SAE The Engineering Society For Advancing Mobility Land Sea Air and Space®
INTERNATIONAL
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SURFACE VEHICLE RECOMMENDED PRACTICE

Submitted for recognition as an American National Standard

SAE J2122

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NUMBERING SYSTEM FOR STANDARD DRILLS

1. SCOPE:

This SAE recommended practice provides a systematic method for the identification of standard drills. It is intended to assist in the cataloging and supplying of these tools. The report was developed in cooperation with the Automotive Industry Action Group (AIAG).

2. REFERENCES:

ANSI B94.11M-1979	Nomenclature, Definitions, Sizes, and Tolerances of Twist Drills
A.I.A. NAS-907-1986	Nomenclature, definitions, sizes, and tolerances of twist drills

3. NUMBERING SYSTEM:

3.1 Categories:

The basic numbering system is subdivided into the following six categories of standard drills:

Jobbers Length
Taper Length
Taper Shank
Screw Machine
Core Drill
Combined Drill and Countersink

3.2 Content of Numbering System:

The numbering system has 16 positions to fully describe the various dimensions, types, materials, and attributes of drills. Figure 1 illustrates the content and sequence of these positions in the numbering system.

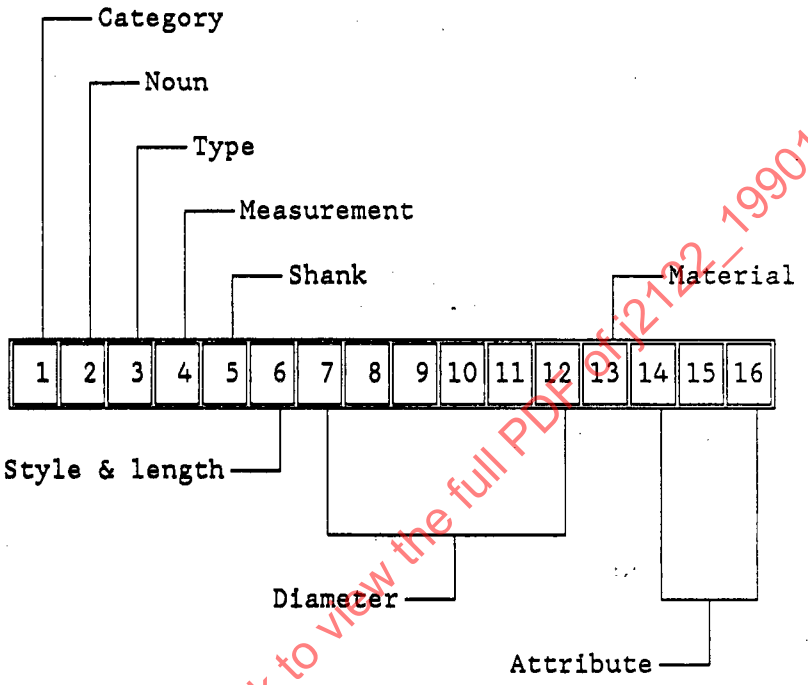

Figure 1 - Numbering System for Drills

3.3 Positions:

The content of each position is explained in detail in the following sections:

3.3.1 Positions 1 and 2, Category and Noun: Positions 1 and 2 will always be alphabetic. The following designations have been assigned:

Position 1: T - designates TOOL
Position 2: D - designates DRILL

3.3.2 Position 3, Type: Position 3 will always be numeric based on the type of drill. The following codes have been assigned:

1 - Straight Shank
2 - Taper Shank
3 - Core Drill 3-Flute (Straight Shank or Taper Shank)
4 - Core Drill 4-Flute (Straight Shank or Taper Shank)
5 - Combined Drill & Countersink (Straight Shank)

3.3.3 Position 4, Measurement Designator: Position 4 will always be alphabetic. The following codes have been assigned:

C - Inch, Right Hand
L - Inch, Left Hand
M - Metric, Right Hand
N - Metric, Left Hand

3.3.4 Position 5, Shank Designator: Position 5 can be alpha or numeric and is used in conjunction with Position 3.

If position 3 indicates a Taper Shank drill (#2) or a Core drill (#3 or #4) with a Taper Shank, Position 5 will designate the Morse Taper number as assigned below:

0 - No. 0 Morse Taper
1 - No. 1 Morse Taper
2 - No. 2 Morse Taper
3 - No. 3 Morse Taper
4 - No. 4 Morse Taper
5 - No. 5 Morse Taper
6 - No. 6 Morse Taper

If Position 3 indicates a Straight Shank (#1 or #5) or a Core drill (#3 or #4) with a straight shank, Position 5 will be an "S".

3.3.5 Position 6, Style & Standard Length Designator: Position 6 will always be numeric. The following codes have been assigned:

1 - Taper Length
2 - Jobbers Length
3 - Heavy Duty Taper Length (long flute length)
4 - Heavy Duty Jobbers Length
5 - High Helix Jobbers Length
6 - High Helix Taper Length
7 - Unassigned
8 - Unassigned
9 - Screw Machine Length
0 - Combination Drill & Countersink

3.3.6 Positions 7, 8, 9, 10, 11, and 12, Diameter (Inch or metric):

3.3.6.1 Diameter - Drill (Inch): Positions 7, 9, 10, 11, and 12 will always be numeric. If Position 4 indicates "C" or "L", numbers in these positions will represent the diameter to the ten thousandth of an inch. The decimal point is to be an integral part of the number and is to be located in Position 8.

3.3.6.1 (Continued):

NOTE: Use zeroes for all open positions.

Examples:

0.1250 (1/8)	1.0000 (1 in)
0.1876 (3/16)	1.2500 (1-1/4)
0.2500 (1/4)	1.5000 (1-1/2)
0.8750 (7/8)	1.7500 (1-3/4)
0.9375 (15/16)	1.8750 (1-7/8)

3.3.6.2 Diameter - Drill (Millimeters): Positions 7, 8, 9, 11, and 12 will always be numeric. If Position 4 indicates "M" or "N", numbers in these positions will represent the diameter in millimeters. The decimal point is to be an integral part of the number and is located in Position 10.

NOTE: Use zeroes for all open positions.

Examples:

000.90 mm	015.00 mm
003.25 mm	057.50 mm
009.75 mm	175.50 mm

3.3.6.3 Diameter - Combination Drill & Countersink (Numeric): If Position 3 indicates #5, Positions 7, 9, 10, 11, and 12, will always be numeric. If Position 4 indicates "C" or "L" and Position 6 indicates "0", Position 7, 9, and 10 will always be "0". Positions 11 and 12 will contain the number size of the Combination Drill & countersink. The decimal point is to be an integral part of the number and is located in Position 8.

Examples:

0.0001 (#1)	0.0011 (#11)
0.0002 (#2)	0.0012 (#12)
0.0003 (#3)	0.0013 (#13)
0.0004 (#4)	0.0014 (#14)
0.0005 (#5)	0.0015 (#15)

3.3.7 Position 13, Material Designator: Position 13 will always be alphabetic. The following codes have been assigned:

H - High Speed Steel
C - Cobalt High Speed Steel
S - Solid Carbide
T - Carbide Tipped

3.3.8 Positions 14, 15, and 16, Attribute Designator: Positions 14, 15, and 16 will always be numeric. The codes in Table 1 have been assigned to specify additional item description.

TABLE 1 - Attribute Designator

Section	Main Attribute
3.3.8.1	Aircraft type
3.3.8.2	Chipbreaker (construction)
3.3.8.3	Chrome treated
3.3.8.4	Double margin
3.3.8.5	Half round
3.3.8.6	Nitride steam ox treated
3.3.8.7	Oil hole
3.3.8.8	Parabolic
3.3.8.9	Prethin web chipbreaker
3.3.8.10	Slow spiral
3.3.8.11	Standard treated
3.3.8.12	Straight flute
3.3.8.13	Titanium nitride treated
3.3.8.14	Triple margin
3.3.8.15	Untreated (bright)

NOTE: For drills with gray satin finish and gold oxide treatment, use untreated (bright) attributes.

3.3.8.1 AIRCRAFT TYPE:

TYPE A - NIT/STM OX TREATED - 118 DEGREE SPLIT PT	001
TYPE A - NIT/STM OX TREATED - 118 DEGREE SPLIT PT - TANGED	002
TYPE B - NIT/STM OX TREATED - 135 DEGREE SPLIT PT	003
TYPE B - NIT/STM OX TREATED - 135 DEGREE SPLIT PT - TANGED	004
TYPE C - NIT/STM OX TREATED - 135 DEGREE SPLIT PT	005
TYPE C - NIT/STM OX TREATED - 135 DEGREE SPLIT PT - TANGED	006
TYPE D - COBALT - STD TREATED - 135 DEGREE MODIFIED SPLIT PT	007
TYPE D - COBALT - STD TREATED - 135 DEGREE MODIFIED SPLIT PT - TANGED	008
TYPE D - COBALT - UNTREATED (BRIGHT) - 135 DEGREE MODIFIED SPLIT PT	009
TYPE D - COBALT - UNTREATED (BRIGHT) - 135 DEGREE MODIFIED SPLIT PT - TANGED	010

3.3.8.2 CHIPBREAKER (CONSTRUCTION):

STANDARD TREATED - 118 DEGREE PT	050
STANDARD TREATED - 118 DEGREE PT - TANGED	051

3.3.8.3 CHROME TREATED:

118 DEGREE PT	100
118 DEGREE PT - TANGED	101

3.3.8.4 DOUBLE MARGIN:

NIT/STM OX TREATED - 118 DEGREE PT	156
NIT/STM OX TREATED - 118 DEGREE PT - TANGED	157
NIT/STM OX TREATED - 118 DEGREE BRT PT	158
NIT/STM OX TREATED - 118 DEGREE BRT PT - TANGED	159
NIT/STM OX TREATED - 118 DEGREE SPLIT PT	164
NIT/STM OX TREATED - 118 DEGREE SPLIT PT - TANGED	165
STANDARD TREATED - 118 DEGREE PT	150
STANDARD TREATED - 118 DEGREE PT - TANGED	151
STANDARD TREATED - 118 DEGREE HELICAL PT	162
STANDARD TREATED - 118 DEGREE HELICAL PT - TANGED	163
STANDARD TREATED - 118 DEGREE NOTCHED THIN PT	176
STANDARD TREATED - 118 DEGREE NOTCHED THIN PT - TANGED	177
STANDARD TREATED - 118 DEGREE SPLIT PT	154
STANDARD TREATED - 118 DEGREE SPLIT PT - TANGED	155
TITANIUM NITRIDE TREATED - 118 DEGREE PT	170
TITANIUM NITRIDE TREATED - 118 DEGREE PT - TANGED	171
UNTREATED (BRIGHT) - 118 DEGREE PT	152
UNTREATED (BRIGHT) - 118 DEGREE PT - TANGED	153
UNTREATED (BRIGHT) - 118 DEGREE NOTCHED THIN PT	160
UNTREATED (BRIGHT) - 118 DEGREE NOTCHED THIN PT - TANGED	161
UNTREATED (BRIGHT) - 118 DEGREE SPLIT PT	168
UNTREATED (BRIGHT) - 118 DEGREE SPLIT PT - TANGED	169
UNTREATED (BRIGHT) - 135 DEGREE PT	172
UNTREATED (BRIGHT) - 135 DEGREE PT - TANGED	173
UNTREATED (BRIGHT) - 135 DEGREE SPLIT PT	174
UNTREATED (BRIGHT) - 135 DEGREE SPLIT PT - TANGED	175
UNTREATED (BRIGHT) - 180 DEGREE PT (FLAT BOTTOM)	166
UNTREATED (BRIGHT) - 180 DEGREE PT (FLAT BOTTOM) - TANGED	167

3.3.8.5 HALF ROUND:

UNTREATED (BRIGHT) - 60 DEGREE PT	256
UNTREATED (BRIGHT) - 60 DEGREE PT - TANGED	257
UNTREATED (BRIGHT) - 90 DEGREE PT	252
UNTREATED (BRIGHT) - 90 DEGREE PT - TANGED	253
UNTREATED (BRIGHT) - 118 DEGREE PT	250
UNTREATED (BRIGHT) - 118 DEGREE PT - TANGED	251

3.3.8.6 NITRIDE STEAM OX TREATED:

60 DEGREE PT	322
60 DEGREE PT - TANGED	323
90 DEGREE PT	300
90 DEGREE PT - TANGED	301
90 DEGREE BLEND THIN PT	324
90 DEGREE BLEND THIN PT - TANGED	325
90 DEGREE HELICAL PT	320
90 DEGREE HELICAL PT - TANGED	321
90 DEGREE NOTCHED PT	318

3.3.8.6 (Continued):

3.3.8.7 OIL HOLE (COOLANT FEEDING):

3.3.8.7 (Continued):

STANDARD TREATED - 118 DEGREE PT 356
STANDARD TREATED - 118 DEGREE NOTCHED PT 350
TITANIUM NITRIDE TREATED - 118 DEGREE NOTCHED PT 366
TITANIUM NITRIDE TREATED - 135 DEGREE SPLIT 365
UNTREATED (BRIGHT) - 118 DEGREE PT 357
UNTREATED (BRIGHT) - 118 DEGREE NOTCHED PT 363
UNTREATED (BRIGHT) - 135 DEGREE SPLIT PT 364

3.3.8.8 PARABOLIC:

CHROME TREATED - 135 DEGREE SPLIT PT 443
CHROME TREATED - 135 DEGREE SPLIT PT - TANGED 444
NITRIDE STEAM OX TREATED - 118 DEGREE PT 433
NITRIDE STEAM OX TREATED - 118 DEGREE PT - TANGED 434
NITRIDE STEAM OX TREATED - 130 DEGREE HELICAL PT 406
NITRIDE STEAM OX TREATED - 130 DEGREE HELICAL PT - TANGED 407
NITRIDE STEAM OX TREATED - 135 DEGREE NOTCHED PT 430
NITRIDE STEAM OX TREATED - 135 DEGREE NOTCHED PT - TANGED 445
NITRIDE STEAM OX TREATED - 135 DEGREE SPLIT PT 431
NITRIDE STEAM OX TREATED - 135 DEGREE SPLIT PT - TANGED 432
STANDARD TREATED - 90 DEGREE BLEND THIN PT 426
STANDARD TREATED - 90 DEGREE BLEND THIN PT - TANGED 427
STANDARD TREATED - 118 DEGREE PT 439
STANDARD TREATED - 118 DEGREE PT - TANGED 440
STANDARD TREATED - 118 DEGREE BLEND THIN PT 400
STANDARD TREATED - 118 DEGREE BLEND THIN PT - TANGED 401
STANDARD TREATED - 118 DEGREE NOTCHED PT 402
STANDARD TREATED - 118 DEGREE NOTCHED PT - TANGED 403
STANDARD TREATED - 118 DEGREE SPLIT PT 422
STANDARD TREATED - 118 DEGREE SPLIT PT - TANGED 423
STANDARD TREATED - 135 DEGREE SPLIT PT 404
STANDARD TREATED - 135 DEGREE SPLIT PT - TANGED 405
TITANIUM NITRIDE TREATED - 90 DEGREE BLEND THIN PT 428
TITANIUM NITRIDE TREATED - 90 DEGREE BLEND THIN PT - TANGED 429
TITANIUM NITRIDE TREATED - 118 DEGREE PT 441
TITANIUM NITRIDE TREATED - 118 DEGREE PT - TANGED 442
TITANIUM NITRIDE TREATED - 118 DEGREE BLEND THIN PT 408
TITANIUM NITRIDE TREATED - 118 DEGREE BLEND THIN PT - TANGED 409
TITANIUM NITRIDE TREATED - 118 DEGREE SPLIT PT 424
TITANIUM NITRIDE TREATED - 118 DEGREE SPLIT PT - TANGED 425
TITANIUM NITRIDE TREATED - 130 DEGREE HELICAL PT 412
TITANIUM NITRIDE TREATED - 130 DEGREE HELICAL PT - TANGED 413
TITANIUM NITRIDE TREATED - 135 DEGREE SPLIT PT 410
TITANIUM NITRIDE TREATED - 135 DEGREE SPLIT PT - TANGED 411
UNTREATED (BRIGHT) - 118 DEGREE PT 437
UNTREATED (BRIGHT) - 118 DEGREE PT - TANGED 438
UNTREATED (BRIGHT) - 118 DEGREE BLEND THIN PT 414
UNTREATED (BRIGHT) - 118 DEGREE BLEND THIN PT - TANGED 415
UNTREATED (BRIGHT) - 118 DEGREE NOTCHED PT 416

3.3.8.8 (Continued):

UNTREATED (BRIGHT) - 118 DEGREE NOTCHED PT - TANGED 417
UNTREATED (BRIGHT) - 118 DEGREE SPLIT PT 435
UNTREATED (BRIGHT) - 118 DEGREE SPLIT PT - TANGED 436
UNTREATED (BRIGHT) - 130 DEGREE HELICAL PT 420
UNTREATED (BRIGHT) - 130 DEGREE HELICAL PT - TANGED 421
UNTREATED (BRIGHT) - 135 DEGREE SPLIT PT 418
UNTREATED (BRIGHT) - 135 DEGREE SPLIT PT - TANGED 419

3.3.8.9 PRETHIN WEB CHIPBREAKER:

NITRIDE STEAM OX TREATED - 90 DEGREE PT 456
NITRIDE STEAM OX TREATED - 90 DEGREE PT - TANGED 457
NITRIDE STEAM OX TREATED - 118 DEGREE PT 450
NITRIDE STEAM OX TREATED - 118 DEGREE PT - TANGED 451
STANDARD TREATED - 90 DEGREE PT 458
STANDARD TREATED - 90 DEGREE PT - TANGED 459
STANDARD TREATED - 118 DEGREE PT 452
STANDARD TREATED - 118 DEGREE PT - TANGED 453
UNTREATED (BRIGHT) - 118 DEGREE PT 454
UNTREATED (BRIGHT) - 118 DEGREE PT - TANGED 455

3.3.8.10 SLOW SPIRAL:

NITRIDE STEAM OX TREATED - 118 DEGREE PT 556
NITRIDE STEAM OX TREATED - 118 DEGREE PT - TANGED 557
STANDARD TREATED - 118 DEGREE PT 560
STANDARD TREATED - 118 DEGREE PT - TANGED 561
UNTREATED (BRIGHT) - 60 DEGREE PT 554
UNTREATED (BRIGHT) - 60 DEGREE PT - TANGED 555
UNTREATED (BRIGHT) - 90 DEGREE PT 550
UNTREATED (BRIGHT) - 90 DEGREE PT - TANGED 551
UNTREATED (BRIGHT) - 118 DEGREE PT 552
UNTREATED (BRIGHT) - 118 DEGREE PT - TANGED 553
UNTREATED (BRIGHT) - 180 DEGREE PT (FLAT BOTTOM) 558
UNTREATED (BRIGHT) - 180 DEGREE PT (FLAT BOTTOM) - TANGED 559

3.3.8.11 STANDARD TREATED:

60 DEGREE PT 627
60 DEGREE PT - TANGED 628
90 DEGREE PT 600
90 DEGREE PT - TANGED 601
90 DEGREE HELICAL PT 625
90 DEGREE HELICAL PT - TANGED 626
90 DEGREE NOTCHED PT 621
90 DEGREE NOTCHED PT - TANGED 622
90 DEGREE SPLIT PT 642
90 DEGREE SPLIT PT - TANGED 643
100 DEGREE PT 640

3.3.8.11 (Continued):

100 DEGREE PT - TANGED	641
110 DEGREE PT	638
110 DEGREE PT - TANGED	639
110 DEGREE CHIPBREAKER PT	596
110 DEGREE CHIPBREAKER PT - TANGED	597
118 DEGREE PT	602
118 DEGREE PT - TANGED	603
118 DEGREE BRIGHT PT	604
118 DEGREE BRIGHT PT - TANGED	605
118 DEGREE BLEND THIN PT	623
118 DEGREE BLEND THIN PT - TANGED	624
118 DEGREE CHIPBREAKER PT	598
118 DEGREE CHIPBREAKER PT - TANGED	599
118 DEGREE HELICAL PT	617
118 DEGREE HELICAL PT - TANGED	618
118 DEGREE NOTCHED PT	619
118 DEGREE NOTCHED PT - TANGED	620
118 DEGREE SPLIT PT	606
118 DEGREE SPLIT PT - TANGED	607
130 DEGREE HELICAL PT	629
130 DEGREE HELICAL PT - TANGED	630
135 DEGREE PT	631
135 DEGREE PT - TANGED	632
135 DEGREE CHIPBREAKER PT	647
135 DEGREE CHIPBREAKER PT - TANGED	648
135 DEGREE NOTCHED PT	610
135 DEGREE NOTCHED PT - TANGED	611
135 DEGREE SPLIT PT	608
135 DEGREE SPLIT PT - TANGED	609
140 DEGREE PT	645
140 DEGREE PT - TANGED	646
180 DEGREE PT (FLAT BOTTOM)	635
180 DEGREE PT (FLAT BOTTOM) - TANGED	636
FISHTAIL PT	633
FISHTAIL PT - TANGED	634
RACON PT	612
RACON PT - TANGED	613
1/4 IN SHANK - 118 DEGREE PT	614
1/4 IN SHANK - 118 DEGREE NOTCHED POINT	615
1/4 IN SHANK - 135 DEGREE SPLIT PT	644
3/8 IN SHANK - 90 DEGREE PT	637
3/8 IN SHANK - 118 DEGREE PT	616

3.3.8.12 STRAIGHT FLUTE:

NITRIDE STEAM OX TREATED - 118 DEGREE PT	752
STANDARD TREATED - 118 DEGREE PT	751
UNTREATED (BRIGHT) - 118 DEGREE	750

3.3.8.13 TITANIUM NITRIDE TREATED:

60 DEGREE PT	670
60 DEGREE PT - TANGED	671
90 DEGREE PT	650
90 DEGREE PT - TANGED	651
90 DEGREE BLEND THIN PT	664
90 DEGREE BLEND THIN PT - TANGED	665
118 DEGREE PT	652
118 DEGREE PT - TANGED	653
118 DEGREE HELICAL PT	672
118 DEGREE HELICAL PT - TANGED	673
118 DEGREE NOTCHED PT	654
118 DEGREE NOTCHED PT - TANGED	655
118 DEGREE SPLIT PT	656
118 DEGREE SPLIT PT - TANGED	657
130 DEGREE HELICAL PT	666
130 DEGREE HELICAL PT - TANGED	667
135 DEGREE PT	668
135 DEGREE PT - TANGED	669
135 DEGREE NOTCHED PT	658
135 DEGREE NOTCHED PT - TANGED	659
135 DEGREE SPLIT PT	660
135 DEGREE SPLIT PT - TANGED	661
RACON PT	662
RACON PT - TANGED	663

3.3.8.14 TRIPLE MARGIN:

STANDARD TREATED - 118 DEGREE PT	202
STANDARD TREATED - 118 DEGREE PT - TANGED	203
NITRIDE STEAM OX TREATED - 118 DEGREE PT	204
NITRIDE STEAM OX TREATED - 118 DEGREE PT - TANGED	205
UNTREATED (BRIGHT) - 118 DEGREE PT	200
UNTREATED (BRIGHT) - 118 DEGREE PT - TANGED	201
UNTREATED (BRIGHT) - 118 DEGREE SPLIT PT	206
UNTREATED (BRIGHT) - 118 DEGREE SPLIT PT - TANGED	207

3.3.8.15 UNTREATED (BRIGHT):

50 DEGREE PT	736
50 DEGREE PT - TANGED	737
60 DEGREE PT	714
60 DEGREE PT - TANGED	715
90 DEGREE PT	700
90 DEGREE PT - TANGED	701
90 DEGREE NOTCHED PT	726
90 DEGREE NOTCHED PT - TANGED	727
90 DEGREE SPLIT PT	739
90 DEGREE SPLIT PT - TANGED	740
100 DEGREE PT	734

3.3.8.15 (Continued):

100 DEGREE PT - TANGED 735
110 DEGREE PT 742
110 DEGREE PT - TANGED 743
118 DEGREE PT 702
118 DEGREE PT - TANGED 703
118 DEGREE BLEND THIN PT 716
118 DEGREE BLEND THIN PT - TANGED 717
118 DEGREE HELICAL PT 712
118 DEGREE HELICAL PT - TANGED 713
118 DEGREE NOTCHED PT 732
118 DEGREE NOTCHED PT - TANGED 733
118 DEGREE SPLIT PT 704
118 DEGREE SPLIT PT - TANGED 705
120 DEGREE PT 744
120 DEGREE PT - TANGED 745
130 DEGREE HELICAL PT 718
130 DEGREE HELICAL PT - TANGED 719
135 DEGREE PT 722
135 DEGREE PT - TANGED 723
135 DEGREE NOTCHED PT 730
135 DEGREE NOTCHED PT - TANGED 731
135 DEGREE SPLIT PT 706
135 DEGREE SPLIT PT - TANGED 707
140 DEGREE PT 720
140 DEGREE PT - TANGED 721
180 DEGREE PT (FLAT BOTTOM) 728
180 DEGREE PT (FLAT BOTTOM) - TANGED 729
FISHTAIL PT 724
FISHTAIL PT - TANGED 725
RACON PT 708
RACON PT - TANGED 709
1/4 IN SHANK - 118 DEGREE PT 710
1/4 IN SHANK - 118 DEGREE NOTCHED POINT 711
3/8 IN SHANK - 90 DEGREE PT 738
3/8 IN SHANK - 118 DEGREE PT 741

4. EXAMPLES:

The following are examples of the application of the Drill Numbering System:

a. TD1CS20.2500H602: This Tool is a 1/4 (0.2500) in Diameter, HSS, Jobbers Length, 2.7500 Flt Lgth, 4.0000 OAL, Straight Shank w/o Tang, Right Hand Spiral, Standard Treated, 118-Degree Point, Drill.

b. TD1CS20.2500H603: This Tool is a 1/4 (0.2500) in Diameter, HSS, Jobbers Length, 2.7500 Flt Lgth, 4.0000 OAL, Straight Shank with Tang, Right Hand Spiral, Standard Treated, 118-Degree Point, Drill.