



**TABLE 1A - DASH NUMBERS AND DIMENSIONS B - F**

| DASH NO. | NOMINAL THREAD D      |                    | B              |              | ØC          | ØE          | ØF MIN |
|----------|-----------------------|--------------------|----------------|--------------|-------------|-------------|--------|
|          | DESIGNATION           | MODIFIED MAJOR DIA | AS870 DASH NO. | NOMINAL SIZE |             |             |        |
| -3       | .1900-32 UNJF-3A MOD  | .1840-.1875        | -08            | .2500        | .1885-.1895 | .365-.385   | .335   |
| -4       | .2500-28 UNJF-3A MOD  | .2435-.2475        | -10            | .3125        | .2485-.2495 | .455-.475   | .425   |
| -5       | .3125-24 UNJF-3A MOD  | .3053-.3100        | -12            | .3750        | .3110-.3120 | .570-.590   | .540   |
| -6       | .3750-24 UNJF-3A MOD  | .3678-.3725        | -14            | .4375        | .3735-.3745 | .686-.706   | .656   |
| -7       | .4375-20 UNJF-3A MOD  | .4294-.4350        | -16            | .5000        | .4360-.4370 | .802-.822   | .772   |
| -8       | .5000-20 UNJF-3A MOD  | .4919-.4975        | -18            | .5625        | .4985-.4995 | .917-.937   | .887   |
| -9       | .5625-18 UNJF-3A MOD  | .5538-.5600        | -20            | .6250        | .5610-.5620 | 1.032-1.052 | 1.002  |
| -10      | .6250-18 UNJF-3A MOD  | .6163-.6225        | -22            | .6875        | .6235-.6245 | 1.148-1.168 | 1.118  |
| -12      | .7500-16 UNJF-3A MOD  | .7406-.7475        | -26            | .8125        | .7485-.7495 | 1.379-1.399 | 1.349  |
| -14      | .8750-14 UNJF-3A MOD  | .8647-.8725        | -30            | .9375        | .8735-.8745 | 1.610-1.630 | 1.580  |
| -16      | 1.0000-12 UNJF-3A MOD | .9886-.9975        | -34            | 1.0625       | .9985-.9995 | 1.841-1.861 | 1.811  |

**TABLE 1B - DASH NUMBERS AND DIMENSIONS G - V**

| DASH NO. | ØG          | H MIN | ØJ        | K         | P BASIC | R         | T MIN | U         | ØV        |
|----------|-------------|-------|-----------|-----------|---------|-----------|-------|-----------|-----------|
| -3       | .240-.260   | .020  | .042-.052 | .248-.268 | .188    | .015-.025 | .122  | .114-.134 | .090-.110 |
| -4       | .302-.322   | .026  | .060-.070 | .293-.313 | .229    | .020-.030 | .144  | .150-.170 | .140-.160 |
| -5       | .365-.385   | .035  | .060-.080 | .354-.374 | .285    | .026-.036 | .166  | .188-.208 | .196-.216 |
| -6       | .428-.448   | .044  | .060-.080 | .405-.425 | .335    | .033-.043 | .188  | .225-.245 | .250-.270 |
| -7       | .490-.510   | .053  | .060-.080 | .462-.482 | .392    | .039-.049 | .210  | .262-.282 | .300-.320 |
| -8       | .552-.572   | .062  | .060-.080 | .510-.530 | .440    | .045-.055 | .232  | .300-.320 | .360-.380 |
| -9       | .615-.635   | .071  | .060-.080 | .558-.578 | .488    | .051-.061 | .254  | .338-.358 | .430-.450 |
| -10      | .677-.697   | .080  | .060-.080 | .635-.655 | .525    | .058-.068 | .336  | .375-.395 | .490-.510 |
| -12      | .802-.822   | .098  | .060-.080 | .735-.755 | .620    | .070-.080 | .371  | .450-.470 | .560-.580 |
| -14      | .927-.947   | .116  | .090-.110 | .875-.895 | .715    | .083-.093 | .442  | .525-.545 | .640-.660 |
| -16      | 1.052-1.072 | .134  | .090-.110 | .975-.995 | .790    | .095-.105 | .512  | .600-.620 | .730-.750 |

**TABLE 1C - DASH NUMBERS, DIMENSIONS AB, AH, AJ, AK, AND TOLERANCES AC, AD, AE, & AG**

| DASH NO. | ØAB       | AC TOL | AD TOL | AE TOL | AG TOL | ØAH       | AJ MAX | AK   |
|----------|-----------|--------|--------|--------|--------|-----------|--------|------|
| -3       | .130-.150 | .006   | .001   | .003   | .015   | .060-.070 | .154   | .015 |
| -4       | .184-.204 | .007   | .001   | .003   | .015   | .080-.090 | .199   | .018 |
| -5       | .239-.259 | .008   | .001   | .003   | .015   | .090-.110 | .247   | .022 |
| -6       | .301-.321 | .010   | .0008  | .003   | .020   | .090-.110 | .294   | .022 |
| -7       | .354-.374 | .010   | .0008  | .003   | .020   | .090-.110 | .340   | .027 |
| -8       | .416-.436 | .012   | .0006  | .003   | .020   | .090-.110 | .389   | .027 |
| -9       | .472-.492 | .013   | .0006  | .003   | .020   | .090-.110 | .440   | .030 |
| -10      | .534-.554 | .016   | .0006  | .003   | .020   | .090-.110 | .488   | .030 |
| -12      | .650-.670 | .017   | .0006  | .003   | .020   | .090-.110 | .576   | .030 |
| -14      | .764-.784 | .022   | .0006  | .005   | .030   | .120-.145 | .665   | .035 |
| -16      | .874-.894 | .025   | .0006  | .005   | .030   | .120-.145 | .756   | .040 |



**AEROSPACE STANDARD**

BOLT, MACHINE - DOUBLE HEXAGON EXTENDED  
WASHER HEAD, DRILLED, CLOSE TOLERANCE SHANK,  
COBALT-NICKEL ALLOY, UNS R30159, 260 KSI MIN

**AS3659™**  
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NOTES:

- /1/ FOR PARTS WITH A MINIMUM GRIP LENGTH (DIM N) EQUAL TO OR LESS THAN 1.5D, DATUM **Z** (THREAD PD) SHALL REPLACE DATUM **Y**.
2. MATERIAL: COBALT-NICKEL ALLOY PER AMS5842 (COMPOSITION SIMILAR TO UNS R30159).
3. PROCUREMENT SPECIFICATION: AS7475.
4. FLUORESCENT PENETRANT INSPECTION PER ASTM E1417/E1417M, TYPE 1, SENSITIVITY LEVEL 2 MIN.
5. SURFACE TEXTURE: SYMBOLS PER ASME Y14.36M. REQUIREMENTS PER ASME B46.1. UNLESS OTHERWISE SPECIFIED, SURFACES TO BE 125 MICROINCHES Ra.
6. BREAK SHARP EDGES .003 TO .015, UNLESS OTHERWISE SPECIFIED.
7. DIMENSIONS ARE IN INCHES.
8. DIMENSIONING AND TOLERANCING PER ANSI Y14.5-1982 (ASME PUBLICATION).
9. DO NOT USE UNASSIGNED PART NUMBERS.
10. UNLESS OTHERWISE SPECIFIED, PART INVENTORY MANUFACTURED TO PREVIOUS REVISIONS OF THE APPLICABLE DRAWING OR SPECIFICATION MAY BE PROCURED AND USED UNTIL STOCK IS DEPLETED.
11. THE PART NUMBER SHALL CONSIST OF THE BASIC PART NUMBER, FIRST DASH NUMBER DESIGNATING THE NOMINAL DIAMETER AND THE SECOND DASH NUMBER DESIGNATING THE MINIMUM GRIP IN SIXTEENTHS (.0625) OF AN INCH.

EXAMPLE OF COMPLETE PART NUMBER: **AS3659 - 4 - 14**

BASIC PART NUMBER \_\_\_\_\_

NOMINAL DIAMETER = .2500 INCHES \_\_\_\_\_

MINIMUM GRIP = .8750 INCHES

12. REVISION INDICATOR: A CHANGE BAR (I) LOCATED IN THE LEFT MARGIN IS FOR THE CONVENIENCE OF THE USER IN LOCATING AREAS WHERE TECHNICAL REVISIONS, NOT EDITORIAL CHANGES, HAVE BEEN MADE TO THE PREVIOUS ISSUE OF THIS DOCUMENT. AN (R) SYMBOL TO THE LEFT OF THE DOCUMENT TITLE INDICATES A COMPLETE REVISION OF THE DOCUMENT, INCLUDING TECHNICAL REVISIONS. CHANGE BARS AND (R) ARE NOT USED IN ORIGINAL PUBLICATIONS, NOR IN DOCUMENTS THAT CONTAIN EDITORIAL CHANGES ONLY.

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|  | <b>AEROSPACE STANDARD</b>                                                                                                             | <b>AS3659™</b><br>SHEET 5 OF 12 | <b>REV.</b><br><b>A</b> |
|                                                                                     | BOLT, MACHINE - DOUBLE HEXAGON EXTENDED<br>WASHER HEAD, DRILLED, CLOSE TOLERANCE SHANK,<br>COBALT-NICKEL ALLOY UNS R30159 260 KSI MIN |                                 |                         |

**TABLE 2 - PART NUMBER AND SHANK LENGTH DIMENSIONS FOR .1900 NOMINAL DIAMETER BOLTS**

| PART NUMBER | N MIN (GRIP) | M MAX | L           | APPROX MASS LB/100 | PART NUMBER | N MIN (GRIP) | M MAX | L           | APPROX MASS LB/100 |
|-------------|--------------|-------|-------------|--------------------|-------------|--------------|-------|-------------|--------------------|
| AS3659-3-02 | .125         | .198  | .610- .630  | .986               | AS3659-3-18 | 1.125        | 1.198 | 1.610-1.630 | 1.842              |
| AS3659-3-03 | .188         | .261  | .673- .693  | 1.040              | AS3659-3-19 | 1.188        | 1.260 | 1.672-1.692 | 1.895              |
| AS3659-3-04 | .250         | .322  | .734- .754  | 1.093              | AS3659-3-20 | 1.250        | 1.322 | 1.734-1.754 | 1.948              |
| AS3659-3-05 | .312         | .385  | .797- .817  | 1.146              | AS3659-3-21 | 1.312        | 1.384 | 1.796-1.816 | 2.002              |
| AS3659-3-06 | .375         | .448  | .860- .880  | 1.200              | AS3659-3-22 | 1.375        | 1.448 | 1.860-1.880 | 2.056              |
| AS3659-3-07 | .438         | .510  | .922- .942  | 1.253              | AS3659-3-23 | 1.438        | 1.510 | 1.922-1.942 | 2.109              |
| AS3659-3-08 | .500         | .572  | .984-1.004  | 1.306              | AS3659-3-24 | 1.500        | 1.572 | 1.984-2.004 | 2.162              |
| AS3659-3-09 | .562         | .634  | 1.046-1.066 | 1.360              | AS3659-3-25 | 1.562        | 1.634 | 2.046-2.066 | 2.216              |
| AS3659-3-10 | .625         | .698  | 1.110-1.130 | 1.414              | AS3659-3-26 | 1.625        | 1.698 | 2.110-2.130 | 2.270              |
| AS3659-3-11 | .688         | .760  | 1.172-1.192 | 1.467              | AS3659-3-27 | 1.688        | 1.760 | 2.172-2.192 | 2.323              |
| AS3659-3-12 | .750         | .822  | 1.234-1.254 | 1.520              | AS3659-3-28 | 1.750        | 1.822 | 2.234-2.254 | 2.376              |
| AS3659-3-13 | .812         | .884  | 1.296-1.316 | 1.574              | AS3659-3-29 | 1.812        | 1.884 | 2.296-2.316 | 2.430              |
| AS3659-3-14 | .875         | .948  | 1.360-1.380 | 1.628              | AS3659-3-30 | 1.875        | 1.948 | 2.360-2.380 | 2.484              |
| AS3659-3-15 | .938         | 1.010 | 1.422-1.442 | 1.681              | AS3659-3-31 | 1.938        | 2.010 | 2.422-2.442 | 2.538              |
| AS3659-3-16 | 1.000        | 1.072 | 1.484-1.504 | 1.734              | AS3659-3-32 | 2.000        | 2.072 | 2.484-2.504 | 2.591              |
| AS3659-3-17 | 1.062        | 1.134 | 1.546-1.566 | 1.788              |             |              |       |             |                    |

**TABLE 3 - PART NUMBER AND SHANK LENGTH DIMENSIONS FOR .2500 NOMINAL DIAMETER BOLTS**

| PART NUMBER | N MIN (GRIP) | M MAX | L           | APPROX MASS LB/100 | PART NUMBER | N MIN (GRIP) | M MAX | L           | APPROX MASS LB/100 |
|-------------|--------------|-------|-------------|--------------------|-------------|--------------|-------|-------------|--------------------|
| AS3659-4-02 | .125         | .206  | .715- .735  | 1.920              | AS3659-4-18 | 1.125        | 1.206 | 1.715-1.735 | 3.404              |
| AS3659-4-03 | .188         | .269  | .778- .798  | 2.013              | AS3659-4-19 | 1.188        | 1.269 | 1.778-1.798 | 3.496              |
| AS3659-4-04 | .250         | .331  | .840- .860  | 2.106              | AS3659-4-20 | 1.250        | 1.331 | 1.840-1.860 | 3.589              |
| AS3659-4-05 | .312         | .393  | .902- .922  | 2.198              | AS3659-4-21 | 1.312        | 1.393 | 1.902-1.922 | 3.682              |
| AS3659-4-06 | .375         | .456  | .965- .985  | 2.291              | AS3659-4-22 | 1.375        | 1.456 | 1.965-1.985 | 3.774              |
| AS3659-4-07 | .438         | .519  | 1.028-1.048 | 2.384              | AS3659-4-23 | 1.438        | 1.519 | 2.028-2.048 | 3.867              |
| AS3659-4-08 | .500         | .581  | 1.090-1.110 | 2.476              | AS3659-4-24 | 1.500        | 1.581 | 2.090-2.110 | 3.960              |
| AS3659-4-09 | .562         | .643  | 1.152-1.172 | 2.569              | AS3659-4-25 | 1.562        | 1.643 | 2.152-2.172 | 4.052              |
| AS3659-4-10 | .625         | .706  | 1.215-1.235 | 2.662              | AS3659-4-26 | 1.625        | 1.706 | 2.215-2.235 | 4.145              |
| AS3659-4-11 | .688         | .769  | 1.278-1.298 | 2.755              | AS3659-4-27 | 1.688        | 1.769 | 2.278-2.298 | 4.238              |
| AS3659-4-12 | .750         | .831  | 1.340-1.360 | 2.847              | AS3659-4-28 | 1.750        | 1.831 | 2.340-2.360 | 4.331              |
| AS3659-4-13 | .812         | .893  | 1.402-1.422 | 2.940              | AS3659-4-29 | 1.812        | 1.893 | 2.402-2.422 | 4.423              |
| AS3659-4-14 | .875         | .955  | 1.465-1.485 | 3.032              | AS3659-4-30 | 1.875        | 1.956 | 2.465-2.485 | 4.516              |
| AS3659-4-15 | .938         | 1.019 | 1.528-1.548 | 3.125              | AS3659-4-31 | 1.938        | 2.019 | 2.528-2.548 | 4.609              |
| AS3659-4-16 | 1.000        | 1.081 | 1.590-1.610 | 3.218              | AS3659-4-32 | 2.000        | 2.081 | 2.590-2.610 | 4.702              |
| AS3659-4-17 | 1.062        | 1.143 | 1.652-1.672 | 3.311              |             |              |       |             |                    |



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