CHT-242

THREAD ELEMENTS AND FORMULAS

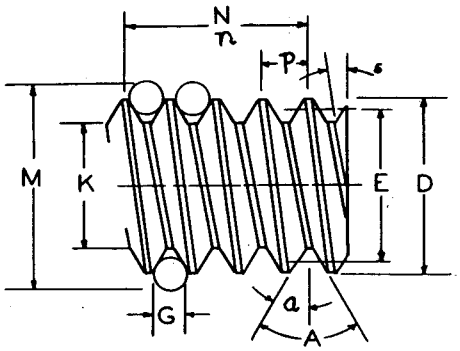


FIG. 1

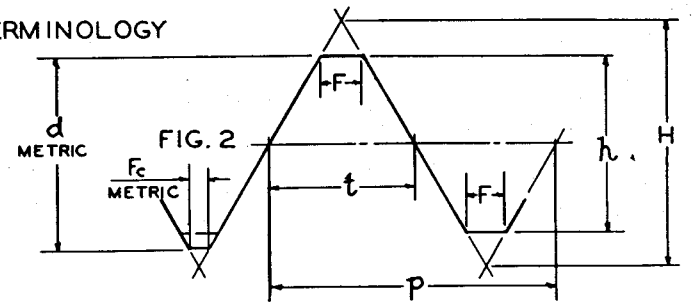
A - THREAD ANGLE
a - HALF THREAD ANGLE
D - MAJOR DIAMETER (OUTSIDE)
E - PITCH DIAMETER
F - BASIC FLAT CREST AND ROOT
F_c - CLEARANCE FLAT AT ROOT (FIGS. 2 & 4)
G - WIRE DIAMETER
H - HEIGHT OF BASIC TRIANGLE = $\frac{\text{COTAN HALF-ANGLE}}{2n}$
K - MINOR DIAMETER (ROOT)
M - MEASUREMENT OVER WIRES
M - MEASUREMENT OVER WIRES WHEN CALCULATED ON HELIX ANGLE
S - TANGENT OF HELIX ANGLE = $\frac{L}{3.14159 \times E}$
s - HELIX ANGLE
L - LEAD (ADVANCE IN ONE REVOLUTION) = $\frac{1}{N}$
P - PITCH OF THREAD = $\frac{1}{n}$
h - BASIC THREAD DEPTH
d - TOTAL THREAD DEPTH
N - NUMBER OF TURNS PER INCH
n - NUMBER OF THREADS PER INCH

SEE PAGE 30 FOR COMPLETE DATA ON UNIFIED THREAD FORM

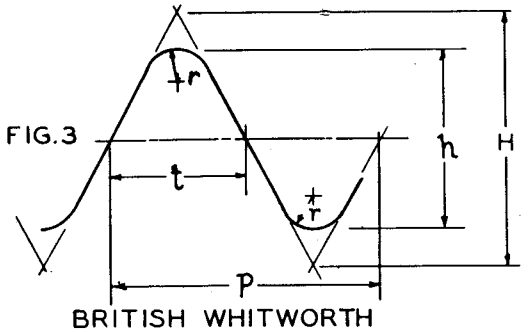
F - THREAD SHOWN IN FIG. 6 MAY HAVE RADIUS AT CREST AND ROOT
B - ANGLE OF FLANK NEAREST HORIZONTAL
R - ANGLE OF FLANK NEAREST VERTICAL
X - AXIS OF THREAD WITH CENTER
t - THREAD THICKNESS AT PITCH LINE

THREAD ELEMENTS CONFORM TO NATIONAL BUREAU OF STANDARDS HANDBOOK H-28 (1944)

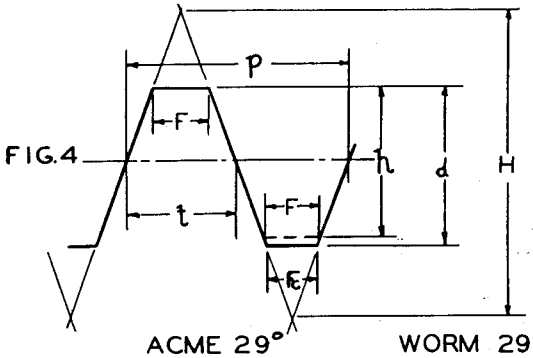
TERMINOLOGY



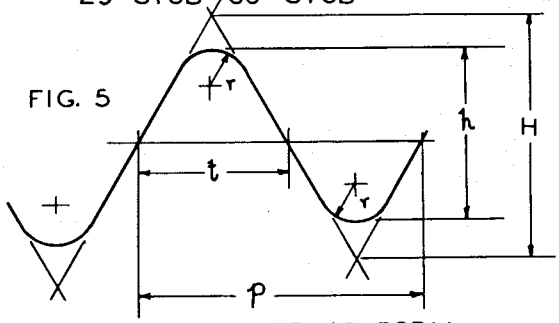
AMERICAN NATIONAL-METRIC-LOWENHERZ



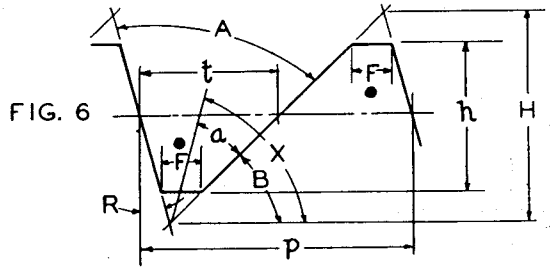
BRITISH WHITWORTH
BRITISH ASSOCIATION THREAD



ACME 29° WORM 29°
MODIFIED SQUARE WORM 40°
29° STUB - 60° STUB



UNIFIED THREAD FORM



BUTTRESS - UNEQUAL ANGLE THREAD

ELEMENTS OF AMERICAN NATIONAL THREAD

THD'S PER INCH	DECIMAL PITCH	WIRE SIZES			60°-V DEPTH	BASIC THREAD DEPTH	3G IN FORMULA
		BEST	MAXIMUM	MINIMUM			
4	0.25000	0.14434	0.25259	0.12630	0.21651	0.16238	0.43302
4½	0.22222	0.12830	0.22453	0.11226	0.19245	0.14434	0.38490
5	0.20000	0.11547	0.20207	0.10104	0.17321	0.12990	0.34641
5½	0.18182	0.10497	0.18370	0.09185	0.15746	0.11809	0.31491
6	0.16667	0.09622	0.16839	0.08420	0.14434	0.10825	0.28866
7	0.14286	0.08248	0.14434	0.07217	0.12372	0.09279	0.24744
8	0.12500	0.07217	0.12630	0.06315	0.10825	0.08119	0.21651
9	0.11111	0.06415	0.11226	0.05613	0.09622	0.07217	0.19245
10	0.10000	0.05774	0.10104	0.05052	0.08660	0.06495	0.17322
11	0.09091	0.05249	0.09185	0.04593	0.07873	0.05905	0.15747
12	0.08333	0.04811	0.08420	0.04210	0.07217	0.05413	0.14433
13	0.07692	0.04441	0.07772	0.03886	0.06662	0.04996	0.13323
14	0.07143	0.04124	0.07217	0.03608	0.06186	0.04639	0.12372
16	0.06250	0.03608	0.06315	0.03157	0.05413	0.04059	0.10824
18	0.05556	0.03207	0.05613	0.02807	0.04811	0.03608	0.09621
20	0.05000	0.02887	0.05052	0.02526	0.04330	0.03248	0.08661
22	0.04545	0.02624	0.04592	0.02296	0.03936	0.02952	0.07872
24	0.04167	0.02406	0.04210	0.02105	0.03608	0.02706	0.07218
26	0.03846	0.02221	0.03886	0.01943	0.03331	0.02498	0.06663
27	0.03704	0.02138	0.03742	0.01871	0.03208	0.02406	0.06414
28	0.03571	0.02062	0.03608	0.01804	0.03093	0.02320	0.06186
30	0.03333	0.01924	0.03368	0.01684	0.02887	0.02165	0.05772
32	0.03125	0.01804	0.03157	0.01579	0.02706	0.02030	0.05412
36	0.02778	0.01604	0.02807	0.01403	0.02406	0.01804	0.04812
40	0.02500	0.01443	0.02526	0.01263	0.02165	0.01624	0.04329
44	0.02273	0.01312	0.02296	0.01148	0.01968	0.01476	0.03936
48	0.02083	0.01203	0.02105	0.01052	0.01804	0.01353	0.03609
50	0.02000	0.01155	0.02021	0.01010	0.01732	0.01299	0.03465
56	0.01786	0.01031	0.01804	0.00902	0.01546	0.01160	0.03093
64	0.01562	0.00902	0.01579	0.00789	0.01353	0.01015	0.02706
72	0.01389	0.00802	0.01403	0.00702	0.01203	0.00902	0.02406
80	0.01250	0.00722	0.01263	0.00631	0.01083	0.00812	0.02166
n	$p = \frac{1}{n}$	G .57735p	G-MAX. 1.01036p	G-MIN. .50518p	$\frac{.86603}{n}$	$\frac{.64952}{n}$	3G
1	2	3	4	5	6	7	8

THE FOLLOWING TABLES OF WIRE READINGS CAN BE USED FOR ANY CLASS OF THREAD WHERE THE PITCH DIAMETER IS BASIC INCLUDING THE NEW UNIFIED THREAD 3A SERIES. FOR THE NEW 1A AND 2A UNIFIED SCREW THREAD SERIES CLASSIFICATION AN ALLOWANCE HAS BEEN MADE ON THE PITCH DIAMETER REDUCING THE BASIC SIZE BY THE AMOUNTS GIVEN IN THE TABLES ON PAGES 32,33,34 AND 35.

NUMBERED SIZES AND DIAMETERS

SIZE	0	1	2	3	4	5	6	8	10	12
DIAM.	0.060	0.073	0.086	0.099	0.112	0.125	0.138	0.164	0.190	0.216
PITCH WIRE										
24 0.02406									.19904 .16294 4° 39' 13"	.22504 .18894 4° 0'56"
28 0.02082									.19774 .16681 3° 53'58"	.22374 .19281 3° 22'28"
32 0.01804							.14476 .11770 4° 49'50"	.17076 .14370 3° 57'34"	.19676 .16970 3° 21' 16"	.22276 .19570 2° 54'35"
36 0.01604							.14402 .11996 4° 12'56"	.17002 .14596 3° 27'59"	.19602 .17196 2° 56'36"	.22202 .19796 2° 33' 27"
40 0.01443					.11740 .09576 4° 45' 1"	.13040 .10876 4° 11'5"	.14340 .12176 3° 44'21"	.16940 .14776 3° 4'58"	.19540 .17376 2° 37'20"	.22140 .19976 2° 16'52"
44 0.01312					.11692 .09724 4° 15' 18"	.12992 .11024 3° 45' 17"	.14292 .12324 3° 21' 34"	.16892 .14924 2° 46' 31"	.19492 .17524 2° 21'50"	.22092 .20124 2° 3'32"
48 0.01203				.10352 .08547 4° 26' 12"	.11652 .09847 3° 51' 10"	.12952 .11147 3° 24' 17"	.14252 .12447 3° 2' 59"	.16852 .15047 2° 31' 24"	.19452 .17647 2° 9' 8"	.22052 .20247 1° 52'33"
56 0.01031			.08987 .07440 4° 22' 8"	.10287 .08740 3° 43' 15"	.11587 .10040 3° 14'25"	.12887 .11340 2° 52' 10"	.14187 .12640 2° 34'29"	.16787 .15240 2° 8' 9"	.19387 .17840 1° 49' 30"	.21987 .20440 1° 35' 34"
64 0.00902		.07639 .06286 4° 31' 28"	.08939 .07586 3° 45'6"	.10239 .08886 3° 12' 14"	.11539 .10186 2° 47'44"	.12839 .11486 2° 28'47"	.14139 .12786 2° 13'40"	.16739 .15386 1° 51' 6"	.19339 .17986 1° 35' 3"	.21939 .20586 1° 23' 3"
72 0.00802		.07601 .06398 3° 57' 10"	.08901 .07698 3° 17' 13"	.10201 .08998 2°48'46"	.11501 .10298 2°27'30"	.12801 .11598 2° 10'59"	.14101 .12898 1° 57'47"	.16701 .15498 1° 38'2"	.19301 .18098 1°23'57"	.21901 .20698 1° 13'25"
80 0.00722	.06271 .05188 4° 23'8"	.07571 .06488 3° 30'34"	.08871 .07788 2°55'29"	.10171 .09088 2° 30'25"	.11471 .10388 2°11'37"	.12771 .11688 1° 56'59"	.14071 .12988 1° 45' 17"	.16671 .15588 1° 27'44"	.19271 .18188 1° 15' 12"	.21871 .20788 1° 5'47"

KEY- WIRE READING ——— 'M' .10171
PITCH DIAMETER ——— 'E' .09088
HELIX ANGLE ——— 's' 2° 30'25"

PITCH / WIRE	DIAMETERS 3/32	1/8	5/32	3/16	7/32	1/4	9/32	5/16	11/32	
12 0.04811								.33053 .25837 5°51'42"	.36178 .28962 5°13'59"	
13 0.04441								.32915 .26254 5°19'42"	.36040 .29379 4°45'51"	
14 0.04124								.32796 .26610 4°53'34"	.35921 .29735 4°22'21"	
16 0.03608						.26351 .20940 5°25'38"	.29476 .24065 4°43'33"	.32601 .27190 4°11'5"	.35726 .30315 3°45'17"	
18 0.03207						.26202 .21392 4°43'33"	.29327 .24517 4°7'32"	.32452 .27642 3°39'39"	.35577 .30767 3°17'22"	
20 0.02887				.19833 .15502 5°51'42"	.22958 .18627 4°53'1"	.26083 .21752 4°11'5"	.29208 .24877 3°39'38"	.32333 .28002 3°15'11"	.35458 .31127 2°55'37"	
22 0.02624				.19734 .15798 5°13'59"	.22859 .18923 4°22'21"	.25984 .22048 3°45'17"	.29109 .25173 3°17'23"	.32234 .28298 2°55'38"	.35359 .31423 2°38'11"	
24 0.02406				.19654 .16044 4°43'33"	.22779 .19169 3°57'29"	.25904 .22294 3°24'17"	.29029 .25419 2°59'13"	.32154 .28544 2°39'37"	.35279 .31669 2°23'53"	
26 0.02221			.16459 .13127 5°19'42"	.19584 .16252 4°18'29"	.22709 .19377 3°36'55"	.25834 .22502 3°6'51"	.28959 .25627 2°44'6"	.32084 .28752 2°26'18"	.35209 .31877 2°11'58"	
28 0.02062			.16399 .13306 4°53'34"	.19524 .16431 3°57'29"	.22649 .19556 3°19'37"	.25774 .22681 2°52'10"	.28899 .25806 2°31'21"	.32024 .28931 2°15'1"	.35149 .32056 2°1'52"	
30 0.01924		.13220 .10335 5°51'42"	.16345 .13460 4°30'26"	.19470 .16585 3°39'38"	.22595 .19710 3°4'53"	.25720 .22835 2°39'37"	.28845 .25960 2°20'26"	.31970 .29085 2°5'21"	.35095 .32210 1°53'12"	
32 0.01804		.13176 .10470 5°25'37"	.16301 .13595 4°11'5"	.19426 .16720 3°24'17"	.22551 .19845 2°52'10"	.25676 .22970 2°28'47"	.28801 .26095 2°10'59"	.31926 .29220 1°56'59"	.35051 .32345 1°45'41"	
36 0.01604		.13102 .10696 4°43'33"	.16227 .13821 3°39'38"	.19352 .16946 2°59'13"	.22477 .20071 2°31'21"	.25602 .23196 2°10'59"	.28727 .26321 1°55'26"	.31852 .29446 1°43'12"	.34977 .32571 1°33'18"	
40 0.01443		.13040 .10876 4°11'5"	.16165 .14001 3°15'11"	.19290 .17126 2°39'37"	.22415 .20251 2°15'1"	.25540 .23376 1°56'59"	.28665 .26501 1°43'12"	.31790 .29626 1°32'19"	.34915 .32751 1°23'31"	
44 0.01312	.09867 .07899 5°13'59"	.12992 .11024 3°45'17"	.16117 .14149 2°55'38"	.19242 .17274 2°23'53"	.22367 .20399 2°1'52"	.25492 .23524 1°45'41"	.28617 .26649 1°33'18"	.31742 .29774 1°23'31"	.34867 .32899 1°15'35"	
48 0.01203	.09827 .08022 4°43'33"	.12952 .11147 3°24'17"	.16077 .14272 2°39'37"	.19202 .17397 2°10'59"	.22327 .20522 1°51'3"	.25452 .23647 1°36'23"	.28577 .26772 1°25'8"	.31702 .29897 1°16'14"	.34827 .33022 1°9'2"	
50 0.01155	.09809 .08076 4°30'26"	.12934 .11201 3°15'11"	.16059 .14326 2°32'40"	.19184 .17451 2°5'21"	.22309 .20576 1°46'20"	.25434 .23701 1°32'19"	.28559 .26826 1°21'34"	.31684 .29951 1°13'4"	.34809 .33076 1°6'10"	
56 0.01031	.09762 .08215 3°57'29"	.12887 .11340 2°52'10"	.16012 .14465 2°15'1"	.19137 .17590 1°51'3"	.22262 .20715 1°34'18"	.25387 .23840 1°21'57"	.28512 .26965 1°12'27"	.31637 .30090 1°4'56"	.34762 .33215 0°58'49"	
64 0.00902	.09714 .08361 3°24'17"	.12839 .11486 2°28'47"	.15964 .14611 1°56'59"	.19089 .17736 1°36'23"	.22214 .20861 1°21'57"	.25339 .23986 1°11'16"	.28464 .27111 1°3'4"	.31589 .30236 0°56'33"	.34714 .33361 0°51'15"	

KEY- WIRE READING——'M' .19089
PITCH DIAMETER——'E' .17736
HELIX ANGLE——'S' 1°36'23"

PITCH / WIRE	DIAMETERS $\frac{3}{8}$	$\frac{13}{32}$	$\frac{7}{16}$	$\frac{15}{32}$	$\frac{1}{2}$	$\frac{17}{32}$	$\frac{9}{16}$	$\frac{19}{32}$	$\frac{5}{8}$	
9 0.05415				.49280 .39657 5°5'46"	.52405 .42782 4°43'33"	.55530 .45907 4°24'19"	.58655 .49032 4°7'32"	.61780 .52157 3°52'45"	.64905 .55282 3°39'39"	
10 0.05774				.49042 .40380 4°30'26"	.52167 .43505 4°11'5"	.55292 .46630 3°54'18"	.58417 .49755 3°39'38"	.61542 .52880 3°26'41"	.64667 .56005 3°15'11"	
11 0.05249	.39470 .31596 5°13'59"	.42595 .34721 4°45'51"	.45720 .37846 4°22'21"	.48845 .40971 4°2'24"	.51970 .44096 3°45'17"	.55095 .47221 3°30'24"	.58220 .50346 3°17'23"	.61345 .53471 3°5'52"	.64470 .56596 2°55'38"	
12 0.04811	.39303 .32087 4°43'33"	.42428 .35212 4°18'29"	.45553 .38337 3°57'29"	.48678 .41462 3°39'38"	.51803 .44587 3°24'17"	.54928 .47712 3°10'56"	.58053 .50837 2°59'13"	.61178 .53962 2°48'51"	.64303 .57087 2°39'37"	
13 0.04441	.39165 .32504 4°18'29"	.42290 .35629 3°55'53"	.45415 .38754 3°36'55"	.48540 .41879 3°20'46"	.51665 .45004 3°6'51"	.54790 .48129 2°54'45"	.57915 .51254 2°44'6"	.61040 .54379 2°34'41"	.64165 .57504 2°26'18"	
14 0.04124	.39046 .32860 3°57'29"	.42171 .35985 3°36'55"	.45296 .39110 3°19'37"	.48421 .42235 3°4'53"	.51546 .45360 2°52'10"	.54671 .48485 2°41'5"	.57796 .51610 2°31'21"	.60921 .54735 2°22'43"	.64046 .57860 2°15'1"	
16 0.03608	.38851 .33440 3°24'17"	.41976 .36565 3°6'51"	.45101 .39690 2°52'10"	.48226 .42815 2°39'37"	.51351 .45940 2°28'46"	.54476 .49065 2°19'19"	.57601 .52190 2°10'59"	.60726 .55315 2°3'35"	.63851 .58440 1°56'59"	
18 0.03207	.38702 .33892 2°59'13"	.41827 .37017 2°44'6"	.44952 .40142 2°31'20"	.48077 .43267 2°20'26"	.51202 .46392 2°10'59"	.54327 .49517 2°2'43"	.57452 .52642 1°55'26"	.60577 .55767 1°48'59"	.63702 .58892 1°43'12"	
20 0.02887	.38583 .34252 2°39'37"	.41708 .37377 2°26'18"	.44833 .40502 2°15'1"	.47958 .43627 2°5'21"	.51083 .46752 1°56'59"	.54208 .49877 1°49'39"	.57333 .53002 1°43'12"	.60458 .56127 1°37'27"	.63583 .59252 1°32'19"	
22 0.02624	.38484 .34548 2°23'53"	.41609 .37673 2°11'58"	.44734 .40798 2°1'52"	.47859 .43923 1°53'12"	.50984 .47048 1°45'41"	.54109 .50173 1°39'7"	.57234 .53298 1°33'18"	.60359 .56423 1°28'8"	.63484 .59548 1°23'31"	
24 0.02406	.38404 .34794 2°10'59"	.41529 .37919 2°0'12"	.44654 .41044 1°51'3"	.47779 .44169 1°43'12"	.50904 .47294 1°36'23"	.54029 .50419 1°30'25"	.57154 .53544 1°25'8"	.60279 .56669 1°20'27"	.63404 .59794 1°16'14"	
26 0.02221	.38334 .35002 2°0'12"	.41459 .38127 1°50'21"	.44584 .41252 1°42'0"	.47709 .44377 1°34'49"	.50834 .47502 1°28'35"	.53959 .50627 1°23'7"	.57084 .53752 1°18'17"	.60209 .56877 1°13'59"	.63334 .60002 1°10'8"	
28 0.02062	.38274 .35181 1°51'3"	.41399 .38306 1°42'0"	.44524 .41431 1°34'18"	.47649 .44556 1°27'42"	.50774 .47681 1°21'57"	.53899 .50806 1°16'55"	.57024 .53931 1°12'27"	.60149 .57056 1°8'29"	.63274 .60181 1°4'56"	
30 0.01924	.38220 .35335 1°43'12"	.41345 .38460 1°34'49"	.44470 .41585 1°27'42"	.47595 .44710 1°21'34"	.50720 .47835 1°16'14"	.53845 .50960 1°11'34"	.56970 .54085 1°7'26"	.60095 .57210 1°3'45"	.63220 .60335 1°0'27"	
32 0.01804	.38176 .35470 1°36'23"	.41301 .38595 1°28'35"	.44426 .41720 1°21'57"	.47551 .44845 1°16'14"	.50676 .47970 1°11'16"	.53801 .51095 1°6'55"	.56926 .54220 1°3'4"	.60051 .57345 0°59'38"	.63176 .60470 0°56'33"	
36 0.01604	.38102 .35696 1°25'8"	.41227 .38821 1°18'17"	.44352 .41946 1°12'27"	.47477 .45071 1°7'26"	.50602 .48196 1°3'4"	.53727 .51321 0°59'13"	.56852 .54446 0°55'49"	.59977 .57571 0°52'48"	.63102 .60696 0°50'5"	
40 0.01443	.38040 .35876 1°16'14"	.41165 .39001 1°10'8"	.44290 .42126 1°4'56"	.47415 .45251 1°0'27"	.50540 .48376 0°56'33"	.53665 .51501 0°53'7"	.56790 .54626 0°50'4"	.59915 .57751 0°47'22"	.63040 .60876 0°44'56"	
44 0.01312	.37992 .36024 1°9'2"	.41117 .39149 1°3'31"	.44242 .42274 0°58'50"	.47367 .45399 0°54'47"	.50492 .48524 0°51'15"	.53617 .51649 0°48'9"	.56742 .54774 0°45'24"	.59867 .57899 0°42'57"	.62992 .61024 0°40'45"	
48 0.01203	.37952 .36147 1°3'4"	.41077 .39272 0°58'3"	.44202 .42397 0°53'46"	.47327 .45522 0°50'5"	.50452 .48647 0°46'52"	.53577 .51772 0°44'2"	.56702 .54897 0°41'32"	.59827 .58022 0°39'17"	.62952 .61147 0°37'18"	
50 0.01155	.37934 .36201 1°0'27"	.41059 .39326 0°55'39"	.44184 .42451 0°51'33"	.47309 .45576 0°48'1"	.50434 .48701 0°44'56"	.53559 .51826 0°42'14"	.56684 .54951 0°39'50"	.59809 .58076 0°37'41"	.62934 .61201 0°35'45"	
56 0.01031	.37887 .36340 0°53'46"	.41012 .39465 0°49'31"	.44137 .42590 0°45'53"	.47262 .45715 0°42'45"	.50387 .48840 0°40'0"	.53512 .51965 0°37'36"	.56637 .55090 0°35'28"	.59762 .58215 0°33'34"	.62887 .61340 0°31'51"	

KEY- WIRE READING——'M' .47262
PITCH DIAMETER—'E' .45715
HELIX ANGLE——'s' 0°42'45"

PITCH / WIRE	DIAMETERS 21/32	DIAMETERS 11/16	23/32	3/4	25/32	13/16	27/32	7/8	29/32	
5 0.11547			.76206 .58885 6°10'14"	.79331 .62010 5°51'42"	.82456 .65135 5°34'56"	.85581 .68260 5°19'42"	.88706 .71385 5°5'47"	.91831 .74510 4°53'1"	.94956 .77635 4°41'16"	
5½ 0.10497			.75811 .60066 5°30'13"	.78936 .63191 5°13'59"	.82061 .66316 4°59'16"	.85186 .69441 4°45'51"	.88311 .72566 4°33'36"	.91436 .75691 4°22'21"	.94561 .78816 4°11'59"	
6 0.09622	.69232 .54800 5°31'46"	.72357 .57925 5°13'59"	.75482 .61050 4°57'59"	.78607 .64175 4°43'33"	.81732 .67300 4°30'26"	.84857 .70425 4°18'29"	.87982 .73550 4°7'32"	.91107 .76675 3°57'29"	.94232 .79800 3°48'13"	
7 0.08248	.68718 .56346 4°36'50"	.71843 .59471 4°22'21"	.74968 .62596 4°9'18"	.78093 .65721 3°57'29"	.81218 .68846 3°46'44"	.84343 .71971 3°36'55"	.87468 .75096 3°27'55"	.90593 .78221 3°19'37"	.93718 .81346 3°11'58"	
8 0.07217	.68332 .57506 3°57'29"	.71457 .60631 3°45'17"	.74582 .63756 3°34'16"	.77707 .66881 3°24'17"	.80832 .70006 3°15'11"	.83957 .73131 3°6'51"	.87082 .76256 2°59'13"	.90207 .79381 2°52'10"	.93332 .82506 2°45'39"	
9 0.06415	.68030 .58407 3°27'55"	.71155 .61532 3°17'22"	.74280 .64657 3°7'51"	.77405 .67782 2°59'13"	.80530 .70907 2°51'20"	.83655 .74032 2°44'6"	.86780 .77157 2°37'28"	.89905 .80282 2°31'21"	.93030 .83407 2°25'41"	
10 0.05774	.67792 .59130 3°4'53"	.70917 .62255 2°55'37"	.74042 .65380 2°47'14"	.77167 .68505 2°39'37"	.80292 .71630 2°32'40"	.83417 .74755 2°26'18"	.86542 .77880 2°20'26"	.89667 .81005 2°15'1"	.92792 .84130 2°10'0"	
11 0.05249	.67595 .59721 2°46'27"	.70720 .62846 2°38'11"	.73845 .65971 2°30'42"	.76970 .69096 2°23'53"	.80095 .72221 2°17'40"	.83220 .75346 2°11'58"	.86345 .78471 2°6'43"	.89470 .81596 2°1'52"	.92595 .84721 1°57'22"	
12 0.04811	.67428 .60212 2°31'21"	.70553 .63337 2°23'53"	.73678 .66462 2°17'8"	.76803 .69587 2°10'59"	.79928 .72712 2°5'21"	.83053 .75837 2°0'12"	.86178 .78962 1°55'26"	.89303 .82087 1°51'3"	.92428 .85212 1°46'59"	
13 0.04441	.67290 .60629 2°18'46"	.70415 63754 2°11'58"	.73540 .66879 2°5'48"	.76665 .70004 2°0'12"	.79790 .73129 1°55'4"	.82915 .76254 1°50'21"	.86040 .79379 1°46'1"	.89165 .82504 1°42'0"	.92290 .85629 1°38'17"	
14 0.04124	.67171 .60985 2°8'6"	.70296 .64110 2°1'52"	.73421 .67235 1°56'12"	.76546 .70360 1°51'3"	.79671 .73485 1°46'20"	.82796 .76610 1°42'0"	.85921 .79735 1°38'0"	.89046 .82860 1°34'18"	.92171 .85985 1°30'53"	
16 0.03608	.66976 .61565 1°51'3"	.70101 .64690 1°45'41"	.73226 .67815 1°40'49"	.76351 .70940 1°36'23"	.79476 .74065 1°32'19"	.82601 .77190 1°28'35"	.85726 .80315 1°25'8"	.88851 .83440 1°21'57"	.91976 .86565 1°19'0"	
18 0.03207	.66827 .62017 1°38'0"	.69952 .65142 1°33'18"	.73077 .68267 1°29'2"	.76202 .71392 1°25'8"	.79327 .74517 1°21'34"	.82452 .77642 1°18'17"	.85577 .80767 1°15'15"	.88702 .83892 1°12'27"	.91827 .87017 1°9'51"	
20 0.02887	.66708 .62377 1°27'42"	.69833 .65502 1°23'31"	.72958 .68627 1°19'43"	.76083 .71752 1°16'14"	.79208 .74877 1°13'4"	.82333 .78002 1°10'8"	.85458 .81127 1°7'26"	.88583 .84252 1°4'56"	.91708 .87377 1°2'37"	
22 0.02624	.66609 .62673 1°19'21"	.69734 .65798 1°15'35"	.72859 .68923 1°12'9"	.75984 .72048 1°9'2"	.79109 .75173 1°6'10"	.82234 .78298 1°3'31"	.85359 .81423 1°1'5"	.88484 .84548 0°58'50"	.91609 .87673 0°56'44"	
24 0.02406	.66529 .62919 1°12'27"	.69654 .66044 1°9'2"	.72779 .69169 1°5'55"	.75904 .72294 1°3'4"	.79029 .75419 1°0'28"	.82154 .78544 0°58'3"	.85279 .81669 0°55'49"	.88404 .84794 0°53'46"	.91529 .87919 0°51'51"	
26 0.02221	.66459 .63127 1°6'40"	.69584 .66252 1°3'31"	.72709 .69377 1°0'40"	.75834 .72502 0°58'3"	.78959 .75627 0°55'39"	.82084 .78752 0°53'26"	.85209 .81877 0°51'24"	.88334 .85002 0°49'31"	.91459 .88127 0°47'45"	
28 0.02062	.66399 .63306 1°1'44"	.69524 .66431 0°58'49"	.72649 .69556 0°56'11"	.75774 .72681 0°53'46"	.78899 .75806 0°51'33"	.82024 .78931 0°49'31"	.85149 .82056 0°47'37"	.88274 .85181 0°45'53"	.91399 .88306 0°44'15"	
30 0.01924	.66345 .63460 0°57'28"	.69470 .66585 0°54'47"	.72595 .69710 0°52'19"	.75720 .72835 0°50'5"	.78845 .75960 0°48'1"	.81970 .79085 0°46'7"	.85095 .82210 0°44'22"	.88220 .85335 0°42'44"	.91345 .88460 0°41'14"	
32 0.01804	.66301 .63595 0°53'46"	.69426 .66720 0°51'15"	.72551 .69845 0°48'57"	.75676 .72970 0°46'52"	.78801 .76095 0°44'56"	.81926 .79220 0°43'10"	.85051 .82345 0°41'32"	.88176 .85470 0°40'0"	.91301 .88595 0°38'36"	
36 0.01604	.66227 .63821 0°47'37"	.69352 .66946 0°45'24"	.72477 .70071 0°43'23"	.75602 .73196 0°41'32"	.78727 .76321 0°39'50"	.81852 .79446 0°38'16"	.84977 .82571 0°36'49"	.88102 .85696 0°35'28"	.91227 .88821 0°34'13"	
40 0.01443	.66165 .64001 0°42'45"	.69290 .67126 0°40'45"	.72415 .70251 0°38'56"	.75540 .73376 0°37'17"	.78665 .76501 0°35'46"	.81790 .79626 0°34'21"	.84915 .82751 0°33'4"	.88040 .85876 0°31'51"	.91165 .89001 0°30'44"	

KEY— WIRE READING ——— 'M' .75540
PITCH DIAMETER ——— 'E' .73376
HELIX ANGLE ——— 'S' 0°37'17"

PITCH / WIRE	DIAMETERS 1 5/16	1 3/32	1	1 1/32	1 1/16	1 3/32	1 1/8	1 5/32	1 3/16	
5 0.11547	.98081 .80760 4°30'26"	1.01206 .83885 4°20'24"	1.04331 .87010 4°11'5"	1.07456 .90135 4°2'24"	1.10581 .93260 3°54'18"	1.13706 .96385 3°46'44"	1.16831 .99510 3°39'38"	1.19956 1.02635 3°32'58"	1.23081 1.05760 3°26'41"	
5 1/2 0.10497	.97686 .81941 4°2'24"	1.00811 .85066 3°53'32"	1.03936 .88191 3°45'17"	1.07061 .91316 3°37'35"	1.10186 .94441 3°30'24"	1.13311 .97566 3°23'41"	1.16436 1.00691 3°17'23"	1.19561 1.03816 3°11'27"	1.22686 1.06941 3°5'52"	
6 0.09622	.97357 .82925 3°39'38"	1.00482 .86050 3°31'41"	1.03607 .89175 3°24'17"	1.06732 .92300 3°17'23"	1.09857 .95425 3°10'56"	1.12982 .98550 3°4'53"	1.16107 1.01675 2°59'13"	1.19232 1.04800 2°53'53"	1.22357 1.07925 2°48'51"	
7 0.08248	.96843 .84471 3°4'53"	.99968 .87596 2°58'18"	1.03093 .90721 2°52'10"	1.06218 .93846 2°46'27"	1.09343 .96971 2°41'5"	1.12468 1.00096 2°36'4"	1.15593 1.03221 2°31'21"	1.18718 1.06346 2°26'54"	1.21843 1.09471 2°22'43"	
8 0.07217	.96457 .85631 2°39'37"	.99582 .88756 2°34'1"	1.02707 .91881 2°28'47"	1.05832 .95006 2°23'53"	1.08957 .98131 2°19'19"	1.12082 1.01256 2°15'1"	1.15207 1.04381 2°10'59"	1.18332 1.07506 2°7'11"	1.21457 1.10631 2°3'35"	
9 0.06415	.96155 .86532 2°20'26"	.99280 .89657 2°15'32"	1.02405 .92782 2°10'59"	1.05530 .95907 2°6'43"	1.08655 .99032 2°2'43"	1.11780 1.02157 1°58'58"	1.14905 1.05282 1°55'26"	1.18030 1.08407 1°52'7"	1.21155 1.11532 1°48'59"	
10 0.05774	.95917 .87255 2°5'21"	.99042 .90380 2°1'1"	1.02167 .93505 1°56'59"	1.05292 .96630 1°53'12"	1.08417 .99755 1°49'39"	1.11542 1.02880 1°46'20"	1.14667 1.06005 1°43'12"	1.17792 1.09130 1°40'15"	1.20917 1.12255 1°37'27"	
11 0.05249	.95720 .87846 1°53'12"	.98845 .90971 1°49'19"	1.01970 .94096 1°45'41"	1.05095 .97221 1°42'18"	1.08220 1.00346 1°39'7"	1.11345 1.03471 1°36'7"	1.14470 1.06596 1°33'18"	1.17595 1.09721 1°30'39"	1.20720 1.12846 1°28'8"	
12 0.04811	.95553 .88337 1°43'12"	.98678 .91462 1°39'40"	1.01803 .94587 1°36'23"	1.04928 .97712 1°33'18"	1.08053 1.00837 1°30'25"	1.11178 1.03962 1°27'42"	1.14303 1.07087 1°25'8"	1.17428 1.10212 1°22'43"	1.20553 1.13337 1°20'27"	
13 0.04441	.95415 .88754 1°34'49"	.98540 .91879 1°31'36"	1.01665 .95004 1°28'35"	1.04790 .98129 1°25'46"	1.07915 1.01254 1°23'7"	1.11040 1.04379 1°20'38"	1.14165 1.07504 1°18'17"	1.17290 1.10629 1°16'4"	1.20415 1.13754 1°13'59"	
14 0.04124	.95296 .89110 1°27'42"	.98421 .92235 1°24'43"	1.01546 .95360 1°21'57"	1.04671 .98485 1°19'21"	1.07796 1.01610 1°16'55"	1.10921 1.04735 1°14'37"	1.14046 1.07860 1°12'27"	1.17171 1.10985 1°10'25"	1.20296 1.14110 1°8'29"	
16 0.03608	.95101 .89690 1°16'14"	.98226 .92815 1°13'40"	1.01351 .95940 1°11'16"	1.04476 .99065 1°9'2"	1.07601 1.02190 1°6'55"	1.10726 1.05315 1°4'56"	1.13851 1.08440 1°3'4"	1.16976 1.11565 1°1'18"	1.20101 1.14690 0°59'38"	
18 0.03207	.94952 .90142 1°7'26"	.98077 .93267 1°5'10"	1.01202 .96392 1°3'4"	1.04327 .99517 1°1'5"	1.07452 1.02642 0°59'13"	1.10577 1.05767 0°57'28"	1.13702 1.08892 0°55'49"	1.16827 1.12017 0°54'16"	1.19952 1.15142 0°52'48"	
20 0.02887	.94833 .90502 1°0'27"	.97958 .93627 0°58'26"	1.01083 .96752 0°56'33"	1.04208 .99877 0°54'47"	1.07333 1.03002 0°53'7"	1.10458 1.06127 0°51'33"	1.13583 1.09252 0°50'5"	1.16708 1.12377 0°48'41"	1.19833 1.15502 0°47'22"	
22 0.02624	.94734 .90798 0°54'47"	.97859 .93923 0°52'57"	1.00984 .97048 0°51'15"	1.04109 1.00173 0°49'39"	1.07234 1.03298 0°48'9"	1.10359 1.06423 0°46'44"	1.13484 1.09548 0°45'24"	1.16609 1.12673 0°44'9"	1.19734 1.15798 0°42'57"	
24 0.02406	.94654 .91044 0°50'5"	.97779 .94169 0°48'25"	1.00904 .97294 0°46'52"	1.04029 1.00419 0°45'24"	1.07154 1.03544 0°44'2"	1.10279 1.06669 0°42'45"	1.13404 1.09794 0°41'32"	1.16529 1.12919 0°40'23"	1.19654 1.16044 0°39'17"	
26 0.02221	.94584 .91252 0°46'7"	.97709 .94377 0°44'36"	1.00834 .97502 0°43'10"	1.03959 1.00627 0°41'49"	1.07084 1.03752 0°40'34"	1.10209 1.06877 0°39'23"	1.13334 1.10002 0°38'16"	1.16459 1.13127 0°37'12"	1.19584 1.16252 0°36'12"	
28 0.02062	.94524 .91431 0°42'45"	.97649 .94556 0°41'20"	1.00774 .97681 0°40'0"	1.03899 1.00806 0°38'46"	1.07024 1.03931 0°37'36"	1.10149 1.07056 0°36'30"	1.13274 1.10181 0°35'28"	1.16399 1.13306 0°34'29"	1.19524 1.16431 0°33'34"	
30 0.01924	.94470 .91585 0°39'50"	.97595 .94710 0°38'31"	1.00720 .97835 0°37'17"	1.03845 1.00960 0°36'8"	1.06970 1.04085 0°35'3"	1.10095 1.07210 0°34'1"	1.13220 1.10335 0°33'3"	1.16345 1.13460 0°32'9"	1.19470 1.16585 0°31'17"	
32 0.01804	.94426 .91720 0°37'17"	.97551 .94845 0°36'3"	1.00676 .97970 0°34'54"	1.03801 1.01095 0°33'49"	1.06926 1.04220 0°32'49"	1.10051 1.07345 0°31'51"	1.13176 1.10470 0°30'57"	1.16301 1.13595 0°30'6"	1.19426 1.16720 0°29'18"	
36 0.01604	.94352 .91946 0°33'3"	.97477 .95071 0°31'58"	1.00602 .98196 0°30'57"	1.03727 1.01321 0°30'0"	1.06852 1.04446 0°29'6"	1.09977 1.07571 0°28'15"				
40 0.01443	.94290 .92126 0°29'42"	.97415 .95251 0°28'43"	1.00540 .98376 0°27'48"	1.03665 1.01501 0°26'57"	1.06790 1.04626 0°26'9"					

KEY- WIRE READING——'M' 1.03665
PITCH DIAMETER——'E' 1.01501
HELIX ANGLE——S 0°26'57"

PITCH / WIRE	DIAMETERS $1\frac{7}{32}$	$1\frac{1}{4}$	$1\frac{9}{32}$	$1\frac{5}{16}$	$1\frac{11}{32}$	$1\frac{3}{8}$	$1\frac{13}{32}$	$1\frac{7}{16}$	$1\frac{15}{32}$	$1\frac{1}{2}$
4	1.27288	1.30413	1.33538	1.36663	1.39788	1.42913	1.46038	1.49163	1.52288	1.55413
0.14434	1.05637	1.08762	1.11887	1.15012	1.18137	1.21262	1.24387	1.27512	1.30637	1.33762
	4° 18'29"	4° 11' 5"	4° 4' 6"	3° 57'29"	3° 51'13"	3° 45'17"	3° 39'38"	3° 34'16"	3° 29' 9"	3° 24'17"
$4\frac{1}{2}$	1.26686	1.29811	1.32936	1.36061	1.39186	1.42311	1.45436	1.48561	1.51686	1.54811
0.12830	1.07441	1.10566	1.13691	1.16816	1.19941	1.23066	1.26191	1.29316	1.32441	1.35566
	3° 46'0"	3° 39'38"	3° 33'37"	3° 27'55"	3° 22'30"	3° 17'23"	3° 12'30"	3° 7'51"	3° 3'26"	2° 59'13"
5	1.26206	1.29331	1.32456	1.35581	1.38706	1.41831	1.44956	1.48081	1.51206	1.54331
0.11547	1.08885	1.12010	1.15135	1.18260	1.21385	1.24510	1.27635	1.30760	1.33885	1.37010
	3° 20'46"	3° 15'11"	3° 9'54"	3° 4'53"	3° 0' 8"	2° 55'37"	2° 51'20"	2° 47'14"	2° 43'20"	2° 39'37"
$5\frac{1}{2}$	1.25811	1.28936	1.32061	1.35186	1.38311	1.41436	1.44561	1.47686	1.50811	1.53936
0.10497	1.10066	1.13191	1.16316	1.19441	1.22566	1.25691	1.28816	1.31941	1.35066	1.38191
	3° 0'36"	2° 55'38"	2° 50'55"	2° 46'27"	2° 42'12"	2° 38'11"	2° 34'21"	2° 30'42"	2° 27'13"	2° 25'53"
6	1.25482	1.28607	1.31732	1.34857	1.37982	1.41107	1.44232	1.47357	1.50482	1.53607
0.09622	1.11050	1.14175	1.17300	1.20425	1.23550	1.26675	1.29800	1.32925	1.36050	1.39175
	2° 44'6"	2° 39'37"	2° 35'22"	2° 31'21"	2° 27'31"	2° 23'53"	2° 20'26"	2° 17' 8"	2° 13'59"	2° 10'59"
7	1.24968	1.28093	1.31218	1.34343	1.37468	1.40593	1.43718	1.46843	1.49968	1.53093
0.08248	1.12596	1.15721	1.18846	1.21971	1.25096	1.28221	1.31346	1.34471	1.37596	1.40721
	2° 18'46"	2° 15' 1"	2° 11'28"	2° 8' 6"	2° 4' 54"	2° 1' 52"	1° 58'58"	1° 56' 12"	1° 53'34"	1° 51' 3"
8	1.24582	1.27707	1.30832	1.33957	1.37082	1.40207	1.43332	1.46457	1.49582	1.52707
0.07217	1.13756	1.16881	1.20006	1.23131	1.26256	1.29381	1.32506	1.35631	1.38756	1.41881
	2° 0'12"	1° 56'59"	1° 53'57"	1° 51' 3"	1° 48'18"	1° 45'41"	1° 43'12"	1° 40'49"	1° 38'33"	1° 36'23"
9	1.24280	1.27405	1.30530	1.33655	1.36780	1.39905	1.43030	1.46155	1.49280	1.52405
0.06415	1.14657	1.17782	1.20907	1.24032	1.27157	1.30282	1.33407	1.36532	1.39657	1.42782
	1° 46' 0"	1° 43'12"	1° 40'32"	1° 38' 0"	1° 35'36"	1° 33'18"	1° 31' 7"	1° 29' 2"	1° 27' 2"	1° 25' 8"
10	1.24042	1.27167	1.30292	1.33417	1.36542	1.39667	1.42792	1.45917	1.49042	1.52167
0.05774	1.15380	1.18505	1.21630	1.24755	1.27880	1.31005	1.34130	1.37255	1.40380	1.43505
	1° 34'49"	1° 32'19"	1° 29'57"	1° 27'42"	1° 25' 33"	1° 23'31"	1° 21'34"	1° 19'43"	1° 17'56"	1° 16'14"
11	1.23845	1.26970	1.30095	1.33220	1.36345	1.39470	1.42595	1.45720	1.48845	1.51970
0.05249	1.15971	1.19096	1.22221	1.25346	1.28471	1.31596	1.34721	1.37846	1.40971	1.44096
	1° 25'46"	1° 23' 31"	1° 21'23"	1° 19'21"	1° 17'25"	1° 15'35"	1° 13'50"	1° 12' 9"	1° 10'33"	1° 9' 2"
12	1.23678	1.26803	1.29928	1.33053	1.36178	1.39303	1.42428	1.45553	1.48678	1.51803
0.04811	1.16462	1.19587	1.22712	1.25837	1.28962	1.32087	1.35212	1.38337	1.41462	1.44587
	1° 18'17"	1° 16'14"	1° 14'18"	1° 12'27"	1° 10'42"	1° 9' 2"	1° 7'26"	1° 5' 55"	1° 4'28"	1° 3' 4"
13	1.23540	1.26665	1.29790	1.32915	1.36040	1.39165	1.42290	1.45415	1.48540	1.51665
0.04441	1.16879	1.20004	1.23129	1.26254	1.29379	1.32504	1.35629	1.38754	1.41879	1.45004
	1° 12' 0"	1° 10' 8"	1° 8'21"	1° 6'40"	1° 5' 3"	1° 3' 31"	1° 2' 3"	1° 0' 40"	0° 59'19"	0° 58' 3"
14	1.23421	1.26546	1.29671	1.32796	1.35921	1.39046	1.42171	1.45296	1.48421	1.51546
0.04124	1.17235	1.20360	1.23485	1.26610	1.29735	1.32860	1.35985	1.39110	1.42235	1.45360
	1° 6'40"	1° 4'56"	1° 3'17"	1° 1'44"	1° 0'14"	0° 58'49"	0° 57'28"	0° 56'11"	0° 54'57"	0° 53'46"
16	1.23226	1.26351	1.29476	1.32601	1.35726	1.38851	1.41976	1.45101	1.48226	1.51351
0.03608	1.17815	1.20940	1.24065	1.27190	1.30315	1.33440	1.36565	1.39690	1.42815	1.45940
	0° 58' 3"	0° 56'33"	0° 55' 7"	0° 53'46"	0° 52'29"	0° 51'15"	0° 50' 5"	0° 48'57"	0° 47'53"	0° 46'52"
18	1.23077	1.26202	1.29327	1.32452	1.35577	1.38702	1.41827	1.44952	1.48077	1.51202
0.03207	1.18267	1.21392	1.24517	1.27642	1.30767	1.33892	1.37017	1.40142	1.43267	1.46392
	0° 51'24"	0° 50' 5"	0° 48'49"	0° 47'37"	0° 46'29"	0° 45'24"	0° 44'22"	0° 43'23"	0° 42'28"	0° 41'32"
20	1.22958	1.26083	1.29208	1.32333	1.35458	1.38583	1.41708	1.44833	1.47958	1.51083
0.02887	1.18627	1.21752	1.24877	1.28002	1.31127	1.34252	1.37377	1.40502	1.43627	1.46754
	0° 46'7"	0° 44'56"	0° 43'49"	0° 42'45"	0° 41'43"	0° 40'45"	0° 39'50"	0° 38'56"	0° 38' 6"	0° 37'17"
22	1.22859	1.25984	1.29109	1.32234	1.35359	1.38484	1.41609	1.44734	1.47859	1.50984
0.02624	1.18923	1.22048	1.25173	1.28298	1.31423	1.34548	1.37673	1.40798	1.43923	1.47048
	0° 41'49"	0° 40'45"	0° 39'44"	0° 38'46"	0° 37'51"	0° 36'58"	0° 36' 8"	0° 35'20"	0° 34'34"	0° 33'49"
24	1.22779	1.25904	1.29029	1.32154	1.35279	1.38404	1.41529	1.44654	1.47779	1.50904
0.02406	1.19169	1.22294	1.25419	1.28544	1.31669	1.34794	1.37919	1.41044	1.44169	1.47294
	0° 38'17"	0° 37'18"	0° 36'21"	0° 35'28"	0° 34'38"	0° 33'50"	0° 33' 4"	0° 32'20"	0° 31'37"	0° 30'57"
26	1.22709	1.25834	1.28959	1.32084	1.35209	1.38334	1.41459	1.44584	1.47709	1.50834
0.02221	1.19377	1.22502	1.25627	1.28752	1.31877	1.35002	1.38127	1.41252	1.44377	1.47502
	0° 35'15"	0° 34'21"	0° 33'30"	0° 32'41"	0° 31'55"	0° 31'10"	0° 30'28"	0° 29'48"	0° 29' 9"	0° 28'32"
28	1.22649	1.25774	1.28899	1.32024	1.35149	1.38274	1.41399	1.44524	1.47649	1.50774
0.02062	1.19556	1.22681	1.25806	1.28931	1.32056	1.35181	1.38306	1.41431	1.44556	1.47681
	0° 32'42"	0° 31'51"	0° 31' 4"	0° 30'19"	0° 29'36"	0° 28'55"	0° 28'15"	0° 27'38"	0° 27' 2"	0° 26'28"
30	1.22595	1.25720	1.28845	1.31970	1.35095	1.38220	1.41345	1.44470	1.47595	1.50720
0.01924	1.19710	1.22835	1.25960	1.29805	1.32210	1.35335	1.38460	1.41585	1.44710	1.47835
	0° 30'28"	0° 29'42"	0° 28'57"	0° 28'15"	0° 27'35"	0° 26'57"	0° 26'21"	0° 25'46"	0° 25'12"	0° 24'40"
32	1.22551	1.25676	1.28801	1.31926	1.35051	1.38176	1.41301	1.44426	1.47551	1.50676
0.01804	1.19845	1.22970	1.26095	1.29220	1.32345	1.35470	1.38595	1.41720	1.44845	1.47970
	0° 28'32"	0° 27'48"	0° 27' 7"	0° 26'28"	0° 25'50"	0° 25'14"	0° 24'40"	0° 24' 8"	0° 23'37"	0° 23' 7"

KEY—

WIRE READING —— 'M'	1.31926	
PITCH DIAMETER —— 'E'	1.29220	
HELIX ANGLE —— 'S'	0° 26'28"	

PITCH / WIRE	DIAMETERS 1 17/32	1 9/16	1 19/32	1 5/8	1 21/32	1 11/16	1 23/32	1 3/4	1 25/32	1 13/16
4	1.58538	1.61663	1.64788	1.67913	1.71038	1.74163	1.77288	1.80413	1.83538	1.86663
0.14434	1.36887	1.40012	1.43137	1.46262	1.49387	1.52512	1.55637	1.58762	1.61887	1.65012
	3° 19'37"	3° 15' 11"	3° 10'56"	3° 6' 51"	3° 2'57"	2° 59' 13"	2° 55'37"	2° 52' 10"	2° 48'51"	2°45'39"
4½	1.57936	1.61061	1.64186	1.67311	1.70436	1.73561	1.76686	1.79811	1.82936	1.86061
0.12830	1.38691	1.41816	1.44941	1.48066	1.51191	1.54316	1.57441	1.60566	1.63691	1.66816
	2°55'11"	2° 51' 20"	2°47'38"	2°44' 6"	2° 40'43"	2°37'28"	2° 34'21"	2°31' 21"	2°28'28"	2°25' 41"
5	1.57456	1.60581	1.63706	1.66831	1.69956	1.73081	1.76206	1.79331	1.82456	1.85581
0.11547	1.40135	1.43260	1.46385	1.49510	1.52635	1.55760	1.58885	1.62010	1.65135	1.68260
	2°36' 4"	2° 32'40"	2° 29' 25"	2° 26'18"	2° 23'18"	2° 20' 26"	2° 17'40"	2°15' 1"	2°12'28"	2°10'0"
5½	1.57061	1.60186	1.63311	1.66436	1.69561	1.72686	1.75811	1.78936	1.82061	1.85186
0.10497	1.41316	1.44441	1.47566	1.50691	1.53816	1.56941	1.60066	1.63191	1.66316	1.69441
	2° 20'43"	2° 17' 40"	2° 14'45"	2° 11'58"	2° 9'17"	2° 6'43"	2° 4' 15"	2° 1' 52"	1°59' 35"	1°57' 22"
6	1.56732	1.59857	1.62982	1.66107	1.69232	1.72357	1.75482	1.78607	1.81732	1.84857
0.09622	1.42300	1.45425	1.48550	1.51675	1.54800	1.57925	1.61050	1.64175	1.67300	1.70425
	2° 8' 6"	2° 5' 21"	2° 2' 43"	2°0' 12"	1°57' 46"	1° 55'26"	1°53' 12"	1°51' 3"	1° 48'59"	1°46'59"
7	1.56218	1.59343	1.62468	1.65593	1.68718	1.71843	1.74968	1.78093	1.81218	1.84343
0.08248	1.43846	1.46971	1.50096	1.53221	1.56346	1.59471	1.62596	1.65721	1.68846	1.71971
	1°48'38"	1°46' 20"	1° 44' 7"	1°42'0"	1° 39'57"	1° 38' 0"	1° 36' 7"	1° 34'18"	1°32' 34"	1°30 53"
8	1.55832	1.58957	1.62082	1.65207	1.68332	1.71457	1.74582	1.77707	1.80832	1.83957
0.07217	1.45006	1.48131	1.51256	1.54381	1.57506	1.60631	1.63756	1.66881	1.700 06	1.73131
	1°34'18"	1°32'19"	1°30' 25"	1° 28' 35"	1° 26'49"	1° 25' 8"	1° 23'31"	1° 21' 57"	1° 20' 27"	1° 19'0"
9	1.55530	1.58655	1.61780	1.64905	1.68030	1.71155	1.74280	1.77405	1.80530	1.83655
0.06415	1.45907	1.49032	1.52157	1.55282	1.58407	1.61532	1.64657	1.67782	1.70907	1.74032
	1°23'19"	1° 21'34"	1° 19' 54"	1°18' 17"	1° 16' 44"	1° 15' 15"	1° 13' 50"	1° 12' 27"	1° 11' 8"	1° 9'51"
10	1.55292	1.58417	1.61542	1.64667	1.67792	1.70917	1.74042	1.77167	1.80292	1.83417
0.05774	1.46630	1.49755	1.52880	1.56005	1.59130	1.62255	1.65380	1.68505	1.71630	1.74755
	1°14'37"	1°13' 4"	1° 11'34"	1°10' 8"	1° 8'45"	1° 7'26"	1° 6' 10"	1° 4' 56"	1° 3' 45"	1° 2'37"
11	1.55095	1.58220	1.61345	1.64470	1.67595	1.70720	1.73845	1.76970	1.80095	1.83220
0.05249	1.47221	1.50346	1.53471	1.56596	1.59721	1.62846	1.65971	1.69096	1.72221	1.75346
	1° 7'34"	1° 6' 10"	1°4'49"	1° 3' 31"	1°2' 17"	1° 1' 5"	0° 59'56"	0° 58'50"	0°57'45"	0° 56'44"
12	1.54928	1.58053	1.61178	1.64303	1.67428	1.70553	1.73678	1.76803	1.79928	1.83053
0.04811	1.47712	1.50837	1.53962	1.57087	1.60212	1.63337	1.66462	1.69587	1.72712	1.75837
	1° 1'44"	1°0'28"	0° 59'13"	0° 58'3"	0°56'55"	0° 55'49"	0° 54'47"	0°53'46"	0° 52'48"	0°51'51"
13	1.54790	1.57915	1.61040	1.64165	1.67290	1.70415	1.73540	1.76665	1.79790	1.82915
0.04441	1.48129	1.51254	1.54379	1.57504	1.60629	1.63754	1.66879	1.70004	1.73129	1.76254
	0°56'49"	0° 55'39"	0°54'31"	0° 53'26"	0°52'24"	0° 51'24"	0° 50'26"	0° 49'31"	0°48'37"	0°47'45"
14	1.54671	1.57796	1.60921	1.64046	1.67171	1.70296	1.73421	1.76546	1.79671	1.82796
0.04124	1.48485	1.51610	1.54735	1.57860	1.60985	1.64110	1.67235	1.70360	1.73485	1.76610
	0°52'38"	0°51'33"	0°50'31"	0°49'31"	0°48"33"	0°47'37"	0°46'44"	0° 45'53"	0°45'3"	0°44'15"
16	1.54476	1.57601	1.60726	1.63851	1.66976	1.70101	1.73226	1.76351	1.79476	1.82601
0.03608	1.49065	1.52190	1.55315	1.58440	1.61565	1.64690	1.67815	1.70940	1.74065	1.77190
	0°45'53"	0°44'56"	0°44'2"	0°43' 10"	0°42'20"	0° 41'32"	0°40'45"	0°40' 0"	0° 39'17"	0°38'36"
18	1.54327	1.57452	1.60577	1.63702	1.66827	1.69952	1.73077	1.76202	1.79327	1.82452
0.03207	1.49517	1.52642	1.55767	1.58892	1.62017	1.65142	1.68267	1.71392	1.74517	1.77642
	0°40'39"	0° 39'50"	0°39'2"	0°38'16"	0°37'31"	0°36'49"	0°36'8"	0°35'28"	0°34'50"	0°34' 13"
20	1.54208	1.57333	1.60458	1.63583	1.66708	1.69833	1.72958	1.76083	1.79208	1.82333
0.02887	1.49877	1.53002	1.56127	1.59252	1.62377	1.65502	1.68627	1.71752	1.74877	1.78002
	0°36'30"	0° 35'46"	0°35'3"	0°34'21"	0° 33'42"	0°33'4"	0° 32'27"	0°31'51"	0° 31'17"	0° 30'44"
22	1.54109	1.57234	1.60359	1.63484	1.66609	1.69734	1.72859	1.75984	1.79109	1.82234
0.02624	1.50173	1.53298	1.56423	1.59548	1.62673	1.65798	1.68923	1.72048	1.75173	1.78298
	0°33'7"	0° 32'27"	0°31'48"	0° 31'10"	0°30'35"	0° 30'0"	0°29'27"	0° 28'55"	0° 28'24"	0°27'54"
24	1.54029	1.57154	1.60279	1.63404	1.66529	1.69654	1.72779	1.75904	1.79029	1.82154
0.02406	1.50419	1.53544	1.56669	1.59794	1.62919	1.66044	1.69169	1.72294	1.75419	1.78544
	0°30'19"	0° 29'42"	0° 29'6"	0° 28' 32"	0° 27'59"	0° 27'28"	0° 26'57"	0°26'28"	0° 25'59"	0° 25' 32"
26	1.53959	1.57084	1.60209	1.63334	1.66459	1.69584	1.72709	1.75834	1.78959	1.82084
0.02221	1.50627	1.53752	1.56877	1.60002	1.63127	1.66252	1.69377	1.72502	1.75627	1.78752
	0°27'56"	0° 27'22"	0°26'50"	0° 26'18"	0° 25'48"	0° 25'19"	0° 24'51"	0° 24'24"	0° 23'58"	0° 23' 33"
28	1.53899	1.57024	1.60149	1.63274	1.66399	1.69524	1.72649	1.75774	1.78899	1.82024
0.02062	1.50806	1.53931	1.57056	1.60181	1.63306	1.66431	1.69556	1.72681	1.75806	1.78931
	0°25'55"	0° 25'23"	0° 24'53"	0° 24'24"	0°23'56"	0° 23'29"	0° 23'3"	0° 22'38"	0° 22'14"	0° 21'50"
30	1.53845	1.56970	1.60095	1.63220	1.66345	1.69470	1.72595	1.75720	1.78845	1.81970
0.01924	1.50960	1.54085	1.57210	1.60335	1.63460	1.66585	1.69710	1.72835	1.75960	1.79085
	0°24'10"	0° 23'40"	0° 23'12"	0° 22'45"	0°22'19"	0°21'54"	0° 21'30"	0° 21'6"	0° 20'44"	0°20'22"
32	1.53801	1.56926	1.60051	1.63176	1.66301	1.69426	1.72551	1.75676	1.78801	1.81926
0.01804	1.51095	1.54220	1.57345	1.60470	1.63595	1.66720	1.69845	1.72970	1.76095	1.79220
	0°22'38"	0°22'10"	0° 21'44"	0°21'19"	0° 20'54"	0°20'31"	0° 20'8"	0° 19'46"	0° 19'25"	0° 19'5"

KEY— WIRE READING ——— 'M' 1.63176
PITCH DIAMETER ——— 'E' 1.60470
HELIX ANGLE ——— 'S' 0°21'19"

PITCH / WIRE	DIAMETERS $1\frac{27}{32}$	$1\frac{7}{8}$	$1\frac{29}{32}$	$1\frac{15}{16}$	$1\frac{31}{32}$	2	$2\frac{1}{32}$	$2\frac{1}{16}$	$2\frac{3}{32}$	$2\frac{1}{8}$
4	1.89788	1.92913	1.96038	1.99163	2.02288	2.05413	2.08538	2.11663	2.14788	2.17913
0.14434	1.68137	1.71262	1.74387	1.77512	1.80637	1.83762	1.86887	1.90012	1.93137	1.96262
	2°42'35"	2°39'37"	2°36'46"	2°34'1"	2°31'21"	2°28'47"	2°26'18"	2°23'53"	2°21'34"	2°19'18"
$4\frac{1}{2}$	1.89186	1.92311	1.95436	1.98561	2.01686	2.04811	2.07936	2.11061	2.14186	2.17311
0.12830	1.69941	1.73066	1.76191	1.79316	1.82441	1.85566	1.88691	1.91816	1.94941	1.98066
	2°23'1"	2°20'26"	2°17'56"	2°15'32"	2°13'13"	2°10'59"	2°8'49"	2°6'43"	2°4'41"	2°2'43"
5	1.88706	1.91831	1.94956	1.98081	2.01206	2.04331	2.07456	2.10581	2.13706	2.16831
0.11547	1.71385	1.74510	1.77635	1.80760	1.83885	1.87010	1.90135	1.93260	1.96385	1.99510
	2°7'38"	2°5'21"	2°3'9"	2°1'1"	1°58'58"	1°56'59"	1°55'4"	1°53'12"	1°51'24"	1°49'39"
$5\frac{1}{2}$	1.88311	1.91436	1.94561	1.97686	2.00811	2.03936	2.07061	2.10186	2.13311	2.16436
0.10497	1.72566	1.75691	1.78816	1.81941	1.85066	1.88191	1.91316	1.94441	1.97566	2.00691
	1°55'15"	1°53'12"	1°51'14"	1°49'19"	1°47'28"	1°45'41"	1°43'58"	1°42'18"	1°40'41"	1°39'7"
6	1.87982	1.91107	1.94232	1.97357	2.00482	2.03607	2.06732	2.09857	2.12982	2.16107
0.09622	1.73550	1.76675	1.79800	1.82925	1.86050	1.89175	1.92300	1.95425	1.98550	2.01675
	1°45'3"	1°43'12"	1°41'24"	1°39'40"	1°38'0"	1°36'23"	1°34'49"	1°33'18"	1°31'50"	1°30'25"
7	1.87468	1.90593	1.93718	1.96843	1.99968	2.03093	2.06218	2.09343	2.12468	2.15593
0.08248	1.75096	1.78221	1.81346	1.84471	1.87596	1.90721	1.93846	1.96971	2.00096	2.03221
	1°29'16"	1°27'42"	1°26'11"	1°24'43"	1°23'19"	1°21'57"	1°20'38"	1°19'21"	1°18'7"	1°16'55"
8	1.87082	1.90207	1.93332	1.96457	1.99582	2.02707	2.05832	2.08957	2.12082	2.15207
0.07217	1.76256	1.79381	1.82506	1.85631	1.88756	1.91881	1.95006	1.98131	2.01256	2.04381
	1°17'36"	1°16'14"	1°14'56"	1°13'40"	1°12'27"	1°11'16"	1°10'8"	1°9'2"	1°7'57"	1°6'55"
9	1.86780	1.89905	1.93030	1.96155	1.99280	2.02405	2.05530	2.08655	2.11780	2.14905
0.06415	1.77157	1.80282	1.83407	1.86532	1.89657	1.92782	1.95907	1.99032	2.02157	2.05282
	1°8'37"	1°7'26"	1°6'17"	1°5'10"	1°4'6"	1°3'4"	1°2'3"	1°1'5"	1°0'8"	0°59'13"
10	1.86542	1.89667	1.92792	1.95917	1.99042	2.02167	2.05292	2.08417	2.11542	2.14667
0.05774	1.77880	1.81005	1.84130	1.87255	1.91380	1.93505	1.96630	1.99755	2.02880	2.06005
	1°1'31"	1°0'27"	0°59'25"	0°58'26"	0°57'28"	0°56'33"	0°55'39"	0°54'47"	0°53'56"	0°53'7"
11	1.86345	1.89470	1.92595	1.95720	1.98845	2.01970	2.05095	2.08220	2.11345	2.14470
0.05249	1.78471	1.81596	1.84721	1.87846	1.90971	1.94096	1.97221	2.00346	2.03471	2.06596
	0°55'44"	0°54'47"	0°53'51"	0°52'57"	0°52'5"	0°51'15"	0°50'26"	0°49'39"	0°48'53"	0°48'9"
12	1.86178	1.89303	1.92428	1.95553	1.98678	2.01803	2.04928	2.08053	2.11178	2.14303
0.04811	1.78962	1.82087	1.85212	1.88337	1.91462	1.94587	1.97712	2.00837	2.03962	2.07087
	0°50'57"	0°50'5"	0°49'14"	0°48'25"	0°47'37"	0°46'52"	0°46'7"	0°45'24"	0°44'42"	0°44'2"
13	1.86040	1.89165	1.92290	1.95415	1.98540	2.01665	2.04790	2.07915	2.11040	2.14165
0.04441	1.79379	1.82504	1.85629	1.88754	1.91879	1.95004	1.98129	2.01254	2.04379	2.07504
	0°46'55"	0°46'7"	0°45'21"	0°44'36"	0°43'52"	0°43'10"	0°42'29"	0°41'49"	0°41'11"	0°40'34"
14	1.85921	1.89046	1.92171	1.95296	1.98421	2.01546	2.04671	2.07796	2.10921	2.14046
0.04124	1.79735	1.82860	1.85985	1.89110	1.92235	1.95360	1.98485	2.01610	2.04735	2.07860
	0°43'29"	0°42'45"	0°42'1"	0°41'20"	0°40'39"	0°40'0"	0°39'23"	0°38'46"	0°38'11"	0°37'36"
16	1.85726	1.88851	1.91976	1.95101	1.98226	2.01351	2.04476	2.07601	2.10726	2.13851
0.03608	1.80315	1.83440	1.86565	1.89690	1.92815	1.95940	1.99065	2.02190	2.05315	2.08440
	0°37'56"	0°37'17"	0°36'39"	0°36'3"	0°35'28"	0°34'54"	0°34'21"	0°33'49"	0°33'18"	0°32'49"
18	1.85577	1.88702	1.91827	1.94952	1.98077	2.01202	2.04327	2.07452	2.10577	2.13702
0.03207	1.80767	1.83892	1.87017	1.90142	1.93267	1.96392	1.99517	2.02642	2.05767	2.08892
	0°33'38"	0°33'3"	0°32'30"	0°31'58"	0°31'27"	0°30'57"	0°30'28"	0°30'0"	0°29'33"	0°29'6"
20	1.85458	1.88583	1.91708	1.94833	1.97958	2.01083	2.04208	2.07333	2.10458	2.13583
0.02887	1.81127	1.84252	1.87377	1.90502	1.93627	1.96752	1.99877	2.03002	2.06127	2.09252
	0°30'12"	0°29'42"	0°29'12"	0°28'43"	0°28'15"	0°27'48"	0°27'22"	0°26'57"	0°26'33"	0°26'9"
22	1.85359	1.88484	1.91609	1.94734	1.97859	2.00984	2.04109	2.07234	2.10359	2.13484
0.02624	1.81423	1.84548	1.87673	1.90798	1.93923	1.97048	2.00173	2.03298	2.06423	2.09548
	0°27'25"	0°26'57"	0°26'30"	0°26'4"	0°25'39"	0°25'15"	0°24'51"	0°24'28"	0°24'6"	0°23'44"
24	1.85279	1.88404	1.91529	1.94654	1.97779	2.00904	2.04029	2.07154	2.10279	2.13404
0.02406	1.81669	1.84794	1.87919	1.91044	1.94169	1.97294	2.00419	2.03544	2.06669	2.09794
	0°25'6"	0°24'40"	0°24'16"	0°23'52"	0°23'29"	0°23'7"	0°22'45"	0°22'24"	0°22'4"	0°21'44"
26	1.85209	1.88334	1.91459	1.94584	1.97709	2.00834	2.03959	2.07084	2.10209	2.13334
0.02221	1.81877	1.85002	1.88127	1.91252	1.94377	1.97502	2.00627	2.03752	2.06877	2.10002
	0°23'8"	0°22'45"	0°22'22"	0°22'0"	0°21'39"	0°21'19"	0°20'59"	0°20'39"	0°20'21"	0°20'3"
28	1.85149	1.88274	1.91399	1.94524	1.97649	2.00774	2.03899	2.07024	2.10149	2.13274
0.02062	1.82056	1.85181	1.88306	1.91431	1.94556	1.97681	2.00806	2.03931	2.07056	2.10181
	0°21'28"	0°21'6"	0°20'45"	0°20'25"	0°20'5"	0°19'46"	0°19'28"	0°19'10"	0°18'53"	0°18'36"
30	1.85095	1.88220	1.91345	1.94470	1.97595	2.00720	2.03845	2.06970	2.10095	2.13220
0.01924	1.82210	1.85335	1.88460	1.91585	1.94710	1.97835	2.00960	2.04085	2.07210	2.10335
	0°20'1"	0°19'41"	0°19'21"	0°19'2"	0°18'44"	0°18'26"	0°18'9"	0°17'52"	0°17'36"	0°17'20"
32	1.85051	1.88176	1.91301	1.94426	1.97551	2.00676	2.03801	2.06926	2.10051	2.13176
0.01804	1.82345	1.85470	1.88595	1.91720	1.94845	1.97970	2.01095	2.04220	2.07345	2.10470
	0°18'45"	0°18'26"	0°18'8"	0°17'50"	0°17'33"	0°17'16"	0°17'0"	0°16'45"	0°16'30"	0°16'15"

KEY— WIRE READING ——— 'M' 1.94426
PITCH DIAMETER ——— 'E' 1.91720
HELIX ANGLE ——— 's' 0°17'50'

PITCH / WIRE	DIAMETERS $2\frac{5}{32}$	$2\frac{3}{16}$	$2\frac{7}{32}$	$2\frac{1}{4}$	$2\frac{9}{32}$	$2\frac{5}{16}$	$2\frac{11}{32}$	$2\frac{3}{8}$	$2\frac{13}{32}$	$2\frac{7}{16}$
4 0.14434	2.21038 1.99387 2°17′ 8″	2.24163 2.02512 2°15′ 1″	2.27288 2.05637 2°12′58″	2.30413 2.08762 2° 10′59″	2.33538 2.11887 2° 9′ 3″	2.36663 2.15012 2° 7′11″	2.39788 2.18137 2°5′21″	2.42913 2.21262 2°3′35″	2.46038 2.24387 2°1′52″	2.49163 2.27512 2°0′12″
$4\frac{1}{2}$ 0.12830	2.20436 2.01191 2° 0′49″	2.23561 2.04316 1°58′58″	2.26686 2.07441 1° 57′11″	2.29811 2.10566 1° 55′26″	2.32936 2.13691 1° 53′45″	2.36061 2.16816 1° 52′7″	2.39186 2.19941 1°50′31″	2.42311 2.23066 1°48′58″	2.45436 2.26191 1°47′28″	2.48561 2.29316 1°46′1″
5 0.11547	2.19956 2.02635 1°47′58″	2.23081 2.05760 1°46′20″	2.26206 2.08885 1°44′44″	2.29331 2.12010 1° 43′12″	2.32456 2.15135 1°41′42″	2.35581 2.18260 1°40′15″	2.38706 2.21385 1° 38′50″	2.41831 2.24510 1°37′27″	2.44956 2.27635 1° 36′7″	2.48081 2.30760 1°34′49″
$5\frac{1}{2}$ 0.10497	2.19561 2.03816 1° 37′35″	2.22686 2.06941 1° 36′7″	2.25811 2.10066 1°34′41″	2.28936 2.13191 1° 33′18″	2.32061 2.16316 1° 31′57″	2.35186 2.19441 1°30′39″	2.38311 2.22566 1° 29′22″	2.41436 2.25691 1° 28′8″	2.44561 2.28816 1° 26′56″	2.47686 2.31941 1°25′46″
6 0.09622	2.19232 2.04800 1° 29′2″	2.22357 2.07925 1° 27′42″	2.25482 2.11050 1° 26′24″	2.28607 2.14175 1°25′8″	2.31732 2.17300 1° 23′55″	2.34857 2.20425 1°22′43″	2.37982 2.23550 1° 21′34″	2.41107 2.26675 1°20′27″	2.44232 2.29800 1° 19′21″	2.47357 2.32925 1° 18′17″
7 0.08248	2.18718 2.06346 1°15′45″	2.21843 2.09471 1° 14′37″	2.24968 2.12596 1°13′31″	2.28093 2.15721 1° 12′27″	2.31218 2.18846 1° 11′25″	2.34343 2.21971 1° 10′25″	2.37468 2.25096 1° 9′26″	2.40593 2.28221 1° 8′29″	2.43718 2.31346 1° 7′34″	2.46843 2.34471 1° 6′40″
8 0.07217	2.18332 2.07506 1° 5′55″	2.21457 2.10631 1°4′56″	2.24582 2.13756 1° 3′59″	2.27707 2.16881 1° 3′4″	2.30832 2.20006 1° 2′10″	2.33957 2.23131 1° 1′18″	2.37082 2.26256 1° 0′27″	2.40207 2.29381 0° 59′38″	2.43332 2.32506 0° 58′50″	2.46457 2.35631 0° 58′3″
9 0.06415	2.18030 2.08407 0° 58′20″	2.21155 2.11532 0° 57′28″	2.24280 2.14657 0° 56′38″	2.27405 2.17782 0° 55′49″	2.30530 2.20907 0° 55′2″	2.33655 2.24032 0° 54′16″	2.36780 2.27157 0° 53′31″	2.39905 2.30282 0° 52′48″	2.43030 2.33407 0° 52′5″	2.46155 2.36532 0° 51′24″
10 0.05774	2.17792 2.09130 0° 52′19″	2.20917 2.12255 0° 51′33″	2.24042 2.15380 0° 50′48″	2.27167 2.18505 0° 50′5″	2.30292 2.21630 0° 49′22″	2.33417 2.24755 0° 48′41″	2.36542 2.27880 0° 48′1″	2.39667 2.31005 0° 47′22″	2.42792 2.34130 0° 46′44″	2.45917 2.37255 0° 46′7″
11 0.05249	2.17595 2.09721 0° 47′26″	2.20720 2.12846 0° 46′44″	2.23845 2.15971 0° 46′4″	2.26970 2.19096 0° 45′24″	2.30095 2.22221 0° 44′46″	2.33220 2.25346 0° 44′9″	2.36345 2.28471 0° 43′32″	2.39470 2.31596 0° 42′57″	2.42595 2.34721 0° 42′23″	2.45720 2.37846 0° 41′49″
12 0.04811	2.17428 2.10212 0° 43′23″	2.20553 2.13337 0° 42′45″	2.23678 2.16462 0° 42′8″	2.26803 2.19587 0° 41′32″	2.29928 2.22712 0° 40′57″	2.33053 2.25837 0° 40′23″	2.36178 2.28962 0° 39′50″	2.39303 2.32087 0° 39′17″	2.42428 2.35212 0° 38′46″	2.45553 2.38337 0° 38′16″
13 0.04441	2.17290 2.10629 0° 39′58″	2.20415 2.13754 0° 39′23″	2.23540 2.16879 0° 38′49″	2.26665 2.20004 0° 38′16″	2.29790 2.23129 0° 37′43″	2.32915 2.26254 0° 37′12″	2.36040 2.29379 0° 36′42″	2.39165 2.32504 0° 36′12″	2.42290 2.35629 0° 35′43″	2.45415 2.38754 0° 35′15″
14 0.04124	2.17171 2.10985 0° 37′3″	2.20296 2.14110 0° 36′30″	2.23421 2.17235 0° 35′59″	2.26546 2.20360 0° 35′28″	2.29671 2.23485 0° 34′58″	2.32796 2.26610 0° 34′29″	2.35921 2.29735 0° 34′1″	2.39046 2.32860 0° 33′34″	2.42171 2.35985 0° 33′7″	2.45296 2.39110 0° 32′41″
16 0.03608	2.16976 2.11565 0° 32′20″	2.20101 2.14690 0° 31′51″	2.23226 2.17815 0° 31′24″	2.26351 2.20940 0° 30′57″	2.29476 2.24065 0° 30′31″	2.32601 2.27190 0° 30′6″	2.35726 2.30315 0° 29′42″	2.38851 2.33440 0° 29′18″	2.41976 2.36565 0° 28′55″	2.45101 2.39690 0° 28′33″
18 0.03207	2.16827 2.12017 0° 28′40″	2.19952 2.15142 0° 28′15″	2.23077 2.18267 0° 27′51″	2.26202 2.21392 0° 27′28″	2.29327 2.24517 0° 27′5″	2.32452 2.27642 0° 26′42″	2.35577 2.30767 0° 26′21″	2.38702 2.33892 0° 26′0″	2.41827 2.37017 0° 25′39″	2.44952 2.40142 0° 25′19″
20 0.02887	2.16708 2.12377 0° 25′46″	2.19833 2.15502 0° 25′23″	2.22958 2.18627 0° 25′1″	2.26083 2.21752 0° 24′40″	2.29208 2.24877 0° 24′20″	2.32333 2.28002 0° 24′0″	2.35458 2.31127 0° 23′40″	2.38583 2.34252 0° 23′21″	2.41708 2.37377 0° 23′3″	2.44833 2.40502 0° 22′45″
22 0.02624	2.16609 2.12673 0° 23′23″	2.19734 2.15798 0° 23′3″	2.22859 2.18923 0° 22′43″	2.25984 2.22048 0° 22′24″	2.29109 2.25173 0° 22′5″	2.32234 2.28298 0° 21′47″	2.35359 2.31423 0° 21′30″	2.38484 2.34548 0° 21′12″	2.41609 2.37673 0° 20′56″	2.44734 2.40798 0° 20′39″
24 0.02406	2.16529 2.12919 0° 21′25″	2.19654 2.16044 0° 21′6″	2.22779 2.19169 0° 20′48″	2.25904 2.22294 0° 20′31″	2.29029 2.25419 0° 20′14″	2.32154 2.28544 0°19′57″	2.35279 2.31669 0°19′41″	2.38404 2.34794 0°19′25″	2.41529 2.37919 0°19′10″	2.44654 2.41044 0°18′55″
26 0.02221	2.16459 2.13127 0°19′45″	2.19584 2.16252 0°19′28″	2.22708 2.19377 0°19′11″	2.25834 2.22502 0° 18′55″	2.28959 2.25627 0°18′39″	2.32084 2.28752 0°18′24″	2.35209 2.31877 0° 18′9″	2.38334 2.35002 0°17′55″	2.41459 2.38127 0°17′41″	2.44584 2.41252 0°17′27″
28 0.02062	2.16399 2.13306 0°18′19″	2.19524 2.16431 0° 18′3″	2.22649 2.19556 0° 17′48″	2.25774 2.22681 0°17′33″	2.28899 2.25806 0° 17′18″	2.32024 2.28931 0°17′4″	2.35149 2.32056 0°16′50″	2.38274 2.35181 0°16′37″	2.41399 2.38306 0° 16′24″	2.44524 2.41431 0°16′12″
30 0.01924	2.16345 2.13460 0°17′5″	2.19470 2.16585 0°16′50″	2.22595 2.19710 0° 16′36″	2.25720 2.22835 0° 16′22″	2.28845 2.25960 0°16′8″	2.31970 2.29085 0°15′55″	2.35095 2.32210 0°15′42″	2.38220 2.35335 0°15′30″	2.41345 2.38460 0°15′18″	2.44470 2.41585 0°15′6″
32 0.01804	2.16301 2.13595 0° 16′1″	2.19426 2.16720 0°15′47″	2.22551 2.19845 0°15′33″	2.25676 2.22970 0° 15′20″	2.28801 2.26095 0°15′7″	2.31926 2.29220 0°14′55″	2.35051 2.32345 0°14′43″	2.38176 2.35470 0° 14′31″	2.41301 2.38595 0° 14′20″	2.44426 2.41720 0°14′9″

KEY— WIRE READING——M 2.25676
PITCH DIAMETER——E 2.22970
HELIX ANGLE——S 0°15′20″

PITCH / WIRE	DIAMETERS $2\frac{15}{32}$	$2\frac{1}{2}$	$2\frac{17}{32}$	$2\frac{9}{16}$	$2\frac{19}{32}$	$2\frac{5}{8}$	$2\frac{21}{32}$	$2\frac{11}{16}$	$2\frac{23}{32}$	$2\frac{3}{4}$
4	2.52288	2.55413	2.58538	2.61663	2.64788	2.67913	2.71038	2.74163	2.77288	2.80413
	2.30637	2.33762	2.36887	2.40012	2.43137	2.46262	2.49387	2.52512	2.55637	2.58762
0.14434	1°58' 34"	1°56'59"	1°55'26"	1°53'56"	1°52'29"	1°51' 3"	1°49'40"	1°48' 18"	1°46'59"	1°45'41"
$4\frac{1}{2}$	2.51686	2.54811	2.57936	2.61061	2.64186	2.67311	2.70436	2.73561	2.76686	2.79811
	2.32441	2.35566	2.38691	2.41816	2.44941	2.48066	2.51191	2.54316	2.57441	2.60566
0.12830	1°44'35"	1°43' 12"	1°41' 51"	1°40'32"	1°39'15"	1°38'0"	1°36'47"	1°35'36"	1°34'26"	1°33'18"
5	2.51206	2.54331	2.57456	2.60581	2.63706	2.66831	2.69956	2.73081	2.76206	2.79331
	2.33885	2.37010	2.40135	2.43260	2.46385	2.49510	2.52635	2.55760	2.58885	2.62010
0.11547	1°33'33"	1°32'19"	1° 31'7"	1°29'57"	1°28'48"	1°27'42"	1°26'37"	1° 25'33"	1°24'31"	1°23'31"
$5\frac{1}{2}$	2.50811	2.53936	2.57061	2.60186	2.63311	2.66436	2.69561	2.72686	2.75811	2.78936
	2.35066	2.38191	2.41316	2.44441	2.47566	2.50691	2.53816	2.56941	2.60066	2.63191
0.10497	1°24'37"	1°23' 31"	1° 22'26"	1°21' 23"	1°20'21"	1°19'21"	1° 18' 22"	1°17'25"	1°16'29"	1°15'35"
6	2.50482	2.53607	2.56732	2.59857	2.62982	2.66107	2.69232	2.72357	2.75482	2.78607
	2.36050	2.39175	2.42300	2.45425	2.48550	2.51675	2.54800	2.57925	2.61050	2.64175
0.09622	1° 17'15"	1° 16'14"	1° 15'15"	1° 14'18"	1°13'22"	1° 12'27"	1°11'34"	1°10'42"	1° 9'51"	1° 9' 2"
7	2.49968	2.53093	2.56218	2.59343	2.62468	2.65593	2.68718	2.71843	2.74968	2.78093
	2.37596	2.40721	2.43846	2.46971	2.50096	2.53221	2.56346	2.59471	2.62596	2.65721
0.08248	1° 5' 47"	1° 4'56"	1° 4' 6"	1°3' 17"	1° 2' 30"	1° 1'44"	1° 0' 58"	1° 0'14"	0° 59'31"	0° 58'49"
8	2.49582	2.52707	2.55832	2.58957	2.62082	2.65207	2.68332	2.71457	2.74582	2.77707
	2.38756	2.41881	2.45006	2.48131	2.51256	2.54381	2.57506	2.60631	2.63756	2.66881
0.07217	0° 57' 17"	0° 56'33"	0° 55'50"	0° 55' 7"	0° 54'26"	0°53'46"	0° 53'7"	0°52'29"	0°51'51"	0°51'15"
9	2.49280	2.52405	2.55530	2.58655	2.61780	2.64905	2.68030	2.71155	2.74280	2.77405
	2.39657	2.42782	2.45907	2.49032	2.52157	2.55282	2.58407	2.61532	2.64657	2.67782
0.06415	0° 50'44"	0°50' 4"	0° 49'26"	0° 48'49"	0° 48'13"	0°47'37"	0° 47'3"	0° 46'29"	0°45'56"	0°45'24"
10	2.49042	2.52167	2.55292	2.58417	2.61542	2.64667	2.67792	2.70917	2.74042	2.77167
	2.40380	2.43505	2.46630	2.49755	2.52880	2.56005	2.59130	2.62255	2.65380	2.68505
0.05774	0° 45'31"	0° 44'56"	0° 44'22"	0° 43'49"	0° 43'16"	0° 42'45"	0° 42'14"	0° 41'43"	0° 41' 14"	0° 40'45"
11	2.48845	2.51970	2.55095	2.58220	2.61345	2.64470	2.67595	2.70720	2.73845	2.76970
	2.40971	2.44096	2.47221	2.50346	2.53471	2.56596	2.59721	2.62846	2.65971	2.69096
0.05249	0° 41' 17"	0° 40'45"	0° 40'14"	0° 39'44"	0° 39'15"	0° 38'46"	0° 38'18"	0° 37' 51"	0° 37'24"	0° 36' 58"
12	2.48678	2.51803	2.54928	2.58053	2.61178	2.64303	2.67428	2.70553	2.73678	2.76803
	2.41462	2.44587	2.47712	2.50837	2.53962	2.57087	2.60212	2.63337	2.66462	2.69587
0.04811	0° 37'46"	0° 37'17"	0° 36'49"	0° 36'21"	0° 35'54"	0° 35'28"	0° 35' 3"	0° 34'38"	0° 34'13"	0° 33'49"
13	2.48540	2.51665	2.54790	2.57915	2.61040	2.64165	2.67290	2.70415	2.73540	2.76665
	2.41879	2.45004	2.48129	2.51254	2.54379	2.57504	2.60629	2.63754	2.66879	2.70004
0.04441	0°34'48"	0°34'21"	0° 33' 55"	0° 33'30"	0° 33' 5"	0° 32'41"	0° 32'18"	0° 31'55"	0° 31' 32"	0° 31' 10"
14	2.48421	2.51546	2.54671	2.57796	2.60921	2.64046	2.67171	2.70296	2.73421	2.76546
	2.42235	2.45360	2.48485	2.51610	2.54735	2.57860	2.60985	2.64110	2.67235	2.70360
0.04124	0°32' 16"	0° 31' 51"	0°31' 27"	0° 31' 4"	0° 30'41"	0° 30' 19"	0° 29'57"	0° 29'36"	0° 29' 15"	0° 28'55"
16	2.48226	2.51351	2.54476	2.57601	2.60726	2.63851	2.66976	2.70101	2.73226	2.76351
	2.42815	2.45940	2.49065	2.52190	2.55315	2.58440	2.61565	2.64690	2.67815	2.70940
0.03608	0°28' 10"	0° 27'48"	0° 27'28"	0° 27' 7"	0°26'47"	0° 26'28"	0° 26'9"	0° 25'50"	0°25'32"	0° 25' 14"
18	2.48077	2.51202	2.54327	2.57452	2.60577	2.63702	2.66827	2.69952	2.73077	2.76202
	2.43267	2.46392	2.49517	2.52642	2.55767	2.58892	2.62017	2.65142	2.68267	2.71392
0.03207	0°24'59"	0°24'40"	0°24'22"	0°24' 4"	0°23'46"	0°23'29"	0° 23'12"	0°22'56"	0°22'40"	0° 22'24"
20	2.47958	2.51083	2.54208	2.57333	2.60458	2.63583	2.66708	2.69833	2.72958	2.76083
	2.43627	2.46752	2.49877	2.53002	2.56127	2.59252	2.62377	2.65502	2.68627	2.71752
0.02887	0°22'27"	0° 22' 10"	0° 21' 54"	0°21' 38"	0°21'22"	0° 21' 6"	0° 20' 51"	0° 20'36"	0° 20'22"	0°20'8"
22	2.47895	2.50984	2.54109	2.57234	2.60359	2.63484	2.66609	2.69734	2.72859	2.75984
	2.43923	2.47048	2.50173	2.53298	2.56423	2.59548	2.62673	2.65798	2.68923	2.72048
0.02624	0°20'23"	0° 20' 8"	0°19' 53"	0° 19'38"	0°19'24"	0°19'10"	0°18'56"	0°18'43"	0°18'30"	0°18'17"
24	2.47779	2.50904	2.54029	2.57154	2.60279	2.63404	2.66529	2.69654	2.72779	2.75904
	2.44169	2.47294	2.50419	2.53544	2.56669	2.59794	2.62919	2.66044	2.69169	2.72294
0.02406	0°18' 40"	0°18' 26"	0°18'12"	0°17'59"	0° 17'46"	0°17'33"	0°17'20"	0°17' 8"	0°16'56"	0°16'45"
26	2.47709	2.50834	2.53959	2.57084	2.60209	2.63334	2.66459	2.69584	2.72709	2.75834
	2.44377	2.47502	2.50627	2.53752	2.56877	2.60002	2.63127	2.66252	2.69377	2.72502
0.02221	0°17'13"	0°17'0"	0°16'48"	0°16'35"	0° 16'23"	0°16'11"	0° 16'0"	0° 15'48"	0°15'37"	0°15'27"
28	2.47649	2.50774	2.53899	2.57024	2.60149	2.63274	2.66399	2.69524	2.72649	2.75774
	2.44556	2.47681	2.50806	2.53931	2.57056	2.60181	2.63306	2.66431	2.69556	2.72681
0.02062	0°15'59"	0°15'47"	0°15'35"	0°15'23"	0°15' 12"	0° 15' 1"	0°14'51"	0°14'40"	0°14'30"	0°14'20"
30	2.47595	2.50720	2.53845	2.56970	2.60095	2.63220	2.66345	2.69470	2.72595	2.75720
	2.44710	2.47835	2.50960	2.54085	2.57210	2.60335	2.63460	2.66585	2.69710	2.72835
0.01924	0°14' 54"	0°14' 43"	0°14'32"	0° 14' 21"	0°14'11"	0° 14' 1"	0° 13' 51"	0° 13' 41"	0° 13' 31"	0° 13' 22"
32	2.47551	2.50676	2.53801	2.56926	2.60051	2.63176	2.66301	2.69426	2.72551	2.75676
	2.44845	2.47970	2.51095	2.54220	2.57345	2.60470	2.63595	2.66720	2.69845	2.72970
0.01804	0°13'58"	0° 13'47"	0°13' 37"	0° 13'27"	0°13'17"	0° 13' 8"	0° 12'58"	0° 12'49"	0°12' 40"	0°12'32"

KEY— WIRE READING ——— 'M' 2.56926
PITCH DIAMETER ——— 'E' 2.54220
HELIX ANGLE ——— 's' 0°13' 27"

PITCH / WIRE	DIAMETERS $2\frac{25}{32}$	$2\frac{13}{16}$	$2\frac{27}{32}$	$2\frac{7}{8}$	$2\frac{29}{32}$	$2\frac{15}{16}$	$2\frac{31}{32}$	3	$3\frac{1}{16}$	$3\frac{1}{8}$
4 0.14434	2.83538 2.61887 1°44'26"	2.86663 2.65012 1°43'12"	2.89788 2.68137 1°42' 0"	2.92913 2.71262 1°40'49"	2.96038 2.74387 1°39'40"	2.99163 2.77512 1°38'33"	3.02288 2.80637 1°37'27"	3.05413 2.83762 1°36'23"	3.11663 2.90012 1°34'18"	3.17913 2.96262 1°32'19"
$4\frac{1}{2}$ 0.12830	2.82936 2.63691 1°32'12"	2.86061 2.66816 1°31' 7"	2.89186 2.69941 1°30' 4"	2.92311 2.73066 1°29' 2"	2.95436 2.76191 1°28' 1"	2.98561 2.79316 1°27'2"	3.01686 2.82441 1°26' 5"	3.04811 2.85566 1°25' 8"	3.11061 2.91816 1°23'19"	3.17311 2.98066 1°21'34"
5 0.11547	2.82456 2.65135 1°22'32"	2.85581 2.68260 1°21'34"	2.88706 2.71385 1°20'38"	2.91831 2.74510 1°19'43"	2.94956 2.77635 1°18'49"	2.98081 2.80760 1°17'56"	3.01206 2.83885 1°17' 5"	3.04331 2.87010 1°16'14"	3.10581 2.93260 1°14'37"	3.16831 2.99510 1°13'3"
$5\frac{1}{2}$ 0.10497	2.82061 2.66316 1°14'42"	2.85186 2.69441 1°13'50"	2.88311 2.72566 1°12'59"	2.91436 2.75691 1°12'9"	2.94561 2.78816 1°11'21"	2.97686 2.81941 1°10'33"	3.00811 2.85066 1°9'47"	3.03936 2.88191 1°9'2"	3.10186 2.94441 1°7'34"	3.16436 3.00691 1°6'9"
6 0.09622	2.81732 2.67300 1°8'13"	2.84857 2.70425 1°7'26"	2.87982 2.73550 1°6'40"	2.91107 2.76675 1°5'55"	2.94232 2.79800 1°5'10"	2.97357 2.82925 1°4'27"	3.00482 2.86050 1°3'45"	3.03607 2.89175 1°3'4"	3.09857 2.95425 1°1'44"	3.16107 3.01675 1°0'27"
7 0.08248	2.81218 2.68846 0°58'8"	2.84343 2.71971 0°57'28"	2.87468 2.75096 0°56'49"	2.90593 2.78221 0°56'11"	2.93718 2.81346 0°55'34"	2.96843 2.84471 0°54'57"	2.99968 2.87596 0°54'21"	3.03093 2.90721 0°53'46"	3.09343 2.96971 0°52'38"	3.15593 3.03221 0°51'33"
8 0.07217	2.80832 2.70006 0°50'39"	2.83957 2.73131 0°50'5"	2.87082 2.76256 0°49'31"	2.90207 2.79381 0°48'57"	2.93332 2.82506 0°48'25"	2.96457 2.85631 0°47'53"	2.99582 2.88756 0°47'22"	3.02707 2.91881 0°46'52"	3.08957 2.98131 0°45'53"	3.15207 3.04381 0°44'56"
9 0.06415	2.80530 2.70907 0°44'53"	2.83655 2.74032 0°44'22"	2.86780 2.77157 0°43'52"	2.89905 2.80282 0°43'23"	2.93030 2.83407 0°42'54"	2.96155 2.86532 0°42'26"	2.99280 2.89657 0°41'58"	3.02405 2.92782 0°41'32"	3.08655 2.99032 0°40'39"	3.14905 3.05282 0°39'50"
10 0.05774	2.80292 2.71630 0°40'17"	2.83417 2.74755 0°39'50"	2.86542 2.77880 0°39'23"	2.89667 2.81005 0°38'56"	2.92792 2.84130 0°38'31"	2.95917 2.87255 0°38'6"	2.99042 2.90380 0°37'41"	3.02167 2.93505 0°37'17"	3.08417 2.99755 0°36'30"	3.14667 3.06005 0°35'45"
11 0.05249	2.80095 2.72221 0°36'33"	2.83220 2.75346 0°36'8"	2.86345 2.78471 0°35'43"	2.89470 2.81596 0°35'20"	2.92595 2.84721 0°34'56"	2.95720 2.87846 0°34'34"	2.98845 2.90971 0°34'12"	3.01970 2.94096 0°33'49"	3.08220 3.00346 0°33'7"	3.14470 3.06596 0°32'27"
12 0.04811	2.79928 2.72712 0°33'26"	2.83053 2.75837 0°33'3"	2.86178 2.78962 0°32'41"	2.89303 2.82087 0°32'20"	2.92428 2.85212 0°31'58"	2.95553 2.88337 0°31'37"	2.98678 2.91462 0°31'17"	3.01803 2.94587 0°30'57"	3.08053 3.00837 0°30'19"	3.14303 3.07087 0°29'42"
13 0.04441	2.79790 2.73129 0°30'49"	2.82915 2.76254 0°30'28"	2.86040 2.79379 0°30'8"	2.89165 2.82504 0°29'48"	2.92290 2.85629 0°29'28"	2.95415 2.88754 0°29'9"	2.98540 2.91879 0°28'50"	3.01665 2.95004 0°28'32"	3.07915 3.01254 0°27'56"	3.14165 3.07504 0°27'23"
14 0.04124	2.79671 2.73485 0°28'35"	2.82796 2.76610 0°28'15"	2.85921 2.79735 0°27'56"	2.89046 2.82860 0°27'38"	2.92171 2.85985 0°27'20"	2.95296 2.89110 0°27'2"	2.98421 2.92235 0°26'45"	3.01546 2.95360 0°26'28"	3.07796 3.01610 0°25'55"	3.14046 3.07860 0°25'23"
16 0.03608	2.79476 2.74065 0°24'57"	2.82601 2.77190 0°24'40"	2.85726 2.80315 0°24'24"	2.88851 2.83440 0°24'8"	2.91976 2.86565 0°23'52"	2.95101 2.89690 0°23'36"	2.98226 2.92815 0°23'21"	3.01351 2.95940 0°23'7"	3.07601 3.02190 0°22'38"	3.13851 3.08440 0°22'10"
18 0.03207	2.79327 2.74517 0°22'9"	2.82452 2.77642 0°21'54"	2.85577 2.80767 0°21'39"	2.88702 2.83892 0°21'25"	2.91827 2.87017 0°21'11"	2.94952 2.90142 0°20'57"	2.98077 2.93267 0°20'44"	3.01202 2.96392 0°20'31"	3.07452 3.02642 0°20'5"	3.13702 3.08892 0°19'41"
20 0.02887	2.79208 2.74877 0°19'54"	2.82333 2.78002 0°19'41"	2.85458 2.81127 0°19'28"	2.88583 2.84252 0°19'15"	2.91708 2.87377 0°19'2"	2.94833 2.90502 0°18'50"	2.97958 2.93627 0°18'38"	3.01083 2.96752 0°18'26"	3.07333 3.03002 0°18'3"	3.13583 3.09252 0°17'42"
22 0.02624	2.79109 2.75173 0°18'5"	2.82234 2.78298 0°17'52"	2.85359 2.81423 0°17'40"	2.88484 2.84548 0°17'29"	2.91609 2.87673 0°17'17"	2.94734 2.90798 0°17'6"	2.97859 2.93923 0°16'55"	3.00984 2.97048 0°16'45"	3.07234 3.03298 0°16'24"	3.13484 3.09548 0°16'4"
24 0.02406	2.79029 2.75419 0°16'33"	2.82154 2.78544 0°16'22"	2.85279 2.81669 0°16'11"	2.88404 2.84794 0°16'1"	2.91529 2.87919 0°15'50"	2.94654 2.91044 0°15'40"	2.97779 2.94169 0°15'30"	3.00904 2.97294 0°15'20"	3.07154 3.03544 0°15'1"	3.13404 3.09794 0°14'43"
26 0.02221	2.78959 2.75627 0°15'16"	2.82084 2.78752 0°15'6"	2.85209 2.81877 0°14'56"	2.88334 2.85002 0°14'46"	2.91459 2.88127 0°14'36"	2.94584 2.91252 0°14'27"	2.97709 2.94377 0°14'18"	3.00834 2.97502 0°14'9"	3.07084 3.03752 0°13'51"	3.13334 3.10002 0°13'35"
28 0.02062	2.78899 2.75806 0°14'10"	2.82024 2.78931 0°14'1"	2.85149 2.82056 0°13'51"	2.88274 2.85181 0°13'42"	2.91399 2.88306 0°13'33"	2.94524 2.91431 0°13'25"	2.97649 2.94556 0°13'16"	3.00774 2.97681 0°13'7"	3.07024 3.03931 0°12'51"	3.13274 3.10181 0°12'36"
30 0.01924	2.78845 2.75960 0°13'13"	2.81970 2.79085 0°13'4"	2.85095 2.82210 0°12'55"	2.88220 2.85335 0°12'47"	2.91345 2.88460 0°12'39"	2.94470 2.91585 0°12'31"	2.97595 2.94710 0°12'23"	3.00720 2.97835 0°12'15"	3.06970 3.04085 0°12'0"	3.13220 3.10335 0°11'45"
32 0.01804	2.78801 2.76095 0°12'23"	2.81926 2.79220 0°12'15"	2.85051 2.82345 0°12'7"	2.88176 2.85470 0°11'59"	2.91301 2.88595 0°11'51"	2.94426 2.91720 0°11'43"	2.97551 2.94845 0°11'36"	3.00676 2.97970 0°11'29"	3.06926 3.04220 0°11'14"	3.13176 3.10470 0°11'1"

KEY— WIRE READING——M 2.88176
PITCH DIAMETER——E 2.85470
HELIX ANGLE——'S 0°11'59"

PITCH / WIRE	DIAMETERS $3\frac{3}{16}$	$3\frac{1}{4}$	$3\frac{5}{16}$	$3\frac{3}{8}$	$3\frac{7}{16}$	$3\frac{1}{2}$	$3\frac{9}{16}$	$3\frac{5}{8}$	$3\frac{11}{16}$	$3\frac{3}{4}$
4 0.14434	3.24163 3.02512 1°30'25"	3.30413 3.08762 1°28'35"	3.36663 3.15012 1°26'50"	3.42913 3.21262 1°25' 8"	3.49163 3.27512 1°23'31"	3.55413 3.33762 1°21'57"	3.61663 3.40012 1°20'26"	3.67913 3.46262 1°18'59"	3.74163 3.52512 1°17'36"	3.80413 3.58762 1°16'14"
4½ 0.12830	3.23561 3.04316 1°19'54"	3.29811 3.10566 1°18'17"	3.36061 3.16816 1°16'45"	3.42311 3.23066 1°15'16"	3.48561 3.29316 1°13'50"	3.54811 3.35566 1°12'27"	3.61061 3.41816 1°11' 8"	3.67311 3.48066 1° 9'51"	3.73561 3.54316 1° 8'37"	3.79811 3.60566 1° 7'26"
5 0.11547	3.23081 3.05760 1°11'34"	3.29331 3.12010 1°10' 8"	3.35581 3.18260 1° 8'45"	3.41831 3.24510 1° 7'26"	3.48081 3.30760 1° 6' 9"	3.54331 3.37010 1° 4'56"	3.60581 3.43260 1° 3'45"	3.66831 3.49510 1° 2'37"	3.73081 3.55760 1° 1'31"	3.79331 3.62010 1° 0'27"
5½ 0.10497	3.22686 3.06941 1° 4'49"	3.28936 3.13191 1° 3'31"	3.35186 3.19441 1° 2'16"	3.41436 3.25691 1° 1' 5"	3.47686 3.31941 0°59'56"	3.53936 3.38191 0°58'50"	3.60186 3.44441 0°57'45"	3.66436 3.50691 0°56'44"	3.72686 3.56941 0°55'44"	3.78936 3.63191 0°54'47"
6 0.09622	3.22357 3.07925 0°59'13"	3.28607 3.14175 0°58' 3"	3.34857 3.20425 0°56'54"	3.41107 3.26675 0°55'49"	3.47357 3.32925 0°54'47"	3.53607 3.39175 0°53'46"	3.59857 3.45425 0°52'48"	3.66107 3.51675 0°51'51"	3.72357 3.57925 0°50'57"	3.78607 3.64175 0°50'4"
7 0.08248	3.21843 3.09471 0°50'31"	3.28093 3.15721 0°49'30"	3.34343 3.21971 0°48'33"	3.40593 3.28221 0°47'37"	3.46843 3.34471 0°46'44"	3.53093 3.40721 0°45'53"	3.59343 3.46971 0°45' 3"	3.65593 3.53221 0°44'15"	3.71843 3.59471 0°43'29"	3.78093 3.65721 0°42'45"
8 0.07217	3.21457 3.10631 0°44'2"	3.27707 3.16881 0°43'10"	3.33957 3.23131 0°42'20"	3.40207 3.29381 0°41'32"	3.46457 3.35631 0°40'45"	3.52707 3.41881 0°40' 1"	3.58957 3.48131 0°39'18"	3.65207 3.54381 0°38'36"	3.71457 3.60631 0°37'56"	3.77707 3.66881 0°37'17"
9 0.06415	3.21155 3.11532 0°39'2"	3.27405 3.17782 0°38'16"	3.33655 3.24032 0°37'32"	3.39905 3.30282 0°36'49"	3.46155 3.36532 0°36' 8"	3.52405 3.42782 0°35'28"	3.58655 3.49032 0°34'50"	3.64905 3.55282 0°34'14"	3.71155 3.61532 0°33'37"	3.77405 3.67782 0°33' 4"
10 0.05774	3.20917 3.12255 0°35'3"	3.27167 3.18505 0°34'21"	3.33417 3.24755 0°33'42"	3.39667 3.31005 0°33'4"	3.45917 3.37255 0°32'27"	3.52167 3.43505 0°31'51"	3.58417 3.49755 0°31'17"	3.64667 3.56005 0°30'44"	3.70917 3.62255 0°30'12"	3.77167 3.68505 0°29'42"
11 0.05249	3.20720 3.12846 0°31'48"	3.26970 3.19096 0°31'11"	3.33220 3.25346 0°30'35"	3.39470 3.31596 0°30' 0"	3.45720 3.37846 0°29'27"	3.51970 3.44096 0°28'54"	3.58220 3.50346 0°28'23"	3.64470 3.56596 0°27'54"	3.70720 3.62846 0°27'25"	3.76970 3.69096 0°26'57"
12 0.04811	3.20553 3.13337 0°29'6"	3.26803 3.19587 0°28'32"	3.33053 3.25837 0°27'59"	3.39303 3.32087 0°27'28"	3.45553 3.38337 0°26'57"	3.51803 3.44587 0°26'28"	3.58053 3.50837 0°25'59"	3.64303 3.57087 0°25'32"	3.70553 3.63337 0°25'6"	3.76803 3.69587 0°24'40"
13 0.04441	3.20415 3.13754 0°26'50"	3.26665 3.20004 0°26'18"	3.32915 3.26254 0°25'48"	3.39165 3.32504 0°25'19"	3.45415 3.38754 0°24'51"	3.51665 3.45004 0°24'24"	3.57915 3.51254 0°23'58"	3.64165 3.57504 0°23'33"	3.70415 3.63754 0°23'9"	3.76665 3.70004 0°22'45"
14 0.04124	3.20296 3.14110 0°24'53"	3.26546 3.20360 0°24'24"	3.32796 3.26610 0°23'56"	3.39046 3.32860 0°23'29"	3.45296 3.39110 0°23'3"	3.51546 3.45360 0°22'38"	3.57796 3.51610 0°22'14"	3.64046 3.57860 0°21'51"	3.70296 3.64110 0°21'28"	3.76546 3.70360 0°21'6"
16 0.03608	3.20101 3.14690 0°21'44"	3.26351 3.20940 0°21'19"	3.32601 3.27190 0°20'54"	3.38851 3.33440 0°20'31"	3.45101 3.39690 0°20'8"	3.51351 3.45940 0°19'46"	3.57601 3.52190 0°19'25"	3.63851 3.58440 0°19'5"	3.70101 3.64690 0°18'45"	3.76351 3.70940 0°18'26"
18 0.03207	3.19952 3.15142 0°19'18"	3.26202 3.21392 0°18'55"	3.32452 3.27642 0°18'33"	3.38702 3.33892 0°18'12"	3.44952 3.40142 0°17'52"	3.51202 3.46392 0°17'32"	3.57452 3.52642 0°17'14"	3.63702 3.58892 0°16'56"	3.69952 3.65142 0°16'39"	3.76202 3.71392 0°16'22"
20 0.02887	3.19833 3.15502 0°17'20"	3.26083 3.21752 0°17'0"	3.32333 3.28002 0°16'40"	3.38583 3.34252 0°16'22"	3.44833 3.40502 0°16'4"	3.51083 3.46752 0°15'47"	3.57333 3.53002 0°15'30"	3.63583 3.59252 0°15'14"	3.69833 3.65502 0°14'58"	3.76083 3.71752 0°14'43"
22 0.02624	3.19734 3.15798 0°15'45"	3.25984 3.22048 0°15'27"	3.32234 3.28298 0°15'9"	3.38484 3.34548 0°14'52"	3.44734 3.40798 0°14'35"	3.50984 3.47048 0°14'20"	3.57234 3.53298 0°14'5"	3.63484 3.59548 0°13'50"	3.69734 3.65798 0°13'36"	3.75984 3.72048 0°13'22"
24 0.02406	3.19654 3.16044 0°14'26"	3.25904 3.22294 0°14'9"	3.32154 3.28544 0°13'52"	3.38404 3.34794 0°13'37"	3.44654 3.41044 0°13'22"	3.50904 3.47294 0°13'7"	3.57154 3.53544 0°12'54"	3.63404 3.59794 0°12'40"	3.69654 3.66044 0°12'28"	3.75904 3.72294 0°12'15"
26 0.02221	3.19584 3.16252 0°13'18"	3.25834 3.22502 0°13'3"	3.32084 3.28752 0°12'48"	3.38334 3.35002 0°12'34"	3.44584 3.41252 0°12'20"	3.50834 3.47502 0°12'6"	3.57084 3.53752 0°11'54"	3.63334 3.60002 0°11'42"	3.69584 3.66252 0°11'30"	3.75834 3.72502 0°11'18"
28 0.02062	3.19524 3.16431 0°12'21"	3.25774 3.22681 0°12'6"	3.32024 3.28931 0°11'53"	3.38274 3.35181 0°11'40"	3.44524 3.41431 0°11'27"	3.50774 3.47681 0°11'14"	3.57024 3.53931 0°11'2"	3.63274 3.60181 0°10'51"	3.69524 3.66431 0°10'40"	3.75774 3.72681 0°10'29"
30 0.01924	3.19470 3.16585 0°11'31"	3.25720 3.22835 0°11'18"	3.31970 3.29085 0°11'5"	3.38220 3.35335 0°10'53"	3.44470 3.41585 0°10'41"	3.50720 3.47835 0°10'29"	3.56970 3.54085 0°10'18"	3.63220 3.60335 0°10'7"	3.69470 3.66585 0°9'57"	3.75720 3.72835 0°9'47"
32 0.01804	3.19426 3.16720 0°10'48"	3.25676 3.22970 0°10'35"	3.31926 3.29220 0°10'23"	3.38176 3.35470 0°10'12"	3.44426 3.41720 0°10'1"	3.50676 3.47970 0°9'50"	3.56926 3.54220 0°9'39"	3.63176 3.60470 0°9'29"	3.69426 3.66720 0°9'20"	3.75676 3.72970 0°9'10"

KEY— WIRE READING——'M' 3.38176
PITCH DIAMETER——'E' 3.35470
HELIX ANGLE——'s' 0°10'12"

PITCH / WIRE	DIAMETERS $3\frac{13}{16}$	$3\frac{7}{8}$	$3\frac{15}{16}$	4	$4\frac{1}{16}$	$4\frac{1}{8}$	$4\frac{3}{16}$	$4\frac{1}{4}$	$4\frac{5}{16}$	$4\frac{3}{8}$
4 0.14434	3.86663 3.65012 1°14'56"	3.92913 2.71262 1°13'41"	3.99163 3.77512 1°12'27"	4.05413 3.83762 1°11'17"	4.11663 3.90012 1°10' 8"	4.17913 3.96262 1° 9'2"	4.24163 4.02512 1°7'58"	4.30413 4.08762 1° 6'55"	4.36663 4.15012 1° 5'55"	4.42913 4.21262 1°4'56"
$4\frac{1}{2}$ 0.12830	3.86061 3.66816 1° 6'17"	3.92311 3.73066 1°5'10"	3.98561 3.79316 1° 4'6"	4.04811 3.85566 1°3'4"	4.11061 3.91816 1°2'3"	4.17311 3.98066 1° 1' 5"	4.23561 4.04316 1° 0' 8"	4.29811 4.10566 0° 59'13"	4.36061 4.16816 0° 58'20"	4.42311 4.23066 0° 57'28"
5 0.11547	3.85581 3.68260 0° 59'25"	3.91831 3.74510 0° 58' 26"	3.98081 3.80760 0° 57' 28"	4.04331 3.87010 0° 56'33"	4.10581 3.93260 0° 55'39"	4.16831 3.99510 0° 54'47"	4.23081 4.05760 0°53' 56"	4.29331 4.12010 0° 53'7"	4.35581 4.18260 0° 52'19"	4.41831 4.24510 0° 51'33"
$5\frac{1}{2}$ 0.10497	3.85186 3.69441 0° 53' 51"	3.91436 3.75691 0° 52'57"	3.97686 3.81941 0°52'5"	4.03936 3.88191 0° 51' 15"	4.10186 3.94441 0° 50'26"	4.16436 4.00691 0°49'38"	4.22686 4.06941 0°48'53"	4.28936 4.13191 0°48'9"	4.35186 4.19441 0°47'26"	4.41436 4.25691 0°46'44"
6 0.09622	3.84857 3.70425 0°49'13"	3.91107 3.76675 0° 48'25"	3.97357 3.82925 0°47'37"	4.03607 3.89175 0° 46' 52"	4.09857 3.95425 0°46' 7"	4.16107 4.01675 0°45'24"	4.22357 4.07925 0°44'42"	4.28607 4.14175 0°44'2"	4.34857 4.20425 0°43'23"	4.41107 4.26675 0°42' 45"
7 0.08248	3.84343 3.71971 0° 42'2"	3.90593 3.78221 0° 41'20"	3.96843 3.84471 0° 40'39"	4.03093 3.90721 0°40'1"	4.09343 3.96971 0° 39'22"	4.15593 4.03221 0°38'46"	4.21843 4.09471 0° 38' 10"	4.28093 4.15721 0° 37'36"	4.34343 4.21971 0° 37'3"	4.40593 4.28221 0° 36'30"
8 0.07217	3.83957 3.73131 0°36'39"	3.90207 3.79381 0° 36' 3"	3.96457 3.85631 0°35'28"	4.02707 3.91881 0°34'54"	4.08957 3.98131 0° 34'21"	4.15207 4.04381 0°33'49"	4.21457 4.10631 0° 33'19"	4.27707 4.16881 0°32'49"	4.33957 4.23131 0° 32'20"	4.40207 4.29381 0°31'51"
9 0.06415	3.83655 3.74032 0°32' 30"	3.89905 3.80282 0°31' 59"	3.96155 3.86532 0°31'27"	4.02405 3.92782 0°30'57"	4.08655 3.99032 0°30'28"	4.14905 4.05282 0°30' 0"	4.21155 4.11532 0°29'33"	4.27405 4.17782 0°29' 6"	4.33655 4.24032 0°28'40"	4.39905 4.30282 0° 28'15"
10 0.05774	3.83417 3.74755 0°29'13"	3.89667 3.81005 0° 28'43"	3.95917 3.87255 0° 28'15"	4.02167 3.93505 0°27'48"	4.08417 3.99755 0° 27'23"	4.14667 4.06005 0°26'57"	4.20917 4.12255 0°26'33"	4.27167 4.18505 0°26' 9"	4.33417 4.24755 0°25'46"	4.39667 4.31005 0°25'23"
11 0.05249	3.83220 3.75346 0°26' 30"	3.89470 3.81596 0° 26' 4"	3.95720 3.87846 0°25'39"	4.01970 3.94096 0°25'14"	4.08220 4.00346 0°24'51"	4.14470 4.06596 0°24'28"	4.20720 4.12846 0°24' 6"	4.26970 4.19096 0°23'44"	4.33220 4.25346 0°23' 23"	4.39470 4.31596 0°23' 3"
12 0.04811	3.83053 3.75837 0°24'16"	3.89303 3.82087 0°23'52"	3.95553 3.88337 0°23'29"	4.01803 3.94587 0° 23'7"	4.08053 4.00837 0°22'45"	4.14303 4.07087 0°22'24"	4.20553 4.13337 0°22'4"	4.26803 4.19587 0° 21'44"	4.33053 4.25837 0°21'25"	4.39303 4.32087 0°21' 6"
13 0.04441	3.82915 3.76254 0°22'22"	3.89165 3.82504 0° 22'0"	3.95415 3.88754 0°21'39"	4.01665 3.95004 0°21'19"	4.07915 4.01254 0°20'59"	4.14165 4.07504 0°20'39"	4.20415 4.13754 0°20'21"	4.26665 4.20004 0°20'2"	4.32915 4.26254 0°19'45"	4.39165 4.32504 0°19'27"
14 0.04124	3.82796 3.76610 0°20'45"	3.89046 3.82860 0°20'25"	3.95296 3.89110 0°20'5"	4.01546 3.95360 0°19'46"	4.07796 4.01610 0°19'27"	4.14046 4.07860 0° 19'10"	4.20296 4.14110 0° 18'53"	4.26546 4.20360 0°18'36"	4.32796 4.26610 0°18'19"	4.39046 4.32860 0°18'3"
16 0.03808	3.82601 3.77190 0° 18'8"	3.88851 3.83440 0°17'50"	3.95101 3.89690 0°17'33"	4.01351 3.95940 0°17'16"	4.07601 4.02190 0°17' 0"	4.13851 4.08440 0°16'45"	4.20101 4.14690 0° 16'30"	4.26351 4.20940 0°16'15"	4.32601 4.27190 0° 16'1"	4.38851 4.33440 0°15'47"
18 0.03207	3.82452 3.77642 0° 16' 6"	3.88702 3.83892 0° 15' 50"	3.94952 3.90142 0° 15' 35"	4.01202 3.96392 0° 15'20"	4.07452 4.02642 0° 15' 6"	4.13702 4.08892 0° 14'52"	4.19952 4.15142 0°14' 39"	4.26202 4.21392 0°14' 25"	4.32452 4.27642 0° 14'13"	4.38702 4.33892 0°14'1"
20 0.02887	3.82333 3.78002 0° 14'29"	3.88583 3.84252 0° 14'14"	3.94833 3.90502 0° 14'1"	4.01083 3.96752 0°13'48"	4.07333 4.03002 0°13'35"	4.13583 4.09252 0°13' 22"	4.19833 4.15502 0° 13'10"	4.26083 4.21752 0° 12'58"	4.32333 4.28002 0°12' 47"	4.38583 4.34252 0°12'36"
22 0.02624	3.82234 3.78298 0°13' 9"	3.88484 3.84548 0° 12' 56"	3.94734 3.90798 0° 12'44"	4.00984 3.97048 0° 12' 32"	4.07234 4.03298 0° 12'20"	4.13484 4.09548 0° 12' 9"	4.19734 4.15798 0° 11' 58"	4.25984 4.22048 0° 11' 47"	4.32234 4.28298 0° 11' 37"	4.38484 4.34548 0° 11'27"
24 0.02406	3.82154 3.78544 0° 12' 3"	3.88404 3.84794 0° 11'51"	3.94654 3.91044 0° 11' 40"	4.00904 3.97294 0° 11' 29"	4.07154 4.03544 0° 11' 18"	4.13404 4.09794 0° 11' 8"	4.19654 4.16044 0° 10'58"	4.25904 4.22294 0° 10' 48"	4.32154 4.28544 0° 10' 38"	4.38404 4.34794 0° 10' 29"
26 0.02221	3.82084 3.78752 0° 11' 7"	3.88334 3.85002 0° 10' 56"	3.94584 3.91252 0° 10' 45"	4.00834 3.97502 0° 10' 35"	4.07084 4.03752 0° 10' 25"	4.13334 4.10002 0° 10' 16"	4.19584 4.16252 0° 10' 7"	4.25834 4.22502 0° 9' 58"	4.32084 4.28752 0° 9' 49"	4.38334 4.35002 0° 9' 40"
28 0.02062	3.82024 3.78931 0° 10' 19"	3.88274 3.85181 0° 10' 9"	3.94524 3.91431 0° 9' 59"	4.00774 3.97681 0° 9' 50"	4.07024 4.03931 0° 9' 40"	4.13274 4.10181 0° 9' 32"	4.19524 4.16431 0° 9' 23"	4.25774 4.22681 0° 9' 15"	4.32024 4.28931 0° 9' 7"	4.38274 4.35181 0° 8' 59"
30 0.01924	3.81970 3.79085 0° 9' 37"	3.88220 3.85335 0° 9' 28"	3.94470 3.91585 0° 9' 19"	4.00720 3.97835 0° 9' 10"	4.06970 4.04085 0° 9' 2"	4.13220 4.10335 0° 8' 53"	4.19470 4.16585 0° 8' 45"	4.25720 4.22835 0° 8' 38"	4.31970 4.29085 0° 8' 30"	4.38220 4.35335 0° 8' 23"
32 0.01804	3.81926 3.79220 0° 9' 1"	3.88176 3.85470 0° 8' 52"	3.94426 3.91720 0° 8' 44"	4.00676 3.97970 0° 8' 36"	4.06926 4.04220 0° 8' 28"	4.13176 4.10470 0° 8' 20"	4.19426 4.16720 0° 8' 12"	4.25676 4.22970 0° 8' 5"	4.31926 4.29220 0° 7' 58"	4.38176 4.35470 0° 7' 51"

KEY—

WIRE READING	'M'	4.00676
PITCH DIAMETER	'E'	3.97970
HELIX ANGLE	's'	0° 8' 36"

PITCH / WIRE	DIAMETERS $4\frac{7}{16}$	$4\frac{1}{2}$	$4\frac{9}{16}$	$4\frac{5}{8}$	$4\frac{11}{16}$	$4\frac{3}{4}$	$4\frac{13}{16}$	$4\frac{7}{8}$	$4\frac{15}{16}$	5
4 0.14434	4.49163 4.27512 1° 3'59"	4.55413 4.33762 1° 3' 3"	4.61663 4.40012 1° 2'10"	4.67913 4.46262 1° 1'18"	4.74163 4.52512 1° 0'27"	4.80413 4.58762 0°59'38"	4.86663 4.65012 0°58'50"	4.92193 4.71262 0°58'3"	4.99163 4.77512 0°57'17"	5.05413 4.83762 0°56'33"
$4\frac{1}{2}$ 0.12830	4.48561 4.29316 0°56'38"	4.54811 4.35566 0°55'49"	4.61061 4.41816 0°55'2"	4.67311 4.48066 0°54'16"	4.73561 4.54316 0°53'31"	4.79811 4.60566 0°52'48"	4.86061 4.66816 0°52'5"	4.92311 4.73066 0°51'24"	4.98561 4.79316 0°50'44"	5.04811 4.85566 0°50'4"
5 0.11547	4.48081 4.30760 0°50'48"	4.54331 4.37010 0°50'4"	4.60581 4.43260 0°49'23"	4.66831 4.49510 0°48'41"	4.73081 4.55760 0°48'1"	4.79331 4.62010 0°47'21"	4.85581 4.68260 0°46'43"	4.91831 4.74510 0°46'6"	4.98081 4.80760 0°45'30"	5.04331 4.87010 0°44'55"
$5\frac{1}{2}$ 0.10497	4.47686 4.31941 0°46'4"	4.53936 4.38191 0°45'24"	4.60186 4.44441 0°44'45"	4.66436 4.50691 0°44'9"	4.72686 4.56941 0°43'33"	4.78936 4.63191 0°42'57"	4.85186 4.69441 0°42'23"	4.91436 4.75691 0°41'49"	4.97686 4.81941 0°41'16"	5.03936 4.88191 0°40'45"
6 0.09622	4.47357 4.32925 0°42'7"	4.53607 4.39175 0°41'32"	4.59857 4.45425 0°40'56"	4.66107 4.51675 0°40'23"	4.72357 4.57925 0°39'50"	4.78607 4.64175 0°39'18"	4.84857 4.70425 0°38'46"	4.91107 4.76675 0°38'15"	4.97357 4.82925 0°37'46"	5.03607 4.89175 0°37'17"
7 0.08248	4.46843 4.34471 0°35'59"	4.53093 4.40721 0°35'28"	4.59343 4.46971 0°34'58"	4.65593 4.53221 0°34'29"	4.71843 4.59471 0°34'1"	4.78093 4.65721 0°33'34"	4.84343 4.71971 0°33'7"	4.90593 4.78221 0°32'41"	4.96843 4.84471 0°32'16"	5.03093 4.90721 0°31'51"
8 0.07217	4.46457 4.35631 0°31'24"	4.52707 4.41881 0°30'57"	4.58957 4.48131 0°30'31"	4.65207 4.54381 0°30'6"	4.71457 4.60631 0°29'42"	4.77707 4.66881 0°29'18"	4.83957 4.73131 0°28'54"	4.90207 4.79381 0°28'32"	4.96457 4.85631 0°28'10"	5.02707 4.91881 0°27'48"
9 0.06415	4.46155 4.36532 0°27'51"	4.52405 4.42782 0°27'27"	4.58655 4.49032 0°27'4"	4.64905 4.55282 0°26'42"	4.71155 4.61532 0°26'20"	4.77405 4.67782 0°25'59"	4.83655 4.74032 0°25'38"	4.89905 4.80282 0°25'19"	4.96155 4.86532 0°24'59"	5.02405 4.92782 0°24'40"
10 0.05774	4.45917 4.37255 0°25'2"	4.52167 4.43505 0°24'40"	4.58417 4.49755 0°24'19"	4.64667 4.56005 0°23'59"	4.70917 4.62255 0°23'40"	4.77167 4.68505 0°23'21"	4.83417 4.74755 0°23'2"	4.89667 4.81005 0°22'45"	4.95917 4.87255 0°22'27"	5.02167 4.93505 0°22'10"
11 0.05249	4.45720 4.37846 0°22'43"	4.51970 4.44096 0°22'24"	4.58220 4.50346 0°22'5"	4.64470 4.56596 0°21'47"	4.70720 4.62846 0°21'29"	4.76970 4.69096 0°21'12"	4.83220 4.75346 0°20'55"	4.89470 4.81596 0°20'39"	4.95720 4.87846 0°20'23"	5.01970 4.94096 0°20'8"
12 0.04811	4.45553 4.38337 0°20'48"	4.51803 4.44587 0°20'30"	4.58053 4.50837 0°20'13"	4.64303 4.57087 0°19'56"	4.70553 4.63337 0°19'40"	4.76803 4.69587 0°19'25"	4.83053 4.75837 0°19'10"	4.89303 4.82087 0°18'55"	4.95553 4.88337 0°18'40"	5.01803 4.94587 0°18'26"
13 0.04441	4.45415 4.38754 0°19'11"	4.51665 4.45004 0°18'55"	4.57915 4.51254 0°18'39"	4.64165 4.57504 0°18'24"	4.70415 4.63754 0°18'9"	4.76665 4.70004 0°17'54"	4.82915 4.76254 0°17'40"	4.89165 4.82504 0°17'26"	4.95415 4.88754 0°17'13"	5.01665 4.95004 0°17'0"
14 0.04124	4.45296 4.39110 0°17'48"	4.51546 4.45360 0°17'33"	4.57796 4.51610 0°17'18"	4.64046 4.57860 0°17'4"	4.70296 4.64110 0°16'50"	4.76546 4.70360 0°16'37"	4.82796 4.76610 0°16'24"	4.89046 4.82860 0°16'11"	4.95296 4.89110 0°15'59"	5.01546 4.95360 0°15'46"
16 0.03608	4.45101 4.39690 0°15'33"	4.51351 4.45940 0°15'20"	4.57601 4.52190 0°15'7"	4.63851 4.58440 0°14'55"	4.70101 4.64690 0°14'43"	4.76351 4.70940 0°14'31"	4.82601 4.77190 0°14'20"	4.88851 4.83440 0°14'8"	4.95101 4.89690 0°13'58"	5.01351 4.95940 0°13'47"
18 0.03207	4.44952 4.40142 0°13'48"	4.51202 4.46392 0°13'37"	4.57452 4.52642 0°13'25"	4.63702 4.58892 0°13'14"	4.69952 4.65142 0°13'4"	4.76202 4.71392 0°12'53"	4.82452 4.77642 0°12'43"	4.88702 4.83892 0°12'33"	4.94952 4.90142 0°12'24"	5.01202 4.96392 0°12'14"
20 0.02687	4.44833 4.40502 0°12'25"	4.51083 4.46752 0°12'14"	4.57333 4.53002 0°12'4"	4.63583 4.59252 0°11'54"	4.69833 4.65502 0°11'45"	4.76083 4.71752 0°11'36"	4.82333 4.78002 0°11'26"	4.88583 4.84252 0°11'17"	4.94833 4.90502 0°11'9"	5.01083 4.96752 0°11'0"
22 0.02624	4.44734 4.40798 0°11'17"	4.50984 4.47048 0°11'8"	4.57234 4.53298 0°10'58"	4.63484 4.59548 0°10'49"	4.69734 4.65798 0°10'40"	4.75984 4.72048 0°10'32"	4.82234 4.78298 0°10'24"	4.88484 4.84548 0°10'16"	4.94734 4.90798 0°10'8"	5.00984 4.97048 0°10'0"
24 0.02406	4.44654 4.41044 0°10'20"	4.50904 4.47294 0°10'11"	4.57154 4.53544 0°10'3"	4.63404 4.59794 0°9'55"	4.69654 4.66044 0°9'47"	4.75904 4.72294 0°9'39"	4.82154 4.78544 0°9'31"	4.88404 4.84794 0°9'24"	4.94654 4.91044 0°9'17"	5.00904 4.97294 0°9'10"
26 0.02221	4.44584 4.41252 0°9'32"	4.50834 4.47502 0°9'24"	4.57084 4.53752 0°9'16"	4.63334 4.60002 0°9'9"	4.69584 4.66252 0°9'1"	4.75834 4.72502 0°8'54"	4.82084 4.78752 0°8'47"	4.88334 4.85002 0°8'40"	4.94584 4.91252 0°8'34"	5.00834 4.97502 0°8'27"
28 0.02062	4.44524 4.41431 0°8'51"	4.50774 4.47681 0°8'43"	4.57024 4.53931 0°8'36"	4.63274 4.60181 0°8'29"	4.69524 4.66431 0°8'22"	4.75774 4.72681 0°8'16"	4.82024 4.78931 0°8'9"	4.88274 4.85181 0°8'3"	4.94524 4.91431 0°7'57"	5.00774 4.97681 0°7'51"
30 0.01924	4.44470 4.41585 0°8'16"	4.50720 4.47835 0°8'9"	4.56970 4.54085 0°8'2"	4.63220 4.60335 0°7'55"	4.69470 4.66585 0°7'49"	4.75720 4.72835 0°7'43"	4.81970 4.79085 0°7'37"	4.88220 4.85335 0°7'31"	4.94470 4.91585 0°7'25"	5.00720 4.97835 0°7'19"
32 0.01084	4.44426 4.41720 0°7'44"	4.50676 4.47970 0°7'38"	4.56926 4.54220 0°7'32"	4.63176 4.60470 0°7'26"	4.69426 4.66720 0°7'19"	4.75676 4.72970 0°7'13"	4.81926 4.79220 0°7'8"	4.88176 4.85470 0°7'3"	4.94426 4.91720 0°6'57"	5.00676 4.97970 0°6'52"

KEY— WIRE READING ——'M' 4.63176
PITCH DIAMETER——'E' 4.60470
HELIX ANGLE ——'s' 0° 7' 26"

PITCH / WIRE	DIAMETERS $5\frac{1}{16}$	$5\frac{1}{8}$	$5\frac{3}{16}$	$5\frac{1}{4}$	$5\frac{5}{16}$	$5\frac{3}{8}$	$5\frac{7}{16}$	$5\frac{1}{2}$	$5\frac{9}{16}$	$5\frac{5}{8}$
4 0.14434	5.11663 4.90012 0°55'49"	5.17913 4.96262 0°55' 7"	5.24163 5.02512 0°54'26"	5.30413 5.08762 0°53'46"	5.36663 5.15012 0°53' 7"	5.42913 5.21262 0°52'29"	5.49163 5.27512 0°51'51"	5.55413 5.33762 0°51'15"	5.61663 5.40012 0°50'39"	5.67913 5.46262 0°50' 4"
$4\frac{1}{2}$ 0.12830	5.11061 4.91816 0°49'26"	5.17311 4.98066 0°48'49"	5.23561 5.04316 0°48'13"	5.29811 5.10566 0°47'37"	5.36061 5.16816 0°47' 3"	5.42311 5.23066 0°46'29"	5.48561 5.29316 0°45'56"	5.54811 5.35566 0°45'24"	5.61061 5.41816 0°44'52"	5.67311 5.48066 0°44'22"
5 0.11547	5.10581 4.93260 0°44'21"	5.16831 4.99510 0°43'47"	5.23081 5.05760 0°43'15"	5.29331 5.12010 0°42'44"	5.35581 5.18260 0°42'14"	5.41831 5.24510 0°41'43"	5.48081 5.30760 0°41'14"	5.54331 5.37010 0°40'45"	5.60581 5.43260 0°40'17"	5.66831 5.49510 0°39'49"
$5\frac{1}{2}$ 0.10497	5.10186 4.94441 0°40'14"	5.16436 5.00691 0°39'44"	5.22686 5.06941 0°39'15"	5.28936 5.13191 0°38'46"	5.35186 5.19441 0°38'18"	5.41436 5.25691 0°37'50"	5.47686 5.31941 0°37'24"	5.53936 5.38191 0°36'58"	5.60186 5.44441 0°36'32"	5.66436 5.50691 0°36'7"
6 0.09622	5.09857 4.95425 0°36'49"	5.16107 5.01675 0°36'21"	5.22357 5.07925 0°35'54"	5.28607 5.14175 0°35'28"	5.34857 5.20425 0°35'2"	5.41107 5.26675 0°34'38"	5.47357 5.32925 0°34'13"	5.53607 5.39175 0°33'49"	5.59857 5.45425 0°33'26"	5.66107 5.51675 0°33'3"
7 0.08248	5.09343 4.96971 0°31'27"	5.15593 5.03221 0°31'3"	5.21843 5.09471 0°30'42"	5.28093 5.15721 0°30'18"	5.34343 5.21971 0°29'57"	5.40593 5.28221 0°29'35"	5.46843 5.34471 0°29'15"	5.53093 5.40721 0°28'54"	5.59343 5.46971 0°28'34"	5.65593 5.53221 0°28'15"
8 0.07217	5.08957 4.98131 0°27'27"	5.15207 5.04381 0°27'7"	5.21457 5.10631 0°26'47"	5.27707 5.16881 0°26'27"	5.33957 5.23131 0°26'8"	5.40207 5.29381 0°25'50"	5.46457 5.35631 0°25'32"	5.52707 5.41881 0°25'14"	5.58957 5.48131 0°24'57"	5.65207 5.54381 0°24'40"
9 0.06415	5.08655 4.99032 0°24'21"	5.14905 5.05282 0°24'3"	5.21155 5.11532 0°23'46"	5.27405 5.17782 0°23'29"	5.33655 5.24032 0°23'12"	5.39905 5.30282 0°22'55"	5.46155 5.36532 0°22'39"	5.52405 5.42782 0°22'24"	5.58655 5.49032 0°22'8"	5.64905 5.55282 0°21'54"
10 0.05774	5.08417 4.99755 0°21'53"	5.14667 5.06005 0°21'37"	5.20917 5.12255 0°21'21"	5.27167 5.18505 0°21'6"	5.33417 5.24755 0°20'51"	5.39667 5.31005 0°20'36"	5.45917 5.37255 0°20'22"	5.52167 5.43505 0°20'8"	5.58417 5.49755 0°19'54"	5.64667 5.56005 0°19'40"
11 0.05249	5.08220 5.00346 0°19'53"	5.14470 5.06596 0°19'38"	5.20720 5.12846 0°19'23"	5.26970 5.19096 0°19'10"	5.33220 5.25346 0°18'56"	5.39470 5.31596 0°18'42"	5.45720 5.37846 0°18'29"	5.51970 5.44096 0°18'17"	5.58220 5.50346 0°18'4"	5.64470 5.56596 0°17'52"
12 0.04811	5.08053 5.00837 0°18'12"	5.14303 5.07087 0°17'59"	5.20553 5.13337 0°17'46"	5.26803 5.19587 0°17'33"	5.33053 5.25837 0°17'20"	5.39303 5.32087 0°17'8"	5.45553 5.38337 0°16'56"	5.51803 5.44587 0°16'44"	5.58053 5.50837 0°16'33"	5.64303 5.57087 0°16'22"
13 0.04441	5.07915 5.01254 0°16'48"	5.14165 5.07504 0°16'35"	5.20415 5.13754 0°16'23"	5.26665 5.20004 0°16'11"	5.32915 5.26254 0°15'59"	5.39165 5.32504 0°15'48"	5.45415 5.38754 0°15'37"	5.51665 5.45004 0°15'26"	5.57915 5.51254 0°15'16"	5.64165 5.57504 0°15'5"
14 0.04124	5.07796 5.01610 0°15'35"	5.14046 5.07860 0°15'23"	5.20296 5.14110 0°15'12"	5.26546 5.20360 0°15'1"	5.32796 5.26610 0°14'50"	5.39046 5.32860 0°14'40"	5.45296 5.39110 0°14'30"	5.51546 5.45360 0°14'20"	5.57796 5.51610 0°14'10"	5.64046 5.57860 0°14'0"
16 0.03608	5.07601 5.02190 0°13'37"	5.13851 5.08440 0°13'27"	5.20101 5.14690 0°13'17"	5.26351 5.20940 0°13'7"	5.32601 5.27190 0°12'58"	5.38851 5.33440 0°12'49"	5.45101 5.39690 0°12'40"	5.51351 5.45940 0°12'32"	5.57601 5.52190 0°12'23"	5.63851 5.58440 0°12'14"
18 0.03207	5.07452 5.02642 0°12'5"	5.13702 5.08892 0°11'57"	5.19952 5.15142 0°11'48"	5.26202 5.21392 0°11'40"	5.32452 5.27642 0°11'31"	5.38702 5.33892 0°11'23"	5.44952 5.40142 0°11'15"	5.51202 5.46392 0°11'7"	5.57452 5.52642 0°11'0"	5.63702 5.58892 0°10'52"
20 0.02887	5.07333 5.03002 0°10'52"	5.13583 5.09252 0°10'44"	5.19833 5.15502 0°10'36"	5.26083 5.21752 0°10'29"	5.32333 5.28002 0°10'21"	5.38583 5.34252 0°10'15"	5.44833 5.40502 0°10'7"	5.51083 5.46752 0°10'0"	5.57333 5.53002 0°9'54"	5.63583 5.59252 0°9'47"
22 0.02624	5.07234 5.03298 0°9'53"	5.13484 5.09548 0°9'45"	5.19734 5.15798 0°9'38"	5.25984 5.22048 0°9'31"	5.32234 5.28298 0°9'25"	5.38484 5.34548 0°9'19"	5.44734 5.40798 0°9'11"	5.50984 5.47048 0°9'5"	5.57234 5.53298 0°8'59"	5.63484 5.59548 0°8'53"
24 0.02406	5.07154 5.03544 0°9'3"	5.13404 5.09794 0°8'56"	5.19654 5.16044 0°8'50"	5.25904 5.22294 0°8'43"	5.32154 5.28544 0°8'37"	5.38404 5.34794 0°8'31"	5.44654 5.41044 0°8'25"	5.50904 5.47294 0°8'20"	5.57154 5.53544 0°8'13"	5.63404 5.59794 0°8'8"
26 0.02221	5.07084 5.03752 0°8'21"	5.13334 5.10002 0°8'15"	5.19584 5.16252 0°8'9"	5.25834 5.22502 0°8'3"	5.32084 5.28752 0°7'57"	5.38334 5.35002 0°7'52"	5.44584 5.41252 0°7'46"	5.50834 5.47502 0°7'41"	5.57084 5.53752 0°7'36"	5.63334 5.60002 0°7'30"
28 0.02062	5.07024 5.03931 0°7'45"	5.13274 5.10181 0°7'39"	5.19524 5.16431 0°7'34"	5.25774 5.22681 0°7'28"	5.32024 5.28931 0°7'23"	5.38274 5.35181 0°7'18"	5.44524 5.41431 0°7'13"	5.50774 5.47681 0°7'8"	5.57024 5.53931 0°7'3"	5.63274 5.60181 0°6'58"
30 0.01924	5.06970 5.04085 0°7'14"	5.13220 5.10335 0°7'8"	5.19470 5.16585 0°7'3"	5.25720 5.22835 0°6'59"	5.31970 5.29085 0°6'54"	5.38220 5.35335 0°6'49"	5.44470 5.41585 0°6'44"	5.50720 5.47835 0°6'39"	5.56970 5.54085 0°6'35"	5.63220 5.60335 0°6'30"
32 0.01804	5.06926 5.04220 0°6'47"	5.13176 5.10470 0°6'42"	5.19426 5.16720 0°6'37"	5.25676 5.22970 0°6'33"	5.31926 5.29220 0°6'28"	5.38176 5.35470 0°6'23"	5.44426 5.41720 0°6'18"	5.50676 5.47970 0°6'14"	5.56926 5.54220 0°6'11"	5.63176 5.60470 0°6'6"

KEY— WIRE READING —— 'M' 5.25676
PITCH DIAMETER — 'E' 5.22970
HELIX ANGLE —— 's' 0°6'33"

PITCH / WIRE	DIAMETERS $5\frac{11}{16}$	$5\frac{3}{4}$	$5\frac{13}{16}$	$5\frac{7}{8}$	$5\frac{15}{16}$	6	$6\frac{1}{16}$	$6\frac{1}{8}$	$6\frac{3}{16}$	$6\frac{1}{4}$
4	5.74163	5.80413	5.86663	5.92913	5.99163	6.05413	6.11663	6.17913	6.24163	6.30413
0.14434	5.52512	5.58762	5.65012	5.71262	5.77512	5.83762	5.90012	5.96262	6.02512	6.08762
	0°49'30"	0° 48' 57"	0°48'25"	0°47'53"	0°47'22"	0°46' 51"	0°46' 22"	0°45'52"	0°45'24"	0°44'56"
$4\frac{1}{2}$	5.73561	5.79811	5.86061	5.92311	5.98561	6.04811	6.11061	6.17311	6.23561	6.29811
0.12830	5.54316	5.60566	5.66816	5.73066	5.79316	5.85566	5.91816	5.98066	6.04316	6.10566
	0°43'52"	0°43'23"	0°42'54"	0°42'26"	0°41'58"	0°41'32"	0°41' 5"	0° 40'39"	0°40'14"	0°39'50"
5	5.73081	5.79331	5.85581	5.91831	5.98081	6.04331	6.10581	6.16831	6.23081	6.29331
0.11547	5.55760	5.62010	5.68260	5.74510	5.80760	5.87010	5.93260	5.99510	6.05760	6.12010
	0°39'22"	0°38'56"	0°38'31"	0°38' 6"	0°37'41"	0°37'17"	0°36'53"	0°36'30"	0°36' 7"	0°35'45"
$5\frac{1}{2}$	5.72686	5.78936	5.85186	5.91436	5.97686	6.03936	6.10186	6.16436	6.22686	6.28936
0.10497	5.56941	5.63191	5.69441	5.75691	5.81941	5.88191	5.94441	6.00691	6.06941	6.13191
	0°35'43"	0° 35' 19"	0°34'56"	0°34'33"	0°34'11"	0°33'49"	0°33'28"	0°33' 7"	0°32'47"	0°32'26"
6	5.72357	5.78607	5.84857	5.91107	5.97357	6.03607	6.09857	6.16107	6.22357	6.28607
0.09622	5.57925	5.64175	5.70425	5.76675	5.82925	5.89175	5.95425	6.01675	6.07925	6.14175
	0°32'41"	0° 32'20"	0° 31'58"	0° 31' 37"	0°31' 17"	0°30' 57"	0°30' 38"	0°30' 19"	0°30' 0"	0°29'42"
7	5.71843	5.78093	5.84343	5.90593	5.96843	6.03093	6.09343	6.15593	6.21843	6.28093
0.08248	5.59471	5.65721	5.71971	5.78221	5.84471	5.90721	5.96971	6.03221	6.09471	6.15721
	0°27'56"	0°27'38"	0°27'19"	0°27' 2"	0°26'44"	0°26'27"	0°26'11"	0°25'54"	0°25'38"	0°25'23"
8	5.71457	5.77707	5.83957	5.90207	5.96457	6.02707	6.08957	6.15207	6.21457	6.27707
0.07217	5.60631	5.66881	5.73131	5.79381	5.85631	5.91881	5.98131	6.04381	6.10631	6.16881
	0°24'23"	0°24' 7"	0°23'52"	0°23'36"	0°23'21"	0°23' 6"	0°22'52"	0°22'38"	0°22'24"	0°22'10"
9	5.71155	5.77405	5.83655	5.89905	5.96155	6.02405	6.08655	6.14905	6.21155	6.27405
0.06415	5.61532	5.67782	5.74032	5.80282	5.86532	5.92782	5.99032	6.05282	6.11532	6.17782
	0°21'39"	0°21'25"	0°21'10"	0°20'57"	0°20'43"	0°20'30"	0°20'17"	0°20' 5"	0°19'52"	0°19'40"
10	5.70917	5.77167	5.83417	5.89667	5.95917	6.02167	6.08417	6.14667	6.20917	6.27167
0.05774	5.62255	5.68505	5.74755	5.81005	5.87255	5.93505	5.99755	6.06005	6.12255	6.18505
	0°19'27"	0°19'15"	0° 19' 2"	0°18'50"	0° 18'38"	0° 18'26"	0°18'14"	0° 18' 3"	0°17'52"	0°17'41"
11	5.70720	5.76970	5.83220	5.89470	5.95720	6.01970	6.08220	6.14470	6.20720	6.26970
0.05249	5.62846	5.69096	5.75346	5.81596	5.87846	5.94096	6.00346	6.06596	6.12846	6.19096
	0°17'40"	0°17' 28"	0°17'17"	0°17' 6"	0° 16'55"	0° 16' 44"	0° 16'34"	0° 16'24"	0° 16'14"	0°16' 4"
12	5.70553	5.76803	5.83053	5.89303	5.95553	6.01803	6.08053	6.14303	6.20553	6.26803
0.04811	5.63337	5.69587	5.75837	5.82087	5.88337	5.94587	6.00837	6.07087	6.13337	6.19587
	0°16'11"	0°16' 0"	0° 15'50"	0°15'39"	0° 15' 30"	0°15'20"	0° 15'10"	0°15'1"	0°14'52"	0°14'43"
13	5.70415	5.76665	5.82915	5.89165	5.95415	6.01665	6.07915	6.14165	6.20415	6.26665
0.04441	5.63754	5.70004	5.76254	5.82504	5.88754	5.95004	6.01254	6.07504	6.13754	6.20004
	0°14'56"	0° 14'46"	0°14'36"	0°14'27"	0°14'17"	0° 14' 9"	0°14' 2"	0°13'51"	0°13' 43"	0°13' 34"
14	5.70296	5.76546	5.82796	5.89046	5.95296	6.01546	6.07796	6.14046	6.20296	6.26546
0.04124	5.64110	5.70360	5.76610	5.82860	5.89110	5.95360	6.01610	6.07860	6.14110	6.20360
	0° 13' 51"	0°13'42"	0° 13' 33"	0°13'24"	0° 13' 16"	0° 13' 7"	0°13' 0"	0°12'51"	0° 12'43"	0° 12'36"
16	5.70101	5.76351	5.82601	5.88851	5.95101	6.01351	6.07601	6.13851	6.20101	6.26351
0.03608	5.64690	5.70940	5.77190	5.83440	5.89690	5.95940	6.02190	6.08440	6.14690	6.20940
	0°12' 7"	0°11'58"	0°11'51"	0°11'43"	0°11'36"	0° 11'28"	0°11'21"	0° 11'14"	0°11' 8"	0° 11' 0"
18	5.69952	5.76202	5.82452	5.88702	5.94952	6.01202	6.07452	6.13702	6.19952	6.26202
0.03207	5.65142	5.71392	5.77642	5.83890	5.90142	5.96392	6.02642	6.08892	6.15142	6.21392
	0° 10' 45"	0°10' 38"	0° 10' 31"	0°10'24"	0° 10'18"	0° 10' 11"	0° 10'4"	0°9'59"	0°9'53"	0°9'47"
20	5.69833	5.76083	5.82333	5.88583	5.94833	6.01083	6.07333	6.13583	6.19833	6.26083
0.02887	5.65502	5.71752	5.78002	5.84252	5.90502	5.96752	6.03002	6.09252	6.15502	6.21752
	0°9'40"	0°9'34"	0° 9'27"	0° 9'22"	0° 9'16"	0° 9'10"	0°9' 4"	0° 8'58"	0° 8'53"	0° 8'48"
22	5.69734	5.75984	5.82234	5.88484	5.94734	6.00984	6.07234	6.13484	6.19734	6.25984
0.02624	5.65798	5.72048	5.78298	5.84548	5.90798	5.97048	6.03298	6.09548	6.15798	6.22048
	0° 8'47"	0° 8'42"	0° 8'36"	0° 8'30"	0° 8'25"	0° 8'20"	0° 8'14"	0° 8'9"	0° 8'4"	0° 7'59"
24	5.69654	5.75904	5.82154	5.88404	5.94654	6.00904	6.07154	6.13404	6.19654	6.25904
0.02406	5.66044	5.72294	5.78544	5.84794	5.91044	5.97294	6.03544	6.09794	6.16044	6.22294
	0° 8' 3"	0°7'58"	0° 7'52"	0° 7'48"	0° 7'43"	0° 7'38"	0° 7'33"	0° 7'29"	0° 7'24"	0° 7'19"
26	5.69584	5.75834	5.82084	5.88334	5.94584	6.00834	6.07084	6.13334	6.19584	6.25834
0.02221	5.66252	5.72502	5.78752	5.85002	5.91252	5.97502	6.03752	6.10002	6.16252	6.22502
	0° 7'25"	0° 7'21"	0° 7'16"	0° 7'11"	0° 7'7"	0° 7'2"	0° 6'58"	0° 6'54"	0° 6'49"	0°6'45"
28	5.69524	5.75774	5.82024	5.88274	5.94524	6.00774	6.07024	6.13274	6.19524	6.25774
0.02062	5.66431	5.72681	5.78931	5.85181	5.91431	5.97681	6.03931	6.10181	6.16431	6.22681
	0°6'54"	0° 6'49"	0° 6'45"	0° 6'40"	0° 6' 36"	0° 6'32"	0° 6' 27"	0° 6'24"	0° 6'20"	0°6'16"
30	5.69470	5.75720	5.81970	5.88220	5.94470	6.00720	6.06970	6.13220	6.19470	6.25720
0.01924	5.66585	5.72835	5.79085	5.85335	5.91585	5.97835	6.04085	6.10335	6.16585	6.22835
	0° 6' 26"	0° 6'22"	0° 6'17"	0° 6'13"	0° 6'10"	0° 6'6"	0° 6'2"	0° 5'59"	0° 5'55"	0° 5'51"
32	5.69426	5.75676	5.81926	5.88176	5.94426	6.00676	6.06926	6.13176	6.19426	6.25676
0.01804	5.66720	5.72970	5.79220	5.85470	5.91720	5.97970	6.04220	6.10470	6.16720	6.22970
	0°6'2"	0° 5'58"	0° 5' 54"	0° 5' 51"	0° 5' 47"	0° 5'43"	0° 5'39"	0° 5'36"	0° 5'32"	0° 5'29"

KEY— WIRE READING——'M' 5.88176
PITCH DIAMETER——'E' 5.85470
HELIX ANGLE——'S' 0° 5' 51"

PITCH / WIRE	DIAMETERS $6\frac{5}{16}$	$6\frac{3}{8}$	$6\frac{7}{16}$	$6\frac{1}{2}$	$6\frac{9}{16}$	$6\frac{5}{8}$	$6\frac{11}{16}$	$6\frac{3}{4}$	$6\frac{13}{16}$	$6\frac{7}{8}$
4	6.36663	6.42913	6.49163	6.55413	6.61663	6.67913	6.74163	6.80413	6.86663	6.92913
0.14434	6.15012	6.21262	6.27512	6.33762	6.40012	6.46262	6.52512	6.58762	6.65012	6.71262
	0°44'29"	0°44'2"	0°43'36"	0°43'10"	0°42'45"	0°42'20"	0°41'55"	0°41'32"	0°41'8"	0°40'45"
$4\frac{1}{2}$	6.36061	6.42311	6.48561	6.54811	6.61061	6.67311	6.73561	6.79811	6.86061	6.92311
0.12830	6.16816	6.23066	6.29316	6.35566	6.41816	6.48066	6.54316	6.60566	6.66816	6.73066
	0°39'25"	0°39'2"	0°38'38"	0°38'16"	0°37'53"	0°37'31"	0°37'10"	0°36'49"	0°36'28"	0°36'8"
5	6.35581	6.41831	6.48081	6.54331	6.60581	6.66831	6.73081	6.79331	6.85581	6.91831
0.11547	6.18260	6.24510	6.30760	6.37010	6.43260	6.49510	6.55760	6.62010	6.68260	6.74510
	0°35'24"	0°35'3"	0°34'42"	0°34'21"	0°34'1"	0°33'42"	0°33'22"	0°33'3"	0°32'45"	0°32'27"
$5\frac{1}{2}$	6.35186	6.41436	6.47686	6.53936	6.60186	6.66436	6.72686	6.78936	6.85186	6.91436
0.10497	6.19441	6.25691	6.31941	6.38191	6.44441	6.50691	6.56941	6.63191	6.69441	6.75691
	0°32'7"	0°31'48"	0°31'29"	0°31'10"	0°30'52"	0°30'35"	0°30'17"	0°30'0"	0°29'43"	0°29'27"
6	6.34857	6.41107	6.47357	6.53607	6.59857	6.66107	6.72357	6.78607	6.84857	6.91107
0.09622	6.20425	6.26675	6.32925	6.39175	6.45425	6.51675	6.57925	6.64175	6.70425	6.76675
	0°29'24"	0°29'6"	0°28'49"	0°28'32"	0°28'15"	0°27'59"	0°27'43"	0°27'28"	0°27'12"	0°26'57"
7	6.34343	6.40593	6.46843	6.53093	6.59343	6.65593	6.71843	6.78093	6.84343	6.90593
0.08248	6.21971	6.28221	6.34471	6.40721	6.46971	6.53221	6.59471	6.65721	6.71971	6.78221
	0°25'8"	0°24'53"	0°24'38"	0°24'24"	0°24'10"	0°23'56"	0°23'42"	0°23'29"	0°23'16"	0°23'3"
8	6.33957	6.40207	6.46457	6.52707	6.58957	6.65207	6.71457	6.77707	6.83957	6.90207
0.07217	6.23131	6.29381	6.35631	6.41881	6.48131	6.54381	6.60631	6.66881	6.73131	6.79381
	0°21'57"	0°21'44"	0°21'31"	0°21'19"	0°21'6"	0°20'54"	0°20'42"	0°20'31"	0°20'19"	0°20'8"
9	6.33655	6.39905	6.46155	6.52405	6.58655	6.64905	6.71155	6.77405	6.83655	6.89905
0.06415	6.24032	6.30282	6.36532	6.42782	6.49032	6.55282	6.61532	6.67782	6.74032	6.80282
	0°19'29"	0°19'17"	0°19'6"	0°18'55"	0°18'44"	0°18'33"	0°18'23"	0°18'12"	0°18'2"	0°17'52"
10	6.33417	6.39667	6.45917	6.52167	6.58417	6.64667	6.70917	6.77167	6.83417	6.89667
0.05774	6.24755	6.31005	6.37255	6.43505	6.49755	6.56005	6.62255	6.68505	6.74755	6.81005
	0°17'31"	0°17'20"	0°17'10"	0°17'0"	0°16'50"	0°16'41"	0°16'31"	0°16'22"	0°16'13"	0°16'4"
11	6.33220	6.39470	6.45720	6.51970	6.58220	6.64470	6.70720	6.76970	6.83220	6.89470
0.05249	6.25346	6.31596	6.37846	6.44096	6.50346	6.56596	6.62846	6.69096	6.75346	6.81596
	0°15'54"	0°15'45"	0°15'36"	0°15'27"	0°15'18"	0°15'9"	0°15'0"	0°14'52"	0°14'44"	0°14'36"
12	6.33053	6.39303	6.45553	6.51803	6.58053	6.64303	6.70553	6.76803	6.83053	6.89303
0.04811	6.25837	6.32087	6.38337	6.44587	6.50837	6.57087	6.63337	6.69587	6.75837	6.82087
	0°14'34"	0°14'26"	0°14'17"	0°14'9"	0°14'1"	0°13'53"	0°13'45"	0°13'37"	0°13'30"	0°13'22"
13	6.32915	6.39165	6.45415	6.51665	6.57915	6.64165	6.70415	6.76665	6.82915	6.89165
0.04441	6.26254	6.32504	6.38754	6.45004	6.51254	6.57504	6.63754	6.70004	6.76254	6.82504
	0°13'26"	0°13'19"	0°13'11"	0°13'3"	0°12'56"	0°12'48"	0°12'41"	0°12'34"	0°12'27"	0°12'20"
14	6.32796	6.39046	6.45296	6.51546	6.57796	6.64046	6.70296	6.76546	6.82796	6.89046
0.04124	6.26610	6.32860	6.39110	6.45360	6.51610	6.57860	6.64110	6.70360	6.76610	6.82860
	0°12'28"	0°12'21"	0°12'14"	0°12'7"	0°12'0"	0°11'53"	0°11'46"	0°11'40"	0°11'33"	0°11'27"
16	6.32601	6.38851	6.45101	6.51351	6.57601	6.63851	6.70101	6.76351	6.82601	6.88851
0.03608	6.27190	6.33440	6.39690	6.45940	6.52190	6.58440	6.64690	6.70940	6.77190	6.83440
	0°10'54"	0°10'48"	0°10'41"	0°10'35"	0°10'29"	0°10'23"	0°10'17"	0°10'12"	0°10'6"	0°10'0"
18	6.32452	6.38702	6.44952	6.51202	6.57452	6.63702	6.69952	6.76202	6.82452	6.88702
0.03207	6.27642	6.33892	6.40142	6.46392	6.52642	6.58892	6.65142	6.71392	6.77642	6.83892
	0°9'42"	0°9'35"	0°9'30"	0°9'25"	0°9'19"	0°9'13"	0°9'8"	0°9'3"	0°8'58"	0°8'53"
20	6.32333	6.38583	6.44833	6.51083	6.57333	6.63583	6.69833	6.76083	6.82333	6.88583
0.02887	6.28002	6.34252	6.40502	6.46752	6.53002	6.59252	6.65502	6.71752	6.78002	6.84252
	0°8'43"	0°8'38"	0°8'33"	0°8'28"	0°8'23"	0°8'18"	0°8'13"	0°8'9"	0°8'4"	0°8'0"
22	6.32234	6.38484	6.44734	6.50984	6.57234	6.63484	6.69734	6.75984	6.82234	6.88484
0.02624	6.28298	6.34548	6.40798	6.47048	6.53298	6.59548	6.65798	6.72048	6.78298	6.84548
	0°7'55"	0°7'50"	0°7'46"	0°7'41"	0°7'37"	0°7'32"	0°7'28"	0°7'24"	0°7'20"	0°7'16"
24	6.32154	6.38404	6.44654	6.50904	6.57154	6.63404	6.69654	6.75904	6.82154	6.88404
0.02406	6.28544	6.34794	6.41044	6.47294	6.53544	6.59794	6.66044	6.72294	6.78544	6.84794
	0°7'15"	0°7'11"	0°7'7"	0°7'3"	0°6'59"	0°6'55"	0°6'51"	0°6'47"	0°6'43"	0°6'39"
26	6.32084	6.38334	6.44584	6.50834	6.57084	6.63334	6.69584	6.75834	6.82084	6.88334
0.02221	6.28752	6.35002	6.41252	6.47502	6.53752	6.60002	6.66252	6.72502	6.78752	6.85002
	0°6'42"	0°6'38"	0°6'34"	0°6'30"	0°6'26"	0°6'23"	0°6'19"	0°6'15"	0°6'12"	0°6'9"
28	6.32024	6.38274	6.44524	6.50774	6.57024	6.63274	6.69524	6.75774	6.82024	6.88274
0.02062	6.28931	6.35181	6.41431	6.47681	6.53931	6.60181	6.66431	6.72681	6.78931	6.85181
	0°6'13"	0°6'9"	0°6'6"	0°6'2"	0°5'59"	0°5'55"	0°5'52"	0°5'49"	0°5'45"	0°5'42"
30	6.31970	6.38220	6.44470	6.50720	6.56970	6.63220	6.69470	6.75720	6.81970	6.88220
0.01924	6.29085	6.35335	6.41585	6.47835	6.54085	6.60335	6.66585	6.72835	6.79085	6.85335
	0°5'48"	0°5'44"	0°5'41"	0°5'38"	0°5'35"	0°5'31"	0°5'28"	0°5'25"	0°5'22"	0°5'19"
32	6.31926	6.38176	6.44426	6.50676	6.56926	6.63176	6.69426	6.75676	6.81926	6.88176
0.01804	6.29220	6.35470	6.41720	6.47970	6.54220	6.60470	6.66720	6.72970	6.79220	6.85470
	0°5'26"	0°5'23"	0°5'20"	0°5'17"	0°5'14"	0°5'11"	0°5'8"	0°5'5"	0°5'2"	0°4'59"

KEY— WIRE READING ——— 'M' 6.50676
PITCH DIAMETER ——— 'E' 6.47970
HELIX ANGLE ——— 'S' 0°5'17"

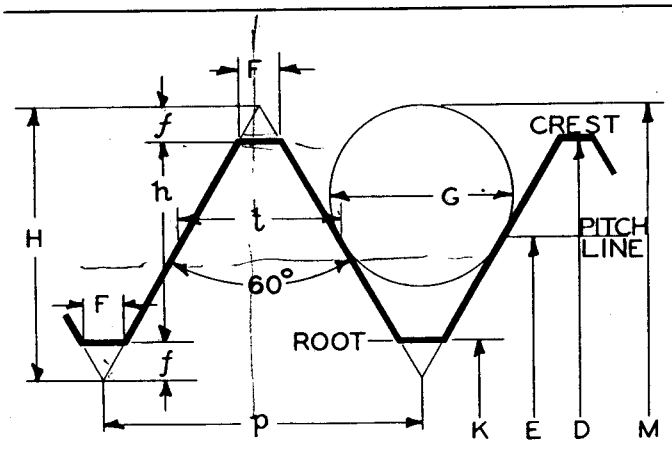
PITCH / WIRE	DIAMETERS $6\frac{15}{16}$	7	$7\frac{1}{16}$	$7\frac{1}{8}$	$7\frac{3}{16}$	$7\frac{1}{4}$	$7\frac{5}{16}$	$7\frac{3}{8}$	$7\frac{7}{16}$	$7\frac{1}{2}$
4 0.14434	6.99163 6.77512 0°40'23"	7.05413 6.83762 0°40' 0"	7.11663 6.90012 0°39' 39"	7.17913 6.96262 0°39' 17"	7.24163 7.02512 0°38'56"	7.30413 7.08762 0°38'36"	7.36663 7.15012 0°38' 16"	7.42913 7.21262 0°37'56"	7.49163 7.27512 0°37'36"	7.55413 7.33762 0°37'17"
$4\frac{1}{2}$ 0.12830	6.98561 6.79316 0°35'48"	7.04811 6.85566 0°35'28"	7.11061 6.91816 0°35' 9"	7.17311 6.98066 0°34'50"	7.23561 7.04316 0°34'31"	7.29811 7.10566 0°34'13"	7.36061 7.16816 0°33'55"	7.42311 7.23066 0°33'38"	7.48561 7.29316 0°33'20"	7.54811 7.35566 0° 33' 3"
5 0.11547	6.98081 6.80760 0°32' 9"	7.04331 6.87010 0°31'51"	7.10581 6.93260 0°31'34"	7.16831 6.99510 0° 31'17"	7.23081 7.05760 0°31' 1"	7.29331 7.12010 0°30'44"	7.35581 7.18260 0° 30'28"	7.41831 7.24510 0°30'12"	7.48081 7.30760 0°29'57"	7.54331 7.37010 0°29'42"
$5\frac{1}{2}$ 0.10497	6.97686 6.81941 0°29'10"	7.03936 6.88191 0°28'55"	7.10186 6.94441 0°28'39"	7.16436 7.00691 0°28'24"	7.22686 7.06941 0°28' 9"	7.28936 7.13191 0°27'54"	7.35186 7.19441 0°27'39"	7.41436 7.25691 0° 27' 25"	7.47686 7.31941 0°27'11"	7.53936 7.38191 0°26'57"
6 0.09622	6.97357 6.82925 0° 26'42"	7.03607 6.89175 0°26' 28"	7.09857 6.95425 0° 26' 13"	7.16107 7.01675 0°25'59"	7.22357 7.07925 0°25'46"	7.28607 7.14175 0°25'32"	7.34857 7.20425 0° 25' 19"	7.41107 7.26675 0°25' 6"	7.47357 7.32925 0°24'53"	7.53607 7.39175 0° 24' 40"
7 0.08248	6.96843 6.84471 0°22'50"	7.03093 6.90721 0°22'38"	7.09343 6.96971 0° 22' 26"	7.15593 7.03221 0°22'14"	7.21843 7.09471 0°22' 2"	7.28093 7.15721 0° 21'50"	7.34343 7.21971 0°21'39"	7.40593 7.28221 0°21'28"	7.46843 7.34471 0°21'17"	7.53093 7.40721 0°21' 6"
8 0.07217	6.96457 6.85631 0°19'57"	7.02707 6.91881 0°19'46"	7.08957 6.98131 0° 19'36"	7.15207 7.04381 0°19'25"	7.21457 7.10631 0° 19' 15"	7.27707 7.16881 0° 19' 5"	7.33957 7.23131 0°18'55"	7.40207 7.29381 0° 18' 45"	7.46457 7.35631 0°18'36"	7.52707 7.41881 0° 18' 26"
9 0.06415	6.96155 6.86532 0° 17' 43"	7.02405 6.92782 0°17'33"	7.08655 6.99032 0° 17'24"	7.14905 7.05282 0°17' 14"	7.21155 7.11532 0°17' 5"	7.27405 7.17782 0°16'56"	7.33655 7.24032 0°16'48"	7.39905 7.30282 0°16'39"	7.46155 7.36532 0°16'30"	7.52405 7.42782 0° 16'22"
10 0.05774	6.95917 6.87255 0°15'55"	7.02167 6.93505 0°15' 47"	7.08417 6.99755 0°15'38"	7.14667 7.06005 0° 15' 30"	7.20917 7.12255 0°15'22"	7.27167 7.18505 0°15'14"	7.33417 7.24755 0°15' 6"	7.39667 7.31005 0°14'58"	7.45917 7.37255 0°14'51"	7.52167 7.43505 0° 14' 43"
11 0.05249	6.95720 6.87846 0° 14'28"	7.01970 6.94096 0°14' 20"	7.08220 7.00346 0°14'12"	7.14470 7.06596 0° 14' 5"	7.20720 7.12846 0°13'57"	7.26970 7.19096 0° 13'50"	7.33220 7.25346 0° 13' 43"	7.39470 7.31596 0° 13'36"	7.45720 7.37846 0°13'29"	7.51970 7.44096 0°13' 22"
12 0.04811	6.95553 6.88337 0°13'15"	7.01803 6.94587 0°13' 8"	7.08053 7.00837 0°13'1"	7.14303 7.07087 0° 12'54"	7.20553 7.13337 0°12' 47"	7.26803 7.19587 0° 12'40"	7.33053 7.25837 0° 12' 34"	7.39303 7.32087 0° 12' 27"	7.45553 7.38337 0°12'21"	7.51803 7.44587 0°12'15"
13 0.04441	6.95415 6.88754 0°12' 14"	7.01665 6.95004 0° 12' 7"	7.07915 7.01254 0° 12'1"	7.14165 7.07504 0°11'54"	7.20415 7.13754 0° 11'48"	7.26665 7.20004 0° 11'42"	7.32915 7.26254 0° 11' 36"	7.39165 7.32504 0°11'30"	7.45415 7.38754 0°11'24"	7.51665 7.45004 0° 11' 18"
14 0.04124	6.95296 6.89110 0° 11'21"	7.01546 6.95360 0° 11' 14"	7.07796 7.01610 0° 11' 8"	7.14046 7.07860 0° 11' 3"	7.20296 7.14110 0° 10' 57"	7.26546 7.20360 0°10' 51"	7.32796 7.26610 0° 10' 45"	7.39046 7.32860 0°10' 40"	7.45296 7.39110 0° 10' 35"	7.51546 7.45360 0°10' 29"
16 0.03608	6.95101 6.89690 0°9'55"	7.01351 6.95940 0° 9' 50"	7.07601 7.02190 0° 9' 44"	7.13815 7.08440 0° 9' 39"	7.20101 7.14690 0° 9' 34"	7.26351 7.20940 0° 9' 29"	7.32601 7.27190 0°9' 24"	7.38851 7.33440 0° 9' 19"	7.45101 7.39690 0° 9' 15"	7.51351 7.45940 0° 9' 10"
18 0.03207	6.94952 6.90142 0° 8'48"	7.01202 6.96392 0° 8'44"	7.07452 7.02642 0° 8' 39"	7.13702 7.08892 0° 8' 34"	7.19952 7.15142 0°8' 30"	7.26202 7.21392 0° 8'26"	7.32452 7.27642 0° 8' 21"	7.38702 7.33892 0° 8' 17"	7.44952 7.40142 0° 8' 13"	7.51202 7.46392 0° 8' 9"
20 0.02887	6.94833 6.90502 0° 7'55"	7.01083 6.96752 0° 7' 51"	7.07333 7.03002 0° 7' 47"	7.13583 7.09252 0° 7' 43"	7.19833 7.15502 0° 7' 39"	7.26083 7.21752 0° 7' 35"	7.32333 7.28002 0° 7' 31"	7.38583 7.34252 0° 7' 27"	7.44833 7.40502 0° 7' 23"	7.51083 7.46752 0° 7' 20"
22 0.02624	6.94734 6.90798 0° 7' 12"	7.00984 6.97048 0° 7' 8"	7.07234 7.03298 0° 7' 4"	7.13484 7.09548 0° 7' 1"	7.19734 7.15798 0° 6'57"	7.25984 7.22048 0° 6'53"	7.32234 7.28298 0° 6' 50"	7.38484 7.34548 0° 6' 46"	7.44734 7.40798 0° 6' 43"	7.50984 7.47048 0° 6' 39"
24 0.02406	6.94654 6.91044 0° 6' 36"	7.00904 6.97294 0° 6' 32"	7.07154 7.03544 0° 6' 29"	7.13404 7.09794 0° 6' 25"	7.19654 7.16044 0° 6' 22"	7.25904 7.22294 0° 6' 19"	7.32154 7.28544 0° 6' 15"	7.38404 7.34794 0° 6' 12"	7.44654 7.41044 0° 6' 9"	7.50904 7.47294 0° 6' 6"
26 0.02221	6.94584 6.91252 0° 6' 5"	7.00834 6.97502 0° 6' 2"	7.07084 7.03752 0° 5' 59"	7.13334 7.10002 0° 5' 56"	7.19584 7.16252 0° 5' 53"	7.25834 7.22502 0° 5' 50"	7.32084 7.28752 0° 5' 47"	7.38334 7.35002 0° 5' 44"	7.44584 7.41252 0° 5' 41"	7.50834 7.47502 0° 5' 38"
28 0.02062	6.94524 6.91431 0° 5' 39"	7.00774 6.97681 0° 5' 36"	7.07024 7.03931 0° 5' 33"	7.13274 7.10181 0° 5' 30"	7.19524 7.16431 0° 5' 27"	7.25774 7.22681 0° 5' 24"	7.32024 7.28931 0° 5' 22"	7.38274 7.35181 0° 5' 19"	7.44524 7.41431 0° 5' 16"	7.50774 7.47681 0° 5' 14"
30 0.01924	6.94470 6.91585 0° 5' 16"	7.00720 6.97835 0° 5' 14"	7.06970 7.04085 0° 5' 11"	7.13220 7.10335 0° 5' 8"	7.19470 7.16585 0° 5' 5"	7.25720 7.22835 0° 5' 3"	7.31970 7.29085 0° 5' 0"	7.38220 7.35335 0° 4' 58"	7.44470 7.41585 0° 4' 55"	7.50720 7.47835 0° 4' 53"
32 0.01804	6.94426 6.91720 0° 4' 57"	7.00676 6.97970 0° 4' 54"	7.06926 7.04220 0° 4' 51"	7.13176 7.10470 0° 4' 49"	7.19426 7.16720 0° 4' 46"	7.25676 7.22970 0° 4' 44"	7.31926 7.29220 0° 4' 41"	7.38176 7.35470 0° 4' 39"	7.44426 7.41720 0° 4' 37"	7.50676 7.47970 0° 4' 34"

KEY— WIRE READING——M 7.13176
PITCH DIAMETER——E 7.10470
HELIX ANGLE——S 0° 4' 49"

PITCH / WIRE	DIAMETERS $7\frac{9}{16}$	$7\frac{5}{8}$	$7\frac{11}{16}$	$7\frac{3}{4}$	$7\frac{13}{16}$	$7\frac{7}{8}$	$7\frac{15}{16}$	8		
4 0.14434	7.61663 7.40012 0°36'58"	7.67913 7.46262 0°36'39"	7.74163 7.52512 0°36'21"	7.80413 7.58762 0°36' 3"	7.86663 7.65012 0°35'46"	7.92913 7.71262 0°35'28"	7.99163 7.77512 0°35'11"	8.05413 7.83762 0°34'54"		
$4\frac{1}{2}$ 0.12830	7.61061 7.41816 0°32'47"	7.67311 7.48066 0°32'30"	7.73561 7.54316 0°32'14"	7.79811 7.60566 0°31'58"	7.86061 7.66816 0°31'43"	7.92311 7.73066 0°31'27"	7.98561 7.79316 0°31'12"	8.04811 7.85566 0°30'57"		
5 0.11547	7.60581 7.43260 0°29'27"	7.66831 7.49510 0°29'12"	7.73081 7.55760 0°28'57"	7.79331 7.62010 0°28'43"	7.85581 7.68260 0°28'29"	7.91831 7.74510 0°28'15"	7.98081 7.80760 0°28'2"	8.04331 7.87010 0°27'48"		
$5\frac{1}{2}$ 0.10497	7.60186 7.44441 0°26'44"	7.66436 7.50691 0°26'30"	7.72686 7.56941 0°26'17"	7.78936 7.63191 0°26' 4"	7.85186 7.69441 0°25'51"	7.91436 7.75691 0°25'39"	7.97686 7.81941 0°25'27"	8.03936 7.88191 0°25'15"		
6 0.09622	7.59857 7.45425 0°24'28"	7.66107 7.51675 0°24'16"	7.72357 7.57925 0°24'4"	7.78607 7.64175 0°23'52"	7.84857 7.70425 0°23'40"	7.91107 7.76675 0°23'29"	7.97357 7.82925 0°23'18"	8.03607 7.89175 0°23'7"		
7 0.08248	7.59343 7.46971 0°20'56"	7.65593 7.53221 0°20'45"	7.71843 7.59471 0°20'35"	7.78093 7.65721 0°20'25"	7.84343 7.71971 0°20'15"	7.90593 7.78221 0°20'5"	7.96843 7.84471 0°19'56"	8.03093 7.90721 0°19'46"		
8 0.07217	7.58957 7.48131 0°18'17"	7.65207 7.54381 0°18'8"	7.71457 7.60631 0°17'59"	7.77707 7.66881 0°17'50"	7.83957 7.73131 0°17'42"	7.90207 7.79381 0°17'33"	7.96457 7.85631 0°17'25"	8.02707 7.91881 0°17'17"		
9 0.06415	7.58655 7.49032 0°16'14"	7.64905 7.55282 0°16'6"	7.71155 7.61532 0°15'58"	7.77405 7.67782 0°15'50"	7.83655 7.74032 0°15'42"	7.89905 7.80282 0°15'35"	7.96155 7.86532 0°15'27"	8.02405 7.92782 0°15'20"		
10 0.05774	7.58417 7.49755 0°14'36"	7.64667 7.56005 0°14'28"	7.70917 7.62255 0°14'21"	7.77167 7.68505 0°14'14"	7.83417 7.74755 0°14'7"	7.89667 7.81005 0°14'1"	7.95917 7.87255 0°13'54"	8.02167 7.93505 0°13'47"		
11 0.05249	7.58220 7.50346 0°13'15"	7.64470 7.56596 0°13'9"	7.70720 7.62846 0°13'2"	7.76970 7.69096 0°12'56"	7.83220 7.75346 0°12'50"	7.89470 7.81596 0°12'44"	7.95720 7.87846 0°12'38"	8.01970 7.94096 0°12'32"		
12 0.04811	7.58053 7.50837 0°12'9"	7.64303 7.57087 0°12'3"	7.70553 7.63337 0°11'57"	7.76803 7.69587 0°11'51"	7.83053 7.75837 0°11'45"	7.89303 7.82087 0°11'40"	7.95553 7.88337 0°11'34"	8.01803 7.94587 0°11'29"		
13 0.04441	7.57915 7.51254 0°11'13"	7.64165 7.57504 0°11'7"	7.70415 7.63754 0°11'2"	7.76665 7.70004 0°10'56"	7.82915 7.76254 0°10'51"	7.89165 7.82504 0°10'46"	7.95415 7.88754 0°10'41"	8.01665 7.95004 0°10'36"		
14 0.04124	7.57796 7.51610 0°10'24"	7.64046 7.57860 0°10'19"	7.70296 7.64110 0°10'14"	7.76546 7.70360 0°10'9"	7.82796 7.76610 0°10'4"	7.89046 7.82860 0°9'59"	7.95296 7.89110 0°9'54"	8.01546 7.95360 0°9'50"		
16 003608	7.57601 7.52190 0°9'6"	7.63851 7.58440 0°9'1"	7.70101 7.64690 0°8'57"	7.76351 7.70940 0°8'52"	7.82601 7.77190 0°8'48"	7.88851 7.83440 0°8'44"	7.95101 7.89690 0°8'40"	8.01351 7.95940 0°8'37"		
18 0.03207	7.57452 7.52642 0°8'4"	7.63702 7.58892 0°8'1"	7.69952 7.65142 0°7'56"	7.76202 7.71392 0°7'53"	7.82452 7.77642 0°7'49"	7.88702 7.83892 0°7'45"	7.94952 7.90142 0°7'41"	8.01202 7.96392 0°7'38"		
20 002887	7.57333 7.53002 0°7'16"	7.63583 7.59252 0°7'12"	7.69833 7.65502 0°7'9"	7.76083 7.71752 0°7'5"	7.82333 7.78002 0°7'2"	7.88583 7.84252 0°6'59"	7.94833 7.90502 0°6'55"	8.01083 7.96752 0°6'52"		
22 0.02624	7.57234 7.53298 0°6'36"	7.63484 7.59548 0°6'33"	7.69734 7.65798 0°6'30"	7.75984 7.72048 0°6'27"	7.82234 7.78298 0°6'23"	7.88484 7.84548 0°6'20"	7.94734 7.90798 0°6'17"	8.00984 7.97048 0°6'14"		
24 0.02406	7.57154 7.53544 0°6'3"	7.63404 7.59794 0°6'0"	7.69654 7.66044 0°5'57"	7.75904 7.72294 0°5'54"	7.82154 7.78544 0°5'51"	7.88404 7.84794 0°5'49"	7.94654 7.91044 0°5'46"	8.00904 7.97294 0°5'43"		
26 0.02221	7.57084 7.53752 0°5'35"	7.63334 7.60002 0°5'32"	7.69584 7.66252 0°5'30"	7.75834 7.72502 0°5'27"	7.82084 7.78752 0°5'24"	7.88334 7.85002 0°5'22"	7.94584 7.91252 0°5'19"	8.00834 7.97502 0°5'17"		
28 0.02062	7.57024 7.53931 0°5'11"	7.63274 7.60181 0°5'8"	7.69524 7.66431 0°5'6"	7.75774 7.72681 0°5'3"	7.82024 7.78931 0°5'1"	7.88274 7.85181 0°4'59"	7.94524 7.91431 0°4'56"	8.00774 7.97681 0°4'54"		
30 001924	7.56970 7.54085 0°4'50"	7.63220 7.60335 0°4'48"	7.69470 7.66585 0°4'45"	7.75720 7.72835 0°4'43"	7.81970 7.79085 0°4'41"	7.88220 7.85335 0°4'39"	7.94470 7.91585 0°4'36"	8.00720 7.97835 0°4'34"		
32 0.01804	7.56926 7.54220 0°4'32"	7.63176 7.60470 0°4'30"	7.69426 7.66720 0°4'28"	7.75676 7.72970 0°4'25"	7.81926 7.79220 0°4'23"	7.88176 7.85470 0°4'21"	7.94426 7.91720 0°4'19"	8.00676 7.97970 0°4'17"		

KEY— WIRE READING——'M' 7.75676
PITCH DIAMETER—'E' 7.72970
HELIX ANGLE——'S' 0°4'25"

THREAD FORMULAS



AMERICAN NATIONAL THREAD FIG. 7

$E = D - h = D - 0.64952p$

$F = 0.125p$

$f = 0.10825p$

$G = 0.57735p$ BEST

$G = 1.01036p$ MAX.

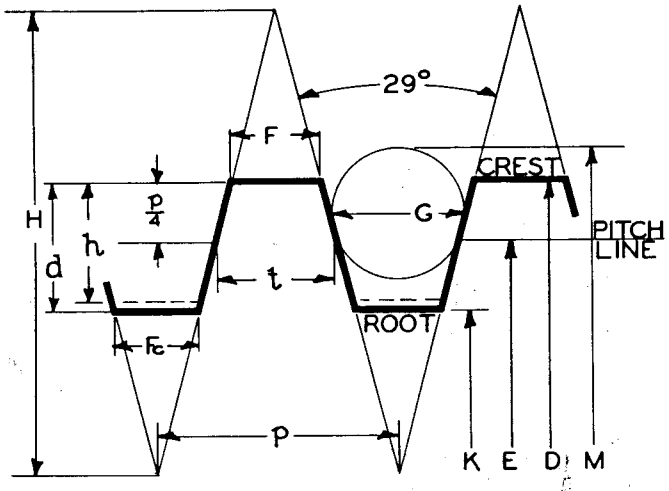
$G = 0.50518p$ MIN.

$H = 0.86603p$

$h = 0.64952p$

$M = E - H + 3G$

$\underline{M} = M + (0.750G \times S^2)$



ACME THREAD FIG. 8

$E = D - 0.50p$

$F = 0.37069p$

$F_c = 0.37069p - .0026$ 12P & FINER

$F_c = 0.37069p - .0052$ 10P & COARSER

$G = 0.51645p$ BEST

$G = 0.65001p$ MAX.

$G = 0.48726p$ MIN.

$H = 1.93336p$

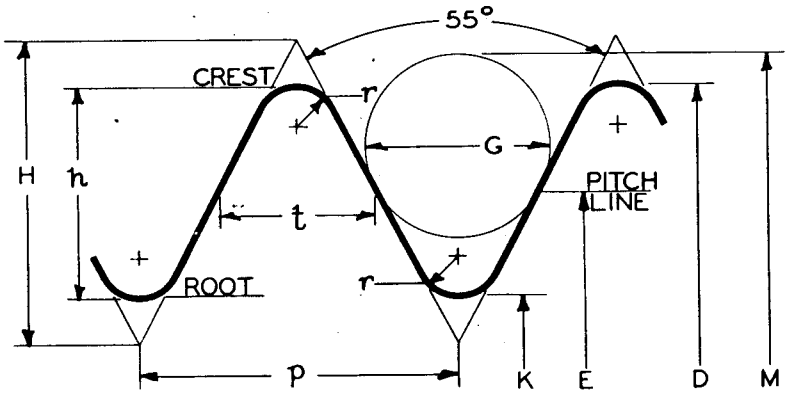
$M = E - H + 4.9939G$

$\underline{M} = M + (1.87178G \times S^2)$

$d = 0.5p + 0.005$ 12P & FINER

$d = 0.5p + 0.010$ 10P & COARSER

$h = 0.50p$



WHITWORTH THREAD FIG. 9

$E = D - h = D - 0.64033p$

$G = 0.56369p$ BEST

$G = 0.85272p$ MAX.

$G = 0.50568p$ MIN.

$H = 0.96049p$

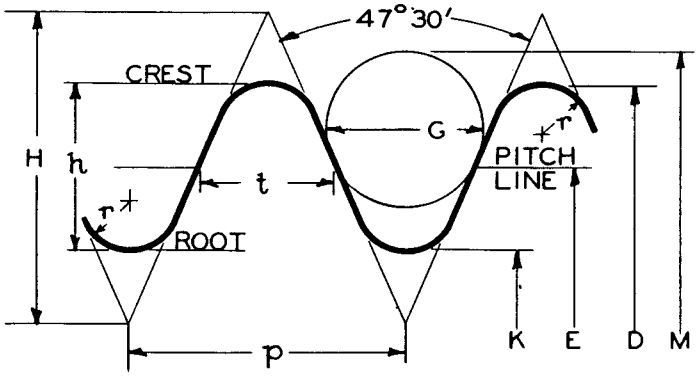
$h = 0.64033p$

$M = E - H + 3.1657G$

$\underline{M} = M + (0.85197G \times S^2)$

$r = 0.13733p$

THREAD FORMULAS



BRITISH ASSOCIATION THREAD FIG. 10

$E = D - h = D - 0.60p$

$G = 0.54626p$ BEST

$G = 0.72889p$ MAX.

$G = 0.49852p$ MIN.

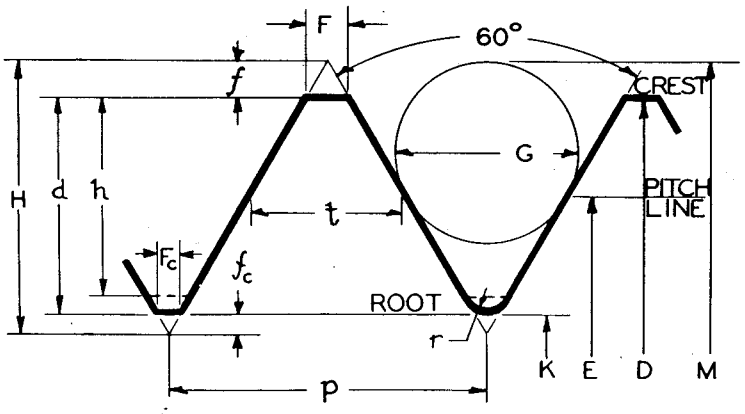
$H = 1.13634p$

$h = 0.60p$

$M = E - H + 3.4829G$

$\underline{M} = M + (1.04010G \times S^2)$

$r = 0.1818p$



METRIC THREAD FIG. 11

$E = D - h = D - 0.64952p$

$F = 0.1250p$ $F_c = 0.0625p$

$f = 0.10825p$ $f_c = 0.05412p$

$G = 0.57735p$ BEST

$G = 1.01036p$ MAX.

$G = 0.50518p$ MIN.

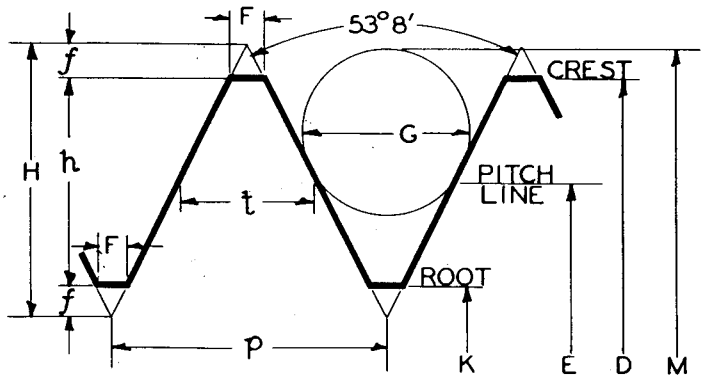
$H = 0.86603p$

$h = 0.64952p$ $d = 0.70364p$

$M = E - H + 3G$

$\underline{M} = M + (0.750G \times S^2)$

$r = 0.054p$ (OPTIONAL)



LOWENHERZ THREAD FIG. 12

$E = D - h = D - 0.75p$

$F = f = 0.125p$

$G = 0.55902p$ BEST

$G = 0.97829p$ MAX.

$G = 0.54080p$ MIN.

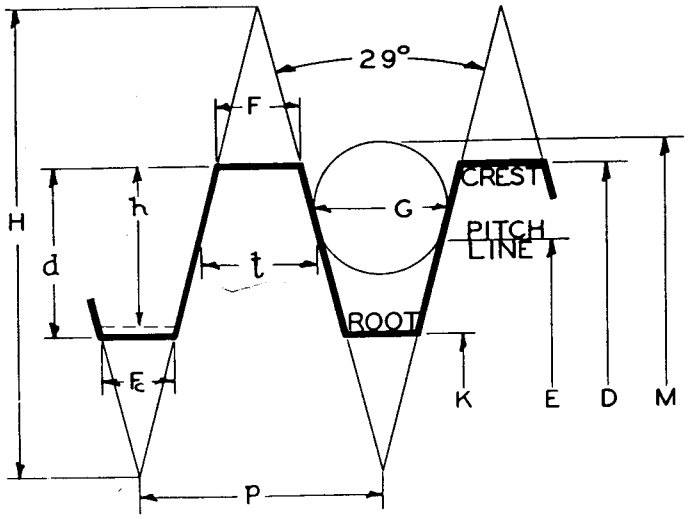
$H = p$

$h = 0.75p$

$M = E - H + 3.23594G$

$\underline{M} = M + (0.89435G \times S^2)$

THREAD FORMULAS



$d = 0.6866\,p$

$E = D - h = D - 0.6366\,p$

$F = 0.33536\,p$

$F_c = 0.30950\,p$

$G = 0.51645\,p$ (BEST WIRE)

$G = 0.68651\,p$ (MAX. WIRE)

$G = 0.51462\,p$ (MIN. WIRE)

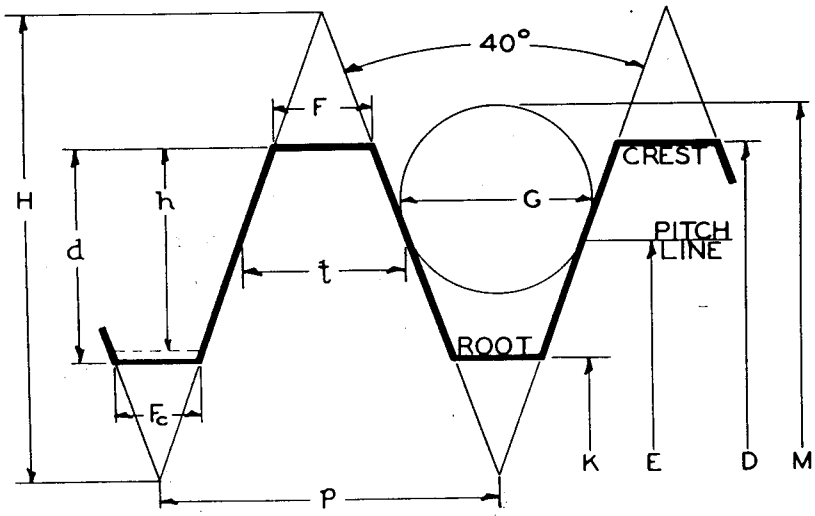
$H = 1.93336\,p$

$h = 0.6366\,p$

$M = E - H + 4.9939G$

$\underline{M} = M + (1.87178\,G \times S^2)$

29° WORM THREAD 14½° PRESSURE ANGLE FIG. 13



$d = 0.6866p$

$E = D - h = D - 0.6366\,p$

$F = 0.26830p$

$F_c = 0.23190\,p$

$G = 0.53209\,p$ (BEST WIRE)

$G = 0.77866p$ (MAX. WIRE)

$G = 0.51234\,p$ (MIN. WIRE)

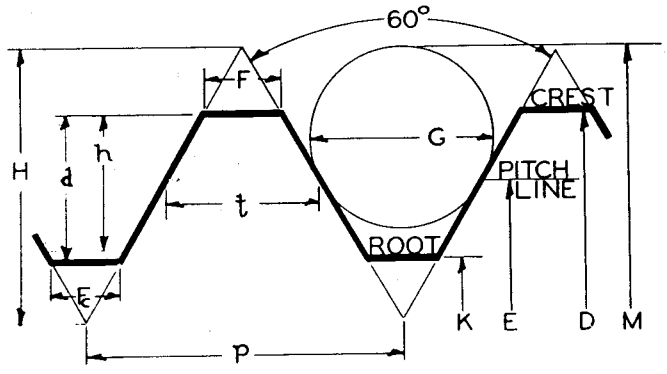
$H = 1.37374\,p$

$h = 0.6366p$

$M = E - H + 3.9238G$

$\underline{M} = M + (1.29089G \times S^2)$

40° WORM THREAD 20° PRESSURE ANGLE FIG. 14



$d = 0.453\,p$

$E = D - h = D - 0.4330\,p$

$F = 0.250\,p$

$F_c = 0.227\,p$

$G = 0.57735\,p$ (BEST WIRE)

$G = 0.86602\,p$ (MAX. WIRE)

$G = 0.433\,p$ (MIN. WIRE)

$H = 0.86603\,p$

$h = 0.433\,p$

$M = E - H + 3G$

$\underline{M} = M + (0.750\,G \times S^2)$

60° STUB OR MODIFIED THREAD FIG. 15

THREAD FORMULAS

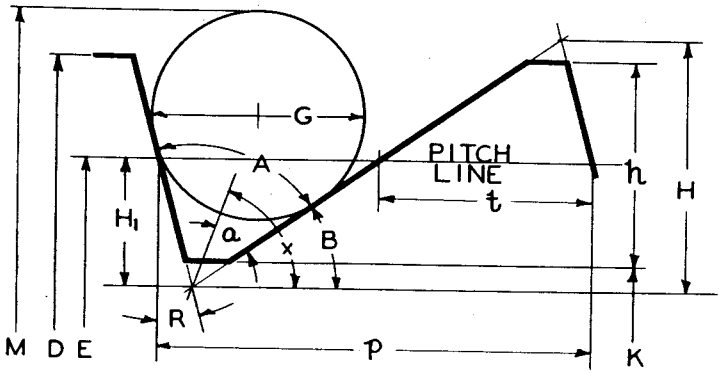


FIG. 16

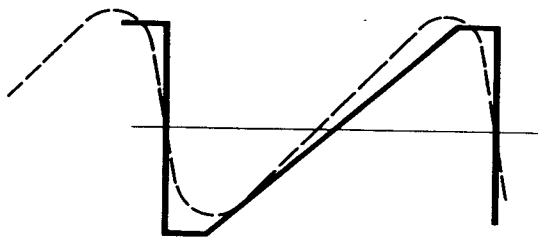


FIG. 17

BUTTRESS OR UNEQUAL ANGLE THREAD

$$M = E - H + G\left(1 + \frac{\sin X}{\sin a}\right)$$

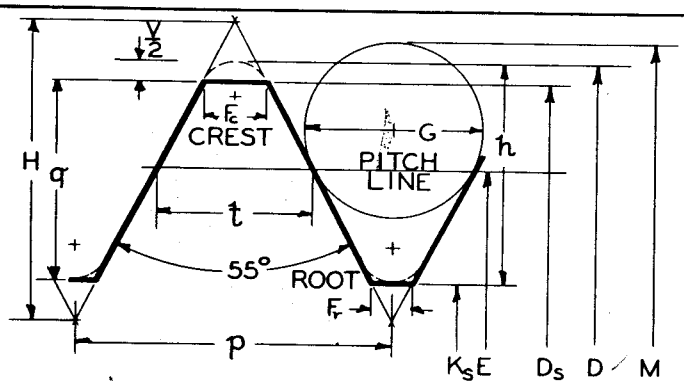
$$E = M + H - G\left(1 + \frac{\sin X}{\sin a}\right)$$

$$X = a + B$$

R = ANGLE OF FLANK NEAREST VERTICAL
B = ANGLE OF FLANK NEAREST HORIZONTAL
A = INCLUDED THREAD ANGLE = 90° + R − B

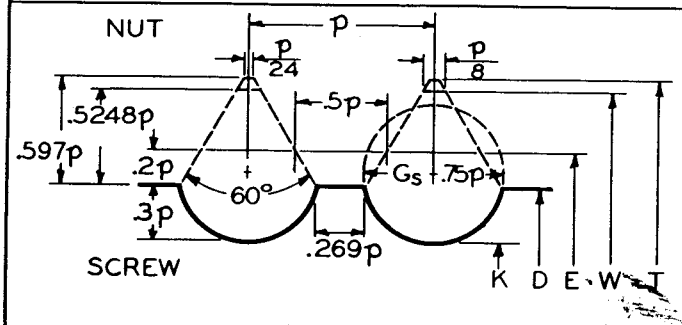
$$H = \frac{p}{\tan R + \cot B} \qquad H_1 = \frac{H}{2} \qquad a = \frac{A}{2} \qquad X = a + B$$

THE CORRECT WIRE SIZE FOR MEASURING IS BEST DETERMINED BY MAKING AN ENLARGED LAYOUT OF THE THREAD. THE BEST WIRE IS ONE THAT IS TANGENT AT THE PITCH LINE TO THE FLANK FORMED BY ANGLE 'B'. CARE MUST BE TAKEN THAT THE WIRE ENGAGES FLANK OF ANGLE 'R' BELOW ANY FLAT OR RADIUS ON THE THREAD FORM. THE WIRE MUST ALWAYS PROJECT ABOVE THE OUTSIDE DIAMETER OF THE THREAD. THE FORMULAS MAY BE USED FOR ANY SIZE WIRE SELECTED PROVIDED THE HELIX ANGLE IS SMALL.



TRUNCATED WHITWORTH FORM FIG. 18

p = PITCH
H = .960491p (BASIC)
D_s = D − V
V = .147835p
E = D − h
F_c = .243624p
F_r = .16667p
q = .56641p
G = .56369p (BEST WIRE)
h = .640327p (BASIC)
D = BASIC MAJOR DIAMETER
M = E − H + 3.1657G $\underline{M} = M + (0.85197G \times S^2)$



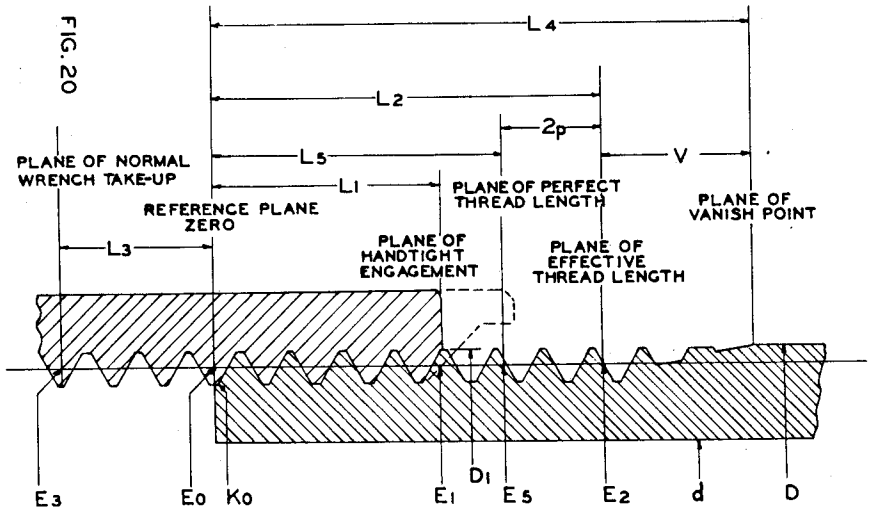
AERO-THREAD FORM FIG. 19

D = MAJOR DIAMETER - SCREW
ALSO MINOR DIAMETER OF TAPPED HOLE
E = PITCH DIAMETER = D + .4p
K = MINOR DIAMETER = D − .6p
W = MAJOR DIAMETER - INSERT = D + 1.0495p
G_s = DIAMETER OF THREAD FORM CIRCLE = .75p
T = MAJOR DIAMETER OF TAP = D + 1.194p
AND MINIMUM = D + 1.122p

COURTESY-AIRCRAFT SCREW PRODUCTS CO. INC.

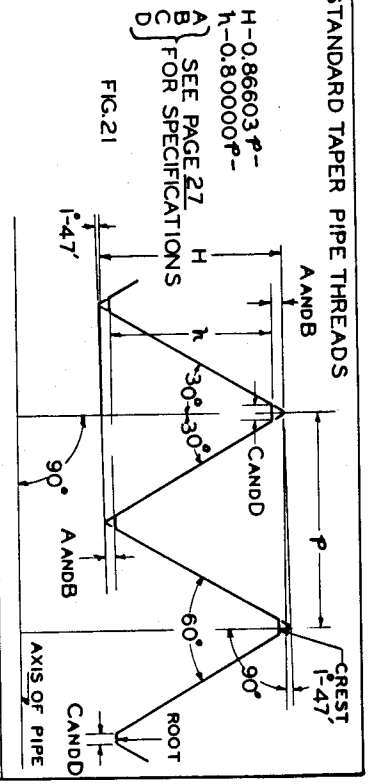
NOMINAL PIPE SIZES (INCHES)	THREADS PER INCH	LIMITS ON TAPER AT PITCH LINE, PER FOOT		LEAD IN LENGTH OF EFFECTIVE THREAD	60° ANGLE OF THREAD
		MAXIMUM	MINIMUM		
		INCH	INCH	INCH	DEGREES
$\frac{1}{16}, \frac{1}{8}$	27	$\frac{7}{8}$	$\frac{11}{16}$	± 0.003	± $2\frac{1}{2}$
$\frac{1}{4}, \frac{3}{8}$	18	$\frac{7}{8}$	$\frac{11}{16}$	.003	2
$\frac{1}{2}, \frac{3}{4}$	14	$\frac{27}{32}$	$\frac{11}{16}$	.003	2
$1, 1\frac{1}{4}, 1\frac{1}{2}, 2$	$11\frac{1}{2}$	$\frac{27}{32}$	$\frac{11}{16}$	.003	$1\frac{1}{2}$
$2\frac{1}{2}$ AND LARGER	8	$\frac{13}{16}$	$\frac{23}{32}$	.006	$1\frac{1}{2}$

FIG. 20



NOMINAL PIPE SIZE	OUTSIDE DIAMETER OF PIPE	THREADS PER INCH	PITCH OF THREAD	DEPTH OF THREAD	PITCH DIAMETER AT BEGINNING OF EXTERNAL THREAD	LENGTH OF EFFECTIVE THREAD		VANISHING THREADS		INCREASE IN DIAMETER PER THREAD	HELIX ANGLE AT MIDPOINT OF EFFECTIVE THREAD LENGTH
						LENGTH	DIAMETER	V			
	D	n	p	h	E0	L2	E2			$= \frac{0.0625}{n}$	
1	2	3	4	5	6	7	8	9	10	11	12	13
$\frac{1}{16}$	0.3125	27	0.03704	0.02963	0.27118	0.2611	7.05	0.28750	0.1285	3.47	0.00231	2°-25′
$\frac{1}{8}$	.405	27	.03704	.02963	.36351	.2639	7.12	.38000	.1285	3.47	.00231	1°-49′
$\frac{1}{4}$	.540	18	.05556	.04444	.47739	.4018	7.23	.50250	.1928	3.47	.00347	2°-4′
$\frac{3}{8}$	.675	18	.05556	.04444	.61201	.4078	7.34	.63750	.1928	3.47	.00347	1°-37′
$\frac{1}{2}$	.840	14	.07143	.05714	.75843	.5337	7.47	.79179	.2478	3.47	.00446	1°-41′
$\frac{3}{4}$	1.050	14	.07143	.05714	.96768	.5457	7.64	1.00179	.2478	3.47	.00446	1°-19′
1	1.315	$11\frac{1}{2}$	.08696	.06957	1.21363	.6828	7.85	1.25630	.3017	3.47	.00543	1°-17′
$1\frac{1}{4}$	1.660	$11\frac{1}{2}$	.08696	.06957	1.55713	.7068	8.13	1.60130	.3017	3.47	.00543	1°-0′
$1\frac{1}{2}$	1.900	$11\frac{1}{2}$	.08696	.06957	1.79609	.7235	8.32	1.84130	.3017	3.47	.00543	0°-52′
2	2.375	$11\frac{1}{2}$	.08696	.06957	2.26902	.7565	8.70	2.31630	.3017	3.47	.00543	0°-41′
$2\frac{1}{2}$	2.875	8	.12500	.100000	2.71953	1.1375	9.10	2.79062	.4337	3.47	.00781	0°-50′
3	3.500	8	.12500	.100000	3.34062	1.2000	9.60	3.41562	.4337	3.47	.00781	0°-41′
$3\frac{1}{2}$	4.000	8	.12500	.100000	3.83750	1.2500	10.00	3.91562	.4337	3.47	.00781	0°-35′
4	4.500	8	.12500	.100000	4.33438	1.3000	10.40	4.41562	.4337	3.47	.00781	0°-31′
5	5.563	8	.12500	.100000	5.39073	1.4063	11.25	5.47862	.4337	3.47	.00781	0°-25′

FIG. 21



AMERICAN NATIONAL TAPER PIPE THREADS

LIMITS ON CREST AND ROOT TRUNCATION

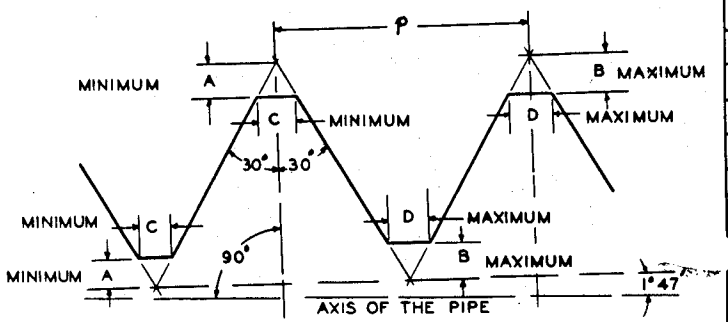


FIG. 22

AMERICAN NATIONAL SPECIFICATIONS

THREADS PER INCH	TRUNCATION				WIDTH OF FLAT			
	A MINIMUM		B MAXIMUM		C MINIMUM		D MINIMUM	
1	2	3	4	5	6	7	8	9
	FORMULA	INCH	FORMULA	INCH	FORMULA	INCH	FORMULA	INCH
27	0.033_p	0.0012	0.096_p	0.0036	0.038_p	0.0014	0.111_p	0.0041
18	0.033_p	0.0018	0.088_p	0.0049	0.038_p	0.0021	0.102_p	0.0057
14	0.033_p	0.0024	0.078_p	0.0056	0.038_p	0.0027	0.090_p	0.0064
11 1/2	0.033_p	0.0029	0.073_p	0.0064	0.038_p	0.0033	0.084_p	0.0073
8	0.033_p	0.0041	0.062_p	0.0078	0.038_p	0.0048	0.072_p	0.0090

ARMY AND NAVY AERONAUTICAL SPECIFICATIONS

THREADS PER INCH	TRUNCATION				WIDTH OF FLAT			
	A MINIMUM		B MAXIMUM		C MINIMUM		D MAXIMUM	
	FORMULA	INCH	FORMULA	INCH	FORMULA	INCH	FORMULA	INCH
27	0.033_p	0.0012	0.073_p	0.0027	0.038_p	0.0014	0.084_p	0.0031
18	0.033_p	0.0018	0.088_p	0.0049	0.038_p	0.0021	0.102_p	0.0057
14	0.033_p	0.0024	0.078_p	0.0056	0.038_p	0.0027	0.090_p	0.0064
11 1/2	0.033_p	0.0029	0.073_p	0.0064	0.038_p	0.0033	0.084_p	0.0073
8	0.033_p	0.0041	0.062_p	0.0078	0.038_p	0.0048	0.072_p	0.0090

DRYSEAL AMERICAN STANDARD

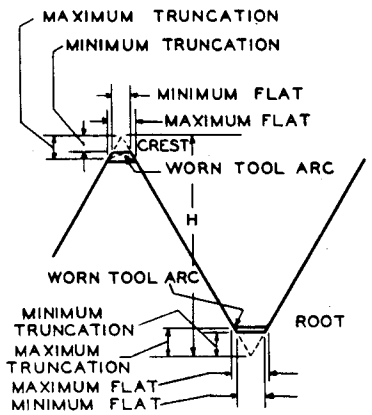


FIG. 23

DRYSEAL AMERICAN STANDARD

THREADS PER INCH		DEPTH OF SHARP V THREAD H	DEPTH OF PIPE THREAD		TRUNCATION				TOLERANCE ON TRUNCATION	EQUIVALENT WIDTH OF FLAT				TOLERANCE ON EQUIVALENT WIDTH OF FLAT
			MAXIMUM h	MINIMUM	MINIMUM		MAXIMUM			MINIMUM		MAXIMUM		
1		2	3	4	5	6	7	8	9	10	11	12	13	14
		INCH	INCH	INCH	FORMULA	INCH	FORMULA	INCH	INCH	FORMULA	INCH	FORMULA	INCH	INCH
27	CREST	.03208	0.02685	0.02426	0.047_p	0.0017	0.094_p	0.0035	0.0018	0.054_p	0.0020	0.108_p	0.0040	0.0020
	ROOT				$.094_p$	.0035	$.140_p$	.0052	.0017	$.108_p$	.0040	$.162_p$	.0060	.0020
18	CREST	.04811	.04117	.03856	$.047_p$	.0026	$.078_p$	.0043	.0017	$.054_p$	.0030	$.090_p$	.0050	.0020
	ROOT				$.078_p$	.0043	$.109_p$	.0061	.0018	$.090_p$	.0050	$.126_p$	.0070	.0020
14	CREST	.06186	.05500	.05236	$.036_p$	.0026	$.060_p$	.0043	.0017	$.042_p$	.0030	$.070_p$	.0050	.0020
	ROOT				$.060_p$	.0043	$.085_p$	.0061	.0018	$.070_p$	.0050	$.098_p$	.0070	.0020
11½	CREST	.07531	.06661	.06313	$.040_p$	.0035	$.060_p$	.0052	.0017	$.046_p$	.0040	$.069_p$	.0060	.0020
	ROOT				$.060_p$	.0052	$.090_p$	.0078	.0026	$.069_p$	.0060	$.103_p$	.0090	.0030
8	CREST	.10825	.09613	.09275	$.042_p$	.0052	$.055_p$	.0069	.0017	$.048_p$	.0060	$.064_p$	.0080	.0020
	ROOT				$.055_p$	.0069	$.076_p$	.0095	.0026	$.064_p$	.0080	$.088_p$	.0110	.0030

AMERICAN NATIONAL STRAIGHT PIPE THREADS FOR MECHANICAL JOINTS (FREE FITTING)

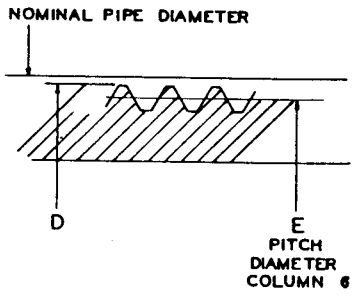


FIG. 24

NOMINAL PIPE SIZE	THREADS PER INCH	DEPTH OF THREAD h=0.666025P	EXTERNAL THREAD				
			MAJOR DIAMETER		PITCH DIAMETER		MINOR DIAMETER, MAXIMUM
			MAXIMUM	MINIMUM	MAXIMUM	MINIMUM	
1	2	3	4	5	6	7	8
1/8	27	0.02467	0.3995	0.3926	0.3748	0.3713	0.3501
1/4	18	.03700	.5269	.5165	.4899	.4847	.4529
3/8	18	.03700	.6640	.6536	.6270	.6218	.5900
1/2	14	.04757	.8260	.8126	.7784	.7717	.7308
3/4	14	.04757	1.0365	1.0231	.9889	.9822	.9413
1	11 1/2	.05792	1.2965	1.2802	1.2386	1.2305	1.1807
1 1/4	11 1/2	.05792	1.6413	1.6250	1.5834	1.5753	1.5255
1 1/2	11 1/2	.05792	1.8802	1.8639	1.8223	1.8142	1.7644
2	11 1/2	.05792	2.3542	2.3379	2.2963	2.2882	2.2384
2 1/2	8	.08325	2.8455	2.8221	2.7622	2.7505	2.6789
3	8	.08325	3.4718	3.4484	3.3885	3.3768	3.3052
3 1/2	8	.08325	3.9721	3.9487	3.8888	3.8771	3.8055
4	8	.08325	4.4704	4.4470	4.3871	4.3754	4.3038
5	8	.08325	5.5326	5.5092	5.4493	5.4376	5.3660

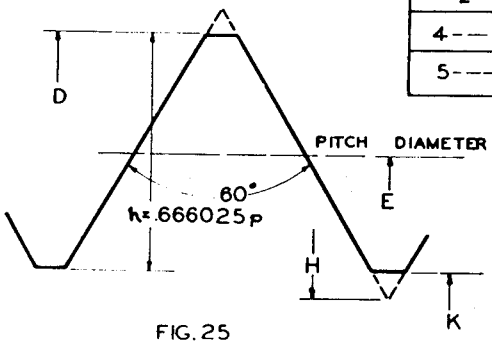


FIG. 25

AMERICAN NATIONAL STRAIGHT PIPE THREADS FOR LOCKNUTS AND LOCKNUT PIPE THREADS (LOOSE FITTING MECHANICAL JOINTS)

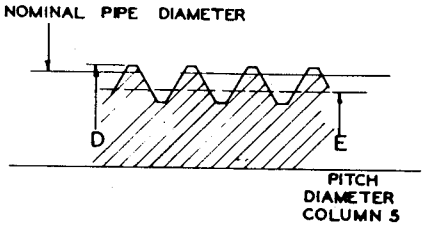


FIG. 26

NOMINAL PIPE SIZE	THREADS PER INCH	EXTERNAL THREADS				
		MAJOR DIAMETER		PITCH DIAMETER		MINOR DIAMETER, MAXIMUM
		MAXIMUM	MINIMUM	MAXIMUM	MINIMUM	
1	2	3	4	5	6	7
1/8	27	0.4087	0.4018	0.3840	0.3805	0.3593
1/4	18	.5408	.5304	.5038	.4986	.4668
3/8	18	.6779	.6675	.6409	.6357	.6039
1/2	14	.8439	.8305	.7963	.7896	.7487
3/4	14	1.0543	1.0409	1.0067	1.0000	.9591
1	11 1/2	1.3183	1.3020	1.2604	1.2523	1.2025
1 1/4	11 1/2	1.6630	1.6467	1.6051	1.5970	1.5472
1 1/2	11 1/2	1.9020	1.8857	1.8441	1.8360	1.7862
2	11 1/2	2.3759	2.3596	2.3180	2.3099	2.2601
2 1/2	8	2.8767	2.8533	2.7934	2.7817	2.7101
3	8	3.5031	3.4797	3.4198	3.4081	3.3365
3 1/2	8	4.0034	3.9800	3.9201	3.9084	3.8368
4	8	4.5017	4.4783	4.4184	4.4067	4.3351
5	8	5.5638	5.5404	5.4805	5.4688	5.3973

AMERICAN NATIONAL HOSE COUPLING THREADS
NIPPLE THREAD

NOMINAL SIZE OF HOSE	SERVICE	THREADS PER INCH	PITCH	DEPTH OF THREAD	MAJOR DIAMETER			PITCH DIAMETER		
					MAXIMUM	TOLERANCE	MINIMUM	MAXIMUM	TOLERANCE	MINIMUM
1	2	3	4	5	6	7	8	9	10	11
1, 1 1/2, 2, 2 1/2, 3, 3 1/2, 4	GARDEN HOSE	11 1/2	0.08696	0.05648	1.0625	0.0170	1.0455	1.0060	0.0085	0.9975
3/4, 1	CHEMICAL ENGINE AND BOOSTER HOSE	8	.12500	.08119	1.3750	.0222	1.3528	1.2938	.0111	1.2827
1 1/2	FIRE PROTECTION HOSE	9	.11111	.07217	1.9900	.0222	1.9678	1.9178	.0111	1.9067
1/2	STEAM, AIR, WATER AND ALL OTHER HOSE CONNECTIONS.	14	.07143	.04639	.8248	.0140	.8108	.7784	.0070	.7714
3/4		14	.07143	.04639	1.0353	.0140	1.0213	.9889	.0070	.9819
1		11 1/2	.08696	.05648	1.2951	.0170	1.2781	1.2386	.0085	1.2301
1 1/4		11 1/2	.08696	.05648	1.6399	.0170	1.6229	1.5834	.0085	1.5749
1 1/2		11 1/2	.08696	.05648	1.8788	.0170	1.8618	1.8223	.0085	1.8138
2		11 1/2	.08696	.05648	2.3528	.0170	2.3358	2.2963	.0085	2.2878

THE REFERENCE TO THREAD GAGES BELOW APPLIES TO UNIFIED THREADS UNC AND UNF, DETAILS OF WHICH FOLLOW ON PAGES 32, 33, 34 AND 35.

"GO" THREAD GAGES

CLASS 1A. UNC SERIES: NEW "GO" GAGES ARE REQUIRED.
UNF SERIES: FROM 1/4 TO 3/4 IN., INCLUSIVE, CLASS 1 GAGES ARE APPLICABLE. FOR OTHER SIZES NEW GAGES ARE REQUIRED.

CLASS 2A. UNC AND UNF SERIES: FOR PLATED PRODUCT BASIC-SIZE GAGES (SAME AS FOR CLASSES 2 OR 3) ARE APPLICABLE. FOR UNPLATED PRODUCT, UNLESS THE SPECIFIED 2A ALLOWANCE IS REQUIRED, BASIC-SIZE GAGES ARE LIKEWISE APPLICABLE.

CLASS 3A. UNC AND UNF SERIES: BASIC-SIZE GAGES (SAME AS CLASSES 2 OR 3) ARE APPLICABLE.

"NO GO" THREAD GAGES

CLASS 1A. UNC SERIES: CLASS 1 GAGES ARE APPLICABLE. (THAT IS, PRODUCT WHICH IS ACCEPTABLE TO CLASS 1A GAGES IS ALSO ACCEPTABLE TO CLASS 1 GAGES)
UNF SERIES: NEW GAGES ARE REQUIRED.

CLASS 2A UNC SERIES: IN SIZES 1 3/8 AND FROM 1 3/4 TO 3 1/2 IN., INCLUSIVE, CLASS 2 GAGES ARE APPLICABLE. FOR OTHER SIZES NEW GAGES ARE REQUIRED.
UNF SERIES: NEW GAGES ARE REQUIRED.

CLASS 3A UNC SERIES: CLASS 3 GAGES ARE APPLICABLE.
UNF SERIES: IN SIZES 1/4 TO 5/16 IN., INCLUSIVE, CLASS 3 GAGES ARE APPLICABLE. FOR OTHER SIZES NEW GAGES ARE REQUIRED.

AMERICAN NATIONAL HOSE COUPLING THREADS
NIPPLE THREAD

NOMINAL SIZE OF HOSE	SERVICE	THREADS PER INCH	PITCH	DEPTH OF THREAD	MAJOR DIAMETER			PITCH DIAMETER		
					MAXIMUM	TOLERANCE	MINIMUM	MAXIMUM	TOLERANCE	MINIMUM
1	2	3	4	5	6	7	8	9	10	11
$\frac{1}{2}, \frac{5}{8}, \frac{3}{4}$--	GARDEN HOSE	$11\frac{1}{2}$	0.08696	0.05648	1.0625	0.0170	1.0455	1.0060	0.0085	0.9975
$\frac{3}{4}, 1$----	CHEMICAL ENGINE AND BOOSTER HOSE	8	.12500	.08119	1.3750	.0222	1.3528	1.2938	.0111	1.2827
$1\frac{1}{2}$---	FIRE PROTECTION HOSE	9	.11111	.07217	1.9900	.0222	1.9678	1.9178	.0111	1.9067
$\frac{1}{2}$----	STEAM, AIR, WATER AND ALL OTHER HOSE CONNECTIONS.	14	.07143	.04639	.8248	.0140	.8108	.7784	.0070	.7714
$\frac{3}{4}$----		14	.07143	.04639	1.0353	.0140	1.0213	.9889	.0070	.9819
1----		$11\frac{1}{2}$	.08696	.05648	1.2951	.0170	1.2781	1.2386	.0085	1.2301
$1\frac{1}{4}$----		$11\frac{1}{2}$	.08696	.05648	1.6399	.0170	1.6229	1.5834	.0085	1.5749
$1\frac{1}{2}$---		$11\frac{1}{2}$	.08696	.05648	1.8788	.0170	1.8618	1.8223	.0085	1.8138
2---		$11\frac{1}{2}$	.08696	.05648	2.3528	.0170	2.3358	2.2963	.0085	2.2878

THE REFERENCE TO THREAD GAGES BELOW APPLIES TO UNIFIED THREADS UNC AND UNF, DETAILS OF WHICH FOLLOW ON PAGES 32, 33, 34 AND 35.

"GO" THREAD GAGES

CLASS 1A. UNC SERIES: NEW "GO" GAGES ARE REQUIRED.
UNF SERIES: FROM $\frac{1}{4}$ TO $\frac{3}{4}$ IN., INCLUSIVE, CLASS 1 GAGES ARE APPLICABLE. FOR OTHER SIZES NEW GAGES ARE REQUIRED.

CLASS 2A. UNC AND UNF SERIES: FOR PLATED PRODUCT BASIC-SIZE GAGES (SAME AS FOR CLASSES 2 OR 3) ARE APPLICABLE. FOR UNPLATED PRODUCT, UNLESS THE SPECIFIED 2A ALLOWANCE IS REQUIRED, BASIC-SIZE GAGES ARE LIKEWISE APPLICABLE.

CLASS 3A. UNC AND UNF SERIES: BASIC-SIZE GAGES (SAME AS CLASSES 2 OR 3) ARE APPLICABLE.

"NO GO" THREAD GAGES

CLASS 1A. UNC SERIES: CLASS 1 GAGES ARE APPLICABLE. (THAT IS, PRODUCT WHICH IS ACCEPTABLE TO CLASS 1A GAGES IS ALSO ACCEPTABLE TO CLASS 1 GAGES.)
UNF SERIES: NEW GAGES ARE REQUIRED.

CLASS 2A UNC SERIES: IN SIZES $1\frac{3}{8}$ AND FROM $1\frac{3}{4}$ TO $3\frac{1}{2}$ IN., INCLUSIVE, CLASS 2 GAGES ARE APPLICABLE. FOR OTHER SIZES NEW GAGES ARE REQUIRED.
UNF SERIES: NEW GAGES ARE REQUIRED.

CLASS 3A UNC SERIES: CLASS 3 GAGES ARE APPLICABLE.
UNF SERIES: IN SIZES $\frac{1}{4}$ TO $\frac{5}{16}$ IN., INCLUSIVE, CLASS 3 GAGES ARE APPLICABLE. FOR OTHER SIZES NEW GAGES ARE REQUIRED.

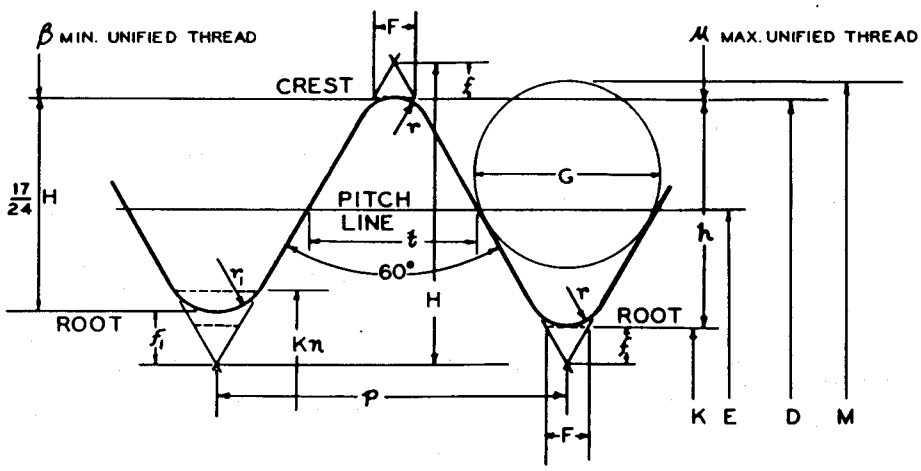
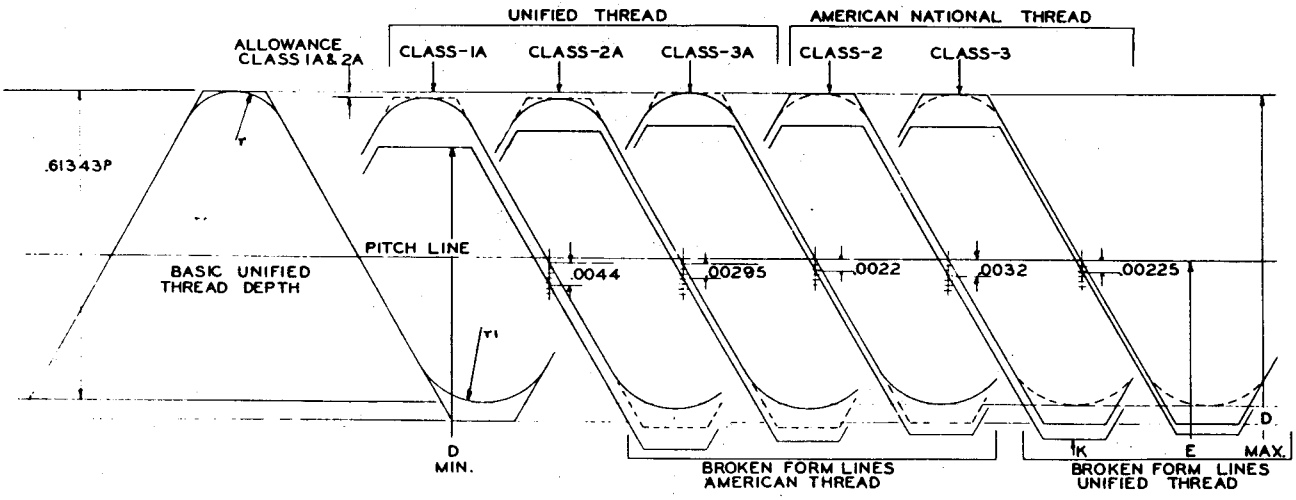


FIG. 27

UNIFIED THREAD FORM

P = PITCH
$H = 0.86603P$
$h = \frac{3}{4}H = 0.64952P$
$G = 0.57735P$ BEST
$G = 1.01036P$ MAX.
$G = 0.50518P$ MIN.
$M = E - H + 3G$
$M = (M + 0.7500 \times S^2)$
$E = Dh = D - 0.64952P$
$F = 0.12500P$
$f = 0.10825P = \frac{H}{6}$

Kn = MINOR DIA. NUT (MINIMUM)
$r = 0.10825P$ $\frac{\text{TANGENT TO } f}{\text{AT CREST \& ROOT}} = \frac{H}{6}$
$r_1 = 0.14434P$ $\frac{\text{TANGENT TO}}{f_1 \text{ AT ROOT}} = \frac{H}{6}$
$f_1 = \frac{H}{6} = r_1$
$\frac{17}{24}H = 0.61343P$ $\frac{\text{MAXIMUM METAL CONDITION}}{\text{FOR FULL UNIFIED THREAD}}$
β = FULL UNIFIED FORM = $\frac{17}{24}H$
μ = MAXIMUM UNIFIED DEPTH = $\frac{3}{4}H$



PITCH DIAMETER TOLERANCE FIGURES SHOWN ARE ONE HALF OF $\frac{3}{4}$ —10 SCREW FOR THE VARIOUS CLASSES OF THREAD.

FIG. 28

WE HAVE J & L OPTICAL COMPARATOR CHARTS FOR EVERY UNIFIED THREAD

THREAD DATA — UNIFIED THREAD SERIES												
THREADS PER INCH n	PITCH p	HEIGHT OF SHARP V-THD. $H=0.86603p$	HEIGHT OF EXTERNAL THREAD, $H_3=17/24\,H=0.61343p$	HEIGHT OF INTERNAL THREAD AND DEPTH OF THREAD ENGAGEMENT, $h_N=h_E=5\,8H=0.54127p$	FLAT AT EXTERNAL THREAD CREST AND INTERNAL THREAD ROOT, $F_{cs}=F_{RN}=p/8=0.125p$	TRUNCATION OF EXTERNAL THREAD CREST AND INTERNAL THREAD ROOT, $f_{cs}=f_{RN}=H/8=0.10825p$	TRUNCATION OF EXTERNAL THREAD ROOT, $S_{RS}=H/8=0.14434p$	FLAT AT INTERNAL THREAD CREST, $F_{CN}=p/4=0.25p$	TRUNCATION OF INTERNAL THREAD CREST, $f_{CN}=H/4=0.21651p$	DIFFERENCE BETWEEN MAX. MAJOR AND PITCH DIAMETERS OF INTERNAL THREAD, $11/12H=0.79386p$	DOUBLE HEIGHT OF INTERNAL THREAD $1\,1/4H=1.08253p$	DOUBLE HEIGHT OF EXTERNAL THREAD $15/12H=1.22687p$
—1	2	3	4	5	6	7	8	9	10	11	12	13
80	0.01250	0.01083	0.00767	0.00677	0.00156	0.00135	0.00180	0.00312	0.00271	0.00992	0.01353	0.01534
72	.01389	.01203	.00852	.00752	.00174	.00150	.00200	.00347	.00301	.01103	.01504	.01704
64	.01563	.01353	.00958	.00846	.00195	.00169	.00226	.00391	.00338	.01240	.01691	.01917
56	.01786	.01546	.01095	.00967	.00223	.00193	.00258	.00446	.00387	.01418	.01933	.02191
48	.02083	.01804	.01278	.01128	.00260	.00226	.00301	.00521	.00451	.01654	.02255	.02556
44	.02273	.01968	.01394	.01230	.00284	.00246	.00328	.00568	.00492	.01804	.02460	.02788
40	.02500	.02165	.01534	.01353	.00312	.00271	.00361	.00625	.00541	.01985	.02706	.03067
36	.02778	.02406	.01704	.01504	.00347	.00301	.00401	.00694	.00601	.02205	.03007	.03408
32	.03125	.02706	.01917	.01691	.00391	.00338	.00451	.00781	.00677	.02481	.03383	.03834
28	.03571	.03093	.02191	.01933	.00446	.00387	.00515	.00893	.00773	.02835	.03866	.04382
24	.04167	.03608	.02556	.02255	.00521	.00451	.00601	.01042	.00902	.03308	.04511	.05112
20	.05000	.04330	.03067	.02706	.00625	.00541	.00722	.01250	.01083	.03969	.05413	.06134
18	.05556	.04811	.03408	.03007	.00694	.00601	.00802	.01389	.01203	.04410	.06014	.06816
16	.06250	.05413	.03834	.03383	.00781	.00677	.00902	.01562	.01353	.04962	.06766	.07668
14	.07143	.06186	.04382	.03866	.00893	.00773	.01031	.01786	.01546	.05670	.07732	.08763
13	.07692	.06662	.04719	.04164	.00962	.00833	.01110	.01923	.01665	.06107	.08327	.09437
12	.08333	.07217	.05112	.04511	.01042	.00902	.01203	.02083	.01804	.06615	.09021	.10224
$11\frac{1}{2}$	.08696	.07531	.05334	.04707	.01087	.00941	.01255	.02174	.01883	.06903	.09413	.10668
11	.09091	.07873	.05577	.04921	.01136	.00984	.01312	.02273	.01968	.07271	.09841	.11153
10	.10000	.08660	.06134	.05413	.01250	.01083	.01443	.02500	.02165	.07939	.10825	.12269
9	.11111	.09623	.06816	.06014	.01389	.01203	.01604	.02778	.02406	.08821	.12028	.13632
8	.12500	.10825	.07668	.06766	.01562	.01353	.01804	.03125	.02706	.09923	.13532	.15336
7	.14286	.12372	.08763	.07732	.01786	.01546	.02062	.03571	.03093	.11341	.15465	.17527
6	.16667	.14434	.10224	.09021	.02083	.01804	.02406	.04167	.03608	.13231	.18042	.20448
5	.20000	.17321	.12269	.10825	.02500	.02165	.02887	.05000	.04330	.15877	.21651	.24537
$4\frac{1}{2}$	.22222	.19245	.13632	.12028	.02778	.02406	.03208	.05556	.04811	.17641	.24056	.27264
4	.25000	.21651	.15336	.13532	.03125	.02706	.03608	.06250	.05413	.19846	.27063	.30672

PITCH DIAMETERS — UNC & NC COARSE THREAD SERIES — UNF & NF FINE THREAD SERIES

					UNC-2A			UNC-3A			NC—2			NC—3			ALLOWANCES (UNDER BASIC)	
					MAX.	MIN.	TOL.	MAX.	MIN.	TOL.	MAX.	MIN.	TOL.	MAX.	MIN.	TOL.	BASIC	UNC-2A
UNC&NC	IN.																	
1-64	.073				.0623	.0603	.0020	.0629	.0614	.0015	.0629	.0610	.0019	.0629	.0615	.0014	.0629	.0006
2-56	.086				.0738	.0717	.0021	.0744	.0728	.0016	.0744	.0724	.0020	.0744	.0729	.0015	.0744	.0006
3-48	.099				.0848	.0825	.0023	.0855	.0838	.0017	.0855	.0833	.0022	.0855	.0839	.0016	.0855	.0007
4-40	.112				.0950	.0925	.0025	.0958	.0939	.0019	.0958	.0934	.0024	.0958	.0941	.0017	.0958	.0008
5-40	.125				.1080	.1054	.0026	.1088	.1068	.0019	.1088	.1064	.0024	.1088	.1071	.0017	.1088	.0008
6-32	.138				.1169	.1141	.0028	.1177	.1156	.0021	.1177	.1150	.0027	.1177	.1158	.0019	.1177	.0008
8-32	.164				.1428	.1399	.0029	.1437	.1415	.0022	.1437	.1410	.0027	.1437	.1418	.0019	.1437	.0009
10-24	.190				.1619	.1586	.0033	.1629	.1604	.0025	.1629	.1596	.0033	.1629	.1605	.0024	.1629	.0010
12-24	.216				.1879	.1845	.0034	.1889	.1863	.0026	.1889	.1856	.0033	.1889	.1865	.0024	.1889	.0010
UNF&NF					UNF-2A			UNF-3A			NF—2			NF—3			BASIC	UNF-2A
0-80	.060				.0514	.0496	.0018	.0519	.0506	.0013	.0519	.0502	.0017	.0519	.0506	.0013	.0519	.0005
1-72	.073				.0634	.0615	.0019	.0640	.0626	.0014	.0640	.0622	.0018	.0640	.0627	.0013	.0640	.0006
2-64	.086				.0753	.0733	.0020	.0759	.0744	.0015	.0759	.0740	.0019	.0759	.0745	.0014	.0759	.0006
3-56	.099				.0867	.0845	.0022	.0874	.0858	.0016	.0874	.0854	.0020	.0874	.0859	.0015	.0874	.0007
4-48	.112				.0978	.0954	.0024	.0985	.0967	.0018	.0985	.0963	.0022	.0985	.0969	.0016	.0985	.0007
5-44	.125				.1095	.1070	.0025	.1102	.1083	.0019	.1102	.1079	.0023	.1102	.1086	.0016	.1102	.0007
6-40	.138				.1210	.1184	.0026	.1218	.1198	.0020	.1218	.1194	.0024	.1218	.1201	.0017	.1218	.0008
8-36	.164				.1452	.1424	.0028	.1460	.1439	.0021	.1460	.1435	.0025	.1460	.1442	.0018	.1460	.0008
10-32	.190				.1688	.1658	.0030	.1697	.1674	.0023	.1697	.1670	.0027	.1697	.1678	.0019	.1697	.0009
12-28	.216				.1918	.1886	.0032	.1928	.1904	.0024	.1928	.1897	.0031	.1928	.1906	.0022	.1928	.0010

SIZE	PITCH DIAMETERS UNC & NC COARSE THREAD SERIES															ALLOWANCES (UNDER BASIC)	
	UNC-1A			UNC-2A			UNC-3A			NC-2			NC-3				
	MAX.	MIN.	TOL.	MAX.	MIN.	TOL.	MAX.	MIN.	TOL.	MAX.	MIN.	TOL.	MAX.	MIN.	TOL.	BASIC	UNC-1A UNC-2A
1/4-20	.2164	.2108	.0056	.2164	.2127	.0037	.2175	.2147	.0028	.2175	.2139	.0036	.2175	.2149	.0026	.2175	.0011
5/16-18	.2752	.2691	.0061	.2752	.2712	.0040	.2764	.2734	.0030	.2764	.2723	.0041	.2764	.2734	.0030	.2764	.0012
3/8-16	.3331	.3266	.0065	.3331	.3287	.0044	.3344	.3311	.0033	.3344	.3299	.0045	.3344	.3312	.0032	.3344	.0013
7/16-14	.3897	.3826	.0071	.3897	.3850	.0047	.3911	.3876	.0035	.3911	.3862	.0049	.3911	.3875	.0036	.3911	.0014
1/2-13	.4485	.4411	.0074	.4485	.4435	.0050	.4500	.4463	.0037	.4500	.4448	.0052	.4500	.4463	.0037	.4500	.0015
1/2-12	.4444	.4367	.0077	.4444	.4393	.0051	.4459	.4421	.0038							.4459	.0015
9/16-12	.5068	.4990	.0078	.5068	.5016	.0052	.5084	.5045	.0039	.5084	.5028	.0056	.5084	.5044	.0040	.5084	.0016
5/8-11	.5644	.5561	.0083	.5644	.5589	.0055	.5660	.5619	.0041	.5660	.5601	.0059	.5660	.5618	.0042	.5660	.0016
3/4-10	.6832	.6744	.0088	.6832	.6773	.0059	.6850	.6806	.0044	.6850	.6786	.0064	.6850	.6805	.0045	.6850	.0018
7/8-9	.8009	.7914	.0095	.8009	.7946	.0063	.8028	.7981	.0047	.8028	.7958	.0070	.8028	.7979	.0049	.8028	.0019
1-8	.9168	.9067	.0101	.9168	.9100	.0068	.9188	.9137	.0051	.9188	.9112	.0076	.9188	.9134	.0054	.9188	.0020
1 1/8-7	1.0300	1.0191	.0109	1.0300	1.0228	.0072	1.0322	1.0268	.0054	1.0322	1.0237	.0085	1.0322	1.0263	.0059	1.0322	.0022
1 1/4-7	1.1550	1.1439	.0111	1.1550	1.1476	.0074	1.1572	1.1517	.0055	1.1572	1.1487	.0085	1.1572	1.1513	.0059	1.1572	.0022
1 3/8-6	1.2643	1.2523	.0120	1.2643	1.2563	.0080	1.2667	1.2607	.0060	1.2667	1.2566	.0101	1.2667	1.2596	.0071	1.2667	.0024
1 1/2-6	1.3893	1.3772	.0121	1.3893	1.3812	.0081	1.3917	1.3856	.0061	1.3917	1.3816	.0101	1.3917	1.3846	.0071	1.3917	.0024
1 3/4-5	1.6174	1.6040	.0134	1.6174	1.6085	.0089	1.6201	1.6134	.0067	1.6201	1.6085	.0116	1.6201	1.6119	.0082	1.6201	.0027
2-4 1/2	1.8528	1.8385	.0143	1.8528	1.8433	.0095	1.8557	1.8486	.0071	1.8557	1.8430	.0127	1.8557	1.8468	.0089	1.8557	.0029
2 1/4-4 1/2	2.1028	2.0882	.0146	2.1028	2.0931	.0097	2.1057	2.0984	.0073	2.1057	2.0930	.0127	2.1057	2.0968	.0089	2.1057	.0029
2 1/2-4	2.3345	2.3190	.0155	2.3345	2.3241	.0104	2.3376	2.3298	.0078	2.3376	2.3236	.0140	2.3376	2.3279	.0097	2.3376	.0031
2 3/4-4	2.5844	2.5686	.0158	2.5844	2.5739	.0105	2.5876	2.5797	.0079	2.5876	2.5736	.0140	2.5876	2.5779	.0097	2.5876	.0032
3-4	2.8344	2.8183	.0161	2.8344	2.8237	.0107	2.8376	2.8296	.0080	2.8376	2.8236	.0140	2.8376	2.8279	.0097	2.8376	.0032
3 1/4-4	3.0843	3.0680	.0163	3.0843	3.0734	.0109	3.0876	3.0794	.0082	3.0876	3.0736	.0140	3.0876	3.0779	.0097	3.0876	.0033
3 1/2-4	3.3343	3.3177	.0166	3.3343	3.3233	.0110	3.3376	3.3293	.0083	3.3376	3.3236	.0140	3.3376	3.3279	.0097	3.3376	.0033
3 3/4-4	3.5842	3.5674	.0168	3.5842	3.5730	.0112	3.5876	3.5792	.0084	3.5876	3.5736	.0140	3.5876	3.5779	.0097	3.5876	.0034
4-4	3.8342	3.8172	.0170	3.8342	3.8229	.0113	3.8376	3.8291	.0085	3.8376	3.8236	.0140	3.8376	3.8279	.0097	3.8376	.0034

UNF AND NF FINE THREAD SERIES

SIZE	CLASS-2A					SIZE	CLASS-2				SIZE	CLASS-3A				SIZE	CLASS-3			
	MAJOR DIAMETER		PITCH DIAMETER		ALLOW-ANCE		MAJOR DIAMETER		PITCH DIAMETER			MAJOR DIAMETER		PITCH DIAMETER			MAJOR DIAMETER		PITCH DIAMETER	
	MAX.	MIN.	MAX.	MIN.			MAX.	MIN.	MAX.	MIN.		MAX.	MIN.	MAX.	MIN.		MAX.	MIN.	MAX.	MIN.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
1/4-28	0.2490	0.2425	0.2258	0.2225	0.0010	1/4-28	0.2500	0.2438	0.2268	0.2237	1/4-28	0.2500	0.2435	0.2268	0.2243	1/4-28	0.2500	0.2438	0.2268	0.2246
5/16-24	.3114	.3042	.2843	.2806	.0011	5/16-24	.3125	.3059	.2854	.2821	5/16-24	.3125	.3053	.2854	.2827	5/16-24	.3125	.3059	.2854	.2830
3/8-24	.3739	.3667	.3468	.3430	.0011	3/8-24	.3750	.3684	.3479	.3446	3/8-24	.3750	.3678	.3479	.3450	3/8-24	.3750	.3684	.3479	.3455
7/16-20	.4362	.4281	.4037	.3995	.0013	7/16-20	.4375	.4303	.4050	.4014	7/16-20	.4375	.4294	.4050	.4019	7/16-20	.4375	.4303	.4050	.4024
1/2-20	.4987	.4906	.4662	.4619	.0013	1/2-20	.5000	.4928	.4675	.4639	1/2-20	.5000	.4919	.4675	.4643	1/2-20	.5000	.4928	.4675	.4649
9/16-18	.5611	.5524	.5250	.5205	.0014	9/16-18	.5625	.5543	.5264	.5223	9/16-18	.5625	.5538	.5264	.5230	9/16-18	.5625	.5543	.5264	.5234
5/8-18	.6236	.6149	.5875	.5828	.0014	5/8-18	.6250	.6168	.5889	.5848	5/8-18	.6250	.6163	.5889	.5854	5/8-18	.6250	.6168	.5889	.5859
3/4-16	.7485	.7391	.7079	.7029	.0015	3/4-16	.7500	.7410	.7094	.7049	3/4-16	.7500	.7406	.7094	.7056	3/4 16	.7500	.7410	.7094	.7062
7/8-14	.8734	.8631	.8270	.8216	.0016	7/8-14	.8750	.8652	.8286	.8237	7/8-14	.8750	.8647	.8286	.8245	7/8-14	.8750	.8652	.8286	.8250
* 1 -14	.9983	.9880	.9519	.9463	.0017	1 —14	1.0000	.9902	.9536	.9487	1 —14	1.0000	.9897	.9536	.9494	1 —14	1.0000	.9902	.9536	.9500
1 —12	.9982	.9868	.9441	.9382	.0018						1 —12	1.0000	.9886	.9459	.9415					
1 1/8-12	1.1232	1.1118	1.0691	1.0631	.0018	1 1/8-12	1.1250	1.1138	1.0709	1.0653	1 1/8-12	1.1250	1.1136	1.0709	1.0664	1 1/8-12	1.1250	1.1138	1.0709	1.0669
1 1/4-12	1.2482	1.2368	1.1941	1.1879	.0018	1 1/4-12	1.2500	1.2388	1.1959	1.1903	1 1/4-12	1.2500	1.2386	1.1959	1.1913	1 1/4-12	1.2500	1.2388	1.1959	1.1919
1 3/8-12	1.3731	1.3617	1.3190	1.3127	.0019	1 3/8-12	1.3750	1.3638	1.3209	1.3153	1 3/8-12	1.3750	1.3636	1.3209	1.3162	1 3/8-12	1.3750	1.3638	1.3209	1.3169
1 1/2-12	1.4981	1.4867	1.4440	1.4376	.0019	1 1/2-12	1.5000	1.4888	1.4459	1.4403	1 1/2-12	1.5000	1.4886	1.4459	1.4411	1 1/2-12	1.5000	1.4888	1.4459	1.4419

* 14 PITCH IS STANDARD FOR AMERICAN NATIONAL FINE SERIES.

UNEF AND NEF EXTRA FINE THREAD SERIES

SIZE	CLASS-2A					SIZE	CLASS-2				SIZE	CLASS-3A				SIZE	CLASS-3			
	MAJOR DIAMETER		PITCH DIAMETER		ALLOW-ANCE		MAJOR DIAMETER		PITCH DIAMETER			MAJOR DIAMETER		PITCH DIAMETER			MAJOR DIAMETER		PITCH DIAMETER	
	MAX	MIN	MAX	MIN			MAX	MIN	MAX	MIN		MAX	MIN	MAX	MIN		MAX	MIN	MAX	MIN
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
1/4-32	0.2490	0.2430	0.2287	0.2255	0.0010	1/4-32	0.2500	0.2446	0.2297	0.2265	1/4-32	0.2500	0.2440	0.2297	0.2273	1/4-32	0.2500	0.2446	0.2297	0.2275
5/16-32	.3115	.3055	.2912	.2880	.0010	5/16-32	.3125	.3071	.2922	.2889	5/16-32	.3125	.3065	.2922	.2898	5/16-32	.3125	.3071	.2922	.2899
3/8-32	.3740	.3680	.3537	.3503	.0010	3/8-32	.3750	.3696	.3547	.3513	3/8-32	.3750	.3690	.3547	.3522	3/8-32	.3750	.3696	.3547	.3523
7/16-28	.4364	.4299	.4132	.4096	.0011	7/16-28	.4375	.4313	.4143	.4107	7/16-28	.4375	.4310	.4143	.4116	7/16-28	.4375	.4313	.4143	.4118
1/2-28	.4989	.4924	.4757	.4720	.0011	1/2-28	.5000	.4938	.4768	.4731	1/2-28	.5000	.4935	.4768	.4740	1/2-28	.5000	.4938	.4768	.4742
9/16-24	.5613	.5541	.5342	.5303	.0012	9/16-24	.5625	.5559	.5354	.5314	9/16-24	.5625	.5553	.5354	.5325	9/16-24	.5625	.5559	.5354	.5326
5/8-24	.6238	.6166	.5967	.5927	.0012	5/8-24	.6250	.6184	.5979	.5938	5/8-24	.6250	.6178	.5979	.5949	5/8-24	.6250	.6184	.5979	.5950
11/16-24	.6863	.6791	.6592	.6552	.0012	11/16-24	.6875	.6809	.6604	.6563	11/16-24	.6875	.6803	.6604	.6574	11/16-20	.6875	.6809	.6604	.6575
3/4-20	.7487	.7406	.7162	.7118	.0013	3/4-20	.7500	.7428	.7175	.7129	3/4-20	.7500	.7419	.7175	.7142	3/4-20	.7500	.7428	.7175	.7143
13/16-20	.8112	.8031	.7787	.7743	.0013	13/16-20	.8125	.8053	.7800	.7754	13/16-20	.8125	.8044	.7800	.7767	13/16-20	.8125	.8053	.7800	.7768
7/8-20	.8737	.8656	.8412	.8368	.0013	7/8-20	.8750	.8678	.8425	.8378	7/8-20	.8750	.8669	.8425	.8392	7/8-20	.8750	.8678	.8425	.8392
15/16-20	.9361	.9280	.9036	.8991	.0014	15/16-20	.9375	.9303	.9050	.9003	15/16-20	.9375	.9294	.9050	.9016	15/16-20	.9375	.9303	.9050	.9017
1 -20	.9986	.9905	.9661	.9616	.0014	1 -20	1.0000	.9928	.9675	.9627	1 -20	1.0000	.9919	.9675	.9641	1 -20	1.0000	.9928	.9675	.9641
1 1/16-18	1.0611	1.0524	1.0250	1.0203	.0014	1 1/16-18	1.0625	1.0543	1.0264	1.0216	1 1/16-18	1.0625	1.0538	1.0264	1.0228	1 1/16-18	1.0625	1.0543	1.0264	1.0228
1 1/8-18	1.1236	1.1149	1.0875	1.0828	.0014	1 1/8-18	1.1250	1.1168	1.0889	1.0837	1 1/8-18	1.1250	1.1163	1.0889	1.0853	1 1/8-18	1.1250	1.1168	1.0889	1.0853
1 3/16-18	1.1860	1.1773	1.1499	1.1450	.0015	1 3/16-18	1.1875	1.1793	1.1514	1.1462	1 3/16-18	1.1875	1.1788	1.1514	1.1478	1 3/16-18	1.1875	1.1793	1.1514	1.1478
1 1/4-18	1.2485	1.2398	1.2124	1.2075	.0015	1 1/4-18	1.2500	1.2418	1.2139	1.2086	1 1/4-18	1.2500	1.2413	1.2139	1.2103	1 1/4-18	1.2500	1.2418	1.2139	1.2102
1 5/16-18	1.3110	1.3023	1.2749	1.2700	.0015	1 5/16-18	1.3125	1.3043	1.2764	1.2711	1 5/16-18	1.3125	1.3038	1.2764	1.2728	1 5/16-18	1.3125	1.3043	1.2764	1.2727
1 3/8-18	1.3735	1.3648	1.3374	1.3325	.0015	1 3/8-18	1.3750	1.3668	1.3389	1.3335	1 3/8-18	1.3750	1.3663	1.3389	1.3353	1 3/8-18	1.3750	1.3668	1.3389	1.3351
1 7/16-18	1.4360	1.4273	1.3999	1.3949	.0015	1 7/16-18	1.4375	1.4293	1.4014	1.3960	1 7/16-18	1.4375	1.4288	1.4014	1.3977	1 7/16-18	1.4375	1.4293	1.4014	1.3976
1 1/2-18	1.4985	1.4898	1.4624	1.4574	.0015	1 1/2-18	1.5000	1.4918	1.4639	1.4584	1 1/2-18	1.5000	1.4913	1.4639	1.4602	1 1/2-18	1.5000	1.4918	1.4639	1.4601
1 9/16-18	1.5610	1.5523	1.5249	1.5199	.0015	1 9/16-18	1.5625	1.5543	1.5264	1.5209	1 9/16-18	1.5625	1.5538	1.5264	1.5227	1 9/16-18	1.5625	1.5543	1.5264	1.5225
1 5/8-18	1.6235	1.6148	1.5874	1.5824	.0015	1 5/8-18	1.6250	1.6168	1.5889	1.5833	1 5/8-18	1.6250	1.6163	1.5889	1.5852	1 5/8-18	1.6250	1.6168	1.5889	1.5850
1 11/16-18	1.6860	1.6773	1.6499	1.6448	.0015	1 11/16-18	1.6875	1.6793	1.6514	1.6458	1 11/16-18	1.6875	1.6788	1.6514	1.6476	1 11/16-18	1.6875	1.6793	1.6514	1.6475

PITCH DIAMETERS AND TOLERANCES—8—12—16 PITCH UNIFIED THREAD SERIES
CLASS—2A

8N				12UN—12N				16UN—16N			
DIA. PITCH	MAX.	MIN.	TOL.	DIA. PITCH	MAX.	MIN.	TOL.	DIA. PITCH	MAX	MIN.	TOL.
1 1/8	1.0417	1.0348	0.0069	1 1/16	1.0067	1.0010	0.0057	1 3/4	1.7078	1.7025	0.0053
1 1/4	1.1667	1.1597	.0070	1 3/16	1.1317	1.1259	.0058	1 13/16	1.7703	1.7650	.0053
1 3/8	1.2916	1.2844	.0072	1 5/16	1.2567	1.2509	.0058	1 7/8	1.8328	1.8275	.0053
1 1/2	1.4166	1.4093	.0073	1 7/16	1.3816	1.3757	.0059	1 15/16	1.8953	1.8899	.0054
1 5/8	1.5416	1.5342	.0074	1 5/8	1.5691	1.5632	.0059	2	1.9578	1.9524	.0054
1 3/4	1.6665	1.6590	.0075	1 3/4	1.6941	1.6881	.0060	2 1/16	2.0203	2.0149	.0054
1 7/8	1.7915	1.7838	.0077	1 7/8	1.8191	1.8131	.0060	2 1/8	2.0828	2.0774	.0054
2	1.9165	1.9037	.0078	2	1.9441	1.9380	.0061	2 3/16	2.1453	2.1399	.0054
2 1/8	2.0414	2.0335	.0079	2 1/8	2.0691	2.0630	.0061	2 1/4	2.2078	2.2024	.0054
2 1/4	2.1664	2.1584	.0080	2 1/4	2.1941	2.1880	.0061	2 5/16	2.2702	2.2647	.0055
				2 3/8	2.3190	2.3128	.0062	2 3/8	2.3327	2.3272	.0055
								2 7/16	2.3952	2.3897	.0055
2 1/2	2.4164	2.4082	.0082	2 1/2	2.4440	2.4378	.0062	2 1/2	2.4577	2.4522	.0055
				2 5/8	2.5690	2.5628	.0062	2 5/8	2.5827	2.5772	.0055
2 3/4	2.6663	2.6580	.0083	2 3/4	2.6940	2.6878	.0062	2 3/4	2.7077	2.7022	.0055
				2 7/8	2.8190	2.8127	.0063	2 7/8	2.8327	2.8271	.0056
3	2.9162	2.9077	.0085	3	2.9440	2.9377	.0063	3	2.9577	2.9521	.0056
				3 1/8	3.0690	3.0627	.0063	3 1/8	3.0827	3.0771	.0056
3 1/4	3.1662	3.1575	.0087	3 1/4	3.1940	3.1877	.0063	3 1/4	3.2077	3.2021	.0056
				3 3/8	3.3190	3.3126	.0064	3 3/8	3.3327	3.3269	.0058
3 1/2	3.4162	3.4074	.0088	3 1/2	3.4440	3.4376	.0064	3 1/2	3.4577	3.4519	.0058
				3 5/8	3.5690	3.5626	.0064	3 5/8	3.5827	3.5769	.0058
3 3/4	3.6661	3.6571	.0090	3 3/4	3.6940	3.6876	.0064	3 3/4	3.7077	3.7019	.0058
				3 7/8	3.8189	3.8124	.0065	3 7/8	3.8326	3.8267	.0059
4	3.9161	3.9070	.0091	4	3.9439	3.9374	.0065	4	3.9576	3.9517	.0059
4 1/4	4.1660	4.1567	.0093	4 1/4	4.1939	4.1874	.0065	4 1/4	4.2076	4.2017	.0059
4 1/2	4.4160	4.4066	.0094	4 1/2	4.4439	4.4374	.0065	4 1/2	4.4576	4.4517	.0059
4 3/4	4.6659	4.6564	.0095	4 3/4	4.6939	4.6872	.0067	4 3/4	4.7076	4.7015	.0061
5	4.9159	4.9062	.0097	5	4.9439	4.9372	.0067	5	4.9576	4.9515	.0061
5 1/4	5.0659	5.0561	.0098	5 1/4	5.1939	5.1872	.0067	5 1/4	5.2076	5.2015	.0061
5 1/2	5.4158	5.4059	.0099	5 1/2	5.4439	5.4372	.0067	5 1/2	5.4576	5.4515	.0061
5 3/4	5.6658	5.6558	.0100	5 3/4	5.6938	5.6869	.0069	5 3/4	5.7075	5.7013	.0062
6	5.9158	5.9056	.0102	6	5.9438	5.9369	.0069	6	5.9575	5.9513	.0062

PITCH DIAMETER AND TOLERANCES — 8 — 12 — 16 PITCH UNIFIED THREAD SERIES
CLASS — 3A

8N				12UN — 12N				16UN — 16N			
DIA. PITCH	MAX.	MIN.	TOL.	DIA. PITCH	MAX.	MIN.	TOL.	DIA. PITCH	MAX.	MIN.	TOL.
1 1/8	1.0438	1.0386	0.0052	1 1/16	1.0084	1.0042	0.0042	1 3/4	1.7094	1.7054	0.0040
1 1/4	1.1688	1.1635	.0053	1 3/16	1.1334	1.1291	.0043	1 13/16	1.7719	1.7679	.0040
1 3/8	1.2938	1.2884	.0054	1 5/16	1.2584	1.2541	.0043	1 7/8	1.8344	1.8304	.0040
1 1/2	1.4188	1.4133	.0055	1 7/16	1.3834	1.3790	.0044	1 15/16	1.8969	1.8929	.0040
1 5/8	1.5438	1.5382	.0056	1 5/8	1.5709	1.5665	.0044	2	1.9594	1.9554	.0040
1 3/4	1.6688	1.6632	.0056	1 3/4	1.6959	1.6914	.0045	2 1/16	2.0219	2.0179	.0040
1 7/8	1.7938	1.7881	.0057	1 7/8	1.8209	1.8164	.0045	2 1/8	2.0844	2.0804	.0040
2	1.9188	1.9130	.0058	2	1.9459	1.9414	.0045	2 3/16	2.1469	2.1429	.0040
2 1/8	2.0438	2.0379	.0059	2 1/8	2.0709	2.0664	.0045	2 1/4	2.2094	2.2054	.0040
2 1/4	2.1688	2.1628	.0060	2 1/4	2.1959	2.1914	.0045	2 5/16	2.2719	2.2678	.0041
				2 3/8	2.3209	2.3163	.0046	2 3/8	2.3344	2.3303	.0041
								2 7/16	2.3969	2.3928	.0041
2 1/2	2.4188	2.4127	.0061	2 1/2	2.4459	2.4413	.0046	2 1/2	2.4594	2.4553	.0041
				2 5/8	2.5709	2.5663	.0046	2 5/8	2.5844	2.5803	.0041
2 3/4	2.6688	2.6626	.0062	2 3/4	2.6959	2.6913	.0046	2 3/4	2.7094	2.7053	.0041
				2 7/8	2.8209	2.8162	.0047	2 7/8	2.8344	2.8302	.0042
3	2.9188	2.9124	.0064	3	2.9459	2.9412	.0047	3	2.9594	2.9552	.0042
				3 1/8	3.0709	3.0662	.0047	3 1/8	3.0844	3.0802	.0042
3 1/4	3.1688	3.1623	.0065	3 1/4	3.1959	3.1912	.0047	3 1/4	3.2094	3.2052	.0042
				3 3/8	3.3209	3.3161	.0048	3 3/8	3.3344	3.3301	.0043
3 1/2	3.4188	3.4122	.0066	3 1/2	3.4459	3.4411	.0048	3 1/2	3.4594	3.4551	.0043
				3 5/8	3.5709	3.5661	.0048	3 5/8	3.5844	3.5801	.0043
3 3/4	3.6688	3.6621	.0067	3 3/4	3.6959	3.6911	.0048	3 3/4	3.7094	3.7051	.0043
				3 7/8	3.8209	3.8160	.0049	3 7/8	3.8344	3.8300	.0044
4	3.9188	3.9120	.0068	4	3.9459	3.9410	.0049	4	3.9594	3.9550	.0044
4 1/4	4.1688	4.1618	.0070	4 1/4	4.1959	4.1910	.0049	4 1/4	4.2094	4.2050	.0044
4 1/2	4.4188	4.4117	.0071	4 1/2	4.4459	4.4410	.0049	4 1/2	4.4594	4.4550	.0044
4 3/4	4.6688	4.6616	.0072	4 3/4	4.6959	4.6909	.0050	4 3/4	4.7094	4.7049	.0045
5	4.9188	4.9116	.0072	5	4.9459	4.9409	.0050	5	4.9594	4.9549	.0045
5 1/4	5.1688	5.1615	.0073	5 1/4	5.1959	5.1909	.0050	5 1/4	5.2094	5.2049	.0045
5 1/2	5.4188	5.4114	.0074	5 1/2	5.4459	5.4409	.0050	5 1/2	5.4594	5.4549	.0045
5 3/4	5.6688	5.6613	.0075	5 3/4	5.6959	5.6907	.0052	5 3/4	5.7094	5.7047	.0047
6	5.9188	5.9112	.0076	6	5.9459	5.9407	.0052	6	5.9594	5.9547	.0047

WIRE SIZES

ACME - WORM - LOWENHERZ - METRIC THREAD FORMS

THD'S PER INCH	DECIMAL PITCH	WIRE SIZE		M/M PITCH	DECIMAL PITCH	WIRE SIZE	
		ACME	WORM			LOWENHERZ	METRIC
½	2.00000		1.10000	.25	0.00984		
1	1.00000	0.50000	0.52000	.30	0.01181	0.00722	0.00722
1¼	0.80000		0.42000	.35	0.01378	0.00802	0.00802
1⅓	0.75000	0.40000		.40	0.01575	0.00902	0.00902
1½	0.66667	0.35000	0.35000	.45	0.01772	0.01031	0.01031
2	0.50000	0.25000	0.27000	.50	0.01968	0.01155	0.01155
2½	0.40000	0.20800	0.20800	.60	0.02362	0.01443	0.01443
3	0.33333	0.18000	0.18000	.70	0.02756	0.01604	0.01604
3½	0.28571	0.15100	0.15100	.75	0.02953	0.01804	0.01804
4	0.25000	0.12830	0.14434	.80	0.03150	0.01804	0.01804
4½	0.22222	0.11547	0.11547	.90	0.03543	0.02062	0.02062
5	0.20000	0.10497	0.10497	1.00	0.03937	0.02221	0.02406
5½	0.18182	0.09622		1.1	0.04331	0.02624	
6	0.16667	0.08248	0.09622	1.2	0.04724	0.02887	
7	0.14286	0.07217	0.08248	1.25	0.04921		0.02887
8	0.12500	0.06415	0.07217	1.3	0.05118	0.02887	
9	0.11111	0.05774	0.06415	1.4	0.05512	0.03207	
10	0.10000	0.05249	0.05774	1.5	0.05905		0.03608
12	0.08333	0.04441	0.04441	1.75	0.06890		0.04124
14	0.07143	0.03608	0.04441	2.0	0.07874		0.04441
16	0.06250	0.03207	0.03608	2.5	0.09843		0.05774
18	0.05556		0.02887	3.0	0.11811		0.07217
20	0.05000		0.02624	3.5	0.13780		0.08248
				4.0	0.15748		0.09622
				4.5	0.17717		0.10497
				5.0	0.19685		0.11547
				5.5	0.21654		0.12830
				6.0	0.23622		0.14434

ELEMENTS OF WHITWORTH THREADS

THREADS PER INCH - DECIMAL PITCH - WIRE SIZES
DEPTH - RADIUS OF ROOT & CREST

THD'S PER INCH	DECIMAL PITCH	AMERICAN NATIONAL WIRE SIZE	DEPTH	RADIUS OF ROOT & CREST	THEORETICAL WHITWORTH WIRE SIZE	
2.5	0.40000	0.20800	0.2561	0.05492	0.22548	
2.625	0.38095	0.20800	0.2439	0.05230	0.21474	
2.75	0.36364	0.20800	0.2328	0.04993	0.20498	
2.875	0.34783	0.18000	0.2227	0.04776	0.19607	
3	0.33333	0.18000	0.2134	0.04578	0.18790	
3.25	0.30769	0.18000	0.1970	0.04226	0.17344	
3.5	0.28571	0.15100	0.1830	0.03923	0.16105	
4	0.25000	0.14434	0.1601	0.03433	0.14092	
4.5	0.22222	0.12830	0.1423	0.03051	0.12526	
5	0.20000	0.11547	0.1281	0.02746	0.11274	
6	0.16667	0.09622	0.1067	0.02288	0.09395	
7	0.14286	0.08248	0.0915	0.01961	0.08053	
8	0.12500	0.07217	0.0800	0.01716	0.07046	
9	0.11111	0.06415	0.0711	0.01526	0.06263	
10	0.10000	0.05774	0.0640	0.01373	0.05637	
11	0.09091	0.05249	0.0582	0.01248	0.05124	
12	0.08333	0.04811	0.0534	0.01144	0.04697	
14	0.07143	0.04124	0.0457	0.00980	0.04026	
16	0.06250	0.03608	0.0400	0.00858	0.03523	
18	0.05556	0.03207	0.0356	0.00763	0.03132	
19	0.05263	0.03207	0.0337	0.00723	0.02967	
20	0.05000	0.02887	0.0320	0.00687	0.02818	
22	0.04545	0.02624	0.0291	0.00624	0.02562	
24	0.04167	0.02406	0.0267	0.00572	0.02349	
26	0.03846	0.02221	0.0246	0.00528	0.02168	
28	0.03571	0.02062	0.0229	0.00490	0.02013	
32	0.03125	0.01804	0.0200	0.00429	0.01762	
36	0.02778	0.01604	0.0178	0.00381	0.01566	
40	0.02500	0.01443	0.0160	0.00343	0.01409	
P	p	G	h	r	G THEORETICAL	
1	2	3	4	5	6	

ELEMENTS OF BRITISH ASSOCIATION THREAD

THREADS PER INCH – M/M DIAMETER – M/M PITCH – DECIMAL PITCH
WIRE SIZE – DEPTH – RADIUS OF ROOT & CREST

DESIG. NO.	M/M DIA.	M/M PITCH	APPROX. THD'S PER INCH	DECIMAL PITCH INCHES	AMERICAN NATIONAL WIRE SIZE	DEPTH	RADIUS OF ROOT & CREST	THEORETICAL B. A. WIRE SIZE
0	6.0	1.00	25.4	0.0394	0.02221	.0236	.0072	0.02151
1	5.3	.90	28.2	0.0354	0.02062	.0213	.0064	0.01936
2	4.7	.81	31.4	0.0319	0.01804	.0191	.0058	0.01742
3	4.1	.73	34.8	0.0287	0.01604	.0173	.0052	0.01570
4	3.6	.66	38.5	0.0260	0.01443	.0155	.0047	0.01419
5	3.2	.59	43.1	0.0232	0.01312	.0140	.0042	0.01269
6	2.8	.53	47.9	0.0209	0.01203	.0125	.0038	.0.01140
7	2.5	.48	52.9	0.0189	0.01155	.0114	.0034	0.01032
8	2.2	.43	59.1	0.0169	0.01031	.0102	.0031	0.00925
9	1.9	.39	65.1	0.0154	0.00902	.0092	.0028	0.00839
10	1.7	.35	72.6	0.0138	0.00802	.0083	.0025	0.00753
11	1.5	.31	81.9	0.0122	0.00722	.0073	.0022	0.00667
12	1.3	.28	90.7	0.0110	0.00604	.0067	.0020	0.00602
13	1.2	.25	101.6	0.0098	0.00544	.0059	.0018	0.00538
14	1.0	.23	110.4	0.0091	0.00544	.0055	.0016	0.00495
15	0.9	.21	121.0	0.0083	0.00455	.0049	.0015	0.00452
	D	p	P	p	G	h	r	G THEORETICAL
1	2	3	4	5	6	7	8	9

PITCH DIAMETERS — LIMITS AND TOLERANCES

DIAMETER AND PITCH	CLASS 1			CLASS 2			CLASS 3			CLASS 4		
	MAX.	MIN.	TOL.	MAX.	MIN.	TOL.	MAX.	MIN.	TOL.	MAX.	MIN.	TOL.
0-80 NF	0.0512	0.0488	.0024	0.0519	0.0502	.0017	0.0519	0.0506	.0013			
1-72 NF	0.0633	0.0608	.0025	0.0640	0.0622	.0018	0.0640	0.0627	.0013			
1-64 NC	0.0622	0.0596	.0026	0.0629	0.0610	.0019	0.0629	0.0615	.0014			
2-64 NF	0.0752	0.0726	.0026	0.0759	0.0740	.0019	0.0759	0.0745	.0014			
2-56 NC	0.0736	0.0708	.0028	0.0744	0.0724	.0020	0.0744	0.0729	.0015			
3-56 NF	0.0866	0.0838	.0028	0.0874	0.0854	.0020	0.0874	0.0859	.0015			
3-48 NC	0.0846	0.0815	.0031	0.0855	0.0833	.0022	0.0855	0.0839	.0016			
4-48 NF	0.0976	0.0945	.0031	0.0985	0.0963	.0022	0.0985	0.0969	.0016			
4-40 NC	0.0948	0.0914	.0034	0.0958	0.0934	.0024	0.0958	0.0941	.0017			
5-44 NF	0.1093	0.1061	.0032	0.1102	0.1079	.0023	0.1102	0.1086	.0016			
5-40 NC	0.1078	0.1044	.0034	0.1088	0.1064	.0024	0.1088	0.1071	.0017			
6-40 NF	0.1208	0.1174	.0034	0.1218	0.1194	.0024	0.1218	0.1201	.0017			
6-32 NC	0.1166	0.1128	.0038	0.1177	0.1150	.0027	0.1177	0.1156	.0019			
8-36 NF	0.1449	0.1413	.0036	0.1460	0.1435	.0025	0.1460	0.1442	.0018			
8-32 NC	0.1426	0.1388	.0038	0.1437	0.1410	.0027	0.1437	0.1418	.0019			
10-32 NF	0.1686	0.1648	.0038	0.1697	0.1670	.0027	0.1697	0.1678	.0019			
10-24 NC	0.1616	0.1570	.0046	0.1629	0.1596	.0033	0.1629	0.1605	.0024			
12-28 NF	0.1916	0.1873	.0043	0.1928	0.1897	.0031	0.1928	0.1906	.0022			
12-24 NC	0.1876	0.1830	.0046	0.1889	0.1856	.0033	0.1889	0.1865	.0024			
1/4-32 NEF				0.2297	0.2265	.0032	0.2297	0.2275	.0022			
1/4-28 NF	0.2256	0.2213	.0043	0.2268	0.2237	.0031	0.2268	0.2246	.0022	0.2270	0.2259	.0011
1/4-20 NC	0.2160	0.2109	.0051	0.2175	0.2139	.0036	0.2175	0.2149	.0026	0.2178	0.2165	.0013
5/16-32 NEF				0.2922	0.2889	.0033	0.2922	0.2899	.0023			
5/16-24 NF	0.2841	0.2795	.0046	0.2854	0.2821	.0033	0.2854	0.2830	.0024	0.2857	0.2845	.0012
5/16-18 NC	0.2748	0.2691	.0057	0.2764	0.2723	.0041	0.2764	0.2734	.0030	0.2767	0.2752	.0015
3/8-32 NEF				0.3547	0.3513	.0034	0.3547	0.3523	.0024			
3/8-24 NF	0.3466	0.3420	.0046	0.3479	0.3446	.0033	0.3479	0.3455	.0024	0.3482	0.3470	.0012
3/8-16 NC	0.3326	0.3263	.0063	0.3344	0.3299	.0045	0.3344	0.3312	.0032	0.3348	0.3332	.0016
7/16-28 NEF				0.4143	0.4107	.0036	0.4143	0.4118	.0025			
7/16-20 NF	0.4035	0.3984	.0051	0.4050	0.4014	.0036	0.4050	0.4024	.0026	0.4053	0.4040	.0013
7/16-14 NC	0.3890	0.3820	.0070	0.3911	0.3862	.0049	0.3911	0.3875	.0036	0.3915	0.3897	.0018
1/2-28 NEF				0.4768	0.4731	.0037	0.4768	0.4742	.0026			
1/2-20 NF	0.4660	0.4609	.0051	0.4675	0.4639	.0036	0.4675	0.4649	.0026	0.4678	0.4665	.0013
1/2-13 NC	0.4478	0.4404	.0074	0.4500	0.4448	.0052	0.4500	0.4463	.0037	0.4504	0.4485	.0019
9/16-24 NEF				0.5354	0.5314	.0040	0.5354	0.5326	.0028			
9/16-18 NF	0.5248	0.5191	.0057	0.5264	0.5223	.0041	0.5264	0.5234	.0030	0.5267	0.5252	.0015
9/16-12 NC	0.5060	0.4981	.0079	0.5084	0.5028	.0056	0.5084	0.5044	.0040	0.5089	0.5069	.0020
5/8-24 NEF				0.5979	0.5938	.0041	0.5979	0.5950	.0029			
5/8-18 NF	0.5873	0.5816	.0057	0.5889	0.5848	.0041	0.5889	0.5859	.0030	0.5892	0.5877	.0015
5/8-11 NC	0.5634	0.5549	.0085	0.5660	0.5601	.0059	0.5660	0.5618	.0042	0.5665	0.5644	.0021
11/16-24 NEF				0.6604	0.6563	.0041	0.6604	0.6575	.0029			
3/4-20 NEF				0.7175	0.7129	.0046	0.7175	0.7143	.0032			

PITCH DIAMETERS — LIMITS AND TOLERANCES

DIAMETER AND PITCH	CLASS 1			CLASS 2			CLASS 3			CLASS 4		
	MAX.	MIN.	TOL.	MAX.	MIN.	TOL.	MAX.	MIN.	TOL.	MAX.	MIN.	TOL.
3/4 - 16 NF	0.7076	0.7013	.0063	0.7094	0.7049	.0045	0.7094	0.7062	.0032	0.7098	0.7082	.0016
3/4 - 10 NC	0.6822	0.6730	.0092	0.6850	0.6786	.0064	0.6850	0.6805	.0045	0.6856	0.6833	.0023
13/16 - 20 NEF				0.7800	0.7754	.0046	0.7800	0.7768	.0032			
7/8 - 20 NEF				0.8425	0.8378	.0047	0.8425	0.8392	.0033			
7/8 - 14 NF	0.8265	0.8195	.0070	0.8286	0.8237	.0049	0.8286	0.8250	.0036	0.8290	0.8272	.0018
7/8 - 9 NC	0.7997	0.7897	.0100	0.8028	0.7958	.0070	0.8028	0.7979	.0049	0.8034	0.8010	.0024
15/16 - 20 NEF				0.9050	0.9003	.0047	0.9050	0.9017	.0033			
1 - 20 NEF				0.9675	0.9627	.0048	0.9675	0.9641	.0034			
1 - 14 NF	0.9515	0.9445	.0070	0.9536	0.9487	.0049	0.9536	0.9500	.0036	0.9540	0.9522	.0018
1 - 8 NC	0.9154	0.9043	.0111	0.9188	0.9112	.0076	0.9188	0.9134	.0054	0.9185	0.9168	.0027
1 1/16 - 18 NEF				1.0264	1.0216	.0048	1.0264	1.0228	.0036			
1 1/8 - 18 NEF				1.0889	1.0837	.0052	1.0889	1.0853	.0036			
1 1/8 - 12 NF	1.0685	1.0606	.0079	1.0709	1.0653	.0056	1.0709	1.0669	.0040	1.0714	1.0694	.0020
1 1/8 - 7 NC	1.0283	1.0159	.0124	1.0322	1.0237	.0085	1.0322	1.0263	.0059	1.0330	1.0300	.0030
1 3/16 - 18 NEF				1.1514	1.1462	.0052	1.1514	1.1478	.0036			
1 1/4 - 18 NEF				1.2139	1.2086	.0053	1.2139	1.2102	.0037			
1 1/4 - 12 NF	1.1935	1.1856	.0079	1.1959	1.1903	.0056	1.1959	1.1919	.0040	1.1964	1.1944	.0020
1 1/4 - 7 NC	1.1533	1.1409	.0124	1.1572	1.1487	.0085	1.1572	1.1513	.0059	1.1580	1.1550	.0030
1 5/16 - 18 NEF				1.2764	1.2711	.0053	1.2764	1.2727	.0037			
1 3/8 - 18 NEF				1.3389	1.3335	.0054	1.3389	1.3351	.0038			
1 3/8 - 12 NF	1.3185	1.3106	.0079	1.3209	1.3153	.0056	1.3209	1.3169	.0040	1.3214	1.3194	.0020
1 3/8 - 6 NC	1.2623	1.2478	.0145	1.2667	1.2566	.0101	1.2667	1.2596	.0071	1.2676	1.2640	.0036
1 7/16 - 18 NEF				1.4014	1.3960	.0054	1.4014	1.3976	.0038			
1 1/2 - 18 NEF				1.4639	1.4584	.0055	1.4639	1.4601	.0038			
1 1/2 - 12 NF	1.4435	1.4356	.0079	1.4459	1.4403	.0056	1.4459	1.4419	.0040	1.4464	1.4444	.0020
1 1/2 - 6 NC	1.3873	1.3728	.0145	1.3917	1.3816	.0101	1.3917	1.3846	.0071	1.3926	1.3890	.0036
1 9/16 - 18 NEF				1.5264	1.5209	.0055	1.5264	1.5225	.0039			
1 5/8 - 18 NEF				1.5889	1.5833	.0056	1.5889	1.5850	.0039			
1 11/16 - 18 NEF				1.6514	1.6458	.0056	1.6514	1.6475	.0039			
1 3/4 - 16 NEF				1.7094	1.7035	.0059	1.7094	1.7053	.0041			
1 3/4 - 5 NC	1.6149	1.5980	.0169	1.6201	1.6085	.0116	1.6201	1.6119	.0082	1.6211	1.6170	.0041
2 - 16 NEF				1.9594	1.9533	.0061	1.9594	1.9551	.0043			
2 - 4 1/2 NC	1.8500	1.8316	.0184	1.8557	1.8430	.0127	1.8557	1.8468	.0089	1.8568	1.8524	.0044
2 1/4 - 4 1/2 NC	2.1000	2.0816	.0184	2.1057	2.0930	.0127	2.1057	2.0963	.0089	2.1068	2.1024	.0044
2 1/2 - 4 NC	2.3312	2.3108	.0204	2.3376	2.3236	.0140	2.3376	2.3279	.0097	2.3389	2.3341	.0048
2 3/4 - 4 NC	2.5812	2.5608	.0204	2.5876	2.5736	.0140	2.5876	2.5779	.0097	2.5889	2.5841	.0048
3 - 4 NC	2.8312	2.8108	.0204	2.8376	2.8236	.0140	2.8376	2.8279	.0097	2.8389	2.8341	.0048
3 1/4 - 4 NC	3.0812	3.0608	.0204	3.0876	3.0736	.0140	3.0876	3.0779	.0097	3.0889	3.0841	.0048
3 1/2 - 4 NC	3.3312	3.3108	.0204	3.3376	3.3236	.0140	3.3376	3.3279	.0097	3.3389	3.3341	.0048
3 3/4 - 4 NC	3.5812	3.5608	.0204	3.5876	3.5736	.0140	3.5876	3.5779	.0097	3.5889	3.5841	.0048
4 - 4 NC	3.8312	3.8108	.0204	3.8376	3.8236	.0140	3.8376	3.8279	.0097	3.8389	3.8341	.0048

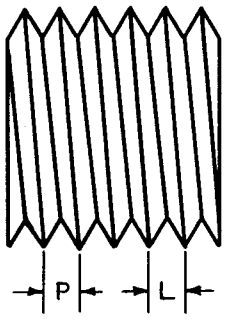
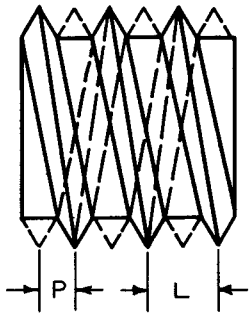
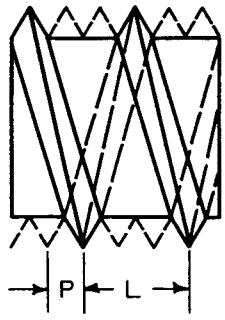
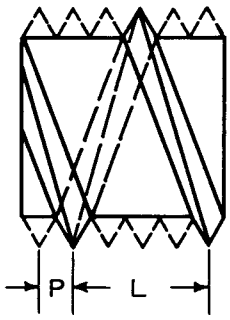
PITCH DIAMETERS AND TOLERANCES - 8 - 12 - 16 PITCH NATIONAL THREAD SERIES
CLASS 2 FIT

DIA. PITCH	MAX.	MIN.	TOL.	DIA. PITCH	MAX.	MIN.	TOL.	DIA. PITCH	MAX.	MIN.	TOL.
1/2 - 12	0.4459	0.4403	.0056					3 1/8 - 12	3.0709	3.0635	.0074
9/16 - 12	0.5084	0.5028	.0056								
5/8 - 12	0.5709	0.5653	.0056	1 3/4 - 8	1.6688	1.6591	.0097	3 1/4 - 8	3.1688	3.1556	.0132
11/16 - 12	0.6334	0.6278	.0056	1 3/4 - 12	1.6959	1.6894	.0065	3 1/4 - 12	3.1959	3.1884	.0075
3/4 - 12	0.6959	0.6903	.0056								
								3 3/8 - 12	3.3209	3.3133	.0076
13/16 - 12	0.7584	0.7528	.0056	1 7/8 - 8	1.7938	1.7838	.0100				
				1 7/8 - 12	1.8209	1.8143	.0066	3 1/2 - 8	3.4188	3.4055	.0133
7/8 - 12	0.8209	0.8153	.0056					3 1/2 - 12	3.4459	3.4383	.0076
5/16 - 12	0.8834	0.8778	.0056	2 - 8	1.9188	1.9084	.0104	3 5/8 - 12	3.5709	3.5632	.0077
				2 - 12	1.9459	1.9392	.0067				
1 - 8	0.9188	0.9112	.0076					3 3/4 - 8	3.6688	3.6554	.0134
1 - 12	0.9459	0.9403	.0056					3 3/4 - 12	3.6959	3.6881	.0078
				2 1/8 - 8	2.0438	2.0331	.0107				
1 1/16 - 12	1.0084	1.0028	.0056	2 1/8 - 12	2.0709	2.0641	.0068	3 7/8 - 12	3.8209	3.8131	.0078
1 1/8 - 8	1.0438	1.0359	.0079					4 - 8	3.9188	3.9053	.0135
1 1/8 - 12	1.0709	1.0653	.0056	2 1/4 - 8	2.1688	2.1578	.0110	4 - 12	3.9459	3.9380	.0079
				2 1/4 - 12	2.1959	2.1890	.0069				
1 3/16 - 12	1.1334	1.1278	.0056					4 1/4 - 8	4.1688	4.1551	.0137
								4 1/4 - 12	4.1959	4.1879	.0080
1 1/4 - 8	1.1688	1.1605	.0083	2 3/8 - 12	2.3209	2.3139	.0070	4 1/2 - 8	4.4188	4.4050	.0138
1 1/4 - 12	1.1959	1.1903	.0056					4 1/2 - 12	4.4459	4.4378	.0081
								4 3/4 - 8	4.6688	4.6549	.0139
1 5/16 - 12	1.2584	1.2528	.0056	2 1/2 - 8	2.4188	2.4071	.0117	4 3/4 - 12	4.6959	4.6876	.0083
				2 1/2 - 12	2.4459	2.4388	.0071	5 - 8	4.9188	4.9048	.0140
1 3/8 - 8	1.2938	1.2852	.0086					5 - 12	4.9459	4.9375	.0084
1 3/8 - 12	1.3209	1.3153	.0056	2 5/8 - 12	2.5709	2.5638	.0071	5 1/4 - 8	5.1688	5.1547	.0141
								5 1/4 - 12	5.1959	5.1874	.0085
1 7/16 - 12	1.3834	1.3778	.0056	2 3/4 - 8	2.6688	2.6564	.0124	5 1/2 - 8	5.4188	5.4046	.0142
				2 3/4 - 12	2.6959	2.6887	.0072	5 1/2 - 12	5.4459	5.4373	.0086
1 1/2 - 8	1.4188	1.4098	.0090					5 3/4 - 8	5.6688	5.6545	.0143
1 1/2 - 12	1.4459	1.4403	.0056	2 7/8 - 12	2.8209	2.8136	.0073	5 3/4 - 12	5.6959	5.6872	.0087
								6 - 8	5.9188	5.9044	.0144
				3 - 8	2.9188	2.9058	.0130	6 - 12	5.9459	5.9371	.0088
1 5/8 - 8	1.5438	1.5345	.0093	3 - 12	2.9459	2.9385	.0074				
1 5/8 - 12	1.5709	1.5645	.0064								

PITCH DIAMETERS AND TOLERANCES - 8 - 12 - 16 PITCH NATIONAL THREAD SERIES CLASS 3 FIT

DIA. PITCH	MAX.	MIN.	TOL.	DIA. PITCH	MAX.	MIN.	TOL.	DIA. PITCH	MAX.	MIN.	TOL.
1/2 - 12	0.4459	0.4419	.0040	1 5/8 - 16	1.5844	1.5803	.0041	3 1/8 - 12	3.0709	3.0657	.0052
9/16 - 12	0.5084	0.5044	.0040	1 11/16 - 16	1.6469	1.6428	.0041	3 1/8 - 16	3.0844	3.0797	.0047
5/8 - 12	0.5709	0.5669	.0040	1 3/4 - 8	1.6688	1.6620	.0068	3 1/4 - 8	3.1688	3.1595	.0093
11/16 - 12	0.6334	0.6294	.0040	1 3/4 - 12	1.6959	1.6913	.0046	3 1/4 - 12	3.1959	3.1907	.0052
3/4 - 12	0.6959	0.6919	.0040	1 3/4 - 16	1.7094	1.7053	.0041	3 1/4 - 16	3.2094	3.2046	.0048
3/4 - 16	0.7094	0.7062	.0032	1 13/16 - 16	1.7719	1.7677	.0042	3 3/8 - 12	3.3209	3.3156	.0053
13/16 - 12	0.7584	0.7544	.0040	1 7/8 - 8	1.7938	1.7868	.0070	3 3/8 - 16	3.3344	3.3296	.0048
13/16 - 16	0.7719	0.7684	.0035	1 7/8 - 12	1.8209	1.8163	.0046	3 1/2 - 8	3.4188	3.4095	.0093
7/8 - 12	0.8209	0.8169	.0040	1 7/8 - 16	1.8344	1.8302	.0042	3 1/2 - 12	3.4459	3.4406	.0053
7/8 - 16	0.8344	0.8308	.0036	1 15/16 - 16	1.8969	1.8927	.0042	3 1/2 - 16	3.4594	3.4545	.0049
15/16 - 12	0.8834	0.8794	.0040	2 - 8	1.9188	1.9115	.0073	3 5/8 - 12	3.5709	3.5655	.0054
15/16 - 16	0.8969	0.8933	.0036	2 - 12	1.9459	1.9412	.0047	3 5/8 - 16	3.5844	3.5795	.0049
1 - 8	0.9188	0.9134	.0054	2 - 16	1.9594	1.9551	.0043	3 3/4 - 8	3.6688	3.6594	.0094
1 - 12	0.9459	0.9419	.0040	2 1/16 - 16	2.0219	2.0176	.0043	3 3/4 - 12	3.6959	3.6905	.0054
1 - 16	0.9594	0.9557	.0037	2 1/8 - 8	2.0438	2.0363	.0075	3 3/4 - 16	3.7094	3.7044	.0050
1 1/16 - 12	1.0084	1.0044	.0040	2 1/8 - 12	2.0709	2.0661	.0048	3 7/8 - 12	3.8209	3.8154	.0055
1 1/16 - 16	1.0219	1.0182	.0037	2 1/8 - 16	2.0844	2.0801	.0043	3 7/8 - 16	3.8344	3.8294	.0050
1 1/8 - 8	1.0438	1.0383	.0055	2 3/16 - 16	2.1469	2.1426	.0043	4 - 8	3.9188	3.9093	.0095
1 1/8 - 12	1.0709	1.0669	.0040	2 1/4 - 8	2.1688	2.1611	.0077	4 - 12	3.9459	3.9404	.0055
1 1/8 - 16	1.0844	1.0806	.0038	2 1/4 - 12	2.1959	2.1911	.0048	4 - 16	3.9594	3.9543	.0051
1 3/16 - 12	1.1334	1.1294	.0040	2 1/4 - 16	2.2094	2.2050	.0044	4 1/4 - 8	4.1688	4.1592	.0096
1 3/16 - 16	1.1469	1.1431	.0038	2 5/16 - 16	2.2719	2.2675	.0044	4 1/4 - 12	4.1959	4.1903	.0056
1 1/4 - 8	1.1688	1.1630	.0058	2 3/8 - 12	2.3209	2.3160	.0049	4 1/2 - 8	4.4188	4.4091	0097
1 1/4 - 12	1.1959	1.1919	.0040	2 3/8 - 16	2.3344	2.3300	.0044	4 1/2 - 12	4.4459	4.4402	.0057
1 1/4 - 16	1.2094	1.2056	.0038	2 7/16 - 16	2.3969	2.3924	.0045	4 3/4 - 8	4.6688	4.6590	.0098
1 5/16 - 12	1.2584	1.2544	.0040	2 1/2 - 8	2.4188	2.4106	.0082	4 3/4 - 12	4.6959	4.6901	.0058
1 5/16 - 16	1.2719	1.2680	.0039	2 1/2 - 12	2.4459	2.4410	.0049	5 - 8	4.9188	4.9089	.0099
1 3/8 - 8	1.2938	1.2877	.0061	2 1/2 - 16	2.4594	2.4549	.0045	5 - 12	4.9459	4.9400	.0059
1 3/8 - 12	1.3209	1.3169	.0040	2 5/8 - 12	2.5709	2.5659	.0050	5 1/4 - 8	5.1688	5.1589	.0099
1 3/8 - 16	1.3344	1.3305	.0039	2 5/8 - 16	2.5844	2.5799	.0045	5 1/4 - 12	5.1959	5.1900	.0059
1 7/16 - 12	1.3834	1.3794	.0040	2 3/4 - 8	2.6688	2.6601	.0087	5 1/2 - 8	5.4188	5.4088	.0100
1 7/16 - 16	1.3969	1.3929	.0040	2 3/4 - 12	2.6959	2.6909	.0050	5 1/2 - 12	5.4459	5.4399	.0060
1 1/2 - 8	1.4188	1.4125	.0063	2 3/4 - 16	2.7094	2.7048	.0046	5 3/4 - 8	5.6688	5.6587	.0101
1 1/2 - 12	1.4459	1.4419	.0040	2 7/8 - 12	2.8209	2.8158	.0051	5 3/4 - 12	5.6959	5.6898	.0061
1 1/2 - 16	1.4594	1.4554	.0040	2 7/8 - 16	2.8344	2.8298	.0046	6 - 8	5.9188	5.9086	.0102
1 9/16 - 16	1.5219	1.5179	.0040	3 - 8	2.9188	2.9096	.0092	6 - 12	5.9459	5.9397	.0062
1 5/8 - 8	1.5438	1.5373	.0065	3 - 12	2.9459	2.9408	.0051				
1 5/8 - 12	1.5709	1.5664	.0045	3 - 16	2.9594	2.9547	.0047				

PITCH AND LEAD CHART

THREADS PER INCH	FRACTIONAL PITCH	SINGLE		DOUBLE		TRIPLE		QUADRUPLE	
		 L = P FIG. 29		 L = 2P FIG. 30		 L = 3P FIG. 31		 L = 4P FIG. 32	
		THD'S PER INCH	DECIMAL FOR LEAD L	THD'S PER INCH	DECIMAL FOR LEAD L	THD'S PER INCH	DECIMAL FOR LEAD L	THD'S PER INCH	DECIMAL FOR LEAD L
3	1/3	3	0.3333	1 1/2	0.6666	1	1.0000	3/4	1.3333
4	1/4	4	0.2500	2	0.5000	1 1/3	0.7500	1	1.0000
5	1/5	5	0.2000	2 1/2	0.4000	1 2/3	0.6000	1 1/4	0.8000
6	1/6	6	0.1666	3	0.3333	2	0.5000	1 1/2	0.6666
7	1/7	7	0.1428	3 1/2	0.2856	2 1/3	0.4284	1 3/4	0.5712
8	1/8	8	0.1250	4	0.2500	2 2/3	0.3750	2	0.5000
9	1/9	9	0.1111	4 1/2	0.2222	3	0.3333	2 1/4	0.4444
10	1/10	10	0.1000	5	0.2000	3 1/3	0.3000	2 1/2	0.4000
12	1/12	12	0.0833	6	0.1666	4	0.2500	3	0.3333
14	1/14	14	0.0714	7	0.1428	4 2/3	0.2142	3 1/2	0.2857
16	1/16	16	0.0625	8	0.1250	5 1/3	0.1875	4	0.2500
18	1/18	18	0.0555	9	0.1111	6	0.1666	4 1/2	0.2222
20	1/20	20	0.0500	10	0.1000	6 2/3	0.1500	5	0.2000

P = PITCH OF SCREW OR DISTANCE BETWEEN TWO THREADS

L = LEAD OR ADVANCE OF SCREW IN ONE REVOLUTION

PITCH DIAMETER CORRECTIONS FOR LEAD ERRORS

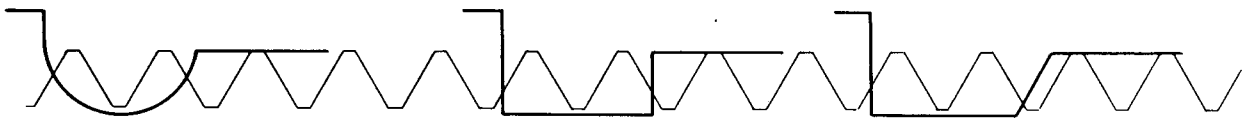
DIAMETER RATIOS FOR A LEAD ERROR OF ONE THOUSANDTH OF AN INCH PER INCH OF LEAD FOR ALL INCLUDED ANGLES OF THE THREAD FROM 0° TO 90°.

THE FIGURES APPEARING AS RATIOS ARE THE PITCH DIAMETER REDUCTIONS FOR ONE THOUSANDTH LEAD ERROR. FOR THREADS HAVING INCLUDED ANGLE NOT FOUND IN THIS TABLE, CORRECTION VALUE MAY BE FOUND BY READING DIRECTLY THE COTANGENT OF ONE HALF THE INCLUDED ANGLE. MOVE THE DECIMAL POINT THREE PLACES TO THE LEFT. RESULT IS RATIO IN THOUSANDTHS.

ANG.	RATIO	ANG.	RATIO	ANG.	RATIO
0°	.001 : INFINITY				
1°	.001 :.114589	31°	.001 :.003606	61°	.001 :.001697
2°	.001 :.057290	32°	.001 :.003486	62°	.001 :.001664
3°	.001 :.038188	33°	.001 :.003376	63°	.001 :.001631
4°	.001 :.028636	34°	.001 :.003271	64°	.001 :.001600
5°	.001 :.022903	35°	.001 :.003171	65°	.001 :.001569
6°	.001 :.019081	36°	.001 :.003077	66°	.001 :.001539
7°	.001 :.016350	37°	.001 :.002988	67°	.001 :.001511
8°	.001 :.014301	38°	.001 :.002904	68°	.001 :.001482
9°	.001 :.012706	39°	.001 :.002824	69°	.001 :.001455
10°	.001 :.011430	40°	.001 :.002747	70°	.001 :.001428
11°	.001 :.010385	41°	.001 :.002674	71°	.001 :.001402
12°	.001 :.009514	42°	.001 :.002605	72°	.001 :.001376
13°	.001 :.008776	43°	.001 :.002538	73°	.001 :.001351
14°	.001 :.008144	44°	.001 :.002475	74°	.001 :.001327
15°	.001 :.007595	45°	.001 :.002414	75°	.001 :.001303
16°	.001 :.007115	46°	.001 :.002355	76°	.001 :.001279
17°	.001 :.006691	47°	.001 :.002299	77°	.001 :.001257
18°	.001 :.006313	48°	.001 :.002246	78°	.001 :.001235
19°	.001 :.005975	49°	.001 :.002194	79°	.001 :.001213
20°	.001 :.005671	50°	.001 :.002144	80°	.001 :.001191
21°	.001 :.005395	51°	.001 :.002096	81°	.001 :.001171
22°	.001 :.005144	52°	.001 :.002050	82°	.001 :.001150
23°	.001 :.004915	53°	.001 :.002005	83°	.001 :.001130
24°	.001 :.004704	54°	.001 :.001962	84°	.001 :.001110
25°	.001 :.004510	55°	.001 :.001921	85°	.001 :.001091
26°	.001 :.004331	56°	.001 :.001880	86°	.001 :.001072
27°	.001 :.004165	57°	.001 :.001841	87°	.001 :.001053
28°	.001 :.004010	58°	.001 :.001804	88°	.001 :.001035
29°	.001 :.003866	59°	.001 :.001767	89°	.001 :.001017
30°	.001 :.003732	60°	.001 :.001732	90°	.001 :.001000

THREAD DATA

DESIGN OF RECESS



HALF ROUND-TYPE A
FIG. 33

SQUARE-TYPE B
FIG. 34

BACK ANGLE-TYPE C
FIG. 35

INTERFERENCE AT ROOT WHEN GAGING

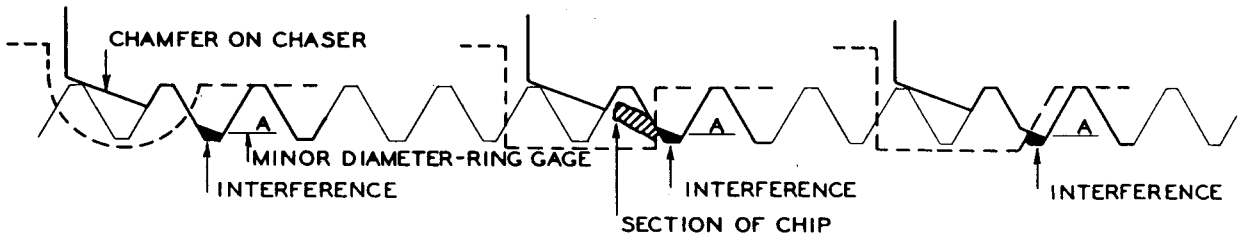


FIG. 36

FIG. 37

FIG. 38

THREADING WHEN RECESS WIDTH IS EQUAL TO PITCH

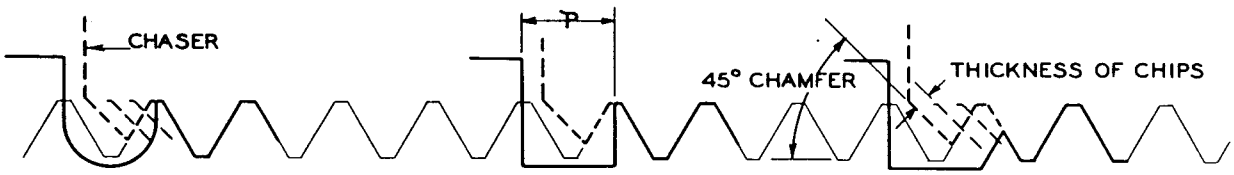


FIG. 39

FIG. 40

FIG. 41

THREADING WHEN RECESS WIDTH IS 1.5p & 2.5p USING TYPE-C

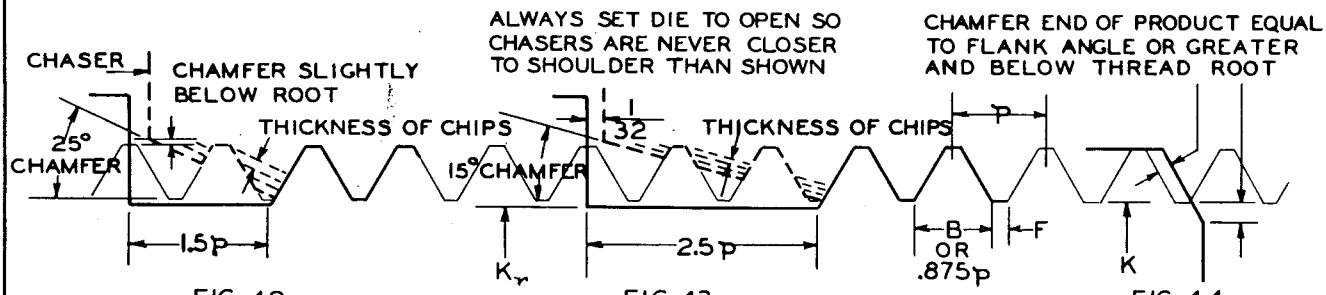


FIG. 42

FIG. 43

FIG. 44

THE ABOVE DIAGRAMS ARE SHOWN TO ILLUSTRATE WHAT IS ENCOUNTERED WHEN THE RECESS ON THE PRODUCT IS NOT PROPERLY DESIGNED. IN ALL CASES THE TYPE 'C' RECESS IS RECOMMENDED AND SHOULD BE WIDE ENOUGH TO ALLOW FOR THE MAXIMUM CHAMFER THEREBY PRODUCING A GREATER NUMBER OF CUTTING SURFACES ON THE CHASERS AND BETTER FINISH ON THE PRODUCT. IN MOST DESIGNS THE TOTAL AREA AT THE BASE SECTION OF THE NUMBER OF FULL THREADS REQUIRED IS OF GREATER CROSS SECTION THAN THAT OF THE RECESS K_r. SEE FIG. 45 USING $\frac{1}{2}$ - 20 N.F. AS AN EXAMPLE AND K_r AS .430 DIAMETER.

AREA $K_r = \frac{\pi (K_r)^2}{4}$

AREA BASE = $\pi K B$ (B-FIG. 43)

$P_s = \frac{(K_r)^2}{3.5 p K}$ = TOTAL THREADS

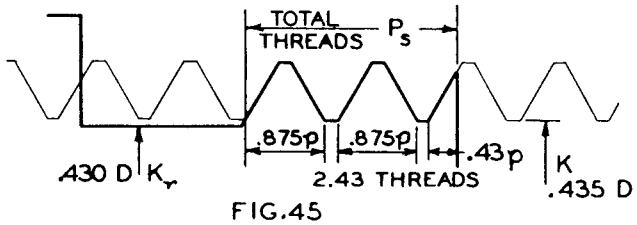


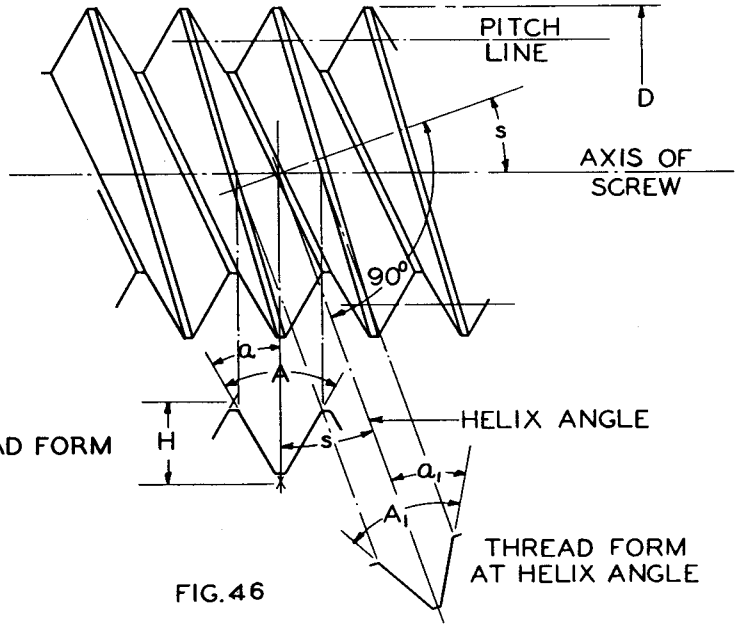
FIG. 45

ADDITIONAL COPIES OF THIS PAGE ARE AVAILABLE UPON REQUEST - CHT-242-47

THREAD DATA

CORRECTION FACTORS FOR MEASURING FLANK ANGLES OF THREADS WHEN HELIX ANGLE IS GREATER THAN 3 DEGREES. TABLES ARE GIVEN FOR 10 MINUTE HELIX ANGLE INTERVALS FOR THREADS MOST COMMONLY USED. FOR THREADS HAVING A FLANK ANGLE OTHER THAN THOSE LISTED MAY BE FOUND BY THE FORMULA.

S – HELIX ANGLE (PITCH LINE)
A – THREAD ANGLE (BASIC)
A_1 – THREAD ANGLE PROJECTED AT HELIX ANGLE
H – HEIGHT OF BASIC TRIANGLE
a_1 – HALF THREAD ANGLE
CF – CORRECTION FACTOR = $a - a_1$
TAN a_1 = TAN a COS s



BASIC THREAD FORM

FIG. 46

IN MEASURING THREADS USING 3 WIRE METHOD IT IS SUGGESTED THAT THE 'BEST' WIRE BE USED, THAT IS, ONE THAT CONTACTS THE THEORETICAL PITCH LINE. IN MOST CASES WIRE READINGS ARE CALCULATED WITHOUT TAKING INTO ACCOUNT THE HELIX ANGLE WHICH CHANGES THE READING WHEN THIS ANGLE IS 3 DEGREES AND GREATER. WHEN THE READING OVER WIRES AT HELIX ANGLE IS REQUIRED USE THE FORMULA GIVEN FOR THIS CHANGE. FOR THREADS OF KNOWN ANGLES THE FORMULA M IS ALREADY GIVEN AS IN FIGURES 7, 8, 9, 10, 11, 12, 13, 14 AND 15. THE BASIC FIGURE FOR A WIRE READING IS TAKEN FROM A CONCENTRIC GROOVE (FIG. 47) AND THE CALCULATION AT THE HELIX ANGLE WILL GIVE THE TOTAL AMOUNT THE WIRES ARE DISPLACED WHEN THE THREAD ANGLE BECOMES NARROWER AS IN FIG. 46. FIGURES 47 AND 48 ILLUSTRATE THE DIFFERENCE AS EXPLAINED ABOVE.

$$W = \frac{G\,(1+\text{cosec } a)-H}{2}$$

$$M = E + 2W$$

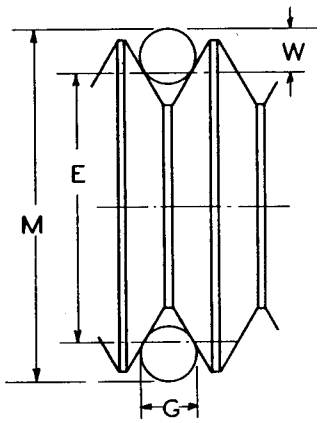


FIG. 47

$$W_1 = \frac{G\,(1+\text{cosec } a_1)-H}{2}$$

$$\underline{M} = E + 2W_1$$

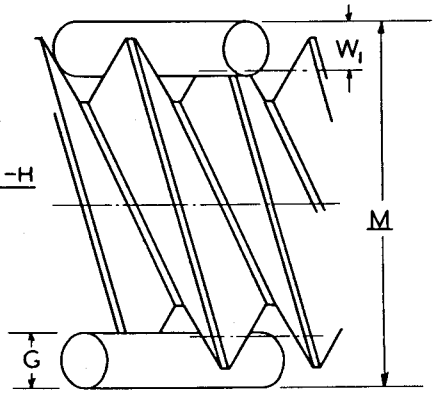


FIG. 48

THREAD DATA

FLANK ANGLE CORRECTION FACTORS FOR 29° THREAD

S	a_1	CF
2°	14° 29' 30"	0' 30"
2° 10'	14° 29' 24"	0' 36"
2° 20'	14° 29' 19"	0' 41"
2° 30'	14° 29' 12"	0' 48"
2° 40'	14° 29' 6"	0' 54"
2° 50'	14° 28' 59"	1' 1"
3°	14° 28' 51"	1' 9"
3° 10'	14° 28' 44"	1' 16"
3° 20'	14° 28' 35"	1' 25"
3° 30'	14° 28' 27"	1' 33"
3° 40'	14° 28' 18"	1' 42"
3° 50'	14° 28' 8"	1' 52"
4°	14° 27' 58"	2' 2"
4° 10'	14° 27' 48"	2' 12"
4° 20'	14° 27' 37"	2' 23"
4° 30'	14° 27' 26"	2' 34"
4° 40'	14° 27' 14"	2' 46"
4° 50'	14° 27' 2"	2' 58"
5°	14° 26' 50"	3' 10"
5° 10'	14° 26' 37"	3' 23"
5° 20'	14° 26' 23"	3' 37"
5° 30'	14° 26' 10"	3' 50"
5° 40'	14° 25' 56"	4' 4"
5° 50'	14° 25' 41"	4' 19"
6°	14° 25' 26"	4' 34"
6° 10'	14° 25' 11"	4' 49"
6° 20'	14° 24' 55"	5' 5"
6° 30'	14° 24' 38"	5' 22
6° 40'	14° 24' 22"	5' 38"
6° 50'	14° 24' 5"	5' 55"
7°	14° 23' 47"	6' 13"
7° 10'	14° 23' 29"	6' 31"
7° 20'	14° 23' 11"	6' 49"
7° 30'	14° 22' 52"	7' 8"
7° 40'	14° 22' 33"	7' 27"
7° 50'	14° 22' 13"	7' 47"
8°	14° 21' 53"	8' 7"
8° 10'	14° 21' 33"	8' 27"
8° 20'	14° 21' 12"	8' 48"
8° 30'	14° 20' 50"	9' 10"
8° 40'	14° 20' 29"	9' 31"
8° 50'	14° 20' 7"	9' 53"
9°	14° 19' 44"	10' 16"
9° 10'	14° 19' 21"	10' 39"
9° 20'	14° 18' 58"	11' 2"
9° 30'	14° 18' 34"	11' 26"
9° 40'	14° 18' 9"	11' 51"
9° 50'	14° 17' 45"	12' 15"
10°	14° 17' 20"	12' 40"
10° 10'	14° 16' 54"	13' 6"
10° 20'	14° 16' 28"	13' 32"
10° 30'	14° 16' 2"	13' 58"
10° 40'	14° 15' 35"	14' 25"
10° 50'	14° 15' 8"	14' 52"
11°	14° 14' 40"	15' 20"
11° 10'	14° 14' 12"	15' 48"
11° 20'	14° 13' 44"	16' 16"
11° 30'	14° 13' 15"	16' 45"
11° 40'	14° 12' 46"	17' 14"
11° 50'	14° 12' 16"	17' 44"
12°	14° 11' 46"	18' 14"
12° 10'	14° 11' 15"	18' 45"
12° 20'	14° 10' 44"	19' 16"
12° 30'	14° 10' 13"	19' 47"
12° 40'	14° 9' 41"	20' 19"
12° 50'	14° 9' 9"	20' 51"
13°	14° 8' 36"	21' 24"
13° 10'	14° 8' 3"	21' 57"
13° 20'	14° 7' 30"	22' 30"
13° 30'	14° 6' 56"	23' 4"
13° 40"	14° 6' 22"	23' 38"
13° 50"	14° 5' 47"	24' 13"
14°	14° 5' 12"	24' 48"
14° 10"	14° 4' 37"	25' 23"
14° 20'	14° 4' 1"	25' 59"
14° 30'	14° 3' 24"	26' 36"
14° 40'	14° 2' 47"	27' 13"
14° 50'	14° 2' 10"	27' 50"
15°	14° 1' 33"	28' 27"

THREAD DATA

FLANK ANGLE CORRECTION FACTORS FOR 40° THREAD

S	a_1	CF
2°	19°- 59'- 20"	0'- 40"
2°- 10'	19°- 59'- 13"	0'- 47"
2°- 20'	19°- 59'- 5"	0'- 55"
2°- 30'	19°- 58'- 57"	1'- 3"
2°- 40'	19°- 58'- 48"	1'- 12"
2°- 50'	19°- 58'- 39"	1'- 21"
3°	19°- 58'- 29"	1'- 31"
3°- 10'	19°- 58'- 19"	1'- 41"
3°- 20'	19°- 58'- 8"	1'- 52"
3°- 30'	19°- 57'- 56"	2'- 4"
3°- 40'	19°- 57'- 44"	2'- 16"
3°- 50'	19°- 57'- 32"	2'- 28"
4°	19°- 57'- 18"	2'- 42"
4°- 10'	19°- 57'- 5"	2'- 55"
4°- 20'	19°- 56'- 50"	3'- 10"
4°- 30'	19°- 56'- 36"	3'- 24"
4°- 40'	19°- 56'- 20"	3'- 40"
4°- 50'	19°- 56'- 4"	3'- 56"
5°	19°- 55'- 48"	4'- 12"
5°- 10'	19°- 55'- 31"	4'- 29"
5°- 20'	19°- 55'- 13"	4'- 47"
5°- 30'	19°- 54'- 55"	5'- 5"
5°- 40'	19°- 54'- 36"	5'- 24"
5°- 50'	19°- 54'- 17"	5'- 43"
6°	19°- 53'- 57"	6'- 3"
6° 10'	19°- 53'- 36"	6'- 24"
6°- 20'	19°- 53'- 15"	6'- 45"
6°- 30'	19°- 52'- 54"	7'- 6"
6°- 40'	19°- 52'- 31"	7'- 29"
6°- 50'	19°- 52'- 9"	7'- 51"
7°	19°- 51'- 45"	8'- 15"
7°- 10'	19°- 51'- 22"	8'- 38"
7°- 20'	19°- 50'- 57"	9'- 3"
7°- 30'	19°- 50'- 32"	9'- 28"
7°- 40'	19°- 50'- 7"	9'- 53"
7°- 50'	19°- 49'- 41"	10'- 19"
8°	19°- 49'- 14"	10'- 46"
8°- 10'	19°- 48'- 47"	11'- 13"
8°- 20'	19°- 48'- 19"	11'- 41"
8°- 30'	19°- 47'- 51"	12'- 9"
8°-40'	19°- 47'- 22"	12'- 38"
8°-50'	19°- 46'- 53"	13'- 7"
9°	19°- 46'- 23"	13'- 37"
9°-10'	19°- 45'- 52"	14'- 8"
9°-20'	19°- 45'- 21"	14'- 39"
9°-30'	19°- 44'- 49"	15'- 11"
9°-40'	19°- 44'- 17"	15'- 43"
9°-50'	19°- 43'- 44"	16'- 16"
10°	19°- 43'- 11"	16'- 49"
10°-10'	19°- 42'- 37"	17'- 23"
10°-20'	19°- 42'- 3"	17'- 57"
10°-30'	19°- 41'- 28"	18'- 32"
10°-40'	19°- 40'- 52"	19'- 8"
10°-50'	19°- 40'- 16"	19'- 44"
11°	19°- 39'- 39"	20'- 21"
11°-10'	19°- 39'- 2"	20'- 58"
11°-20'	19°- 38'- 24"	21'- 36"
11°-30'	19°- 37'- 46"	22'- 14"
11°-40'	19°- 37'- 7"	22'- 53"
11°-50'	19°- 36'- 28"	23'- 32"
12°	19°- 35'- 48"	24'- 12"
12°-10'	19°- 35'- 6"	24'- 53"
12°-20'	19°- 34'- 26"	25'- 34"
12°-30'	19°- 33'- 44"	26'- 16"
12°-40'	19°- 33'- 2"	26'- 58"
12°-50'	19°- 32'- 19"	27'- 41"
13°	19°- 31'- 36"	28'- 24"
13°-10'	19°- 30'- 52"	29'- 8"
13°-20'	19°- 30'- 7"	29'- 53"
13°-30'	19°- 29'- 22"	30'- 38"
13°-40'	19°- 28'- 37"	31'- 23"
13°-50'	19°- 27'- 51"	32'- 9"
14°	19°- 27'- 5"	32'- 56"
14°-10'	19°- 26'- 17'	33'- 43"
14°-20'	19°- 25'- 29"	34'- 31"
14°-30'	19°- 24'- 41"	35'- 19"
14°-40'	19°- 23'- 52"	36'- 8"
14°-50'	19°- 23'- 2"	36'- 58"
15°	19°- 22'- 12"	37'- 48"

THREAD DATA

FLANK ANGLE CORRECTION FACTORS FOR 55° THREAD

S	a_1	CF
2°	27° 29′ 9″	0′ 51″
2°- 10′	27°- 29′- 0″	1′ - 00″
2°- 20′	27°- 28′- 50″	1′ - 10″
2°- 30′	27°- 28′- 40″	1′ - 20″
2°- 40′	27°- 28′- 29″	1′ - 31″
2°- 50′	27°- 28′- 17″	1′ - 43″
3°	27°- 28′- 4″	1′ - 56″
3°- 10′	27°- 27′- 51″	2′- 9″
3°- 20′	27°- 27′- 37″	2′- 23″
3°- 30′	27°- 27′- 22″	2′- 38″
3°- 40′	27°- 27′- 7″	2′- 53″
3°- 50′	27°- 26′- 51″	3′- 9″
4°	27°- 26′- 34″	3′- 26″
4°- 10′	27°- 26′- 17″	3′- 43″
4° 20′	27°- 25′- 58″	4′- 2″
4°- 30′	27°- 25′- 39″	4′- 21″
4°- 40′	27°- 25′- 20″	4′- 40″
4°- 50′	27°- 24′- 59″	5′- 1″
5°	27°- 24′- 38″	5′- 22″
5°- 10′	27°- 24′- 16″	5′- 44″
5°- 20′	27°- 23′- 54″	6′- 6″
5°- 30′	27°- 23′- 31″	6′- 29″
5°- 40′	27°- 23′- 7″	6′- 53″
5°- 50′	27°- 22′- 42″	7′- 18″
6°	27°- 22′- 17″	7′- 43″
6°- 10′	27°- 21′- 51″	8′- 9″
6°- 20′	27°- 21′- 24″	8′- 36″
6°- 30′	27°- 20′- 56″	9′- 4″
6°- 40′	27°- 20′- 28″	9′- 32″
6°- 50′	27°- 19′- 59″	10′- 1″
7°	27°- 19′- 29″	10′- 31″
7°- 10′	27°- 18′- 58″	11′- 2″
7°- 20′	27°- 18′- 28″	11′- 32″
7°- 30′	27°- 17′- 56″	12′- 4″
7°- 40′	27°- 17′- 23″	12′- 37″
7°- 50′	27°- 16′- 50″	13′- 10″
8°	27°- 16′- 16″	13′- 44″
8°- 10′	27°- 15′- 41″	14′- 19″
8°- 20′	27°- 15′- 6″	14′- 54″
8°- 30′	27°- 14′- 30″	15′- 30″

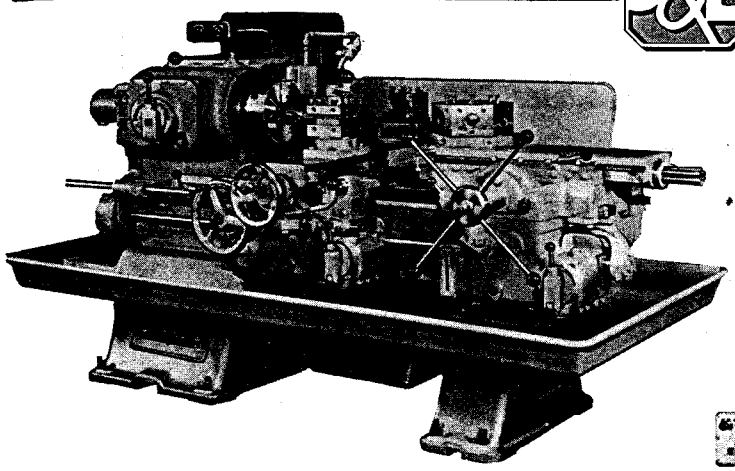
S	a_1	CF
8° 40′	27° 13′ 53″	16′ 7″
8°-50′	27°- 13′- 15″	16′- 45″
9°	27°- 12′- 37″	17′- 23″
9°- 10′	27°- 11′- 58″	18′- 2″
9°- 20′	27°- 11′- 18″	18′- 42″
9°- 30′	27°- 10′- 38″	19′- 22″
9°- 40′	27°- 9′ - 57″	20′- 3″
9°- 50′	27°- 9′ - 15″	20′- 45″
10°	27°- 8′ - 32″	21′- 28″
10°- 10′	27°- 7′ - 49″	22′- 11″
10°- 20′	27°- 7′ - 5″	22′- 55″
10°- 30′	27°- 6′ - 20″	23′- 40″
10°- 40′	27°- 5′ - 35″	24′- 25″
10°- 50′	27°- 4′ - 49″	25′- 11″
11°	27°- 4′ - 2″	25′- 58″
11°- 10′	27°- 3′ - 14″	26′- 46″
11°- 20′	27°- 2′ - 26″	27′- 34″
11°- 30′	27°- 1′ - 37″	28′- 23″
11°- 40′	27°- 0′ - 47″	29′- 13″
11°- 50″	26°- 59′- 57″	30′- 3″
12°	26°- 59′- 5″	30′- 55″
12°- 10′	26°- 58′- 13″	31′- 47″
12°- 20′	26°- 57′- 21″	32′- 39″
12°- 30′	26°- 56′- 27″	33′- 33″
12°- 40′	26°- 55′- 33″	34′- 27″
12°- 50′	26°- 54′- 38″	35′- 22″
13°	26°- 53′- 43″	36′- 17″
13°- 10′	26°- 52′- 47″	37′- 13″
13°- 20′	26°- 51′- 50″	38′- 10″
13°- 30′	26°- 50′- 52″	39′- 8″
13°- 40′	26°- 49′- 54″	40′- 6″
13°- 50′	26°- 48′- 55″	41′- 5″
14°	26°- 47′- 55″	42′- 5″
14°- 10′	26°- 46′- 54″	43′- 6″
14°- 20′	26°- 45′- 53″	44′- 7″
14°- 30′	26°- 44′- 51″	44′- 9″
14°- 40′	26°- 43′- 48″	46′- 12″
14°- 50′	26°- 42′- 45″	47′- 15″
15°	26°- 41′- 41″	48′- 19″

THREAD DATA

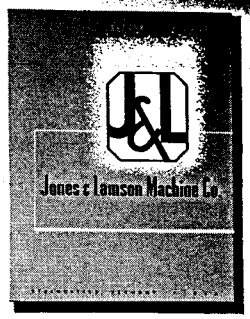
FLANK ANGLE CORRECTION FACTORS FOR 60° THREAD

S	α_1	CF
2°	29°-59'-6"	0'-54"
2°-10'	29°-58'-56"	1'-4"
2°-20'	29°-58'-46"	1'-14"
2°-30'	29°-58'-35"	1'-25"
2°-40'	29°-58'-23"	1'-37"
2°-50'	29°-58'-11"	1'-49"
3°	29°-57'-58"	2'-2"
3°-10'	29°-57'-44"	2'-16"
3°-20'	29°-57'-29"	2'-31"
3°-30'	29°-57'-13"	2'-47"
3°-40'	29°-56'-57"	3'-3"
3°-50'	29°-56'-40"	3'-20"
4°	29°-56'-22"	3'-38"
4°-10'	29°-56'-4"	3'-56"
4°-20'	29°-55'-44"	4'-16"
4°-30'	29°-55'-24"	4'-36"
4°-40'	29°-55'-4"	4'-56"
4°-50'	29°-54'-42"	5'-18"
5°	29°-54'-20"	5'-40"
5°-10'	29°-53'-57"	6'-3"
5°-20'	29°-53'-33"	6'-27"
5°-30'	29°-53'-8"	6'-52"
5°-40'	29°-52'-43"	7'-17"
5°-50'	29°-52'-17"	7'-43"
6°	29°-51'-50"	8'-10"
6°-10'	29°-51'-22"	8'-38"
6°-20'	29°-50'-54"	9'-6"
6°-30'	29°-50'-25"	9'-35"
6°-40'	29°-49'-55"	10'-5"
6°-50'	29°-49'-24"	10'-36"
7°	29°-48'-53"	11'-7"
7°-10'	29°-48'-21"	11'-39"
7°-20'	29°-47' 48"	12'-12"
7°-30'	29°-47'-14"	12'-46"
7°-40'	29°-46'-40"	13'-20"
7°-50'	29°-46'-5"	13'-55"
8°	29°-45'-29"	14'-31"
8°-10'	29°-44'-52"	15'-8"
8°-20'	29°-44'-14"	15'-46"
8°-30'	29°-43'-36"	16'-24"

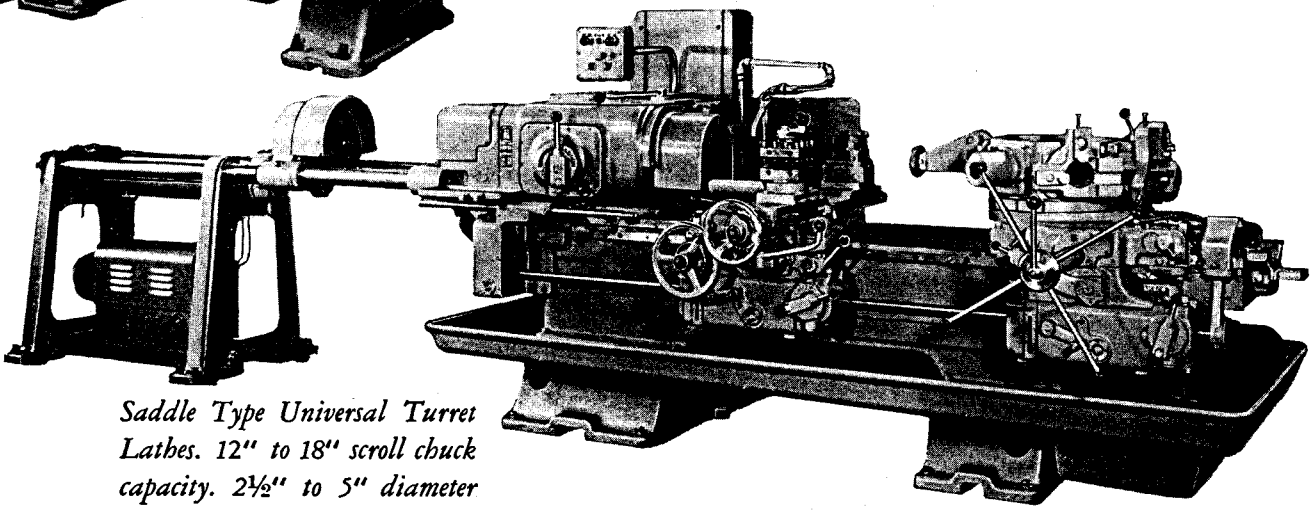
S	α_1	CF
8°-40'	29°-42'-57"	17'-3"
8°-50'	29°-42'-18"	17'-42"
9°	29°-41'-37"	18'-23"
9°-10'	29°-40'-56"	19'-4"
9°-20'	29°-40'-14"	19'-46"
9°-30'	29°-39'-31"	20'-29"
9°-40'	29°-38'-47"	21'-13"
9°-50'	29°-38'-3"	21'-57"
10°	29°-37'-18"	22'-42"
10°-10'	29°-36'-32"	23'-28"
10°-20'	29°-35'-46"	24'-14"
10°-30'	29°-34'-58"	25'-2"
10°-40'	29°-34'-10"	25'-50"
10°-50'	29°-33'-21"	26'-39"
11°	29°-32'-32"	27'-28"
11°-10'	29°-31'-41"	28'-19"
11°-20'	29°-30'-50"	29'-10"
11°-30'	29°-29'-58"	30'-2"
11°-40'	29°-29'-5"	30'-55"
11°-50'	29°-28'-12"	31'-48"
12°	29°-27'-18"	32'-42"
12°-10'	29°-26'-23"	33'-37"
12°-20'	29°-25'-27"	34'-33"
12°-30'	29°-24'-30"	35'-30"
12°-40'	29°-23'-33"	36'-27"
12°-50'	29°-22'-35"	37'-25"
13°	29°-21'-36"	38'-24"
13°-10'	29°-20'-37"	39'-23"
13°-20'	29°-19'-36"	40'-24"
13°-30'	29°-18'-35"	41'-25"
13°-40'	29°-17'-33"	42'-27"
13°-50'	29°-16'-31"	43'-29"
14°	29°-15'-27"	44'-33"
14°-10'	29°-14'-23"	45'-37"
14°-20'	29°-13'-18"	46'-42"
14°-30'	29°-12'-12"	47'-48"
14°-40'	29°-11'-6"	48'-54"
14°-50'	29°-9'-59"	50'-1"
15°	29°-8'-51"	51'-9"



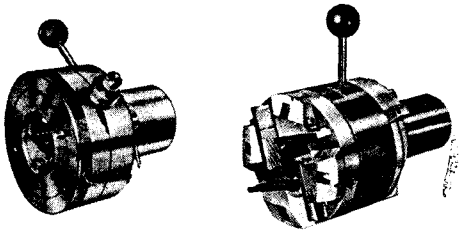
WRITE DEPT. 710
FOR GENERAL CATALOG



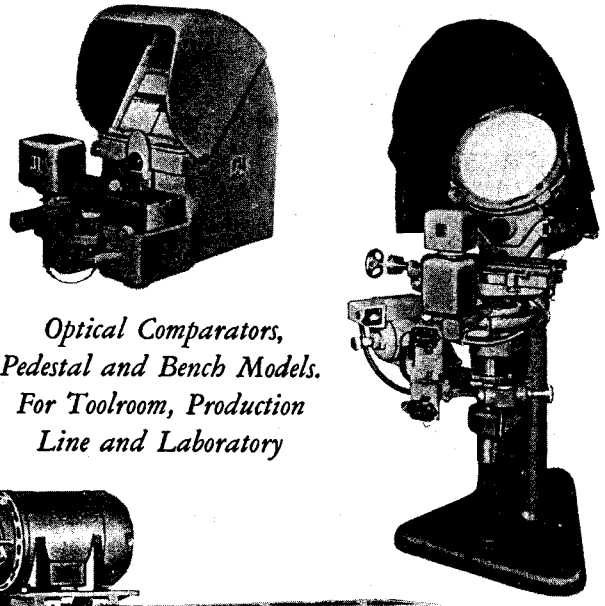
Ram Type Universal Turret Lathes. 10" and 12" scroll chuck capacity. 1½" to 4½" diameter bar capacity.



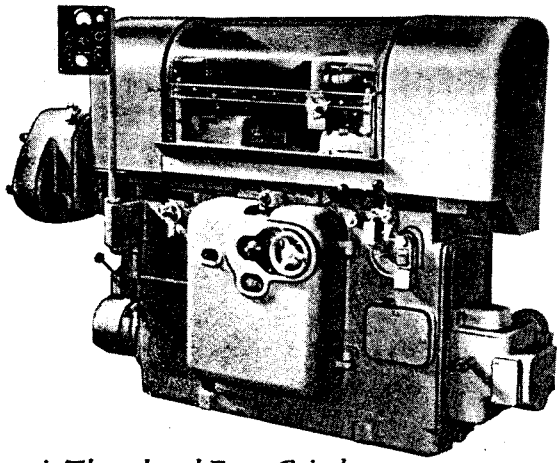
Saddle Type Universal Turret Lathes. 12" to 18" scroll chuck capacity. 2½" to 5" diameter bar capacity.



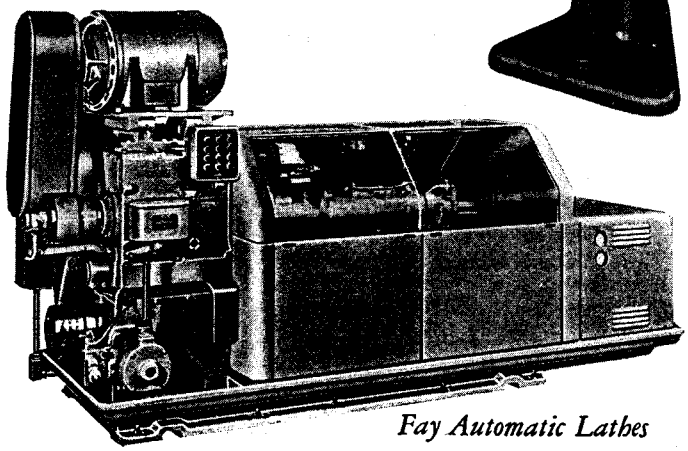
Automatic Opening Die Heads. Radial Chaser Types — Capacities No. 8 through 4¼". Tangent Chaser Types — Capacities No. 4 through 2".



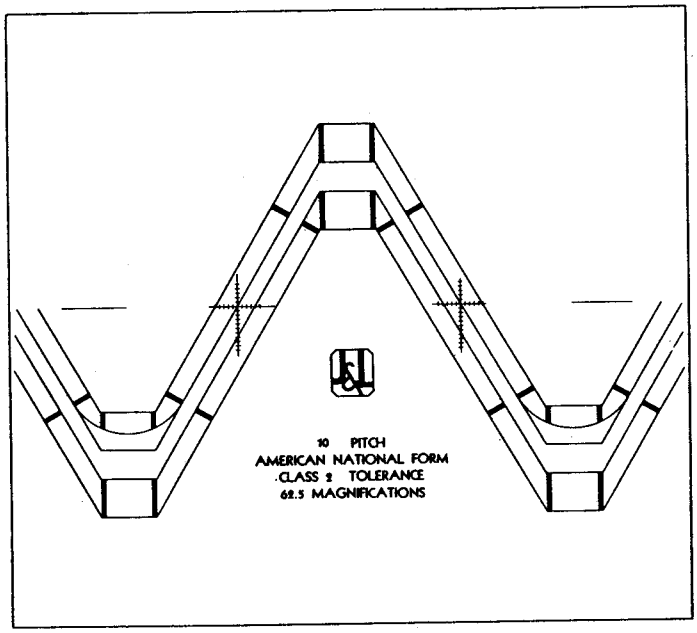
Optical Comparators, Pedestal and Bench Models. For Toolroom, Production Line and Laboratory



Automatic Thread and Form Grinders For Toolroom or Production Line



Fay Automatic Lathes 8", 12", 16" and 20" models



JONES & LAMSON THREAD CHARTS

The practical designs and precision outlines of Jones & Lamson Thread Charts are backed by years of pioneer experience in manufacturing quality thread inspection equipment. The first Optical Comparators introduced in 1919 by Jones & Lamson were pioneered in an effort to provide a rapid complete method of gaging threads produced with the company's famous line of self-opening die heads. A few years later the development of the versatile Jones & Lamson Thread Grinder put commercial thread grinding on a practical production basis. This new machine also stepped up the demand for a faster, more complete method of thread inspection, which, in turn, increased the requests for reliable thread gaging charts covering all varieties of thread forms. At present our thread chart files contain over 500 different master charts. Modified or special applications are continually being added.

ADVANTAGES OF OPTICAL THREAD INSPECTION

Thread Charts:—

Reduce Human Error — No "touch" or "feel" is required — the enlarged shadow reveals the complete story at a glance.

Eliminate Gage Wear — Upkeep and replacement costs of thread gages can be forgotten! You can't wear out a beam of light.

Require No Gage Wear Tolerance — The accuracy of the chart is not affected by constant use, hence no additional tolerance is needed in anticipation of wear.

Last Almost Indefinitely — Quality materials and extremely durable outlines make replacements a rarity except in case of breakage.

Store Easily — One small cabinet or file drawer will store an extensive set of thread charts.

Cost Less — Thread Chart costs amount to a very low fraction of comparable gage expense, even when figured in terms of infrequent usage. The more they are used, the lower the cost.

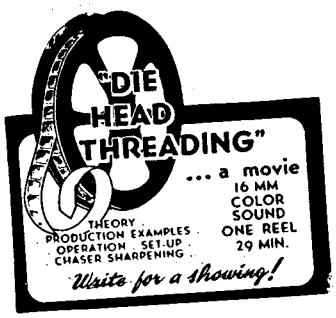
Jones & Lamson Thread Charts are available in single, double or group outline forms. They can be supplied to customer's specifications in any of the following thread types:

STANDARD THREADS

American National Form
American Standard Pipe
A.P.I. Standard
Whitworth Standard
International Metric
British Association
Unified
Acme Standard

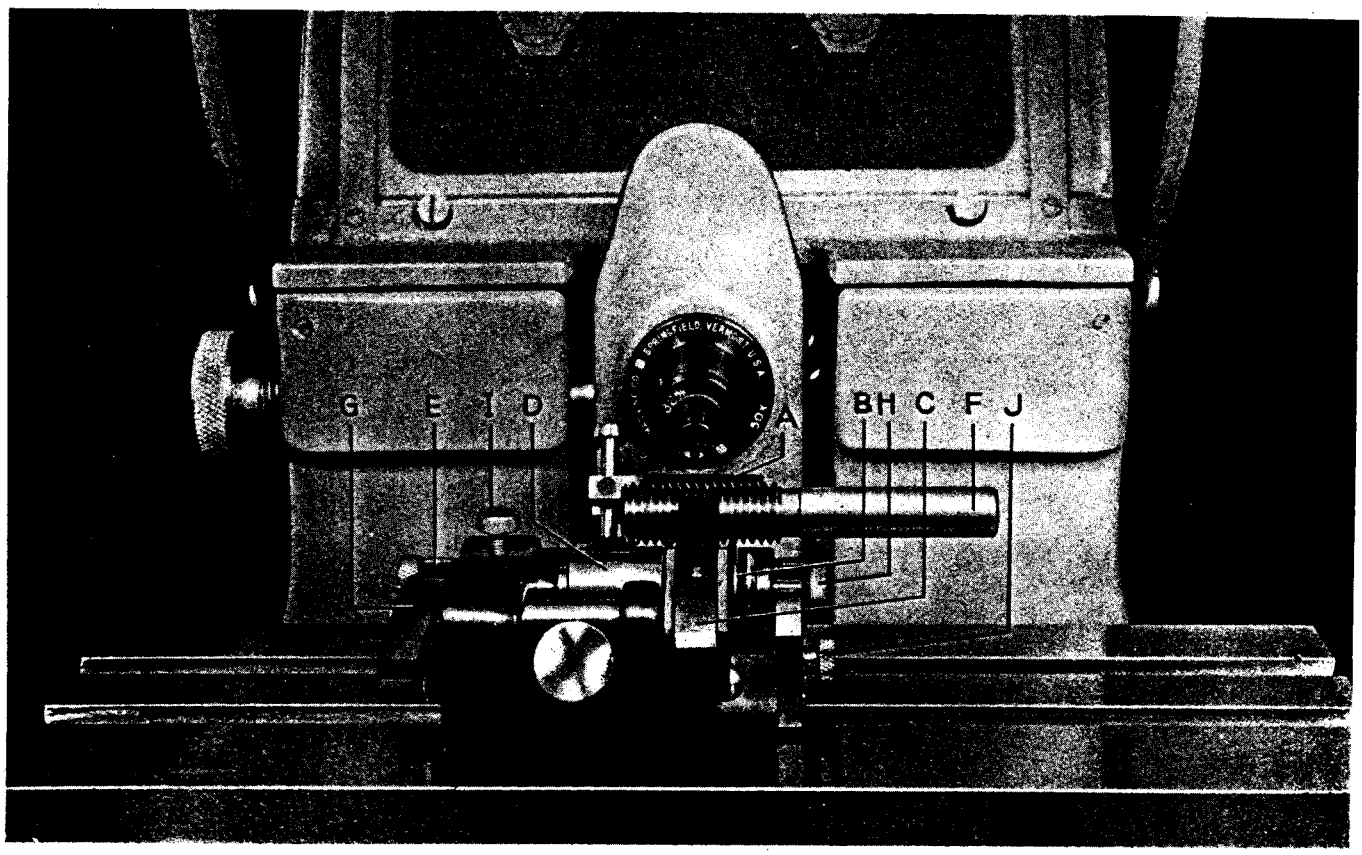
SPECIAL THREADS

Special Acme
Buttress
Worm
Lowenherz
Aero
Electric
Dardalet
Modified Square



JONES & LAMSON UNIVERSAL SCREW STAGE

For Checking Screw Threads on Optical Comparators



MOUNTING CHART & FIXTURE

Mount a thread chart of the desired specifications and magnifications on the Comparator and adjust for exact horizontal alignment with the table. Slide the screw stage fixture onto the table and clamp in approximate position for projecting the thread.

SETTING ROLLS

To place the rolls on the centers, loosen screw "H" and elevate the back stop "A" to its extreme upward position by means of knurled knob "E" and lock with screw "H". Loosen left-hand center binding screw "I" and withdraw center to left. Remove roll "B" from the roll assembly and place it so the spring groove is to the left for long threads or to the right for short threads but make sure the flat spring, under the right-hand center, is in the groove. Insert the shaft (with mounted left-hand roll "D") through the right-hand roll until the center is engaged. Bring the left-hand center into engagement with the shaft. Make sure the shaft is held firmly between the centers and tighten center binding screw "I". Loosen screw "H" and set dial "E" for the size screw to be inspected and tighten binder screw "H". Space the rolls to suit the length of thread or length of thread engagement to be checked. Roll separation should be as great as possible to engage the maximum length of full thread on the part to be inspected. The roll separation is accomplished by sliding the fixed roll "D" along the shaft to engage the proper groove thereon. Slightly depress lever "G" with the left hand and with the right hand move the hold-down clamp "C" so that it is centered between the rolls "B" and "D".

FINAL ADJUSTMENTS, USING MASTER PLUG GAGE

Depress lever "G," insert a master plug thread gage "F" and adjust the movable roll "B" in step with the pitch by means of the spring adjusting screw "J". With the gage located in the fixture, move the fixture to right or left and project on the chart a thread spaced from the fixed roll "D" a distance equal to the length of engagement of the screw with its mating part. Adjust the shadow vertically and horizontally to coincide with the upper or maximum chart outline.

PRODUCTION INSPECTION

Replace the master gage with a production screw. Rotate the screw slightly to make sure it is properly seated on the rolls. The shadow of the production screw thread must fall between the maximum and minimum tolerance outlines on the chart to pass inspection. The space between the outlines represents the permissible tolerance for the class of fit required. Lateral displacement of the shadow shows lead error, vertical displacement shows pitch diameter variation. To detect "drunken" threads, revolve the screw. The amount of drunkenness is determined by the staggering or shifting of the enlarged thread profile on the screen. A drunken thread is acceptable unless the enlarged profile moves outside the tolerance zone on the chart.