



|                   |              |
|-------------------|--------------|
| Safety Pin Part # | Length ( A ) |
| AN416-1           | 1-1/16       |
| AN416-2           | 1-3/8        |

Hex head aircraft bolts are made of high strength type 4037 or 8740 alloy steel. They are heat treated to a minimum tensile strength of 125,000PSI, cad plated per specification QQ-P-416A

The length of a 'AN' aircraft bolt is measured from under the head to the end of the shank, the grip length is measured from under the head to the start of the thread. AN bolts are made in 1/8 – inch increments in length so that in all cases, either one or two washers can position the nut correctly. Since the shank is acting like a pin, we don't want any of the threaded part of the bolt sitting within the hole. A correct length bolt will have all of the thread section just outside the hole in the metal.

For example, an AN4-30A bolt would be;  
 AN = Aircraft Quality  
 4 = 1/4 Diameter  
 30 = 4-9/16 inch grip length  
 A = Shank is undrilled

Add ( H ) instead of ( - ) for hole in the bolt head  
 A bolt code with no ( A ) at the end of all the numbers will indicate that there is a hole in the threaded section of the bolt shank, as in the image above.

| AN #                             | AN3       | AN4   | AN5     | AN6       | AN7     | AN8     | AN9       | AN10      |
|----------------------------------|-----------|-------|---------|-----------|---------|---------|-----------|-----------|
| Diameter                         | 3/16      | 1/4   | 5/16    | 3/8       | 7/16    | 1/2     | 9/16      | 5/8       |
| Threads / inch                   | 32        | 28    | 24      | 24        | 20      | 20      | 18        | 18        |
| Spanner size                     | 3/8       | 7/16  | 1/2     | 9/16      | 5/8     | 3/4     | 7/8       | 15/16     |
| Recommended Torque (inch-pounds) | 20-25     | 50-70 | 100-140 | 160-190   | 450-500 | 480-690 | 800-1000  | 1100-1300 |
| Nut suffix                       | 3         | 4     | 5       | 6         | 7       | 8       | 9         | 10        |
| Flat washer suffix               | 10        | 416   | 516     | 616       | 716     | 816     | 916       | 1016      |
| Cotter pin size                  | AN380-2-2 |       |         | AN380-3-3 |         |         | AN380-4-4 |           |

Standard steel self-locking nylon insert nuts are prefixed with the code MS21044-N  
 Thin steel self-locking nylon insert nuts are prefixed with the code MS21083-N  
 Steel self-locking hex nuts are prefixed with the code MS21045-  
 Full hex nuts are prefixed with the code AN315-  
 Thin hex nuts (check nut) are prefixed with the code AN316-  
 Castle nuts are prefixed with the code AN310-  
 Standard flat washers (1/16" thick) are prefixed with the code AN960-  
 Thin washers will have the letter L at the end of the code (e.g. AN960-416L)

| AN #       | AN3           |                     | AN4         |                     | AN5         |                     | AN6         |                     | AN7         |                     | AN8         |                     |
|------------|---------------|---------------------|-------------|---------------------|-------------|---------------------|-------------|---------------------|-------------|---------------------|-------------|---------------------|
| Dia. Pitch | (3/16) #10-32 |                     | ¼ – 28      |                     | 5/16 – 24   |                     | 3/8 – 24    |                     | 7/16 – 20   |                     | ½ – 20      |                     |
| DASH #     | GRIP ± 1/64   | LENGTH + 1/32 -1/64 | GRIP ± 1/64 | LENGTH + 1/32 -1/64 | GRIP ± 1/64 | LENGTH + 1/32 -1/64 | GRIP ± 1/64 | LENGTH + 1/32 -1/64 | GRIP ± 1/64 | LENGTH + 1/32 -1/64 | GRIP ± 1/64 | LENGTH + 1/32 -1/64 |
| 3          | 1/16          | 15/32               | 1/16        | 15/32               |             |                     |             |                     |             |                     |             |                     |
| 4          | 1/8           | 17/32               | 1/16        | 17/32               | 1/16        | 19/32               |             |                     |             |                     |             |                     |
| 5          | 1/4           | 21/32               | 3/16        | 21/32               | 3/16        | 23/32               | 1/16        | 45/64               | 1/16        | 23/32               |             |                     |
| 6          | 3/8           | 25/32               | 5/16        | 25/32               | 5/16        | 27/32               | 3/16        | 53/64               | 3/16        | 27/32               | 1/16        | 27/32               |
| 7          | 1/2           | 29/32               | 7/16        | 29/32               | 7/16        | 31/32               | 5/16        | 61/64               | 5/16        | 31/32               | 3/16        | 31/32               |
| 10         | 5/8           | 1- 1/32             | 9/16        | 1- 1/32             | 9/16        | 1- 3/32             | 7/16        | 1- 5/64             | 7/16        | 1- 1/32             | 5/16        | 1- 1/32             |
| 11         | 3/4           | 1- 5/32             | 11/16       | 1- 5/32             | 11/16       | 1- 7/32             | 9/16        | 1-13/64             | 9-16        | 1- 7/32             | 7/16        | 1- 7/32             |
| 12         | 7/8           | 1- 9/32             | 13/16       | 1- 9/32             | 13/16       | 1-11/32             | 11/16       | 1-21/64             | 11/16       | 1-11/32             | 9/16        | 1-11/32             |
| 13         | 1             | 1-13/32             | 15/16       | 1-13/32             | 15/16       | 1-15/32             | 13/16       | 1-29/64             | 13/16       | 1-15/32             | 11/16       | 1-15/32             |
| 14         | 1- 1/8        | 1-17/32             | 1- 1/16     | 1-17/32             | 1- 1/16     | 1-19/32             | 15/16       | 1-37/64             | 15/16       | 1-19/32             | 13/16       | 1-19/32             |
| 15         | 1- 1/4        | 1-21/32             | 1- 3/16     | 1-21/32             | 1- 3/16     | 1-23/32             | 1- 1/16     | 1-45/64             | 1- 1/16     | 1-23/32             | 15/16       | 1-23/32             |
| 16         | 1- 3/8        | 1-25/32             | 1- 5/16     | 1-25/32             | 1- 5/16     | 1-27/32             | 1- 3/16     | 1-53/64             | 1- 3/16     | 1-27/32             | 1- 1/16     | 1-27/32             |
| 17         | 1- 1/2        | 1-29/32             | 1- 7/16     | 1-29/32             | 1- 7/16     | 1-31/32             | 1- 5/16     | 1-61/64             | 1- 5/16     | 1-31/32             | 1- 3/16     | 1-31/32             |
| 20         | 1- 5/8        | 2- 1/32             | 1- 9/16     | 2- 1/32             | 1- 9/16     | 2- 3/32             | 1- 7/16     | 2- 5/64             | 1- 7/16     | 2- 3/32             | 1- 5/16     | 2- 3/32             |
| 21         | 1- 3/4        | 2- 5/32             | 1-11/16     | 2- 5/32             | 1-11/16     | 2- 7/32             | 1- 9/16     | 2-13/64             | 1- 6/16     | 2- 7/32             | 1- 7/16     | 2- 7/32             |
| 22         | 1- 7/8        | 2- 9/32             | 1-13/16     | 2- 9/32             | 1-13/16     | 2-11/32             | 1-11/16     | 2-21/64             | 1-11/16     | 2-11/32             | 1- 9/16     | 2-11/32             |
| 23         | 2             | 2-13/32             | 1-15/16     | 2-13/32             | 1-15/16     | 2-15/32             | 1-13/16     | 2-29/64             | 1-13/16     | 2-15/32             | 1-11/16     | 2-15/32             |
| 24         | 2- 1/8        | 2-17/32             | 2- 1/16     | 2-17/32             | 2- 1/16     | 2-19/32             | 1-15/16     | 2-37/64             | 1-15/16     | 2-16/32             | 1-13/16     | 2-19/32             |
| 25         | 2- 1/4        | 2-21/32             | 2- 3/16     | 2-21/32             | 2- 3/16     | 2-23/32             | 2- 1/16     | 2-45/64             | 2- 1/16     | 2-23/32             | 1-15/16     | 2-23/32             |
| 26         | 2- 3/8        | 2-25/32             | 2- 5/16     | 2-25/32             | 2- 5/16     | 2-27/32             | 2- 3/16     | 2-53/64             | 2- 3/16     | 2-27/32             | 2- 1/16     | 2-27/32             |
| 27         | 2- 1/2        | 2-29/32             | 2- 7/16     | 2-29/32             | 2- 7/16     | 2-31/32             | 2- 5/16     | 2-61/64             | 2- 5/16     | 2-31/32             | 2- 3/16     | 2-31/32             |
| 30         | 2- 5/8        | 3- 1/32             | 2- 9/16     | 3- 1/32             | 2- 9/16     | 3- 3/32             | 2- 7/16     | 3- 5/64             | 2- 7/16     | 3- 3/32             | 2- 5/16     | 3- 3/32             |
| 31         | 2- 3/4        | 3- 5/32             | 2-11/16     | 3- 5/32             | 2-11/16     | 3- 7/32             | 2- 9/16     | 3-13/64             | 2- 9/16     | 3- 7/32             | 2- 7/16     | 3- 7/32             |
| 32         | 2- 7/8        | 3- 9/32             | 2-13/16     | 3- 9/32             | 2-13/16     | 3-11/32             | 2-11/16     | 3-21/64             | 2-11/16     | 3-11/32             | 2- 9/16     | 3-11/32             |
| 33         | 3             | 3-13/32             | 2-15/16     | 3-13/32             | 2-15/16     | 3-15/32             | 2-13/16     | 3-29/64             | 2-13/16     | 3-15/32             | 2-11/16     | 3-15/32             |
| 34         | 3- 1/8        | 3-17/32             | 3- 1/16     | 3-17/32             | 3- 1/16     | 3-19/32             | 2-15/16     | 3-37/64             | 2-15/16     | 3-19/32             | 2-13/16     | 3-19/32             |
| 35         | 3- 1/4        | 3-21/32             | 3- 3/16     | 3-21/32             | 3- 3/16     | 3-23/32             | 3- 1/16     | 3-45/64             | 3- 1/16     | 3-23/32             | 2-15/16     | 3-23/32             |
| 36         | 3- 3/8        | 3-25/32             | 3- 5/16     | 3-25/32             | 3- 5/16     | 3-27/32             | 3- 3/16     | 3-53/64             | 3- 3/16     | 3-27/32             | 3- 1/16     | 3-27/32             |
| 37         | 3- 1/2        | 3-29/32             | 3- 7/16     | 3-29/32             | 3- 7/16     | 3-31/32             | 3- 5/16     | 3-61/64             | 3- 5/16     | 3-31/32             | 3- 3/16     | 3-31/32             |
| 40         | 3- 5/8        | 4- 1/32             | 3- 9/16     | 4- 1/32             | 3- 9/16     | 4- 3/32             | 3- 7/16     | 4- 5/64             | 3- 7/16     | 4- 3/32             | 3- 5/16     | 4- 3/32             |
| 41         | 3- 3/4        | 4- 5/32             | 3-11/16     | 4- 5/32             | 3-11/16     | 4- 7/32             | 3- 6/16     | 4-13/64             | 3- 9/16     | 4- 7/32             | 3- 7/16     | 4- 7/32             |
| 42         | 3- 7/8        | 4- 9/32             | 3-13/16     | 4- 9/32             | 3-13/16     | 4-11/32             | 3-11/16     | 4-21/64             | 3-11/16     | 4-11/32             | 3- 9/16     | 4-11/32             |
| 43         | 4             | 4-13/32             | 3-15/16     | 4-13/32             | 3-15/16     | 4-15/32             | 3-13/16     | 4-29/64             | 3-13/16     | 4-15/32             | 3-11/16     | 4-15/32             |
| 44         | 4- 1/8        | 4-17/32             | 4- 1/16     | 4-17/32             | 4- 1/16     | 4-19/32             | 3-15/16     | 4-37/64             | 3-15/16     | 4-19/32             | 3-13/16     | 4-19/32             |
| 45         | 4- 1/4        | 4-21/32             | 4- 3/16     | 4-21/32             | 4- 3/16     | 4-23/32             | 4- 1/16     | 4-45/64             | 4- 1/16     | 4-23/32             | 3-15/16     | 4-23/32             |
| 46         | 4- 3/8        | 4-25/32             | 4- 5/16     | 4-25/32             | 4- 5/16     | 4-27/32             | 4- 3/16     | 4-53/64             | 4- 3/16     | 4-27/32             | 4- 1/16     | 4-27/32             |
| 47         | 4- 1/2        | 4-29/32             | 4- 7/16     | 4-29/32             | 4- 7/16     | 4-31/32             | 4- 5/16     | 4-61/64             | 4- 5/16     | 4-31/32             | 4- 3/16     | 4-31/32             |
| 50         | 4- 5/8        | 5- 1/32             | 4- 9/16     | 5- 1/32             | 4- 9/16     | 5- 3/32             | 4- 7/16     | 5- 5/64             | 4- 7/16     | 5- 3/32             | 4- 5/16     | 5- 3/32             |
| 51         | 4- 3/4        | 5- 5/32             | 4-11/16     | 5- 5/32             | 4-11/16     | 5- 7/32             | 4- 9/16     | 5-13/64             | 4- 9/16     | 5- 7/32             | 4- 7/16     | 5- 7/32             |
| 52         | 4- 7/8        | 5- 9/32             | 4-13/16     | 5- 9/32             | 4-13/16     | 5-11/32             | 4-11/16     | 5-21/64             | 4-11/16     | 5-11/32             | 4- 9/16     | 5-11/32             |
| 53         | 5             | 5-13/32             | 4-15/16     | 5-13/32             | 4-15/16     | 5-15/32             | 4-13/16     | 5-19/64             | 4-13/16     | 5-15/32             | 4-11/16     | 5-15/32             |
| 54         | 5- 1/8        | 5-17/32             | 5- 1/16     | 5-17/32             | 5- 1/16     | 5-19/32             | 4-15/16     | 5-37/64             | 4-15/16     | 5-19/32             | 4-13/16     | 5-19/32             |
| 55         | 5- 1/4        | 5-21/32             | 5- 3/16     | 5-21/32             | 5- 3/16     | 5-23/32             | 5- 1/16     | 5-45/64             | 5- 1/16     | 5-23/32             | 4-15/16     | 5-23/32             |
| 56         | 5- 3/8        | 5-25/32             | 5- 5/16     | 5-25/32             | 5- 5/16     | 5-27/32             | 5- 3/16     | 5-53/64             | 5- 3/16     | 5-27/32             | 5- 1/16     | 5-27/32             |
| 57         | 5- 1/2        | 5-29/32             | 5- 7/16     | 5-29/32             | 5- 7/16     | 5-31/32             | 5- 5/16     | 5-61/64             | 5- 5/16     | 5-31/32             | 5- 3/16     | 5-31/32             |
| 60         | 5- 5/8        | 6- 1/32             | 5- 9/16     | 6- 1/32             | 5- 9/16     | 6- 3/32             | 5- 7/16     | 6- 5/64             | 5- 7/16     | 6- 3/32             | 5- 5/16     | 6- 3/32             |
| 61         | 5- 3/4        | 6- 5/32             | 5-11/16     | 6- 5/32             | 5-11/16     | 6- 7/32             | 5- 9/16     | 6-13/64             | 5- 9/16     | 6- 7/32             | 5- 7/16     | 6- 7/32             |
| 62         | 5- 7/8        | 6- 9/32             | 5-13/16     | 6- 9/32             | 5-13/16     | 6-11/32             | 5-11/16     | 6-21/64             | 5-11/16     | 6-11/32             | 5- 9/16     | 6-11/32             |
| 63         | 6             | 6-13/32             | 5-15/16     | 6-13/32             | 5-15/16     | 6-15/32             | 5-13/16     | 6-19/64             | 5-13/16     | 6-15/32             | 5-11/16     | 6-15/32             |
| 64         | 6- 1/8        | 6-17/32             | 6- 1/16     | 6-17/32             | 6- 1/16     | 6-19/32             | 5-15/16     | 6-37/64             | 5-15/16     | 6-19/32             | 5-13/16     | 6-19/32             |
| 65         | 6- 1/4        | 6-21/32             | 6- 3/16     | 6-21/32             | 6- 3/16     | 6-23/32             | 6- 1/16     | 6-45/64             | 6- 1/16     | 6-23/32             | 5-15/16     | 6-23/32             |
| 66         | 6- 3/8        | 6-25/32             | 6- 5/16     | 6-25/32             | 6- 5/16     | 6-27/32             | 6- 3/16     | 6-53/64             | 6- 3/16     | 6-27/32             | 6- 1/16     | 6-27/32             |
| 67         | 6- 1/2        | 6-29/32             | 6- 7/16     | 6-29/32             | 6- 7/16     | 6-31/32             | 6- 5/16     | 6-61/64             | 6- 5/16     | 6-31/32             | 6- 3/16     | 6-31/32             |
| 70         | 6- 5/8        | 7- 1/32             | 6- 9/16     | 7- 1/32             | 6- 9/16     | 7- 3/32             | 6- 7/16     | 7- 5/64             | 6- 7/16     | 7- 3/32             | 6- 5/16     | 7- 3/32             |
| 71         | 6- 3/4        | 7- 5/32             | 6-11/16     | 7- 5/32             | 6-11/16     | 7- 7/32             | 6- 9/16     | 7-13/64             | 6- 9/16     | 7- 7/32             | 6- 7/16     | 7- 7/32             |
| 72         | 6- 7/8        | 7- 9/32             | 6-13/16     | 7- 9/32             | 6-13/16     | 7-11/32             | 6-11/16     | 7-21/64             | 6-11/16     | 7-11/32             | 6- 9/16     | 7-11/32             |
| 73         | 7             | 7-13/32             | 6-15/16     | 7-13/32             | 6-15/16     | 7-15/32             | 6-13/16     | 7-19/64             | 6-13/16     | 7-15/32             | 6-11/16     | 7-15/32             |
| 74         | 7- 1/8        | 7-17/32             | 7- 1/16     | 7-17/32             | 7- 1/16     | 7-19/32             | 6-15/16     | 7-37/64             | 6-15/16     | 7-19/32             | 6-13/16     | 7-19/32             |
| 75         | 7- 1/4        | 7-21/32             | 7- 3/16     | 7-21/32             | 7- 3/16     | 7-23/32             | 7- 1/16     | 7-45/64             | 7- 1/16     | 7-23/32             | 6-15/16     | 7-23/32             |
| 76         | 7- 3/8        | 7-25/32             | 7- 5/16     | 7-25/32             | 7- 5/16     | 7-27/32             | 7- 3/16     | 7-53/64             | 7- 3/16     | 7-27/32             | 7- 1/16     | 7-27/32             |
| 77         | 7- 1/2        | 7-29/32             | 7- 7/16     | 7-29/32             | 7- 7/16     | 7-31/32             | 7- 5/16     | 7-61/64             | 7- 5/16     | 7-31/32             | 7- 3/16     | 7-31/32             |
| 80         | 7- 5/8        | 8- 1/32             | 7- 9/16     | 8- 1/32             | 7- 9/16     | 8- 3/32             | 7- 7/16     | 8- 5/64             | 7- 7/16     | 8- 3/32             | 7- 5/16     | 8- 3/32             |