FF-P-395B
October 15, 1973
SUPERSEDING
Fed. Spec. FF-P-395A
January 10, 1966

FEDERAL SPECIFICATION

PIN, DRIVE, GUIDED AND PIN DRIVE, POWDER ACTUATED (FASTENERS FOR POWDER ACTUATED AND HAND ACTUATED FASTENING TOOLS)

This specification was approved by the Commissioner, Federal Supply Service, General Services Administration, for the use of all Federal agencies.

1. SCOPE AND CLASSIFICATION

1.1 Scope. This specification covers threaded studs, drive pins, and eye pins for powder actuated tools and hand actuated tools.

1.2 Classification. Fasteners covered by this specification shall be the following types, classes and styles, as specified (see 6.2):

Types; each type describes fasteners for use with:

I - Direct-acting (gas driven, no piston) high velocity tools.
II - Indirect-acting (piston driven) low and medium velocity tools.
III - Hand driven tools.
IV - Special.

Classes; by fastener guide bore diameter (see 6.4):

1 - 0.251-0.261 inch (6.37-6.63 mm).
2 - .313- .330 inch (7.95-8.38 mm).
3 - .340- .345 inch (8.64-8.76 mm).
4 - .376- .390 inch (9.55-9.91 mm).
5 - .392- .400 inch (9.96-10.2 mm).

Styles; drive pins and studs for concrete and steel:

PC - Drive pin for concrete.
PS - Drive pin for steel.
SC - Threaded stud for concrete.
SS - Threaded stud for steel.
EP - Eye pin for concrete and steel.

2. APPLICABLE DOCUMENTS

2.1 The following documents, of the issues in effect on the date of invitation for bids or request for proposal, form a part of this specification to the extent specified herein:

Federal Specification:

PPP-H-1581 - Hardware (Fasteners and Related Items) Packaging and Packing for Shipment and Storage of.

Federal Standard:

Fed. Std. No. 123 - Marking for Domestic Shipment (Civil Agencies).

FSC 5315

(Activities outside the Federal Government may obtain copies of Federal Specifications, Standards, and Handbooks as outlined under General Information in the Index of Federal Specifications and Standards and at the prices indicated in the Index. The Index, which includes cumulative monthly supplements as issued, is for sale on a subscription basis by the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.

(Single copies of this specification and other Federal Specifications required by activities outside the Federal Government for bidding purposes are available without charge from Business Service Centers at the General Services Administration Regional Offices in Boston, New York, Washington, DC, Atlanta, Chicago, Kansas City, MO, Fort Worth, Denver, San Francisco, Los Angeles, and Seattle, WA.

(Federal Government activities may obtain copies of Federal Specifications, Standards, and Handbooks and the Index of Federal Specifications and Standards from established distribution points in their agencies.)

Military Standards:

MIL-STD-105 - Sampling Procedures and Tables for Inspection by Attributes.
MIL-STD-129 - Marking for Shipment and Storage.

(Copies of Military Specifications and Standards required by suppliers in connection with specific procurement functions should be obtained from the procuring activity or as directed by the contracting officer.)

2.2 Other publications. The following documents form a part of this specification to the extent specified herein. Unless a specific issue is identified, the issue in effect on date of invitation for bids or request for proposal shall apply.

National Bureau of Standards (NBS) Handbook:

H28 - Screw-Thread Standards for Federal Services.

(Application for copies should be addressed to the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.)

American Society for Testing and MAterials (ASTM) Standards:

A 283 - Specification for Low and Intermediate Tensile Strength Carbon Steel Plates
B 499 - Method for Measurement of Coating Thickness by the Magnetic: Nonmagnetic Coatings on Magnetic Basis Metals.
B 504 - Method for Measuring the Thickness of Metallic Coatings by the Conlometric Method.
E 18 - Methods of Test for Rockwell Hardness and Rockwell Superficial Hardness of Metallic Materials.

(Application for copies should be addressed to the American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103.)

National Motor Freight Traffic Association, Inc., Agent:

National Motor Freight Classification.

(Application for copies should be addressed to the American Trucking Association, Inc., Tariff Order Section, 1616 P Street, N.W., Washington, DC 20036.)

Uniform Classification Committee, Agent:

Uniform Freight Classification.

(Application for copies should be addressed to the Uniform Classification Committee, Room 1106, 222 South Riverside Plaza, Chicago, IL 60606.)

3. REQUIREMENTS

3.1 Material.

3.1.1 Fasteners. Unless otherwise specified (see 6.2), all fasteners shall be formed from steel wire. The type of steel shall be at the manufacturer's option.

3.1.2 Retention comments. Unless otherwise specified (see 6.2), material for retention components shall be at the manufacturer's option.

3.2 Thermal treatment. All fasteners shall be heat treated to a core hardness of not less than Rc 48 (see 4.4.1).

3.3 Threaded studs. All threaded studs shall have threads in accordance with NBS H28, part I.

3.4 Fastener retention. Each fastener shall be provided with a suitable tip or means for holding or retaining the fastener in the specified class of driver guide bore preparatory to driving (see 4.4.2.1 and 4.4.2.2).

3.5 Dimensions and configuration. Dimensions and configuration of fasteners shall be in accordance with tables IV to XXII and figures 1 to 19, as specified (see 6.2).

3.6 Finish. Fasteners shall be zinc coated. Thickness of zinc shall be 0.00015 inch (0.00381 mm) or greater (see 4.4.3).

3.7 Performance

3.7.1 Bend requirements. Fastener shanks shall be capable of bending a minimum of 30 deg. without fracturing when tested in accordance with 4.4.4.

3.7.2 Drive performance. Type I direct driven fasteners shall be capable of penetrating a 3/8 inch (9.5 m) thickness of steel, and type II Indirect driven fasteners shall be capable of penetrating a 3/16 inch (4.8 mm) thickness of steel. Threaded studs shall be such that a nut with class 2B thread runs on freely after the stud is driven (see 4.4.5)

3.8 Type IV, special. This type of fastener is defined as any type which does not fall within the other types, classes and styles of this specification, but the materials, workmanship, and quality shall meet the applicable provisions of this specification.

3.9 Workmanship. All fasteners shall be free from any imperfections which would impair their serviceability or result in hazardous conditions under normal operating conditions.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in the contract or purchase order, the supplier is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified, the supplier may utilize his own facilities or any commercial laboratory acceptable to the Government. The Government reserves the right to perform any of the inspections set forth In the specification where such inspections are deemed necessary to assure that supplies and services conform to prescribed requirements.

4.2 Sampling for examination and tests. Inspection levels and acceptable quality levels (AQL's) shall be in accordance with MIL-STD-105.

4.2.1 Lot. Unless otherwise specified (see 6.2), a lot shall consist of

each type, style and class of fasteners offered for delivery at the same time.

4.2.2 Sampling for dimensional and visual examination. Fasteners shall be examined for the characteristics listed In table I In accordance with level S-3 and an AQL of 2.5 percent defective for major defects and 4.0 percent defective for minor defects.

TABLE I. Classification of defects, end item

Defects	Major	Minor
Type, style and class not as specified.	x	
Dimensions and shape of fasteners and retention means not as specified.	x	
Shank and head dimensions of fasteners not within tolerance.	x	
Fasteners not free from pits, burrs, or cracks.	x	
Coating on fasteners missing	x	
Threads on studs not in accordance with NBS H28, part 1.	x	
Damage or defects affecting function or serviceability.	x	
Damage or defects not affecting function or serviceability.		x

4.2.3 Dimensional measurements. Measure diameter of pins and studs and thickness of washers using a micrometer. Measure length of pins and studs using a scale or rule graduated in 1/32 inch (0.794 mm.) increments (see figures 1 to 19 and tables IV to XXII).

4.2.4 Sampling and Quality levels for tests. Sampling for tests shall be in accordance with level S-2. The AQL for tests shall 6.5 percent defective.

4.3 Examination of preparation for delivery. An inspection shall be made to determine that the packaging, packing, and marking requirements comply with section 5. Defects shall be scored in accordance with table II. For examination of contents the sample unit shall be one shipping container fully prepared for delivery selected just prior to the closing operations. Sampling shall be in accordance with MIL-STD-105. Defects of closure listed shall be examined on shipping containers fully prepared for delivery. The lot size shall be the number of shipping containers in the end item inspection lot. The inspection level shall be II and the AQL shall be 6 defects per hundred units.

TABLE II. Classification of preparation for delivery defects

Examine	Defects
Markings (exterior and interior)	Omitted, incorrect, illegible, improper size, location, sequence, or method of application.
Materials	Any component missing or damaged.
Workmanship	Inadequate application of components such as incomplete closure of container flaps, loose strapping, or inadequate stapling. Bulging or distortion of container.

4.4 Test methods.

4.4.1 Hardness. Test one half of the samples selected in accordance with 4.2.4 on a Rockwell hardness test unit in accordance with ASTM E 18, or using

a metal comparator with a properly selected and calibrated test coil, or other instrument of equal sensitivity. When determining hardness on curved surfaces remove only the necessary minimum amount of steel at the point of measurement, check core hardness (Rc) at the center of a section at mid shank taken perpendicular to the axis of the fastener (see 3.2).

4.4.2 Penetration tests.

4.4.2.1 Specimens. Test every one of 10 sample fasteners selected in accordance with 4.2.4.

4.4.2.2 Retention tests. Insert fasteners in their respective class bore diameter. Observe whether fastener is retained in the tool (see 1.2 and 3.4).

4.4.3 Coating on fasteners. Determine thickness of zinc coat in accordance with ASTM B 499, B 504 or other acceptable methods (see 3.6).

4.4.4 Bend tests. Test one of every ten sample fasteners selected in accordance with 4.2.4. Bend fasteners over a mandrel equal to the diameter of the fastener under test. A specimen taken from the same lot of wire used to form fasteners and heat treated the same as for the fasteners may be used for the bend test (see 3.7.1).

4.4.5 Drive test. Drive fastener into the specified thickness of steel plate conforming to grade A in ASTM A 283. Fasteners having a shank length of one inch or more may be driven through a piece of hardwood prior to entering the steel. The wood thickness shall be such that not less than 1/2 inch (13 mm) of the shank enters the steel. Turn a nut on threaded fasteners (see 3.7.2).

5. PREPARATION FOR DELIVERY

5.1 Preservation, packaging and packing. Unless otherwise stipulated by the procuring activity, preservation, packaging and packing shall be in accordance with the applicable requirements of PPP-H-1581, as specified (see 6.2).

5.1.1 Preservation and packaging. Preservation and packaging shall be level A, B, or C, in accordance with PPP-H-1581, as specified (see 6.2).

5.1.2 Packing. Packing shall be level A, B, or C, in accordance with PPP-H-1581, as specified (see 6.2).

5.2 Marking. Marking shall be in accordance with 5.2.1 or 5.2.2. as specified (see 6.2).

5.2.1 Civil agencies. In addition to any special markings required by the contract or order, all interior packages and shipping containers shall be marked in accordance with Fed. Std. No. 123.

5.2.2 Military agencies. In addition to any special markings required by the contract or order, all interior packages and shipping containers shall be marked in accordance with MIL-STD-129.

6. NOTES

6.1 Intended use. Fasteners covered by this specification are intended for various applications illustrated in figure 20.

6.2 Ordering data. Purchasers should select the preferred options permitted herein and include the following Information in procurement documents:

(a) Title, number, and date of this specification.
(b) Type, class and style (see 1.2, 6.4 and 6.5).
(c) Material, when required (see 3.1.1).
(d) Retention components, when required (see 3.1.2).
(e) Dimensions and configurations, fasteners (see 3.5, 6.3 and tables IV to XXII).
(f) Size of lot, if different from 4.2.1.
(g) Selection of applicable levels of preservation, packaging, and packing required (see 5.1)
(h) Marking for shipment (see 5.2).
(i) Knurled shanks on pins and studs, when required (see tables XIII to XX).

6.3 Fastener compatibility. When ordering fasteners for use in powder actuated tools make sure that the fasteners are compatible with the tool in type and class.

6.4 Guide bore diameter. Diameter of that part of the tool in which the fastener is retained prior to driving and guided while driven (see 1.2,

classes 1 to 5).

6.5 Classification and dimensional tables. Refer to table III which includes dimensional tables applicable to the various types, classes and styles.

TABLE III. Classification and dimensional tables

Types	Classes	Styles	Dimensional tables
I	1	PC, PS, SC, SS	IV, V, VI, VII
I	4	PC, PS, SC, SS, EP	VIII, IX, X, XI, XII
II	1-5	PC, PS, SC, SS	XIII, XIV
II	2-5	PC, PS, SC, SS	XV, XVI
II	3-5	PC, PS	XVII
II	4,5	PC, PS, SC, SS	XVIII, XIX
II	5	PC, PS	XX
III	1	PC, PS, SC	XXI, XXII

6.6 Cross reference data. Cross reference of classification changes between this specification and the preceding specification FF-P-395A dated January 10, 1966, and specification GGG-D-777B dated October 31, 1966, are as follows:

FF-P-395B	FF-P-395A	GGG-D-777B
Type I, classes 1 and 4		
Style PC	None	Style B
PS	None	A
SC	None	D
SS	None	C
EP	None	None
Type II, classes 1 to 5		
Style PC	Types I	None
PS	I	None
SC	II	None
SS	II	None
Type III, class 1		
Style PC	Types I	None
PS	I	None
SC	II	None
Type IV	None	Styles E to I

6.7 Metric equivalents. The metric equivalents to dimensional requirements are for information only, and are not intended to be used for determining acceptance or rejection of items otherwise conforming to the requirements of this specification.

MILITARY INTERESTS

Custodians:

Navy - YD
Air Force - 82

User activities:

Army - ME
Navy - CG

Preparing activity:

GSA-FSS

Civil Agency Coordinating Activities:

GSA-FSS

Military Coordinating Activity:

Navy - YD

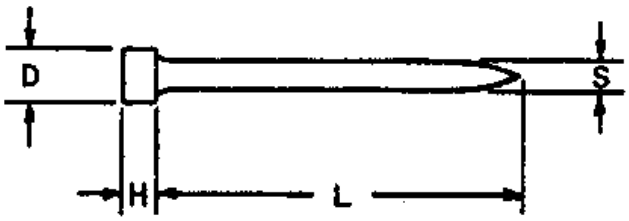


FIGURE 1

TABLE IV. Type I, class 1, style PC, direct-acting drive pin for concrete

Dimensions, figure 1							
L 1/		S 2/		D, maximum		H, minimum	
Inches	mm	Inch	mm	Inch	mm	Inch	mm
1-7/32	31.0	0.155	3.94	0.250	6.35	7/64	2.78
1-37/64	40.1	.155	3.94	.250	6.35	7/64	2.78
2	50.8	.155	3.94	.250	6.35	7/64	2.78
2-1/4	57.2	.155	3.94	.250	6.35	7/64	2.78
2-1/2	63.5	.155	3.94	.250	6.35	7/64	2.78
2-15/16	74.6	.155	3.94	.250	6.35	7/64	2.78
3-15/16	100.	.155	3.94	.250	6.35	7/64	2.78

1/ L dimension tolerance shall be plus or minus 1/8 inch (3.2 mm).
2/ S dimension tolerance shall be plus or minus 0.010 inch (0.254 mm).

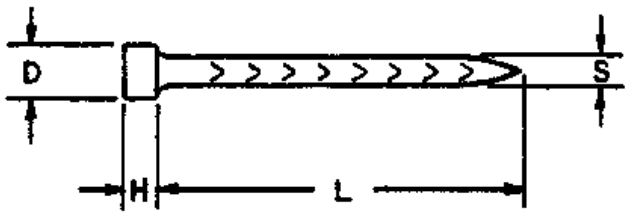


FIGURE 2

TABLE V. Type I, class 1, style PS, direct-acting drive pin for steel

Dimensions, figure 2							
L 1/		S 2/		D, maximum		H, minimum	
Inch	mm	Inch	mm	Inch	mm	Inch	mm
23/32	18.3	0.153	3.89	0.250	6.35	7/64	2.78

1/ Tolerance on L dimension shall be plus or minus 3/32 inch (2.4 mm).
2/ Tolerance on S dimension shall be plus or minus 0.008 inch (0.203 mm).

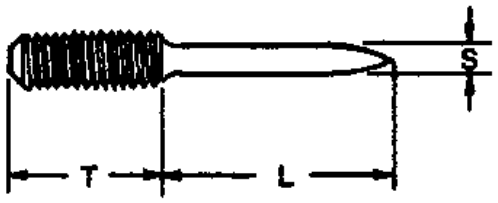


FIGURE 3

TABLE VI. Type I, class 1, style SC, direct-acting threaded stud for concrete

Dimensions, figure 3					
L 1/		T 2, 4/		S 3/	
Inches	mm	Inches	mm	Inch	mm
1	25.4	11/16	17.5	0.160	4.06
1-1/4	31.8	3/8	9.53	.160	4.06
1-1/4	31.8	1/2	12.7	.160	4.06
1-1/4	31.8	3/4	19.1	.160	4.06
1-1/4	31.8	1-1/16	27.0	.160	4.06
1-1/4	31.8	1-1/4	31.8	.160	4.06
1-1/4	31.8	1-7/8	47.6	.160	4.06

1/ L dimension tolerance shall be plus or minus 1/16 inch (1.6 mm).
2/ T dimension tolerance shall be plus or minus 1/8 inch (3.2 mm).
3/ S dimension tolerance shall be plus or minus 0.015 inch (0.381 mm).
4/ Threads shall be .250-20UNC-2A.

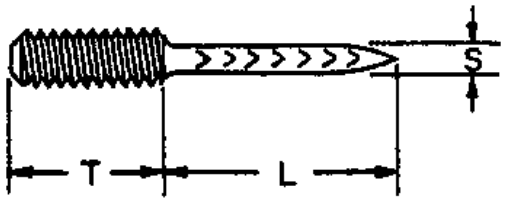


FIGURE 4

TABLE VII. Type I, class 1, style SS, direct-acting threaded stud for steel

Dimensions, figure 4					
L 1/		T 2,4/		S 3/	
Inch	mm	Inches	mm	Inch	mm
11/16	17.5	3/8	9.53	0.155	3.94
11/16	17.5	11/16	17.5	.155	3.94
11/16	17.5	1-1/8	28.6	.155	3.94
11/16	17.5	1-1/4	31.8	.155	3.94

1/ L dimension tolerance shall be plus or minus 5/64 inch (2.0 mm).
2/ T dimension tolerance shall be plus or minus 1/8 inch (3.2 mm).
3/ S dimension tolerance shall be plus or minus 0.010 inch (0.254 mm).
4/ Threads shall be .250-20UNC-2A.

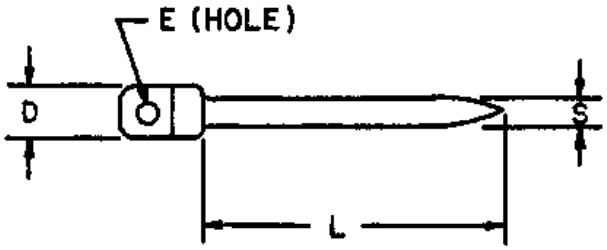


FIGURE 5

TABLE VIII. Type I, class 4, style EP, direct-acting eye pin for concrete or steel

Dimensions, figure 5							
L 1/		S 2/		D, maximum		E 3/	
Inch	mm	Inch	mm	Inch	mm	Inch	mm
1-1/4	31.8	0.185	4.70	0.375	9.52	0.185	4.70
1-1/2	38.1	.175	4.45	.375	9.52	.185	4.70

1/ L dimension tolerance shall be plus or minus 1/8 inch (3.2 mm).
2/ S dimension tolerance shall be plus or minus 0.010 inch (0.254 mm).
3/ E dimension tolerance shall be plus or minus 0.015 inch (0.381 mm).

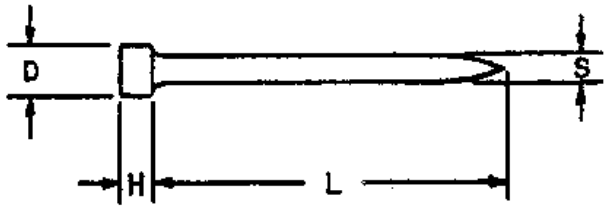


FIGURE 6

TABLE IX. Type I, class 4, style PC, direct-acting drive pin for concrete

Dimensions, figure 6							
L 1/		S 2/		D, maximum		H, minimum	
Inches	mm	Inch	mm	Inch	mm	Inch	mm
1-3/8	34.9	0.181	4.60	0.375	9.52	0.100	2.54
1-7/8	47.6	.181	4.60	.375	9.52	.100	2.54
2-5/16	58.7	.181	4.60	.375	9.52	.100	2.54
2-7/8	73.0	.181	4.60	.375	9.52	.100	2.54
1-5/8	41.3	.222	5.64	.375	9.52	11/14	4.37
1-25/32	45.2	.222	5.64	.375	9.52	11/64	4.37
2-1/16	52.4	.222	5.64	.375	9.52	11/64	4.37
2-5/16	58.7	.222	5.64	.375	9.52	11/64	4.37
2-25/32	70.6	.222	5.64	.375	9.52	11/64	4.37
3-3/16	81.0	.222	5.64	.375	9.52	11/64	4.37
3-1/2	88.9	.222	5.64	.375	9.52	11/64	4.37

1/ L dimension tolerance shall be plus or minus 3/16 inch (4.8 mm).
2/ S dimension tolerance shall be plus or minus 0.012 inch (0.305 mm).

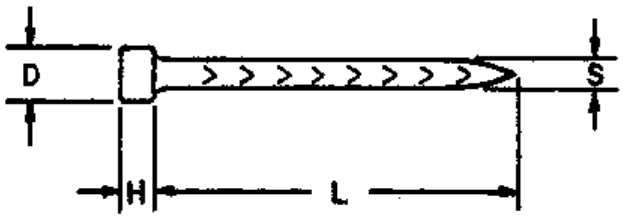


FIGURE 7

TABLE X. Type I, class 4, style PS, direct-acting drive pin for steel

Dimensions, figure 7							
L 1/		S 2/		D, maximum		H, minimum	
Inches	mm	Inch	mm	Inch	mm	Inch	mm
1-3/16	30.2	0.215	5.46	0.375	9.52	11/64	4.37

1/ L dimension tolerance shall be plus or minus 1/8 inch (3.2 mm).
2/ S dimension tolerance shall be plus or minus 0.005 inch (0.125 mm).

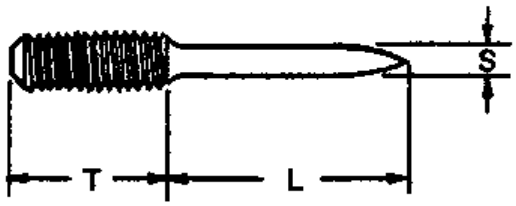


FIGURE 8

TABLE XI. Type I, class 4, style SC, direct-acting threaded stud for concrete

Dimensions, figure 8 1/			
L 2/		T 2,3/	
Inches	mm	Inches	mm
1-5/8	41.3	3/4	19.1
1-5/8	41.3	1-1/4	31.8
1-3/4	44.5	1	25.4
1-3/4	44.5	2-1/4	57.2
1-7/8	47.6	3/4	19.1
1-7/8	47.6	1-1/4	31.8
1-7/8	47.6	1-3/8	34.9
1-7/8	47.6	1-3/4	44.5
2	50.8	1	25.4
2-3/8	60.3	3/4	19.1
2-1/2	63.5	1-1/8	28.6

1/ S dimension for all studs shall be 0.215 or 0.250 inch (5.46 or 6.35 mm). Tolerance on S dimension shall be plus or minus 0.005 inch (0.127 mm).
2/ Tolerance on L and T dimensions shall be plus or minus 1/8 inch (3.2 mm).
3/ Threads shall be .375-16UNC-2A.

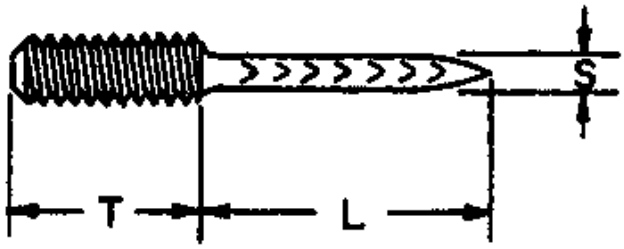


FIGURE 9

TABLE XII. Type I, class 4, style SS, direct-acting unreaded stud for steel

Dimensions, figure 9 1/			
L 2/		T 2,3/	
Inches	mm	Inches	mm
1-1/8	28.6	1-1/4	31.8
1-3/16	30.2	3/4	19.1
1-3/16	30.2	1	25.4
1-3/16	30.2	1-1/2	38.1
1-1/4	31.8	3/4	19.1

1/ S dimension shall be 0.215 or 0.250 inch (5.46 or 6.35 mm). Tolerance on S dimension shall be plus or minus 0.005 inch (0.127 mm).
2/ L and T dimensions, tolerance shall be plus or minus 1/8 inch (3.2 mm).
3/ Threads shall be .375-16UNC-2A.

Stud for Steel]

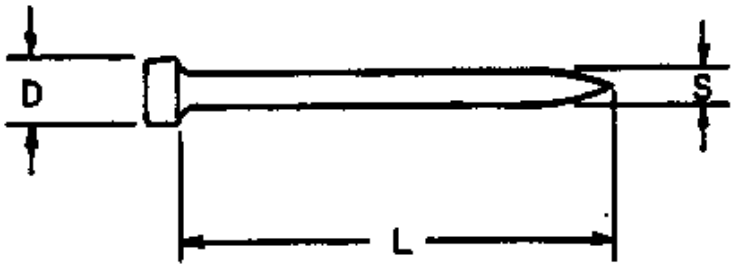


FIGURE 10

TABLE XIII. Type II, classes 1 to 5, style PC or PS, indirect-acting drive pin for concrete or steel 1/

Dimensions, figure 10 2,3/			
L 4/		L 4/	
Inch	mm	Inches	mm
1/2	12.7	1-1/4	31.8
3/4	19.1	1-1/2	38.1
1	25.4	2	50.8
		2-1/2	63.5
		3	76.2

1/ When specified (see 6.2), style PS drive pins shall be furnished with knurled shanks that increase holding capacity.
2/ S dimension for Drive pins 1/2 to 1 inch (12.7 to 25.4 mm) shall be 1/8 or 9/64 inch (3.18 or 3.57 mm). S dimension for drive pins 1-1/4 to 3 inches (31.8 to 76.2 mm) shall be 9/64 or 5/32 inch (3.57 or 3.97 mm). Tolerance on S dimension shall be plus or minus 0.008 inch (0.203 mm).
3/ D dimension for all drive pins shall be 0.250 in (6.35 mm). Tolerance on D dimension shall be minus 0.020 inch (0.508 mm).
4/ L dimension tolerance shall be plus or minus 1/8 inch (3.2 mm).

Indirect-Acting Drive Pin for Concrete or Steel]

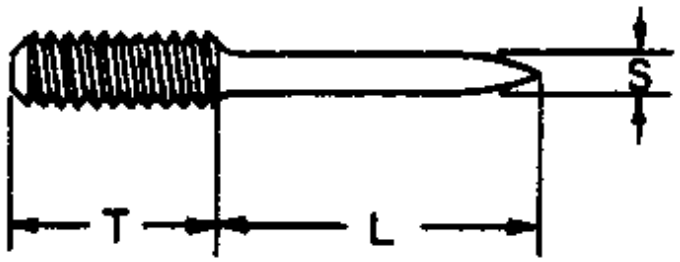


FIGURE 11

TABLE XIV. Type II, classes 1 to 5, style SC or SS, indirect-acting threaded stud for concrete or steel 1/

Dimensions, figure 11			
L 2,3/		T 3,4/	
Inches	mm	Inches	mm
3/4	19.1	1/4	6.4
3/4	19.1	1/2	12.7
3/4	19.1	3/4	19.1
3/4	19.1	1-1/2	38.1
1	25.4	1/4	6.4
1	25.4	1/2	12.7
1	25.4	3/4	19.1
1-1/4	31.8	1/4	6.4
1-1/4	31.8	1/2	12.7
1-1/4	31.8	3/4	19.1
1-1/4	31.8	1	25.4
1-1/4	31.8	1-1/4	31.8

1/ When specified (see 6.2), style SS studs shall be furnished with knurled shanks that increase holding capacity.
2/ S dimension for all studs shall be 9/64 or 5/32 inch (3.57 or 3.97 mm). Tolerance on S dimension shall be plus or minus 0.008 inch (0.203 mm).
3/ L and T dimensional tolerances shall be plus or minus 1/8 inch (3.2 mm).
4/ Threads shall be .250-20UNC-2A.

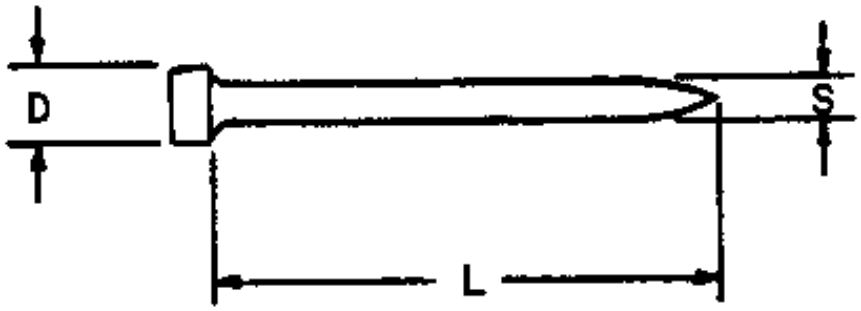


FIGURE 12

TABLE XV. Type II, classes 2 to 5, style PC or PS, indirect-acting drive pin for concrete or steel 1/

Dimensions, figure 12 2,3/			
L		L	
Inch	mm	Inches	mm
1/2	12.7	1-1/4	31.8
3/4	19.1	1-1/2	38.1
1	25.4	2	50.8
		2-1/2	63.5
		3	76.2

1/ When specified (see 6.2), style PS drive pins shall be furnished with knurled shanks that increase holding capacity.
2/ S dimension shall be 1/8 or 9/64 inch (3.18 or 3.57 mm) for drive pins having L dimension of 1/2 to 1 inch (12.7 to 25.4 mm), and S dimension shall be 9/64 or 5/32 inch (3.57 or 3.97 mm) for L dimensions of 1-1/4 to 3 inches (3.18 to 76.2 mm). Tolerance for S dimension shall be plus or minus 0.008 inch (0.203 mm).
3/ D dimension for all drive pins shall be 0.302 inch (7.76 mm). Tolerance on D dimension shall be plus or minus 0.010 inch (0.254 mm).
4/ L dimension tolerance shall be plus or minus 1/8 inch (3.2 mm).

Indirect-Acting Drive Pin for Concrete or Steel]

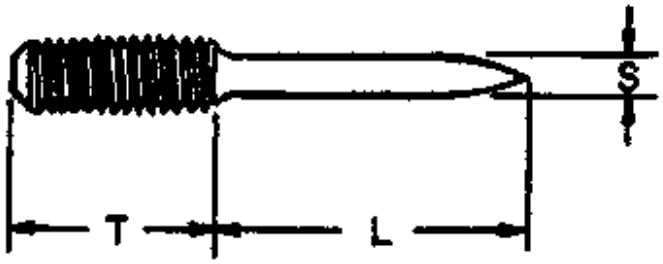


FIGURE 13

TABLE XVI. Type II, classes 2 to 5, style SC or SS, indirect-acting threaded stud for concrete or steel 1/

Dimensions, figure 13			
L 2,3/		T 3,4/	
Inches	mm	Inch	mm
9/16	14.3	3/4	19.1
1-1/16	27.0	3/4	19.1
1-1/4	31.8	3/4	19.1
1-5/8	41.3	3/4	19.1
2-1/16	52.4	3/4	19.1

1/ When specified (see 6.2), style SS studs shall be furnished with knurled shanks that increase holding capacity.
2/ S dimension for studs shall be 0.177 inch (4.50 mm). Tolerance on S dimension shall be plus or minus 0.008 inch (0.203 mm).
3/ L and T dimensional tolerances shall be plus or minus 1/8 inch (3.2 mm).
4/ Threads shall be .312-18UNC-2A.

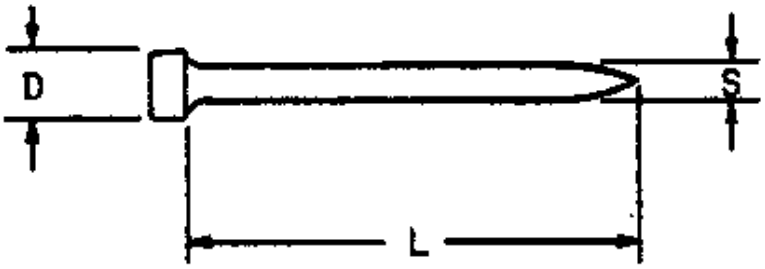


FIGURE 14

TABLE XVII. Type II, classes 3, 4 and 5, styles PC or PS, indirect-acting drive pin for concrete or steel 1/

Dimensions, figure 14 2,3/			
L		L	
Inches	mm	Inches	mm
1/2	12.7	1-1/2	38.1
3/4	19.1	2	50.8
1	25.4	2-1/2	63.5
1-1/4	31.8	3	76.2

1/ When specified (see 6.2), style PS drive pins shall be furnished with knurled shanks that increase holding capacity.
2/ S dimension shall be 1/8 or 9/64 inch (3.18 or 3.57 mm) for drive pins having L dimension of 1/2 to 1 inch (12.7 to 25.4 mm), and S dimension shall be 9/64 or 5/32 inch (3.57 or 3.97 mm) for L dimensions of 1-1/4 to 3 inches (31.8 to 76.2 mm). Tolerance on S dimension shall be plus or minus 0.008 inch (0.203 mm).
3/ D dimension for all drive pins shall be 0.325 inch (8.26 mm). Tolerance on D dimension shall be plus or minus 0.015 inch (0.381 mm).
4/ L dimension tolerance shall be plus or minus 1/8 inch (3.2 mm).

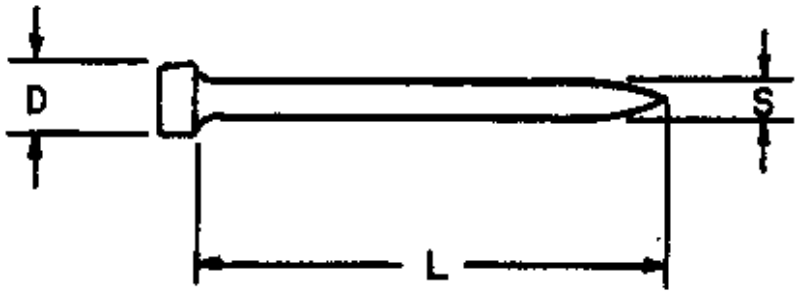


FIGURE 15

TABLE XVIII. Type II, class 4 and 5, style PC or PS, indirect-acting drive pin for concrete 1/

Dimensions, figure 15 2,3/			
L 4/		L 4/	
Inches	mm	Inches	mm
3/4	19.1	2	50.8
1	25.4	2-1/2	63.5
1-1/4	31.8	3	76.2
1-1/2	38.1	3-1/2	88.9
		4	102.

1/ When specified (see 6.2), style PS drive pins shall be furnished with knurled shanks that increase holding capacity.
2/ S dimension for all drive pins shall be 11/64 or 3/16 inch (4.37 or 4.76 mm). Tolerance on S dimension shall be plus or minus 0.008 inch (0.203 mm).
3/ D dimension for all drive pins shall be 0.370 inch (9.40 mm). Tolerance on D dimension shall be plus or minus 0.005 inch (0.127 mm).
4/ L dimension tolerance shall be plus or minus 1/8 inch (3.2 mm).

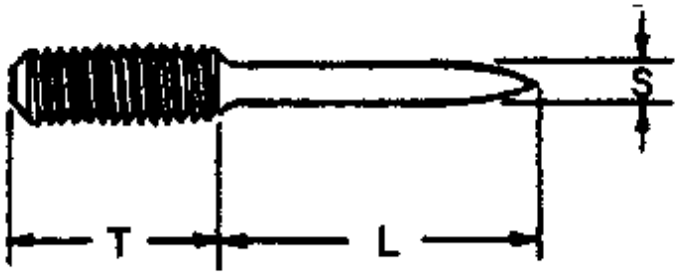


FIGURE 16

TABLE XIX. Type II, classes 4 and 5, style SC or SS, indirect-acting threaded stud for concrete or steel 1/

Dimensions, figure 16 2/			
L 3/		T 3,4/	
Inches	mm	Inches	mm
3/4	19.1	1/2	12.7
3/4	19.1	1-1/4	31.8
1	25.4	3/4	19.1
1	25.4	1-1/4	31.8
1-1/4	31.8	1	25.4
1-1/4	31.8	1-1/4	31.8
1-1/2	38.1	1-1/4	31.8
1-3/4	44.5	1-1/4	31.8

1/ When specified (see 6.2), style SS studs shall be furnished with knurled shanks that increase holding capacity.
2/ S dimension for all studs shall be 0.177, 0.203 or 0.219 inch (4.50, 5.16 or 5.56 mm). Tolerance on S dimension shall be plus or minus 0.008 inch (0.204 mm).
3/ Tolerance on L and T dimensions shall be plus or minus 1/8 inch (3.2 mm).
4/ Threads shall be .375-16UNC-2A.

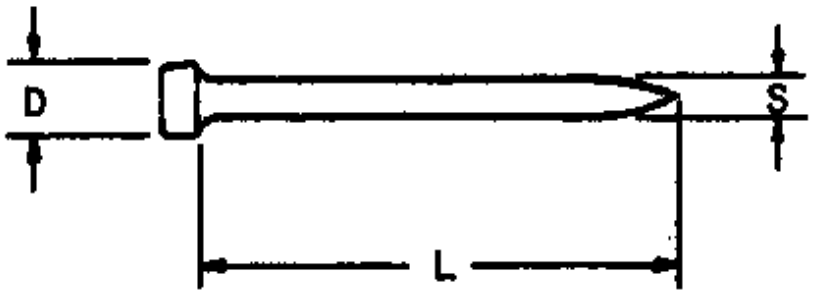


FIGURE 17

TABLE XX. Type II, class 5, style PC or PS, indirect-acting drive pin for concrete or steel 1/

Dimensions, figure 17 2,4/			
L		L	
Inches	mm	Inches	mm
3/4	19.1	2	50.8
1	25.4	2-1/2	63.5
1-1/4	31.8	3	76.2
1-1/2	38.1	3-1/2	88.9
		4	102.

1/ When specified (see 6.2), style PS drive pins shall be furnished with knurled shanks that increase holding capacity.
2/ S dimension for all pins shall be 11/64 or 3/16 inch (4.37 or 4.76 mm). Tolerance on S dimension shall be plus or minus 0.008 inch (0.203 mm).
3/ D dimension for all drive pins shall be 0.376 inch (9.55 mm). Tolerance on D dimension shall be plus or minus 0.010 inch (0.254 mm).
4/ L dimension tolerance shall be plus or minus 1/8 inch (3.2 mm).

Acting Drive Pin for Concrete or Steel]

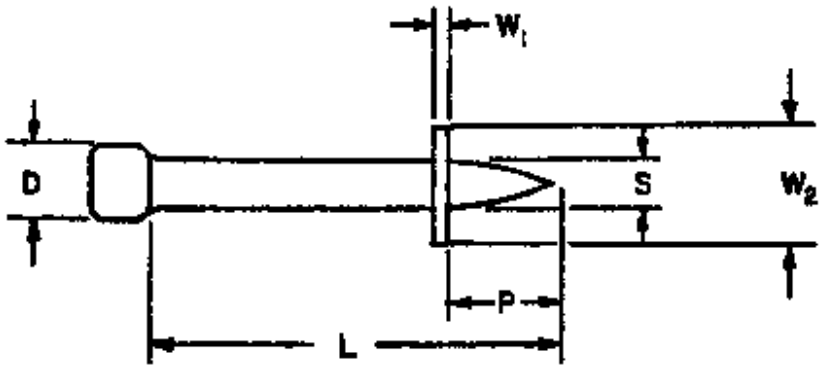


FIGURE 18

TABLE XXI. Type III, class 1, style PC or PS, hand driven drive pin for concrete or steel

Dimension, figure 18 1-6/			
L		L	
Inch	mm	Inches	mm
1/2	12.7	1-1/4	31.8
3/4	19.1	1-1/2	38.1
1	25.4	2	50.8
		2-1/2	63.5
		3	76.2

1/ S dimension for drive pins 1/2 to 1 inch (12.7 to 25.4 mm) shall be 1/8 or 9/64 inch (3.18 or 3.57 mm). S dimension for drive pins 1-1/4 to 3 inches (31.8 to 76.2 mm) shall be 9/64 or 5/32 inch (3.57 or 3.97 mm). Tolerance on S dimension shall be plus or minus 0.008 inch (0.203 mm).

2/ D dimension for all drive pins shall be 0.250 inch (6.35 mm). Tolerance on D dimension shall be -.020 inch (-0.508 m).

3/ P dimension shall be 0.375 inch (9.52 mm). Tolerance on P dimension shall be plus 0.031 inch (0.787 m) or minus 0.063 inch (1.60 mm).

4/ W1 dimension, thickness of washer, shall be 0.040 to 0.050 inch (1.02 to 1.27 mm).

5/ W2 dimension, diameter of washer, shall be 0.375 inch (9.52 mm). Tolerance on W2 dimension shall be plus 0.005 inch (0.127 mm) or minus 0.002 inch (0.051 mm).

6/ L dimension tolerance shall be plus or minus 1/16 inch (1.6 mm).

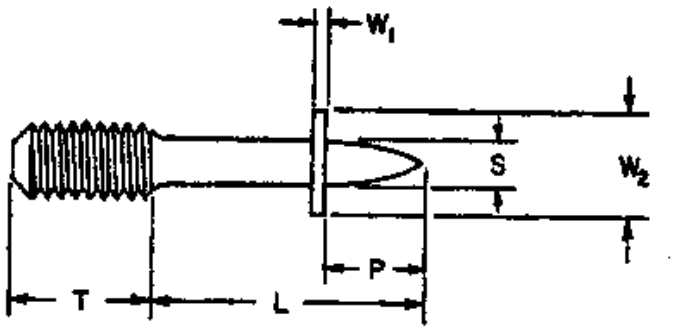


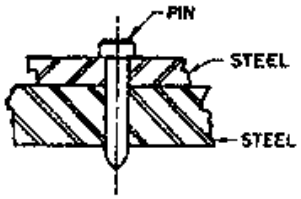
FIGURE 19

TABLE XXII. Type III, class 1, style SC, hand driven threaded stud for concrete

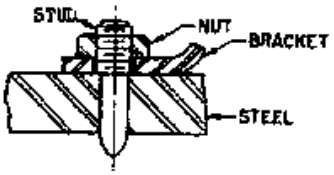
Dimensions, figure 19 1-4/			
L 5/		T 6,7/	
Inches	mm	Inches	mm
3/4	19.1	1/4	6.4
3/4	19.1	1/2	12.7
3/4	19.1	3/4	19.1
1	25.4	1/4	6.4
1	25.4	1/2	12.7
1	25.4	3/4	19.1
1-1/4	31.8	1/4	6.4
1-1/4	31.8	1/2	12.7
1-1/4	31.8	3/4	19.1
1-1/4	31.8	1	25.4
1-1/4	31.8	1-1/4	31.8
1-1/4	31.8	1-1/2	38.1

1/ S dimension for studs shall be 9/64 or 5/32 inch (3.57 or 3.97 mm). Tolerance on S dimension shall be plus or minus 0.008 inch (0.203 mm).
2/ P dimension for all studs shall be 0.375 inch (9.52 mm). Tolerance on P dimension shall be plus 0.031 inch (0.787 mm) or minus 0.063 inch (1.60 mm).
3/ W1 dimension thickness of washer, shall be 0.040 to 0.050 inch (1.02 to 1.27 mm).
4/ W2 dimension, diameter of washer, shall be 0.375 inch (9.52 mm), shank diameter of washer shall be 0.145 inch (3.58 mm). Tolerance on W2 dimension shall be plus 0.005 inch (0.127 mm). or minus 0.002 inch (0.051 mm).
5/ L dimension tolerance shall be plus or minus 1/16 inch (1.6 mm).
6/ T dimension tolerance shall be plus or minus 1/8 inch (3.2 mm).
7/ Threads shall be .250-20UNC-2A.

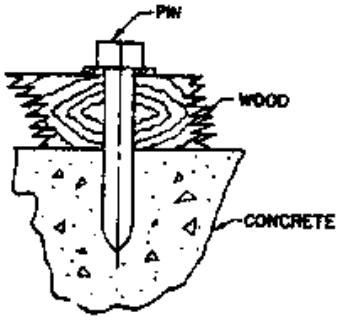
for Concrete]



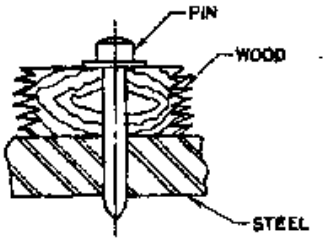
Fastening steel to steel



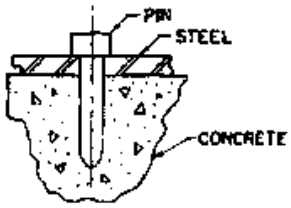
Steel penetration for hanging bracket



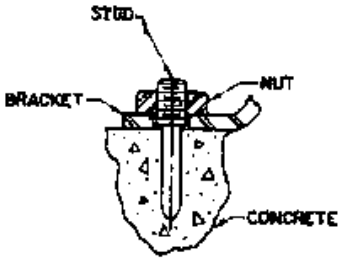
Fastening wood to concrete



Fastening wood to steel



Fastening steel to concrete



Concrete penetration for hanging brackets

FIGURE 20 Drive pin and stud applications

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