifies as metric.)

ASTM Product Standards

A 193/A 193M	Carbon & Alloy Steel - High Temperature (Inch and metric)
A 307	Carbon Steel, 60 000 PSI Tensile Strength
A 325	High Strength Structural Bolts
A 325M	High Strength Structural Bolts [Metric]
A 354	Quenched and Tempered Alloy Steel Bolts & Studs
A 449	Quenched and Tempered Carbon Steel Bolts & Studs

FIGURE 1—PART NUMBER SYSTEM FOR PREFERRED HEX AND SOCKET HEAD FASTENERS IN ACCORDANCE WITH SELECTED ASTM PRODUCT STANDARDS

A 453/A 453M	High-Temperature Bolting Materials (Inch and metric)
A 490	Heat Treated Steel Structural Bolts, 150 ksi Minimum Tensile Strength
A 490M	High Strength Steel Bolts, Classes 10.9 and 10.93 for Structural Steel Joints (Metric)
A 574	Alloy Steel Socket Head Cap Screws
A 574M	Alloy Steel Socket Head Cap Screws [Metric]
B 446	Nickel-Chromium-Molybdenum-Columbium Alloy Material
B 637	Precipitation Hardening Nickel Alloy Material
B 805	Precipitation Hardening Nickel Alloy Material
F 468	Nonferrous Bolts, Hex Cap Screws, and Studs
F 468M	Nonferrous Bolts, Hex Cap Screws, and Studs [Metric]
F 568	Carbon and Alloy Steel Metric Fasteners
F 593	Stainless Steel Bolts and Hex Cap Screws
F 738M	Stainless Steel Metric Bolts, Screws, and Studs
F 835	Alloy Steel Flat Countersunk Head Cap Screws
F 835M	Alloy Steel Flat Countersunk Head Cap Screws [Metric]
F 837	Stainless Steel Socket Head Cap Screws
F 837M	Stainless Steel Socket Head Cap Screws [Metric]
F 879	Stainless Steel Flat Countersunk Head Cap Screws
F 879M	Stainless Steel Flat Countersunk Head Cap Screws [Metric]

NOTES:

(1) For inch type fasteners, express nominal lengths and diameters in 16ths of an inch. For sizes 9/16 inch and smaller, use only one digit.

(2) A "-" is used when there are no special features or optional coatings. However, passivation shall be provided on CRES fasteners and the coating requirements of 3.4.3 shall apply to all titanium fasteners.

(3) Locate locking element in accordance with NAS 1283. Performance and test for locking element in accordance with SAE J2270. Fasteners with self-locking elements shall be identified on the head by six raised or depressed dots, equally spaced in a circle pattern where possible.

(4) Electrodeposited zinc coating per ASTM B 633. (See 3.4.1.3)

(5) Either Hot-Dipped or Mechanically Deposited Zinc may be supplied when the "G" designator is used. Use the "H" or "M" designator if a specific coating is required. Designate threads as oversize when these coatings are used. (See 3.4.1. for additional restrictions.)

(6) Dimensional configurations shall be limited to those ASME standards listed as follows and shall also be limited to the applicable configurations in the material product specification. In addition, for standardization purposes, dimensions should be restricted to those diameters and length increments identified in 3.3.

Type of Fastener	Metric Series	Inch Series
Heavy Hex Struct. Bolt	ASME B18.2.3.7M	ASME B18.2.1
Regular Hex Cap Screw	ASME B18.2.3.1M	ASME B18.2.1
Heavy Hex Cap Screw	ASME B18.2.3.3M	ASME B18.2.1
Socket Head Cap Screw	ASME B18.3.1.M	ASME B18.3
Socket Flat Heat (82 degree counter-sunk) Cap Screw	ASME B18.3.1M	ASME B18.3

(7) Use bolts only when required by the standard, cap screws are preferred where covered by the standard.

Examples of Part Numbers:

Part number shown in Figure 1 (A449C2H8LZ20T1) is for a Heavy Hex Cap Screw 1/2 in (8/16ths) diameter with UNC Class 2A threads and a length of 1-1/4 in (20/16ths) of material in accordance with ASTM A 449 Type 1, with the "LZ" in the features code indicating a self-locking element and zinc electroplating.

A193U2H20-72B16 is the part number for a Heavy Hex Cap Screw 1-1/4 in (20/16ths) in diameter with 8UN Class 2A threads and a length of 4-1/2 in (72/16ths) of material in accordance with ASTM A 193, Grade B16 (chromium-molybdenum-vanadium steel for high temperature applications).

F568M6R16-80-9.8 is the part number for a regular hex metric cap screw with a diameter of 16 mm and metric threads with a class 6g thread fit and a length of 80 mm in medium carbon 9.8 steel per ASTM F 568.

FIGURE 1—PART NUMBER SYSTEM FOR PREFERRED HEX AND SOCKET HEAD FASTENERS IN ACCORDANCE WITH SELECTED ASTM PRODUCT STANDARDS (CONTINUED)

ASTM Standard	ALLOY GROUP & CONDITION	MECHANICAL PROPERTY MARKINGS *	PIN SUFFIX FOR SELECTED MATERIALS
A 193/ A 193 M	Chromium-molybdenum steel, Grades B7, B7M	B7, B7M	"B7" or "B7M" as applicable
	Chromium-molybdenum-vanadium steel, Grade B16 (For standardization preferred to B7)	B16	"B16"
A 307	Carbon steel, Grade B, Plain and Zinc Coatings "G", "H" and "M" per Figure 1 special features	307B	"B"
A 325	Type 1 (medium carbon steel), Plain and Zinc Coatings "G", "H" and "M" per Figure 1 Type 3 (weathering steel)	A325 and optional three radial lines. A325	"T1" "T3"
A 325M	Type 1 (medium carbon steel), Plain and Zinc Coatings "G", "H" and "M" per Figure 1 Type 3 (weathering steel)	A325M A325M and 8S3	"MT1" "MT3"
A 354	Alloy steel, Grade BD	Marked with six radial lines, "BD" optional.	"BD"
A 449	Type 1 medium carbon steel (For zinc coating, see Figure 1 special features code "Z")	3 radial lines, 120° apart.	"T1"
A 453/ A 453M	Grade 660 Class A, B, &or C (Any class may be furnished for the part number)	660 Rolled threads are marked "Ty 2"	"-660"
A 490	Type 1 alloy steel Type 3 alloy steel (weathering)	A490 A490	"T1" "T3"
A 490M	Type 1 alloy steel Type 3 alloy steel (weathering)	"A490" & "10S" "A490" & "10S3"	"T1" "T3"
A 574 or A 574 M	Alloy steel (Use "B" for Black oxide coating in special features code)	No marking per the standard. Recommend invoking "A574" & "A574M" for marking to avoid commingling. No PIN Suffix required.	
B 446	Alloy 625 (Nickel base)	625	None
B 637	Alloy 7718	7718	None
B 805	Alloy 7716 Alloy 7725	7716 7725	"-716" "-725"
F 468 or F 468 M	Nickel-Copper, Alloy 400 (Preferred) Alloy 405	F468U, F468MU F468V, F468MV	Use only the letter(s) after "F468" in the mechanical property marking. For example, "U" or "MU". The letter M after "F468" denotes metric.

FIGURE 2—HEX AND SOCKET HEAD FASTENER MARKINGS AND PIN IDENTIFIERS FOR PREFERRED MATERIALS

ASTM Standard	ALLOY GROUP & CONDITION	MECHANICAL PROPERTY MARKINGS *	PIN SUFFIX FOR SELECTED MATERIALS
F-468 or F 468M	Nickel-Copper-Aluminum, Alloy 500**	F468W, F468MW**	See footnote for marking QQ-N-286 material.
	Titanium, Alloy 19 (See 3.4.3 for coating)	F468FT, F468MFT	
	Brass, Alloy Cu 462	F468C, F468MC	
	Silicon Bronze, Alloy Cu 651	F468K, F468MK	
F 568 (Metric)	Carbon and Alloy steel - Atmospheric corrosion resistance	8.8.3, 10.9.3	Use designation assigned to property class. 8.8.3 = "H3", 10.9.3 = "K3"
	Carbon and Alloy steel (zinc plated - Use "Z" special feature except for classes 10.9 and 12.9)	4.6, 8.8, 9.8, 10.9	4.6 = "E", 8.8 = "H", 9.8 = "J" 10.9 = "K",
F 593	Stainless GP 1 - Alloys 304, 305, 384, XM7 Cold Worked 1 (1/2 to 5/8 Inch Diam.) Cold Worked 2 (3/4 to 1-1/2 Inch Diam.)	 593C 593D	For PIN for Cold Worked and Precipitation Hardened Condition, use only the letter following "F593" in the mechanical property marking. For example "C".
	Strain Hardened 1 (1/4 to 5/8 in Diam.) Strain Hardened 2 (3/4 to 1 in Diam.) Strain Hardened 3 (1-1/8 to 1-1/4 in Diam.) Strain Hardened 4 (1-3/8 to 1-1/2 in Diam.)	593A 593B 593C 593D	
	Stainless Gr 2 - Alloy 316 Cold Worked 1 (1/2 to 5/8 in Diam.) Cold Worked 2 (3/4 to 1-1/2 in Diam.)	 F593G F593H	For PIN for Strain Hardened use the letter following "F593" in the mechanical property marking plus "-SH" to denote Strain Hardened rather than the underlined mechanical property marking. For example "E-SH".
	Strain Hardened 1 (1/4 to 5/8 in Diam.) Strain Hardened 2 (3/4 to 1 in Diam.) Strain Hardened 3 (1-1/8 to 1-1/4 in Diam.) Strain Hardened 4 (1-3/8 to 1-1/2 in Diam.)	F593E F593F F593G F593H	
	Stainless Gp 7 - Precipitation Hardening Alloy 630 Condition AH	F593U	
F 738M	Class A1-70, Alloy 304, 305, 384, XM7 Cold Worked Class A1-80, Alloy 304, 305, 384, XM7 Strain Hardened	 F738D F738G	For PIN, use only the letter following "F738" in the mechanical property marking. For example, "F".
	Class A4-70, Alloy 316 (Cold Worked) Class A4-80, Alloy 316 (Strain Hardened)	F738F F738J	

FIGURE 2—HEX AND SOCKET HEAD FASTENER MARKINGS AND PIN IDENTIFIERS FOR PREFERRED MATERIALS (CONTINUED)

ASTM Standard	ALLOY GROUP & CONDITION	MECHANICAL PROPERTY MARKINGS *	PIN SUFFIX FOR SELECTED MATERIALS
F 835 or F 835M	Alloy steel	None	None
F 837	Alloy Gp 1 - Austenitic Alloys 304, 305, 384 & XM7 - Cold worked	CW (marking optional)	"CW"
	Alloy Gp 5 - Martensitic Alloy 410 Cond HT	HT (marking optional)	"HT"
F 837 M	Alloy Gp 1 (304, 305, 384 & XM7) Grade A1-50	A1-50	"A150"
	Alloy Gp 1 (304, 305, 385 & XM7) Grade A1-70	A1-70	"A170"
	Alloy Gp 5 (410) Grade C1-110 Cond HT	C1-110	"C1"
F 879	Alloy 304, 305, 384, XM7 (Cold Worked)	None (Package only)	"CW"
F 879M	Property Class A1-70, Alloy 304. 305, 384 & XM7 (Cold Worked)		

AH - Solution annealed and age hardened CW - Cold Worked

HT - Hardened & tempered at 274°C min.

* Per the applicable ASTM standard.

** For improved material characteristics it is recommended that the material be in accordance with QQ-N-286 rather than ASTM F 468 or ASTM F 468M Alloy 500. When the QQ-N-286 material is specifically required, as for most military applications, an "X" shall be added at the end of the "W" or "MW" PIN Suffix for material and the marking on the fasteners shall be "•K•", rather than the ASTM F 468 marking. The finished material condition of QQ-N-286 material shall be annealed and age hardened. Fasteners produced by hot or cold heading shall be annealed and age hardened after heading. Threads formed after final anneal or final anneal and aging shall be formed by machining operations only.

FIGURE 2—HEX AND SOCKET HEAD FASTENER MARKINGS AND PIN IDENTIFIERS FOR PREFERRED MATERIALS (CONTINUED)

A194 C 2 R 12 - 7

PIN Suffix to designate material (See Figure 4)

Special Features (Includes Coatings)
- = No special features or coatings
G = Zinc - Hot-Dipped or Mechanically Deposited (See Note 1)
H = Hot-Dip Zinc Coating - ASTM A 153 (See Note 1)
M = Mechanically Deposited Zinc - ASTM B 695 (See Note 1)
Z = Zinc Electroplate (See Note 2)

Nominal Size (Diameter) (See 3.3.2)
Inch products - 16ths of an inch (use one digit below 5/8 in)
Metric products - mm (Use two digits below 100 mm)

Type of Nut (See Note 3)
R = Hex Nut
H = Heavy Hex Nut
J = Hex Jam nut

Thread Class
2 = Class 2B (ASME B1.1)
3 = Class 3B (ASME B1.1)
4 = Class 4H (metric) (ASME B1.13M)
6 = Class 6H (metric) (ASME B1.13M)
9 = Oversize for zinc coating

Thread Form
C = UNC (ASME B1.1)
F = UNF (ASME B1.1)
U = 8UN (ASME B1.1)
M = Metric (ASME B1.13M)

ASTM Product Standard Number—See list below and Figure 4 (Use Prefix Letter and Number without a space and ignore the "M" suffix for metric since the Thread Form Designator "M" identifies as metric.)

A 194/A 194M	Carbon & Alloy Steel Nuts for High-Pressure and High Temperature Service (Inch and Metric)
A 453/A 453M	High-Temperature Corrosion Resistant Bolting Materials
A 563	Carbon & Alloy Steel Nuts - (inch only)
A 563M	Carbon & Alloy Steel Nuts (Metric)
B 446	Nickel-Chromium-Molybdenum-Columbium Alloy Material
B 637	Precipitation Hardening Nickel Alloy Material
B 805	Precipitation Hardening Nickel Alloy Material
F 467	Nonferrous Nuts for General Use - (inch only)
F 467M	Nonferrous Nuts for General Use (Metric)
F 594	Stainless Steel Nuts - (inch only)
F 836M	Stainless steel Metric Nuts

NOTES:
(1) Either Hot-Dipped or Mechanically Deposited Zinc shall be supplied when the "G" designator is used. Use the "H" or "M" designator if a specific coating is required. Designate oversize internal threads when these coatings are used. (See 3.4.1. for additional restrictions.)
(2) Electrodeposited zinc coating per ASTM B 633. (See 3.4.1.3)
(3) Dimensional configurations shall be limited to those ASME standards listed as follows and shall also be limited to the applicable configurations in the material product specification.

Type Nut	Metric	Inch Series
Hex Nut	ASME B18.2.4.1M or ASME B18.2.4.2M	ASME B18.2.2
Heavy Hex Nut	ASME B18.2.4.6M	ASME B18.2.2
Jam Nut	ASME B18.2.4.5M	ASME B18.2.2

PART NUMBER EXAMPLES—The part number in Figure 4 is for a regular hex nut with 3/4 (12/16ths) in diameter Class UNC-2B threadsin chromium-molybdenum steel Grade 7 in accordance with ASTM A 194. F836M6R20-F is the part number for a metric hex nut with M20, Class 6H threads in Alloy 316, cold worked condition per ASTM F 836M. A563U2H20GDH is a heavy hex nut with 1-1/4 8UN Class 2B threads in carbon steel Grade DH with either hot-dipped or mechanically deposited zinc coating.

FIGURE 3—PART NUMBER SYSTEM FOR PREFERRED HEX NUTS IN ACCORDANCE WITH SELECTED ASTM STANDARDS

ASTM	ALLOY GROUP & CONDITION	MECHANICAL PROPERTY MARKINGS	PIN SUFFIX FOR SELECTED MATERIALS
A 194/ A 194M	4, Carbon molybdenum steel 7, 7M - AISI 4140, 4142, 4145, 4140H, 4142H, 4145H	4, 4B 7, 7B, 7M, 7MB	"4" "7"
A 453/ A 453M	Grade 660 Class A, B, or C (Any class may be furnished for the part number.)	660	"660
A 563	Carbon steel, Plain - (Uncoated or with zinc electroplate "Z" per Figure 3 of insufficient thickness to require overtapped nuts) Grade A Grade D Grade DH	 Not normally marked. D DH	 "A" "D" "DH"
	Carbon steel - (Zinc coating G, H or M per Figure 3 - Overtapped nuts required)	Same as above	Same as immediately above
	Atmospheric corrosion resistant weathering steel, Grades C3 & DH3, uncoated	Grade C3 marked on one face with three circumferential marks 120 degrees apart and the numeral "3". Grade DH3 marked "DH3"	"C3" "DH3"
A 563M	Carbon steel - (Plain - Uncoated or with zinc coating "Z" per Figure 3 of insufficient thickness to require overtapped nuts) Gr 5 M5 to M36 B18.2.4.1M hex nut, Style 1 M42 to M100 ASME B18.2.4.6M heavy hex Gr 10 M5 to M36 B18.2.4.1M hex nut Style 1 Gr 10S M12 to M36 B18.2.4.6M Heavy hex	 5 5 10 10S	 "5" "5" "10" "10S"
	Carbon steel - (Zinc Coating G, H or M per Figure 3) - Overtapped nuts (See 3.4.1)	Same as above except no Grade 10S	Same as immediately above - No Grade 10S
	Atmospheric corrosion resisting steel Gr 10S3 (plain, uncoated)	 "10S3"	 "10S3"
B 446	Alloy 625 (Nickel Base)	625	None
B 637	Alloy N07718 (Formerly 718) Nickel Base	7718	None
B 805	Alloy 625+ (UNS 7716) Alloy 725 (UNS 7725)	7716 7725	"716" "725"
F 467 or F 467 M	Nickel Copper, Alloy 400 Nickel Copper, Alloy 405 (preferred)	F467U & F467MU F467V & F467MV	For PIN, use only the letter(s) following "F467"
	Nickel-Copper-Aluminum, Alloy 500*	F467W & F467MW*	See footnote for marking Ni-Cu-Al material to QQ-N-286
	Titanium, Alloy 19 (See 3.4.3 for coating)	F467FT & F467MFT	
	Brass, Alloy Cu 462	F467C & F467MC	

FIGURE 4—PREFERRED MATERIAL FOR NUTS, THEIR MARKING DESIGNATIONS, AND PIN IDENTIFIERS

ASTM	ALLOY GROUP & CONDITION	MECHANICAL PROPERTY MARKINGS	PIN SUFFIX FOR SELECTED MATERIALS
F 467 or F 467 M	Silicon Bronze, Alloy Cu 651	F467K & F467MK	
F 594	Stainless Alloy Gp 1 - 304, 305, 384, XM7 CW1 1/4 to 5/8 CW2 3/4 and greater	F594C F594D	For Cold Worked condition, use only the letter following "F594" For example, "C"
	Stainless Gp 2 - Alloy 316 CW1 1/4 to 5/8 CW2 3/4 and greater	F594G F594H	
	Stainless Alloy Gp 1 - 304, 305, 384, XM7 SH1 1/4 to 5/8 Diam. SH2 3/4 to 1 in Diam. SH3 1-1/8 to 1-1/4 Diam. SH4 1-3/8 to 1-1/2 Diam.	F594A F594B F594C F595D	For strain hardened condition, use the letter following "F594" and add "-SH" for strain hardened rather than the underlined property marking For example, "E-SH"
	Stainless Alloy Gp 3- Alloy 316 SH1 1/4 to 5/8 Diam. SH2 3/4 to 1 in Diam. SH3 1-1/8 to 1-1/4 Diam. SH4 1-3/8 to 1-1/2 Diam.	F594E F594F F594G F594H	
	Stainless Alloy Gp 7- Precipitation Hardening Alloy 630 (Cond. AH - Age Hardened	F594U	Use only the letter "U" following "F594"
F 836M	Class A1-70 Alloys 304, 305, 384 & XM7(CW) Class A1-80 Alloys 304, 305, 384 & XM7 (SH)	F836D F836G	For PIN, use only letter following "F836". For example, "F"
	Class A4-70 Alloy 316 (CW) Class A4-80 Alloy 316 (SH)	F836F F836J	

AH - Solution annealed and aged hardened after forming
CW - Annealed and cold worked. 3/4 in and > may be hot worked
SH - Machined from strain hardened stock

* For improved material characteristics it is recommended that the material be in accordance with QQ-N-286 rather than ASTM F 468 or ASTM F 468M Alloy 500. When the QQ-N-286 material is specifically required, as for most military applications, an "X" shall be added at the end of the "W" or "MW" PIN Suffix for material and the marking on the fasteners shall be "•K•", rather than the ASTM F 468 marking. The finished material condition of QQ-N-286 material shall be annealed and age hardened. Fasteners produced by hot or cold heading shall be annealed and age hardened after heading. Threads formed after final anneal or final anneal and aging shall be formed by machining operations only.

FIGURE 4—PREFERRED MATERIAL FOR NUTS, THEIR MARKING DESIGNATIONS, AND PIN IDENTIFIERS (CONTINUED)

3.3 Dimensional Requirements for ASTM Fasteners—The dimensional requirements for a particular fastener are based on the applicable ASME configuration as identified in the particular ASTM fastener standard. The ASME dimensional standards associated with the particular ASTM fastener standards for which part numbers are established may be found in the applicable ASTM standard and in SAE J2280.

3.3.1 LENGTHS OF FASTENERS—Lengths shall be restricted to those lengths identified in the applicable dimensional standards. When guidance is not provided in the dimensional standard, the length shall be limited to the increments in Table 2:

TABLE 2—INCREMENTS

Units	Screw Length	Length Increments
Metric	0 to 20 mm	2 mm
	25 to 100 mm	5 mm
	110 to 200 mm	10 mm
	220 mm and longer	20 mm
Inch	0 to 1.5 in	0.125 in
	1.75 to 5.0 in	0.250 in
	5.50 and longer	0.500 in

3.3.2 DIAMETERS OF FASTENERS—Diameters shall be restricted to those identified in the applicable dimensional standards. For new design, diameters should be restricted to the following sizes when possible:

a. Metric—M1, M2, M3, M4, M5, M6, M8, M10, M12, M16, M20, M24, M30, M36, M42, M48

Note—The part numbering system does not accommodate metric sizes M1.2, M1.6, M2.5 and other intermediate nonpreferred metric diameters.

b. Inch—1/8, 3/16, 1/4, 5/16, 3/8, 1/2, 5/8, 3/4, 7/8, 1, 1-1/8, 1-1/4, 1-3/8, 1-1/2, 1-3/4, 2

3.3.3 Thread types and fits shall be restricted to those identified in applicable dimensional standards. (See also SAE J2280 for recommendations.)

3.4 Coating Requirements—Coatings shall be limited to those identified for the applicable material standards in Figures 2 and 4. The requirements for the applicable coatings are as follows:

3.4.1 ZINC COATINGS AND ELECTROPLATING

3.4.1.1 Zinc (Hot Dip Galvanized) Coatings—Hot-dip galvanized coating shall be in accordance with ASTM A 153 with thickness and other requirements per the applicable ASTM fastener standard. See the applicable fastener standard for details on dimensions and nut requirements.

3.4.1.2 Mechanically Deposited Zinc—Mechanically deposited zinc coatings shall be in accordance with ASTM B 695 and with the thickness and other requirements per the applicable ASTM fastener standard. These thicker coatings require nuts with oversize internal threads. See the applicable fastener standard for details on dimensions and nut requirements.

3.4.1.3 Electrodeposited Zinc Coatings—Electrodeposited zinc shall be in accordance with ASTM B 633 and as provided herein. The finish shall be Type II unless otherwise approved by the purchaser. A specific coating class should not be specified. Rather the coating shall be to a thickness of 1/6 the allowance of ASME B1.1 or ASME B1.13 as applicable.

3.4.2 BLACK OXIDE COATINGS—Black oxide coatings shall be in accordance with SAE AMS 2485.

3.4.3 COATINGS FOR TITANIUM FASTENERS—Fasteners of titanium alloy shall be anodized in accordance with SAE AMS 2487 (except testing requirements may be negotiated between manufacturer and coating supplier) and then coated with a molybdenum disulfide dry film lubricant in accordance with SAE AS1701, Class I.

3.4.4 PASSIVATION—All corrosion-resistant steel fasteners shall be passivated in accordance with the applicable fastener standard.

3.5 Identification of Part Numbering System on Drawings—On drawings where a column exists for identifying the manufacturer or his Commercial and Government Entity (CAGE) Code, indicate the CAGE Code "81343/J2295" or "SAE J2295" as required by the drawing standard. If no column exists or there is space only for the 5-digit CAGE Code, then a note must indicate that the part numbers are defined in SAE J2295. This is necessary since reference to the applicable ASTM standard will not explain the part identifying number.

4. Notes—This section contains information of a general or explanatory nature that may be helpful, but is not mandatory.

4.1 Intended Use—This document is intended to provide guidance in the selection of fasteners with part or identifying numbers established by industry and military part standards. It also establishes part or identifying numbers for selected materials from ASTM fastener standards often needed for use in ship systems and equipment. While this part numbering system was developed specifically for ship systems and equipment, its use is not restricted to these applications.

4.2 Quality Assurance—This part numbering system does not invoke any particular level of quality assurance. The ordering document must address quality assurance requirements. Many of the ASTM standards have supplementary requirements which apply only when specified by the purchaser in the contract or order. SAE J2280 Appendix A identifies additional test/inspection requirements that are to be applied when SAE J2280 Appendix A is contractually invoked, such as for most military procurements.

4.3 Key words—Fasteners, bolts, nuts, screws, part or identifying numbers

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APPENDIX A
SELECTED PART STANDARDS FOR METRIC FASTENERS

A.1. Scope—This Appendix identifies metric fastener part standards with part or identifying numbers (PINs) which may be used to identify fasteners for ship systems and equipment. Selection of fasteners herein shall be in accordance with SAE J2280 and other invoked requirements. Selection is not limited to the standards identified herein as identified in the basic document.

A.2. Hex Head Cap Screws

A.2.1 ASME B18.2.3.1M covers cadmium and zinc-plated Grade 10.9 alloy steel plain, drilled head and self-locking hex head cap screws in diameters from M5 through M100.

A.3. Socket Head Cap Screws

A.3.1 ASME B18.3.1M covers cadmium, black oxide and zinc-coated alloy steel, property class 12.9 and CRES socket head hex drive cap screws with optional self-locking features in diameters from M3 to M16 and similar flat countersunk head hex drive cap screws in diameters from M3 to M20.

NOTE—Zinc-coated socket head cap screws of property class 12.9 should not be used due to susceptibility to stress corrosion cracking.

A.4. Hex Head Machine Bolts

A.4.1 ASME B18.2.3.5M covers cadmium- and zinc-plated alloy steel (10.9) drilled or self-locking bolts with diameters from M5 through M100.

A.4.2 ASME B18.2.3.6M covers cadmium- and zinc-plated alloy steel (10.9) heavy hex, drilled or self-locking bolts in diameters from M12 to M36.

A.4.3 ASME B18.2.3.7M covers plain- and zinc-coated carbon steel (8.8) heavy hex structural bolts in diameters from M16 to M36.

A.5. Metric Machine Screws (Optional head types)

A.5.1 ASME B18.6.7M covers cadmium- and zinc-coated alloy steel and CRES (A1-50) screws in diameters from M2 to M12.

A.6. Metric Hex Screws

A.6.1 ASME B18.2.3.4M covers cadmium and zinc-coated alloy steel (10.9) plain, drilled and self-locking flange screws in diameters from M5 through M16.

A.6.2 ASME B18.2.3.9M covers cadmium- and zinc-coated alloy steel (10.9) plain, drilled and self-locking heavy hex flange screws in diameters from M10 through M20.

A.6.3 ASME B18.2.3.2M covers cadmium- and zinc-coated alloy steel (10.9) plain, drilled and self-locking formed screws in diameters of M5 through M24.

A.6.4 ASME B18.2.3.3M covers cadmium- and zinc-coated alloy steel (10.9) plain, drilled and self-locking heavy hex screws in diameters M12 through M36.

A.7. Metric Lag Screws

A.7.1 ASME B18.2.3.8M covers zinc and uncoated steel lag screws in diameters M5 through M24.

A.8. Metric Studs—DOD-S-63543 is a general specification covering metric threaded rods and studs. DOD-S-63543/2 covers threaded rod which can be used to manufacture continuously threaded studs of steel, brass, and CRES.

A.8.1 DOD-S-63543/1 covers cadmium- and zinc-plated plain studs of alloy steel, black-oxide coated brass, and CRES in diameters from MJ4 through MJ48.

A.8.2 DOD-S-63543/3 covers cadmium- and zinc-plated continuously threaded studs of alloy steel, black oxide coated brass and CRES in diameters from MJ2 through MJ64.

A.8.3 DOD-S-63275/1 covers cadmium-plated alloy steel and corrosion- and heat-resistant steel (CHRES 718) non-continuously threaded with nut end threads in sizes from M5 to M14 and with set end threads from M8 to M20.

A.8.4 SAE J2271M covers continuous and double end studs of various materials in sizes M6 through M36.

A.9. Metric Plain Hexagon Nuts

A.9.1 ASME B18.2.4.1M covers two styles of cadmium- and zinc-plated carbon steel (property classes 10 and 5) in diameters from M1.6 through M36.

A.9.2 ASME B18.2.4.5M covers cadmium- and zinc-coated carbon steel (property class 10) jam nuts in sizes M3 through M36.

A.9.3 ASME B18.2.4.6M covers cadmium- and zinc-coated steel (10S and 10S3) heavy hex nuts in sizes M12 through M100.

A.9.4 ASME B18.2.4.5M covers cadmium- and zinc-coated carbon steel (property classes 9 and 12) jam nuts in sizes M5 through M36.

NOTE—The property class 12, zinc-plated nuts are not recommended in ship systems.

A.10. Metric Slotted Hex Nuts

A.10.1 ASME B18.2.4.3M covers cadmium- and zinc-coated carbon steel (10) slotted hex nuts in diameters from M5 through M36.

A.11. Metric Hex Flange Nuts

A.11.1 ASME B18.2.4.4M covers cadmium- and zinc-coated carbon steel (10) flange hex nuts in diameters from M5 through M20.

A.12. Metric Washers

A.12.1 ASME B18.22M covers steel uncoated, cadmium- and zinc-coated, and hot-dip galvanized steel washers in soft condition for diameters M1.6 to M36 and in hardened condition for diameters from M6 to M36.

A.13. Metric Lock Washers

A.13.1 ASME B18.21.2M covers helical and toothed lock washers in steel, CRES, aluminum-zinc, phosphor bronze, silicon bronze, and nickel-copper-aluminum materials.

A.14. Metric Square Neck Bolts

A.14.1 ASME B18.5.2.1M covers cadmium- and zinc-plated alloy steel (10.9) round head, short square neck bolts in diameters from M6 through M20.

A.14.2 ASME B18.5.2.2M covers cadmium- and zinc-plated alloy steel (9.8) round head square neck bolts in diameters from M5 through M16 and similar alloy steel (8.8) bolts in diameters M20 through M24.

A.15. Metric Set Screws

A.15.1 ANSI B18.3.6M covers cadmium-plated alloy steel and CRES plain and self-locking set screws in cup, cone and flat styles in diameters from M2 through M12.

A.16. Metric Locked in Inserts

A.16.1 DOD-I-63276/1 covers cadmium-plated alloy steel and corrosion- and heat-resistant (CHRES A286) inserts with internal diameters of MJ5 through MJ14.

A.17. Notes—This section contains information of a general or explanatory nature that may be helpful, but is not mandatory.

A.17.1 Documents listed solely in this Appendix may not be listed as references in the basic document since the titles do not convey information that is not already provided in the text in this Appendix. The reference section of the basic document does provide addresses for the issuing organizations.

A.17.2 Users are cautioned that fasteners to some part identification numbers covered by the listed standards may not be readily available from manufacturers.

APPENDIX B
SELECTED PART STANDARDS FOR INCH TYPE FASTENERS

B.1. Scope—This Appendix identifies inch type fastener part standards with part or identifying numbers (PINs) which may be used to identify fasteners for ship systems and equipment. Selection of fasteners herein shall be in accordance with SAE J2280 and other invoked requirements. Selection is not limited to the standards identified herein as identified in the basic document.

B.2. Hex Head Cap Screws

B.2.1 Part numbers for a wide selection of materials to ASTM fastener standards are identified in the basic document.

B.2.2 ASME B18.2.1 provided part numbers for Grade 8 strength zinc-coated steel fasteners and supersedes equivalent military standards.

B.2.3 MS35309 and MS35310 cover hex head caps screws of naval brass in UNC-2A and UNF-2A thread, respectively, for diameters from 0.250 to 1.250 in. MS 35311 covers Nickel-Copper fasteners of UNC-2A configurations in diameters from 0.250 to 1.250 in.

B.3. Socket Head Cap Screws

B.3.1 NAS 1351 and NAS 1352 cover CRES, alloy steel, and heat- and corrosion-resistant steel (A286) in UNRF-3A and UNRC-3A configurations, respectively. See Figure B1 for a synopsis of the part numbering system and strengths. See the applicable part standard for detailed dimensions and requirements.

B.3.2 Part numbers for a wide selection of materials to ASTM fastener standards are identified in the basic document.

B.4. Screw, Machine, Flat Head, 82 Degrees

B.4.1 Part numbers for a wide selection of materials to ASTM fastener standards are identified in the basic document.

B.4.2 MS16219 covers non-magnetic CRES 300 series screws with UNC-2A threads in diameters from 0.250 to 0.750 in.

B.4.3 MS24671 covers CRES 300 series screws with UNC-3A threads in diameters from 0.112 to 0.750 in. MS51959 covers passivated and black-oxide coated screws with UNC-2A threads in 0.066 to 0.375 in diameter. MS51960 covers passivated and black-oxide coated screws with UNF-2A threads and optional self-locking elements in diameters from 0.060 to 0.750 in.

B.5. Screw Machine, Pan Head

B.5.1 NAS 1635 covers plain and self-locking passivated and black-oxide coated pan head screws in diameters from 0.060 to 0.375 in.

B.5.2 MS51492 covers zinc-plated carbon steel pan head capscrews with UNF-2A threads in diameters from 0.112 to 0.250 in. MS51957 and MS51958 cover passivated and black-oxide coated screws with UNC-2A and UNF-2A thread, respectively, for diameters through 0.375 in.

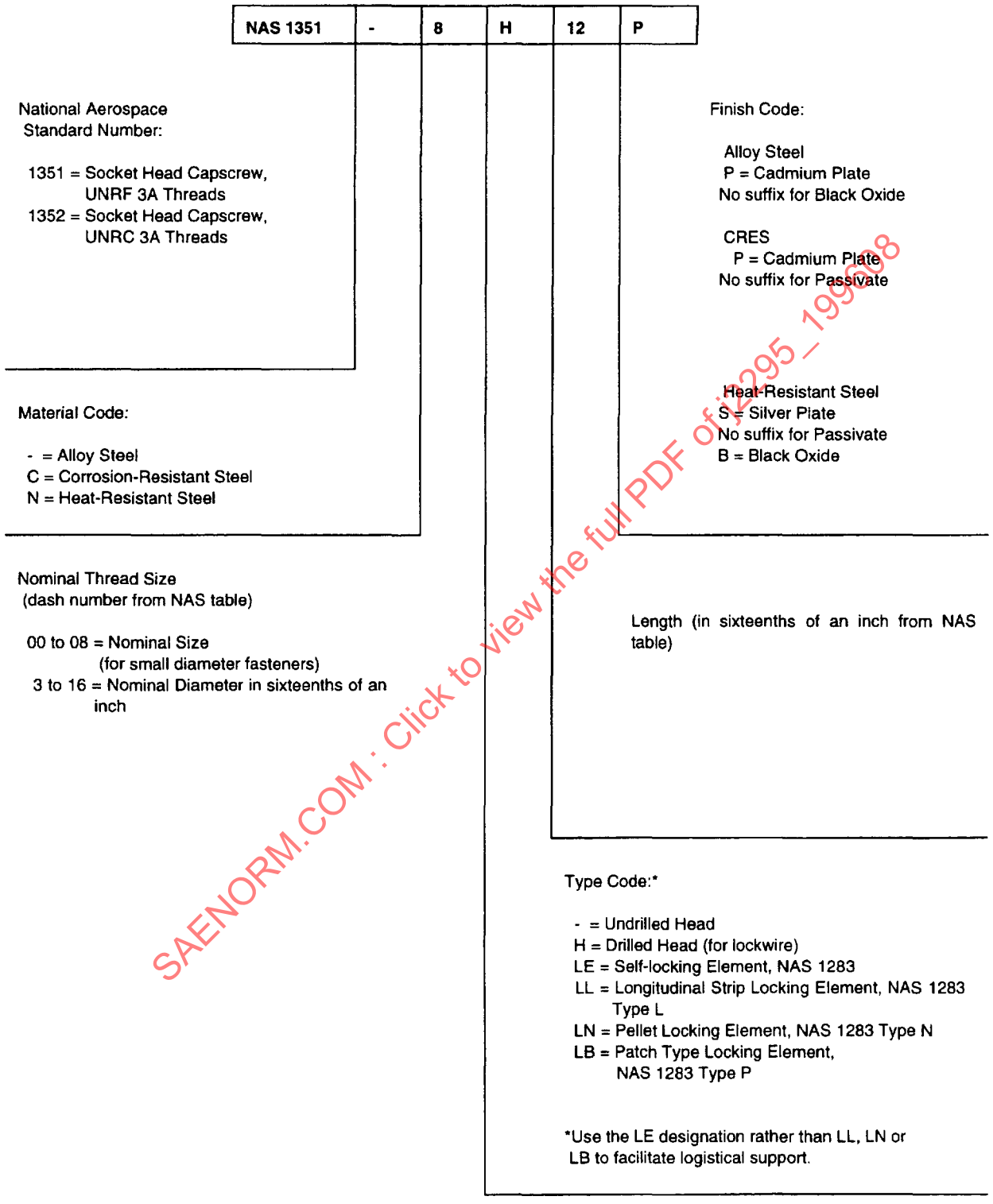

FIGURE B1—NAS 1351 AND NAS 1352 PART NUMBERING SYSTEMS FOR SOCKET HEAD CAPSCREWS

B.6. Studs

B.6.1 SAE J2271 covers continuous and double end inch studs in a number of ferrous and non-ferrous alloys in UNC and 8UN threads in diameters from 0.250 to 2.000 in. SAE J2271 also covers studs with tap end interference fit NC5HFS threads.

B.6.2 Military Stud Standards—MS51864 covers double end studs in cadmium plated steel, brass, 300 series CRES and nickel-copper with UNF threads on one end and interference fit threads on the other end in diameters from 0.250 in to 1.250 in. MS16187 covers ASTM A 193 B16 steel continuously threaded studs with UNC-3A threads from 0.250 to 0.875 in diameters and 8UN-2A threads from 1.00 to 2.500 in diameter.

B.7 Nut, Plain, Hexagon

B.7.1 Part numbers for a wide selection of materials to ASTM fastener standards are identified in the basic document.

B.7.2 MS9356 covers corrosion- and heat-resistant steel nuts with UNJF-3B threads in diameters from 0.112 to 1.00 in.

B.7.3 MS16203 covers non-magnetic, copper-silicon (651) and phosphorous bronze, plain and jam nuts in these materials in diameters from 0.250 to 1.375 in.

B.7.4 MS16285 and MS16286 covers heavy hex and standard hex nuts, respectively, of ASTM A193 Grade 4 steel in UNC-2B and 8UN-2B thread configurations for diameters from 0.250 to 3.000 in.

B.7.5 MS35649 and MS35650 cover carbon steel, 300 Series CRES, copper-silicon (651) and brass nuts in UNC-2B and UNF-2B threads, respectively, for diameters up to 0.625 in. Ni-Cu is currently proposed to be added by revision. MS 35691 covers jam nuts of these materials in UNC-2B and UNF-2B threads for diameters from 0.250 to 3.000 in.

B.8 Nut, Self-locking, Hexagon

B.8.1 MS17828 is being revised to cover regular UNC-3B and UNF-3B copper-nickel hex nuts in diameters from 0.112 in to 1.50 in. MIL-N-25027/1 covers heavy hex copper-nickel nuts with UNJC-3B threads in diameters up to 2.500 in for both 250 °F and 450 °F maximum temperatures.

B.8.2 MS17829 covers both cadmium- and zinc-plated alloy steel self-locking nuts in UNC-3B and UNF-3B threads in diameter from 0.112 to 2.500 in.

B.8.3 MS17830 covers 300 series CRES nuts for UNC-3B threads in diameters between 0.112 and 2.500 in. MS 21044 covers aluminum, steel, brass, and CRES nuts for UNJC-3B threads for diameters of 0.112 to 0.164 in and UNJF-3B threads for diameters of 0.190 to 1.250 in.

B.8.4 MS51922 covers UNC-2B and UNF-2B threads in diameters through 1.00 inch for brass and 1.50 in for aluminum.

B.9 Washer, Flat, Round

B.9.1 NAS 1149 offers the widest choice of materials, sizes and coatings. Figure B2 provides a synopsis of the part numbering system. For a complete listing of dimensions and requirements refer to the standard rather than Figure B2.

B.9.2 NAS 620 covers reduced outside diameter washers in CRES, carbon steel and aluminum. The use of reduced diameter washers should be avoided for new design.

B.9.3 MS15795 covers washers of aluminum alloy, 300 Series CRES, and Nickel-Copper Alloy in diameters from 0.078 to 3.125 in.

B.9.4 MS16212 covers Copper-Silicon (Alloy 651) and 300 Series CRES washers in diameters from 0.164 to 1.500 in.

B.9.5 MS51412 covers zinc-plated carbon or alloy steel in diameters from 0.109 to 2.625 in.

B.10. Washer, Recessed, Countersunk, One Surface

B.10.1 NAS 1587 covers CRES washers from 0.190 to 1.250 in in diameter.

B.10.2 MS20002 covers cadmium-plated alloy steel washers 0.250 to 1.500 in in diameter.

B.11. Washer, Lock

B.11.1. Internal Tooth Lockwashers

B.11.1.1 MS35333 cover internal tooth, flat lockwashers of Carbon Steel, 300 Series CRES, Tin Brass/Phosphor Bronze materials in diameters from 0.086 to 1.250 in.

B.11.1.2 MS35334 covers heavy internal tooth, flat lockwashers of cadmium plated carbon steel in diameters of 0.250 to 0.875 in.

B.11.2 External Tooth Lockwashers

B.11.2.1 MS35335 covers flat external tooth lockwashers in carbon steel, CRES, Tin Brass or Phosphor Bronze in diameters from 0.112 to 1.000 in.

B.11.2.2 MS45904 covers 100 degrees countersunk external tooth washers in cadmium plated carbon steel.

B.11.3 Internal and External Tooth Lock Washers

B.11.3.1 MS45904 covers these lockwashers in cadmium-plated steel in diameters from 0.086 to 0.625 in.

B.11.4 Helical Spring Lockwashers

B.11.4.1 MS35338 covers carbon steel, CRES 300 series and Nickel-Copper-Aluminum helical spring lockwashers in diameters from 0.086 to 1.500 in. CRES 316 is covered in diameters to 0.250 in.

B.11.4.2 MS51415 covers zinc-coated carbon steel helical spring lockwashers in diameters from 0.138 to 1.250 in.