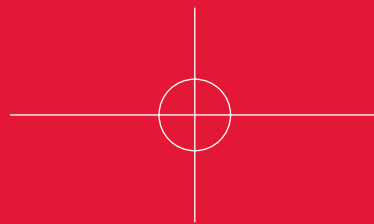




CHERRYLOCK® BLIND RIVET



CHERRY®
AEROSPACE

LIMITED WARRANTY

Seller warrants the goods conform to applicable specifications and drawings and will be manufactured and inspected according to generally accepted practices of companies manufacturing industrial or aerospace fasteners. In the event of any breach of the foregoing warranty, Buyer's sole remedy shall be to return defective goods (after receiving authorization from Seller) for replacement or refund of the purchase price, at the Seller's option. Seller agrees to any freight costs in connection with the return of any defective goods, but any costs relating to removal of the defective or nonconforming goods or installation of replacement goods shall be Buyer's responsibility. SELLER'S WARRANTY DOES NOT APPLY WHEN ANY PHYSICAL OR CHEMICAL CHANGE IN THE FORM OF THE PRODUCT IS MADE BY BUYER. THE FOREGOING EXPRESS WARRANTY AND REMEDY ARE EXCLUSIVE AND ARE IN LIEU OF ALL OTHER WARRANTIES AND REMEDIES; ANY IMPLIED WARRANTY AS TO QUALITY, FITNESS FOR PURPOSE, OR MERCHANTABILITY IS HEREBY SPECIFICALLY DISCLAIMED AND EXCLUDED BY SELLER. This warranty is void if seller is not notified in writing of any rejection of the goods within one (1) Year after initial use by buyer of any power Riveter or ninety (90) days after initial use of any other product.

Seller shall not be liable under any circumstances for incidental, special or consequential damages arising in whole or in part from any breach by Seller, AND SUCH INCIDENTAL, SPECIAL, OR CONSEQUENTIAL DAMAGES ARE HEREBY EXPRESSLY EXCLUDED.

Our policy is one of continuous development. Specifications shown in this document may be subject to changes introduced after publication.

CHERRY®, Cherrylock® and MAXIBOLT® are trademarks of Cherry Aerospace.

NOTE

The properties, strengths, dimensions, installed characteristics and all other information in this catalog is for guidance only to aid in the correct selection of the products described herein and is not intended or implied as part of the warranty. All applications should be evaluated for functional suitability and available samples of the described parts can be requested for installed tests, suitability and evaluations.

ATTENTION:

Important: Blind fasteners are not always interchangeable with non-blind fasteners. Consult with the aircraft original equipment manufacturer for proper application of this product.



CHERRY®
AEROSPACE

BULBED CHERRYLOCK® RIVETS

Rivet Selection

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BULBED CHERRYLOCK® RIVET

RIVET SELECTION

Bulbed CherryLOCK® rivets are locked spindle and flush fracturing structural rivets. They conform to Procurement Specification NAS1740 and Standards Pages NAS1738 and NAS1739.

The bulbed CherryLOCK® rivet is a complete shear fastening system. Its features can be utilized for optimum strength and performance in both thick and thin sheets.

It provides the highest possible design integrity, particularly in double dimple or high vibration areas.

All fasteners should be specified and used in accordance with manufacturer's recommendations, using the grip range and hole size information provided in this catalog.



BULBED CHERRYLOCK® DESIGN FEATURES

- **Large Bulbed Blind Head**
Similar to a solid rivet
Ensures higher tensile, shear and fatigue strengths
- **Steel and Inconel Stem**
High stem break load provides high preload
Higher fatigue strength
- **High Sheet Clamp-Up**
Increased fatigue strength
- **Oversize Shank**
Higher shear strength
Lower flush head height for use in thin sheets
- **Predictable Hole Fill**
Meets requirements of NAS1740
- **Mechanical Locked Stem**
Assured structural reliability in blind and non-blind applications
Exceeds fatigue requirements of NAS1740
- **Genuine Flush Fracturing Spindle**
No shaving, even in thin sheet applications
- **Head Marking**
Grip, materials and manufacturer's identification for installed inspection
- **Self-Inspecting** (per NAS requirements)

INSTALLATION SEQUENCE

- 1. Before pulling begins.**

Labels: stem, rivet head, locking collar, sheet gap, rivet sleeve, shear ring.
- 2. Stem is pulled into rivet sleeve and starts to form bulbed blind head.**

Labels: Clamp-up and hole fill action begin.
- 3. Clamp-up completed as stem continues to bulb out blind head.**

Labels: rivet head firmly seated, bulb head is formed below minimum grip.
- 4. Formation of blind head and hole filling are completed. Shear ring now shears from stem cone to pull further into rivet.**

Labels: shear ring guarantees blind side bulbed head.
- 5. Shear ring has moved down stem cone until pulling head automatically stops stem break notch flush with top of rivet head.**

Labels: locking collar is now ready to be inserted, blind side bulbed head.

(In minimum grip shear ring may not shear)
- 6. Completely installed Bulbed CherryLOCK® rivet**

Labels: Pulling head has inserted locking collar and stem has fractured flush with rivet head, maximum grip illustrated.

BULBED CHERRYLOCK® RIVET

RIVET SELECTION

NUMBERING SYSTEM

NAS1738 B 5 -4

Maximum Grip Length in 16ths of an inch (-4 = $4/16" = .250$)

Shank Diameter -4(.140), -5(.173), -6(.201)

Rivet Type & Material Combination

Head Style:

Odd number = Countersink
Even number = Protruding

NAS Number

CR® 2249 -5 -04

Maximum Grip Length in 16ths of an inch (-04 = $4/16" = .250$)

Shank Diameter -4(.140), -5(.173), -6(.201)

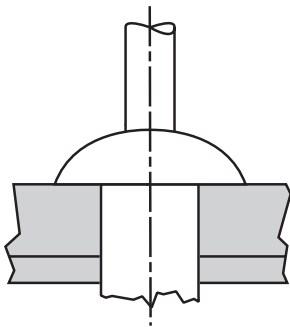
Head Style

Odd number = Protruding
Even number = Countersink

Rivet Type & Material Combination

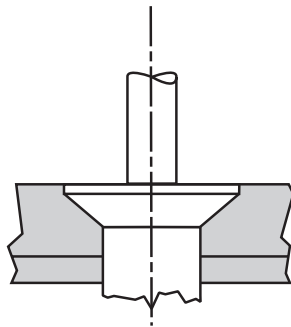
Cherry Number

HEAD STYLES



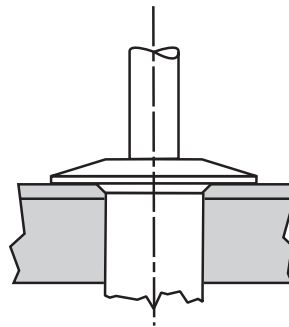
**Universal
(MS20470)**

For protruding head applications



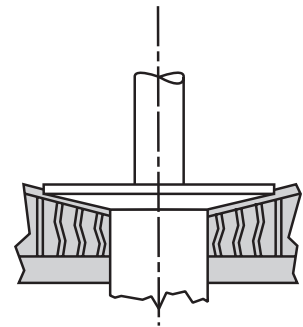
**100° Countersunk
(MS20426)**

For countersunk applications



Unisink

A combination flush and protruding head for use in very thin top sheets. Eliminates need for double-dimpling. Not covered by NAS Standard.



156° Countersunk

A large diameter, shallow countersunk head providing a wide bearing area for honeycomb applications. Not covered by NAS Standard.

DIAMETERS

Bulbed CherryLOCK® rivets are available in three diameters: -4(.140), -5(.173) and -6(.201).

Bulbed CherryLOCK® rivet sleeve is $1/64"$ over nominal size. In most cases, the increased bearing area and high strength stem enables excellent performance in double-dimple and thin sheet applications.

NOTE: Standard drills are used to prepare installation holes.

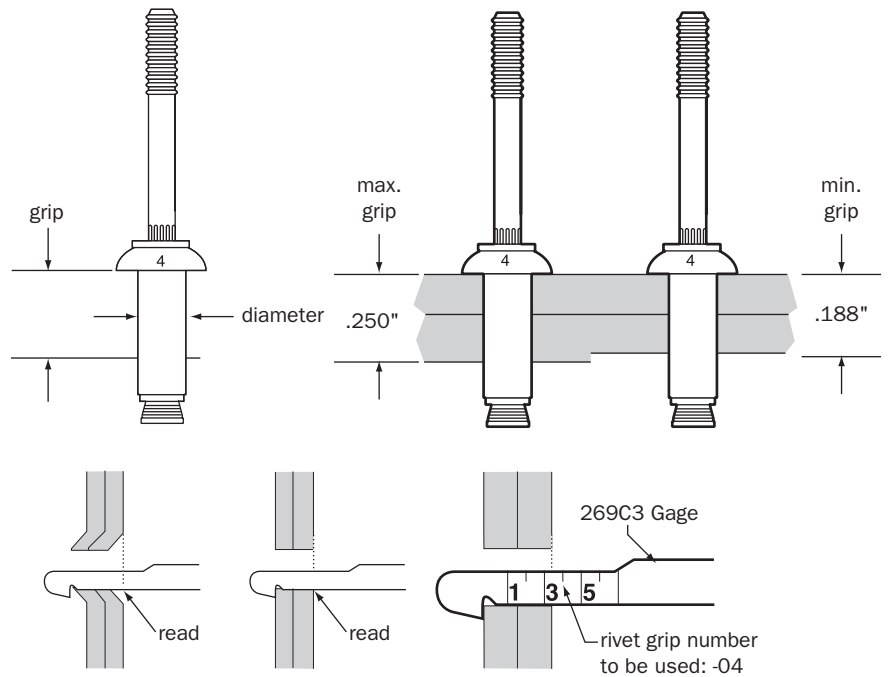
BULBED CHERRYLOCK® RIVET

RIVET SELECTION

GRIP LENGTHS

Grip length refers to the maximum total sheet thickness to be riveted and is measured in 16ths of an inch. This is identified by the second dash number. All CherryLOCK® rivets have their grip length (maximum grip) marked on the rivet head, and have a total grip range of 1/16 of an inch (example: -04 grip rivet has a grip range of .188" to .250").

To determine the proper grip rivet to use, measure the material thickness with a 269C3 selector gage as shown at right. To find the rivet grip number, determine the total thickness of the material to be fastened; locate between minimum and maximum columns on material thickness chart. Read directly across to right to find grip number.



Head Height – Countersunk Bulbed CherryLOCK® Rivets

| Rivet Head | Height in Inches |
|------------|------------------|
| 1/8" | .035 |
| 5/32" | .047 |
| 3/16" | .063 |

| Grip No. | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Minimum | * | * | 0.125 | 0.187 | 0.250 | 0.312 | 0.375 | 0.437 | 0.500 | 0.562 | 0.625 | 0.687 | 0.750 | 0.812 | 0.875 | 0.937 |
| Maximum | 0.063 | 0.125 | 0.187 | 0.250 | 0.312 | 0.375 | 0.437 | 0.500 | 0.562 | 0.625 | 0.687 | 0.750 | 0.812 | 0.875 | 0.937 | 1.000 |

*See Standards pages.

NOTE: For double-dimpled sheets, add the appropriate countersink rivet head height to material thickness.

MATERIALS

Bulbed CherryLOCK® rivets are manufactured in a variety of materials in order to give the user the widest possible choice for optimum design.

| Materials | | Ultimate Shear Strength | Maximum Temperature (°F) |
|---------------|-------------|-------------------------|--------------------------|
| Sleeve | Stem | | |
| 5056 ALUMINUM | ALLOY STEEL | 50,000 psi | 250 |
| 5056 ALUMINUM | INCONEL 600 | 50,000 psi | 250 |
| MONEL | INCONEL 600 | 75,000 psi | 900 |
| INCONEL 600 | A-286 CRES | 75,000 psi | 1400 |

All measurements are at room temperature.

BULBED CHERRYLOCK® RIVET

RIVET SELECTION

STRENGTH

Minimum ultimate rivet shear and tensile strength (lbs.)
per NAS 1740. Test method per NASM1312 -8 and -20.

ATTENTION: Blind rivets are not always a suitable substitute for solid rivets. Maintenance personnel are reminded that AC 43.13-1A chapter 2, section 3 stipulates: "Do not substitute hollow rivets for solid rivets in load carrying members without specific approval of the application by a representative of the Federal Aviation Administration. Blind rivets may be used in blind locations in accordance with the conditions listed in Chapter 5, provided the edge distances and spacings are not less than the minimum listed in paragraph 99d."

| Bulbed CherryLOCK® Rivets | | Single Shear | | | Tensile | | |
|------------------------------|--------|--------------|-------|-------|---------|-------|-------|
| | | 1/8" | 5/32" | 3/16" | 1/8" | 5/32" | 3/16" |
| Aluminum | CR2235 | 619 | 935 | 1260 | 345 | 530 | 710 |
| | CR2238 | | | | | | |
| | CR2239 | | | | | | |
| | CR2245 | | | | | | |
| | CR2248 | | | | | | |
| | CR2249 | | | | | | |
| Monel | CR2538 | 895 | 1353 | 1823 | 490 | 740 | 1000 |
| | CR2539 | | | | | | |
| | CR2540 | | | | | | |
| | CR2545 | | | | | | |
| CRES | CR2838 | 1221 | 1845 | 2488 | 570 | 860 | 1160 |
| | CR2839 | | | | | | |
| | CR2840 | | | | | | |

| Solid Rivets | Single Shear | | |
|-----------------|--------------|-------|-------|
| | 1/8" | 5/32" | 3/16" |
| 2117-T3 | 388 | 596 | 862 |
| 2017-T3 | 494 | 755 | 1090 |
| 2024-T31 | 531 | 815 | 1180 |
| 5056 | 363 | 556 | 802 |
| Monel | 635 | 973 | 1400 |
| A-286 | 1170 | 1790 | 2580 |


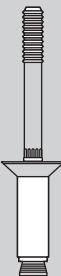

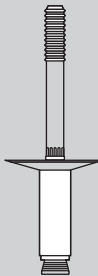
NOTE: Values shown are fastener capabilities only. Consult MIL-Handbook-5 for joint design allowances.

INSTALLED WEIGHTS Pounds per 1000 pieces (Ref.)

| DASH NUMBER | 2235 2245 | 2238 2248 | 2239 2249 | 2538P 2538 | 2539P 2539 | 2540 | 2545 | 2838 | 2839 | 2840 | 2845 |
|----------------|--------------|--------------|--------------|---------------|---------------|-------|------|------|-------|-------|------|
| 4-01 | 0.74 | 0.69 | 0.88 | 1.09 | 1.41 | 1.50 | 1.30 | 1.10 | 1.50 | 1.60 | 1.39 |
| 4-02 | 0.91 | 0.87 | 1.06 | 1.38 | 1.70 | 1.79 | 1.59 | 1.39 | 1.79 | 1.89 | 1.68 |
| 4-03 | 1.09 | 1.05 | 1.24 | 1.67 | 1.99 | 2.08 | 1.88 | 1.68 | 2.08 | 2.18 | 1.97 |
| 4-04 | 1.27 | 1.23 | 1.42 | 1.96 | 2.28 | 2.37 | 2.16 | 1.97 | 2.37 | 2.47 | 2.25 |
| 4-05 | 1.44 | 1.41 | 1.60 | 2.25 | 2.57 | 2.66 | 2.45 | 2.26 | 2.66 | 2.76 | 2.54 |
| 4-06 | — | 1.59 | 1.78 | 2.54 | 2.86 | 2.95 | — | 2.55 | 2.95 | 3.05 | — |
| 4-07 | — | 1.77 | 1.96 | 2.83 | 3.15 | 3.24 | — | 2.84 | 3.24 | 3.34 | — |
| 4-08 | — | 1.95 | 2.14 | 3.12 | 3.44 | 3.53 | — | 3.13 | 3.53 | 3.63 | — |
| 4-09 | — | 2.13 | 2.32 | 3.41 | 3.73 | 3.82 | — | 3.42 | 3.82 | 3.92 | — |
| 5-01 | 1.24 | — | 1.48 | — | 2.46 | — | 2.43 | — | 2.70 | — | 2.67 |
| 5-02 | 1.52 | 1.46 | 1.76 | 2.38 | 2.91 | 3.60 | 2.86 | 2.40 | 3.13 | 3.50 | 3.08 |
| 5-03 | 1.81 | 1.74 | 2.04 | 2.83 | 3.36 | 4.05 | 3.30 | 2.83 | 3.56 | 3.93 | 3.50 |
| 5-04 | 2.08 | 2.02 | 2.32 | 3.28 | 3.81 | 4.50 | 3.73 | 3.26 | 3.99 | 4.35 | 3.91 |
| 5-05 | 2.35 | 2.30 | 2.60 | 3.73 | 4.26 | 4.95 | 4.17 | 3.69 | 4.42 | 4.79 | 4.53 |
| 5-06 | 2.63 | 2.58 | 2.88 | 4.18 | 4.71 | 5.40 | 4.62 | 4.12 | 4.85 | 5.22 | 4.76 |
| 5-07 | — | 2.86 | 3.16 | 4.63 | 5.16 | 5.85 | — | 4.55 | 5.28 | 5.65 | — |
| 5-08 | — | 3.14 | 3.44 | 5.08 | 5.61 | 6.30 | — | 4.98 | 5.71 | 6.08 | — |
| 5-09 | — | 3.42 | 3.72 | 5.53 | 6.06 | 6.75 | — | 5.41 | 6.14 | 6.51 | — |
| 5-10 | — | 3.70 | 4.00 | 5.98 | 6.51 | 7.20 | — | 5.84 | 6.57 | 6.94 | — |
| 5-11 | — | 3.98 | 4.28 | 6.43 | 6.96 | 7.65 | — | 6.27 | 7.00 | 7.37 | — |
| 6-01 | 2.00 | — | 2.47 | — | 3.97 | — | 4.18 | — | 4.30 | — | 4.51 |
| 6-02 | 2.38 | 2.47 | 2.85 | 3.97 | 4.59 | 5.90 | 4.78 | 3.70 | 4.89 | 5.60 | 5.08 |
| 6-03 | 2.77 | 2.85 | 3.24 | 4.59 | 5.21 | 6.52 | 5.39 | 4.29 | 5.48 | 6.19 | 5.66 |
| 6-04 | 3.15 | 3.24 | 3.62 | 5.21 | 5.83 | 7.14 | 6.00 | 4.88 | 6.07 | 6.78 | 6.24 |
| 6-05 | 3.53 | 3.62 | 4.01 | 5.83 | 6.45 | 7.76 | 6.60 | 5.47 | 6.66 | 7.37 | 6.81 |
| 6-06 | 3.90 | 4.01 | 4.39 | 6.45 | 7.07 | 8.38 | 7.20 | 6.06 | 7.25 | 7.95 | 7.38 |
| 6-07 | 4.29 | 4.39 | 4.78 | 7.07 | 7.69 | 9.00 | 7.80 | 6.65 | 7.84 | 8.55 | 7.95 |
| 6-08 | 4.68 | 4.78 | 5.16 | 7.69 | 8.31 | 9.62 | 8.41 | 7.24 | 8.43 | 9.14 | 8.53 |
| 6-09 | — | 5.17 | 5.54 | 8.31 | 8.93 | 10.24 | — | 7.83 | 9.02 | 9.73 | — |
| 6-10 | — | 5.55 | 5.93 | 8.93 | 9.55 | 10.86 | — | 8.42 | 9.61 | 10.32 | — |
| 6-11 | — | 5.94 | 6.31 | 9.55 | 10.17 | 11.48 | — | 9.01 | 10.20 | 10.91 | — |
| 6-12 | — | 6.32 | 6.70 | 10.17 | 10.79 | 12.10 | — | 9.60 | 10.79 | 11.50 | — |

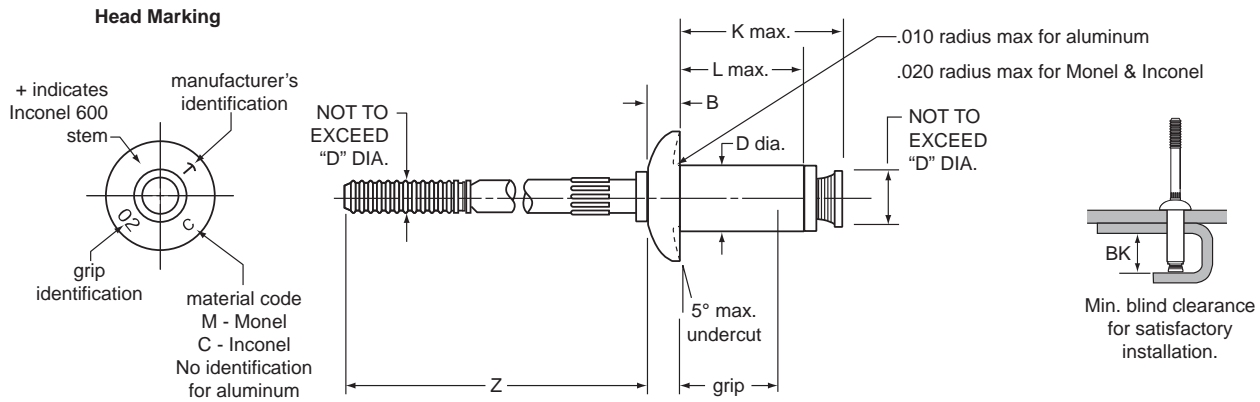
BULBED CHERRYLOCK® RIVET

CONVERSION TABLE

| Head Style | NAS Number | Cherry Number | Rivet Material | Stem Material |
|--|------------|---------------|--------------------------|--------------------------|
| Universal Head (MS20470)  | NAS1738B | CR2249 | 5056 Aluminum | Alloy Steel, Cad. Plt'd. |
| | NAS1738E | CR2239 | 5056 Aluminum | Inconel 600 |
| | NAS1738M | CR2539 | Monel | Inconel 600 |
| | NAS1738MW | CR2539P | Monel, Cad. Plt'd. | Inconel 600 |
| | NAS1738C | CR2839 | Inconel 600 | A-286 CRES |
| | NAS1738CW | CR2839CW | Inconel 600, Cad. Plt'd. | A-286 CRES |
| | | | | |
| Countersunk Head (MS20426)  | NAS1739B | CR2248 | 5056 Aluminum | Alloy Steel, Cad. Plt'd. |
| | NAS1739E | CR2238 | 5056 Aluminum | Inconel 600 |
| | NAS1739M | CR2538 | Monel | Inconel 600 |
| | NAS1739MW | CR2538P | Monel, Cad. Plt'd. | Inconel 600 |
| | NAS1739C | CR2838 | Inconel 600 | A-286 CRES |
| | NAS1739CW | CR2838CW | Inconel 600, Cad. Plt'd. | A-286 CRES |
| | | | | |
| Unisink Head  | — | CR2235 | 5056 Aluminum | Inconel 600 |
| | — | CR2245 | 5056 Aluminum | Alloy Steel, Cad. Plt'd. |
| | — | CR2545 | Monel | Inconel 600 |
| | — | CR2845 | Inconel 600 | A-286 CRES |
| | | | | |
| Countersunk Head (156°)  | — | CR2540 | Monel | Inconel 600 |
| | — | CR2840 | Inconel 600 | A-286 CRES |
| | | | | |

BULBED CHERRYLOCK® RIVET

NAS1738 UNIVERSAL HEAD



Procurement Specification NAS1740 is applicable to NAS1738 rivets

TABLE A

| Dia. Dash No. | Dia. +.003 -.001 | A ±.010 | B +.010 -.000 | BK | | Z (REF) |
|---------------------|------------------------|------------|---------------------|----------|--------------------|------------|
| | | | | Aluminum | Monel & Inconel | |
| -4 | .140 | .250 | .054 | .30 | .33 | 1.65 |
| -5 | .173 | .312 | .067 | .33 | .37 | 1.63 |
| -6 | .201 | .375 | .080 | .37 | .41 | 1.65 |

| Rivet Diameter | - .01 Minimum Grip |
|-------------------|--------------------------|
| 1/8 | .020 |
| 5/32 | .025 |
| 3/16 | .030 |

Rivet Group A

| Grip Limits 1/16" Range | | 1/8" Diameter | | | 5/32" Diameter | | | 3/16" Diameter | | |
|----------------------------|------|---------------|------|-----|----------------|------|------|----------------|------|------|
| | | Dash No. | L | K | Dash No. | L | K | Dash no. | L | K |
| SEE TABLE A | .062 | 4-01 | .230 | .38 | 5-01 | .250 | .42 | 6-01 | .281 | .45 |
| .063 | .125 | 4-02 | .281 | .44 | 5-02 | .312 | .48 | 6-02 | .344 | .51 |
| .126 | .187 | 4-03 | .344 | .50 | 5-03 | .375 | .54 | 6-03 | .406 | .58 |
| .188 | .250 | 4-04 | .406 | .57 | 5-04 | .437 | .60 | 6-04 | .469 | .64 |
| .251 | .312 | 4-05 | .469 | .63 | 5-05 | .500 | .67 | 6-05 | .531 | .70 |
| .313 | .375 | 4-06 | .531 | .69 | 5-06 | .562 | .73 | 6-06 | .594 | .76 |
| .376 | .437 | 4-07 | .594 | .75 | 5-07 | .625 | .79 | 6-07 | .656 | .83 |
| .438 | .500 | 4-08 | .656 | .82 | 5-08 | .687 | .85 | 6-08 | .719 | .89 |
| .501 | .562 | 4-09 | .719 | .88 | 5-09 | .750 | .92 | 6-09 | .782 | .95 |
| .563 | .625 | — | — | — | 5-10 | .812 | .98 | 6-10 | .844 | 1.02 |
| .626 | .687 | — | — | — | 5-11 | .875 | 1.04 | 6-11 | .907 | 1.08 |
| .688 | .750 | — | — | — | — | — | — | 6-12 | .970 | 1.14 |

| Rivet Number | NAS 523 Code | Material * | | | Finish | | |
|-----------------------|-----------------|-------------------------|-------------------------|-------------------------|---------------------------------------|---------------------------------------|-----------|
| | | Sleeve | Stem | Lock Ring | Rivet | Stem | Lock Ring |
| CR2239 NAS1738E | AAP | 5056 QQ-A-430 | INCONEL 600 AMS 5665 | MONEL QQ-N-281 | MIL-C-5541 | NONE | NONE |
| CR2249 NAS1738B | AAO | 5056 QQ-A-430 | 8740 STEEL AMS 6322 | MONEL QQ-N-281 | MIL-C-5541 | CAD PLATE QQ-P-416 TYPE II CLASS 2 | NONE |
| CR2539 NAS1738M | AAR | MONEL QQ-N-281 | INCONEL 600 AMS 5665 | MONEL QQ-N-281 | NONE | NONE | NONE |
| CR2539P NAS1738MW | AAS | MONEL QQ-N-281 | INCONEL 600 AMS 5665 | MONEL QQ-N-281 | CAD PLATE QQ-P-416 TYPE II CLASS 2 | NONE | NONE |
| CR2839 NAS1738C | ADB | INCONEL 600 AMS 5687 | A-286 CRES AMS 5732 | INCONEL 600 AMS 5687 | NONE | PASSIVATE PER AMS 2700 | NONE |
| CR2839CW NAS1738CW | AVP | INCONEL 600 AMS 5687 | A-286 CRES AMS 5732 | INCONEL 600 AMS 5687 | CAD PLATE QQ-P-416 TYPE II CLASS 2 | PASSIVATE PER AMS 2700 | NONE |

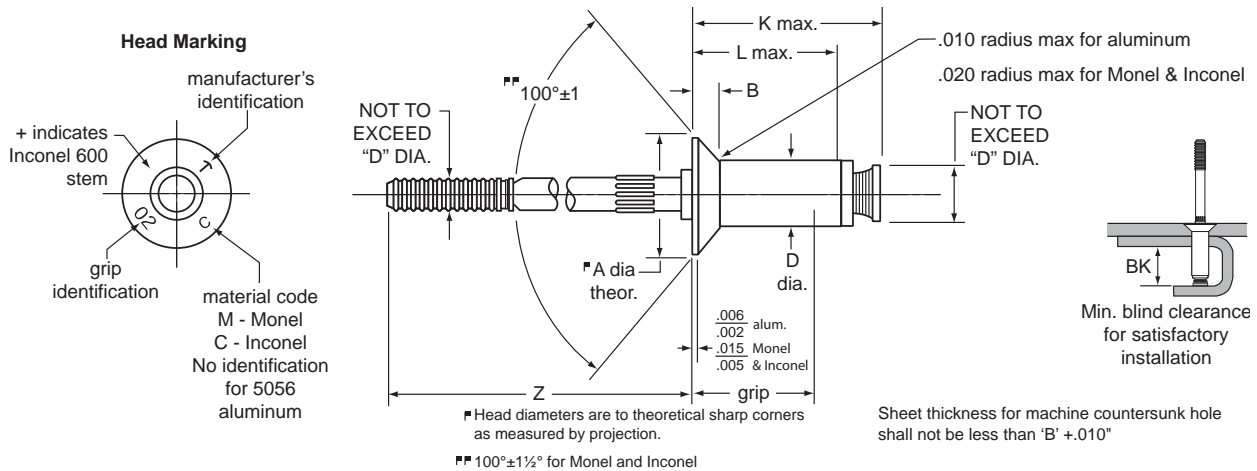
* For chemical composition only

NOTE: Do not clean or degrease prior to installation. All of the rivets above may be lubricated in accordance with NAS 1740. Do not remove lubricant prior to installation.

DESIGN NOTE: Rivets with grips greater than their diameter are not required to meet expansion requirements of procurement specification. NAS1398 rivets will provide more positive hole fill for longer grips.

BULBED CHERRYLOCK® RIVET

NAS1739 COUNTERSUNK HEAD



Procurement Specification NAS1740 is applicable to NAS1739 rivets

| Dia. Dash No. | Dia. +.003 -.001 | A ±.004 | B (Ref) | BK | | Z (REF) |
|---------------------|------------------------|------------|------------|----------|--------------------|------------|
| | | | | Aluminum | Monel & Inconel | |
| -4 | .140 | .225 | .035 | .30 | .33 | 1.62 |
| -5 | .173 | .286 | .047 | .33 | .37 | 1.57 |
| -6 | .201 | .353 | .063 | .37 | .41 | 1.59 |

| Grip Limits 1/16" Range | | 1/8" Diameter | | | 5/32" Diameter | | | 3/16" Diameter | | |
|----------------------------|------|---------------|------|-----|----------------|------|------|----------------|------|------|
| | | Dash No. | L | K | Dash No. | L | K | Dash No. | L | K |
| .045 | .062 | 4-01 | .230 | .38 | — | — | — | — | — | — |
| .063 | .125 | 4-02 | .281 | .44 | 5-02 | .312 | .48 | 6-02 | .344 | .51 |
| .126 | .187 | 4-03 | .344 | .50 | 5-03 | .375 | .54 | 6-03 | .406 | .58 |
| .188 | .250 | 4-04 | .406 | .57 | 5-04 | .437 | .60 | 6-04 | .469 | .64 |
| .251 | .312 | 4-05 | .469 | .63 | 5-05 | .500 | .67 | 6-05 | .531 | .70 |
| .313 | .375 | 4-06 | .531 | .69 | 5-06 | .562 | .73 | 6-06 | .594 | .76 |
| .376 | .437 | 4-07 | .594 | .75 | 5-07 | .625 | .79 | 6-07 | .656 | .83 |
| .438 | .500 | 4-08 | .656 | .82 | 5-08 | .687 | .85 | 6-08 | .719 | .89 |
| .501 | .562 | 4-09 | .719 | .88 | 5-09 | .750 | .92 | 6-09 | .782 | .95 |
| .563 | .625 | — | — | — | 5-10 | .812 | .98 | 6-10 | .844 | 1.02 |
| .626 | .687 | — | — | — | 5-11 | .875 | 1.04 | 6-11 | .907 | 1.08 |
| .688 | .750 | — | — | — | — | — | — | 6-12 | .970 | 1.14 |

| Rivet Number | NAS 523 Code | Material * | | | Finish | | |
|-----------------------|-----------------|-------------------------|-------------------------|-------------------------|---------------------------------------|---------------------------------------|-----------|
| | | Sleeve | Stem | Lock Ring | Rivet | Stem | Lock Ring |
| CR2238 NAS1739E | AAV | 5056 QQ-A-430 | INCONEL 600 AMS 5665 | MONEL QQ-N-281 | MIL-C-5541 | NONE | NONE |
| CR2248 NAS1739B | AAT | 5056 QQ-A-430 | 8740 STEEL AMS 6322 | MONEL QQ-N-281 | MIL-C-5541 | CAD PLATE QQ-P-416 TYPE II CLASS 2 | NONE |
| CR2538 NAS1739M | AAW | MONEL QQ-N-281 | INCONEL 600 AMS 5665 | MONEL QQ-N-281 | NONE | NONE | NONE |
| CR2538P NAS1739MW | AAX | MONEL QQ-N-281 | INCONEL 600 AMS 5665 | MONEL QQ-N-281 | CAD PLATE QQ-P-416 TYPE II CLASS 2 | NONE | NONE |
| CR2838 NAS1739C | ADJ | INCONEL 600 AMS 5687 | A-286 CRES AMS 5732 | INCONEL 600 AMS 5687 | NONE | PASSIVATE PER AMS 2700 | NONE |
| CR2838CW NAS1739CW | AVR | INCONEL 600 AMS 5687 | A-286 CRES AMS 5732 | INCONEL 600 AMS 5687 | CAD PLATE QQ-P-416 TYPE II CLASS 2 | PASSIVATE PER AMS 2700 | NONE |

* For chemical composition only

NOTE: Do not clean or degrease prior to installation. All of the rivets above may be lubricated in accordance with NAS 1740. Do not remove lubricant prior to installation.

DESIGN NOTE: Rivets with grips greater than their diameter are not required to meet expansion requirements of procurement specification. NAS1399 rivets will provide more positive hole fill for longer grips.

BULBED CHERRYLOCK® RIVET

UNISINK HEAD

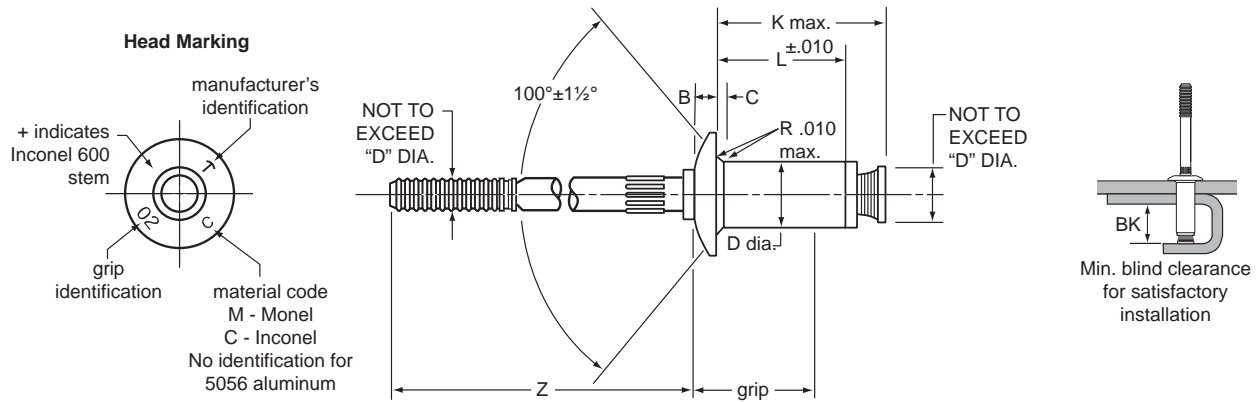


TABLE A

| Dia. Dash No. | Dia. +.003 -.001 | A ±.010 | B +.010 -.000 | C (Ref) | D ±.005 | BK | | Z (REF) |
|---------------------|------------------------|------------|---------------------|---------|---------|----------|--------------------|------------|
| | | | | | | Aluminum | Monel & Inconel | |
| -4 | .140 | .220 | .022 | .013 | .170 | .30 | .33 | 1.65 |
| -5 | .173 | .286 | .030 | .017 | .213 | .33 | .37 | 1.63 |
| -6 | .201 | .353 | .040 | .023 | .255 | .37 | .41 | 1.65 |

| Rivet Diameter | Minimum Grip |
|----------------|--------------|
| 1/8 | .033 |
| 5/32 | .042 |
| 3/16 | .053 |

Rivet Group A

| Grip Limits 1/16" Range | | 1/8" Diameter | | | | | | 5/32" Diameter | | | | 3/16" Diameter | | | | |
|----------------------------|------|---------------|----------|-----|-------|-----|------|----------------|-----|-------|-----|----------------|----------|-----|-------|-----|
| | | Dash | Aluminum | | Monel | | Dash | Aluminum | | Monel | | Dash | Aluminum | | Monel | |
| Min. | Max. | No. | L | K | L | K | No. | L | K | L | K | No. | L | K | L | K |
| see table A | .062 | 4-01 | .183 | .32 | .203 | .34 | 5-01 | .205 | .34 | .236 | .38 | 6-01 | .233 | .38 | .264 | .42 |
| .063 | .125 | 4-02 | .247 | .38 | .265 | .40 | 5-02 | .269 | .41 | .298 | .45 | 6-02 | .297 | .45 | .326 | .49 |
| .126 | .187 | 4-03 | .311 | .45 | .328 | .47 | 5-03 | .333 | .47 | .360 | .51 | 6-03 | .361 | .52 | .389 | .55 |
| .188 | .250 | 4-04 | .375 | .51 | .390 | .53 | 5-04 | .397 | .54 | .423 | .58 | 6-04 | .425 | .58 | .452 | .61 |
| .251 | .312 | 4-05 | .439 | .58 | .453 | .59 | 5-05 | .461 | .60 | .485 | .64 | 6-05 | .489 | .65 | .514 | .68 |
| .313 | .375 | — | — | — | — | — | 5-06 | .525 | .67 | .548 | .70 | 6-06 | .553 | .71 | .577 | .74 |
| .376 | .437 | — | — | — | — | — | — | — | — | — | — | 6-07 | .617 | .78 | .639 | .80 |
| .438 | .500 | — | — | — | — | — | — | — | — | — | — | 6-08 | .681 | .84 | .702 | .86 |

| Rivet Number | NAS 523 Code | Material * | | | Finish | | |
|--------------|--------------|-------------------------|-------------------------|-------------------------|-----------------------------|--|-----------|
| | | Sleeve | Stem | Lock Ring | Rivet | Stem | Lock Ring |
| CR2235 | ACJ | 5056 QQ-A-430 | INCONEL 600 AMS 5665 | MONEL QQ-N-281 | MIL-A-8625 OR MIL-C-5541 | NONE | NONE |
| CR2245 | ACH | 5056 QQ-A-430 | 8740 STEEL AMS 6322 | MONEL QQ-N-281 | MIL-A-8625 OR MIL-C-5541 | CAD PLATE QQ-P-416 TYPE II CLASS 2 | NONE |
| CR2545 | ADK | MONEL QQ-N-281 | INCONEL 600 AMS 5665 | MONEL QQ-N-281 | NONE | NONE | NONE |
| CR2845 | — | INCONEL 600 AMS 5687 | A-286 CRES AMS 5731 | INCONEL 600 AMS 5687 | NONE | PASSIVATE PER AMS 2700 | NONE |

* For chemical composition only

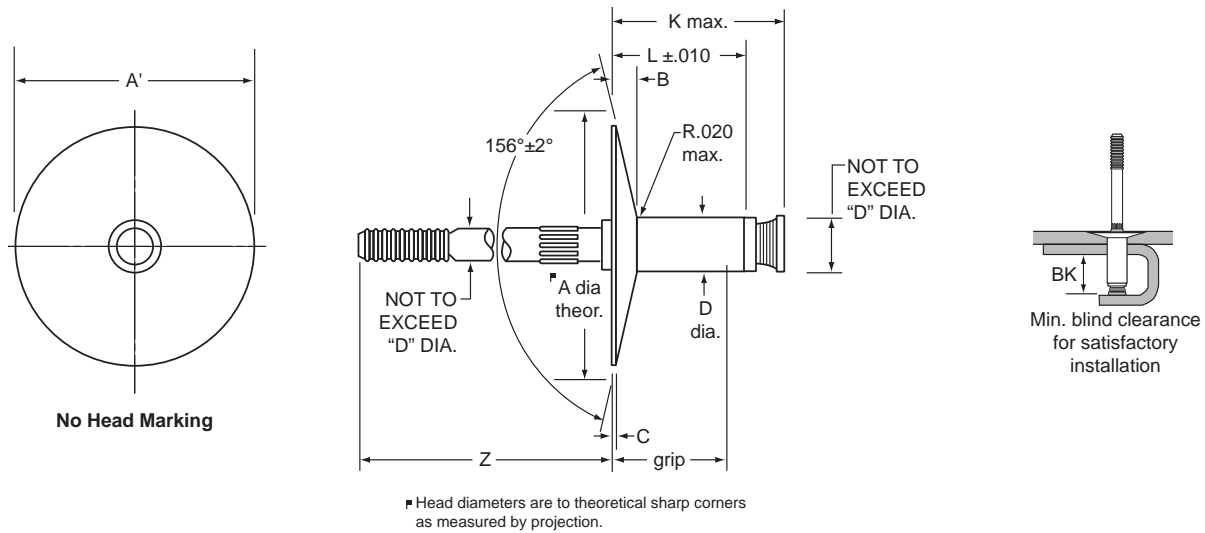
NOTE: Do not clean or degrease prior to installation. All of the rivets above may be lubricated in accordance with NAS 1740. Do not remove lubricant prior to installation.

DESIGN NOTE: Unisink Head not covered by NAS Standard.
Rivets with grips greater than their diameter are not required to meet expansion requirements of procurement specification. NAS1398 rivets will provide more positive hole fill for longer grips.

TOOLING NOTE: Requires H681B166-() series pulling head.

BULBED CHERRYLOCK® RIVET

156° COUNTERSUNK HEAD



| Dia. Dash No. | Dia. +.003/- .001 | A $\pm .004$ | A' | B (REF) | C | BK | Z (REF) |
|------------------|----------------------|-----------------|-----------------|------------|-----------------|-----|------------|
| -4 | .140 | .470 | .400 \pm .020 | .035 | .007 \pm .003 | .33 | 1.62 |
| -5 | .173 | .615 | .520 \pm .025 | .047 | .010 \pm .004 | .37 | 1.57 |
| -6 | .201 | .794 | .605 \pm .030 | .063 | .020 \pm .005 | .41 | 1.59 |

| Grip Limits 1/16" Range | | 1/8" Diameter | | | 5/32" Diameter | | | 3/16" Diameter | | |
|----------------------------|------|---------------|------|-----|----------------|------|------|----------------|------|------|
| | | Dash No. | L | K | Dash No. | L | K | Dash No. | L | K |
| .045 | .062 | 4-01 | .203 | .34 | — | — | — | — | — | — |
| .063 | .125 | 4-02 | .265 | .40 | 5-02 | .298 | .45 | 6-02 | .326 | .49 |
| .126 | .187 | 4-03 | .328 | .47 | 5-03 | .360 | .51 | 6-03 | .389 | .55 |
| .188 | .250 | 4-04 | .390 | .53 | 5-04 | .423 | .58 | 6-04 | .452 | .61 |
| .251 | .312 | 4-05 | .453 | .59 | 5-05 | .485 | .64 | 6-05 | .514 | .68 |
| .313 | .375 | 4-06 | .515 | .65 | 5-06 | .548 | .70 | 6-06 | .577 | .74 |
| .376 | .437 | 4-07 | .578 | .72 | 5-07 | .610 | .76 | 6-07 | .639 | .80 |
| .438 | .500 | 4-08 | .640 | .78 | 5-08 | .673 | .83 | 6-08 | .702 | .86 |
| .501 | .562 | 4-09 | .703 | .84 | 5-09 | .735 | .89 | 6-09 | .764 | .93 |
| .563 | .625 | — | — | — | 5-10 | .798 | .95 | 6-10 | .827 | .99 |
| .626 | .687 | — | — | — | 5-11 | .860 | 1.01 | 6-11 | .889 | 1.05 |
| .688 | .750 | — | — | — | — | — | — | 6-12 | .952 | 1.11 |

| Rivet Number | NAS 523 Code | Material* | | | Finish | | |
|-----------------|-----------------|-------------------------|-------------------------|-------------------------|--------|---------------------------|-----------|
| | | Rivet | Stem | Lock Ring | Rivet | Stem | Lock Ring |
| CR2540 | ADL | MONEL QQ-N-281 | INCONEL 600 AMS 5665 | MONEL QQ-N-281 | NONE | NONE | NONE |
| CR2840 | ADM | INCONEL 600 AMS 5687 | A-286 CRES AMS 5732 | INCONEL 600 AMS 5687 | NONE | PASSIVATE PER AMS 2700 | NONE |

*For chemical composition only

NOTE: Do not clean or degrease prior to installation. All of the rivets above may be lubricated in accordance with NAS 1740. Do not remove lubricant prior to installation.

DESIGN NOTE: 156° Countersunk head not covered by NAS standard. Use for honeycomb or similarly constructed applications where improved manufactured head bearing area is required.

TOOLING NOTE: Requires H681-()F series pulling head.

WIREDRAW CHERRYLOCK® RIVET

RIVET SELECTION

Wiredraw CherryLock® rivets are locked spindle and flush fracturing structural rivets. They conform to Procurement Specification NAS1400, Standards Pages NAS1398 and NAS1399. A wide range of sizes, materials and strength levels are available. This fastener is especially suited for sealing applications and joints requiring substantial sheet take-up.

All fasteners should be specified and used in accordance with manufacturer's recommendations, using the grip range and hole size information provided in this catalog.

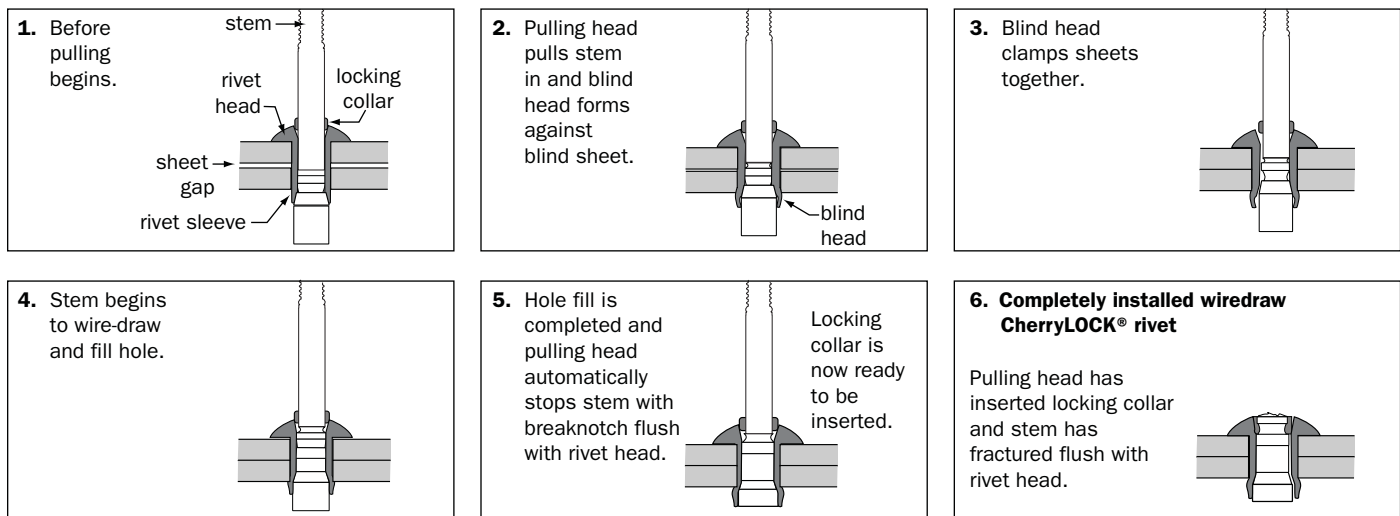


TYPICAL MINIMUM GRIP APPLICATION

WIREDRAW CHERRYLOCK® DESIGN FEATURES

- **Mechanically Locked Stem**
Assured reliability, no lost stems.
- **Wide Grip Range**
Exceeds 1/16" NAS requirements.
- **Self-Inspecting**
Per NAS requirements.
- **Positive Hole Fill**
Increased joint strength.
- **High Sheet Clamp-Up**
Increased fatigue strength.
- **Excellent Head Seating**
Fewer rejections.
- **Genuine Flush Fracturing Spindle**
No shaving, as with other so-called flush break rivets, even in thin sheets.
- **Head Marking**
Grip, materials, and manufacturer's identification for ready inspection.

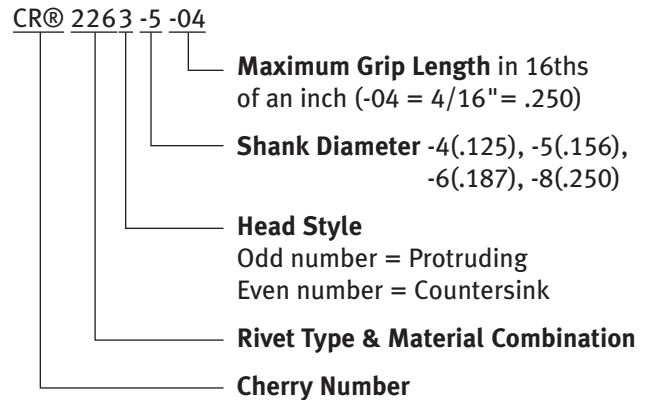
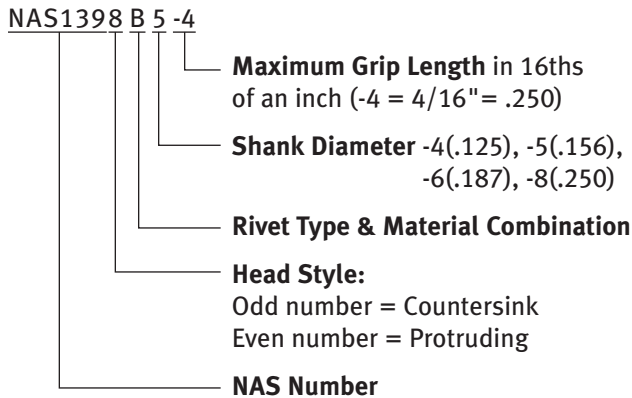
INSTALLATION SEQUENCE



WIREDRAW CHERRYLOCK® RIVET

NUMBERING SYSTEM

NUMBERING SYSTEM



MATERIALS

CherryLOCK® rivets are manufactured in a wide variety of materials in order to give the user the widest possible choice for optimum design.

| Materials | | Ultimate Shear Strength (at room temperature) | Maximum Temperature (°F) |
|---------------|---------------|--|-----------------------------|
| Sleeve | Stem | | |
| 5056 Aluminum | 7075 Aluminum | 30,000 psi | 250 |
| 2017 Aluminum | 7075 Aluminum | 38,000 psi | 250 |
| Monel | Monel | 75,000 psi | 900 |
| A-286 CRES | A-286 CRES | 75,000 psi | 1200 |
| A-286 CRES | A-286 CRES | 95,000 psi †† | 1200 |

ATTENTION: Blind rivets are not always a suitable substitute for solid rivets. Maintenance personnel are reminded that

AC 43.13-1A CHAPTER 2, SECTION 3 STIPULATES:
"Do not substitute hollow rivets for solid rivets in load carrying members without specific approval of the application by a representative of the Federal Aviation Administration. Blind rivets may be used in blind locations in accordance with the conditions listed in Chapter 5, provided the edge distances and spacings are not less than the minimum listed in paragraph 99d."

†† 95 ksi fastener for use in high strength materials. Not suitable for use in aluminum structures.

STRENGTH

Minimum ultimate rivet shear and tensile strength (lbs.) per NAS 1400. Test method per NASM1312 -8 and -20.

| CherryLOCK® Rivets | | Single Shear | | | | | Tensile | | | | |
|--|---------------|--------------|------|-------|-------|------|---------|------|-------|-------|------|
| | | 3/32" † | 1/8" | 5/32" | 3/16" | 1/4" | 3/32"† | 1/8" | 5/32" | 3/16" | 1/4" |
| CR2162 CR2163 CR2164 | 2017 Aluminum | — | 494 | 755 | 1090 | 1970 | — | 230 | 375 | 540 | 1000 |
| CR2262 CR2263 | 5056 Aluminum | — | 388 | 596 | 862 | 1550 | — | 230 | 375 | 540 | 1000 |
| CR2562 CR2563 CR2564 | Monel | — | 710 | 1090 | 1580 | 2840 | — | 340 | 550 | 780 | 1450 |
| CR2652 CR2653 CR2662 CR2663 CR2664 | A-286 CRES | 543 | 970 | 1490 | 2150 | 3890 | 300 | 640 | 1000 | 1500 | 2700 |
| CR2642†† CR2643†† | A-286 CRES | — | 1260 | 1960 | 2810 | 4965 | — | 640 | 1000 | 1500 | 2700 |

† 3/32" diameter rivets available in CR2662 & 2663 only
†† 95KSI fastener for use in high bearing strength materials such as steel, CRES, titanium, etc. Not suitable in aluminum structures.

NOTE: Values shown are fastener capabilities only
Consult Mil-Hdbk-5 for joint design allowables

WIREDRAW CHERRYLOCK® RIVET



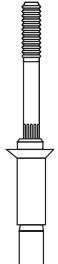
INSTALLED WEIGHTS Pounds per 1000 pieces (Ref.)

| Dash Number | 2162 2262 | 2163 2263 | 2164 | 2562 | 2563 | 2564 | 2642 2652 2662* | 2643 2653 2663* | 2664 |
|-------------|--------------|--------------|------|-------|-------|-------|-----------------------|-----------------------|-------|
| 3-01 | — | — | — | — | — | — | — | .64 | — |
| 3-02 | — | — | — | — | — | — | .60 | .76 | — |
| 3-03 | — | — | — | — | — | — | .71 | .86 | — |
| 3-04 | — | — | — | — | — | — | .84 | .97 | — |
| 3-05 | — | — | — | — | — | — | .96 | 1.09 | — |
| 3-06 | — | — | — | — | — | — | 1.04 | — | — |
| 4-01 | .290 | .437 | .26 | .95 | 1.42 | .84 | .84 | 1.26 | .74 |
| 4-02 | .382 | .528 | .35 | 1.25 | 1.73 | 1.14 | 1.10 | 1.52 | 1.00 |
| 4-03 | .472 | .618 | .44 | 1.54 | 2.02 | 1.43 | 1.36 | 1.78 | 1.26 |
| 4-04 | .562 | .708 | .53 | 1.84 | 2.32 | 1.73 | 1.62 | 2.04 | 1.52 |
| 4-05 | .657 | .802 | .62 | 2.14 | 2.62 | 2.03 | 1.89 | 2.31 | 1.79 |
| 4-06 | .747 | .893 | .71 | 2.44 | 2.91 | 2.33 | 2.15 | 2.57 | 2.05 |
| 4-07 | .827 | — | .79 | 2.73 | — | 2.62 | 2.41 | — | 2.31 |
| 4-08 | — | — | — | — | — | — | — | — | — |
| 5-01 | — | .730 | — | — | 2.38 | — | — | 2.10 | — |
| 5-02 | .622 | .872 | .59 | 2.03 | 2.85 | 1.79 | 1.79 | 2.51 | 1.58 |
| 5-03 | .764 | 1.01 | .69 | 2.49 | 3.30 | 2.25 | 2.20 | 2.91 | 1.99 |
| 5-04 | .903 | 1.15 | .83 | 2.95 | 3.77 | 2.71 | 2.60 | 3.32 | 2.39 |
| 5-05 | 1.04 | 1.30 | .97 | 3.40 | 4.23 | 3.17 | 3.00 | 3.73 | 2.79 |
| 5-06 | 1.18 | 1.44 | 1.11 | 3.87 | 4.69 | 3.63 | 3.41 | 4.13 | 3.20 |
| 5-07 | 1.33 | 1.58 | 1.26 | 4.33 | 5.15 | 4.09 | 3.82 | 4.54 | 3.61 |
| 5-08 | 1.47 | 1.72 | 1.40 | 4.80 | 5.62 | 4.56 | 4.23 | 4.95 | 4.02 |
| 5-09 | — | — | 1.54 | — | — | 5.02 | 4.64 | — | 4.43 |
| 5-10 | — | — | 1.68 | — | — | 5.49 | 5.05 | — | 4.84 |
| 6-01 | — | 1.12 | — | — | 3.68 | — | — | 3.24 | — |
| 6-02 | .94 | 1.32 | .80 | 3.09 | 4.32 | 2.62 | 2.72 | 3.81 | 2.30 |
| 6-03 | 1.15 | 1.53 | 1.00 | 3.74 | 4.98 | 3.27 | 3.30 | 4.39 | 2.88 |
| 6-04 | 1.35 | 1.72 | 1.20 | 4.42 | 5.62 | 3.95 | 3.87 | 4.96 | 3.45 |
| 6-05 | 1.55 | 1.92 | 1.40 | 5.05 | 6.29 | 4.58 | 4.45 | 5.54 | 4.03 |
| 6-06 | 1.75 | 2.12 | 1.60 | 5.71 | 6.93 | 5.24 | 5.03 | 6.11 | 4.61 |
| 6-07 | 1.95 | 2.32 | 1.80 | 6.38 | 7.59 | 5.91 | 5.61 | 6.69 | 5.19 |
| 6-08 | 2.15 | 2.52 | 2.00 | 7.02 | 8.24 | 6.55 | 6.19 | 7.27 | 5.77 |
| 6-09 | 2.35 | 2.73 | 2.20 | 7.66 | 8.91 | 7.19 | 6.76 | 7.85 | 6.34 |
| 6-10 | 2.55 | 2.92 | 2.40 | 8.32 | 9.55 | 7.85 | 7.33 | 8.42 | 6.91 |
| 6-11 | 2.74 | 3.13 | 2.60 | 8.96 | 10.21 | 8.49 | 7.90 | 9.00 | 7.48 |
| 6-12 | 2.95 | 3.32 | 2.80 | 9.61 | 10.84 | 9.14 | 8.48 | 9.56 | 8.06 |
| 6-13 | — | — | 3.00 | — | — | 9.78 | 9.05 | — | 8.63 |
| 6-14 | — | — | 3.20 | — | — | 10.43 | 9.62 | — | 9.20 |
| 8-01 | — | — | — | — | — | — | — | — | — |
| 8-02 | — | 3.00 | — | — | 9.78 | — | — | 8.62 | — |
| 8-03 | 2.56 | 3.35 | 2.16 | 8.35 | 10.95 | 7.08 | 7.37 | 9.65 | 6.23 |
| 8-04 | 2.92 | 3.72 | 2.52 | 9.54 | 12.13 | 8.27 | 8.41 | 10.70 | 7.27 |
| 8-05 | 3.28 | 4.07 | 2.88 | 10.72 | 13.27 | 9.45 | 9.45 | 11.70 | 8.31 |
| 8-06 | 3.65 | 4.45 | 3.24 | 11.91 | 14.49 | 10.64 | 10.49 | 12.80 | 9.35 |
| 8-07 | 4.00 | 4.79 | 3.60 | 13.04 | 15.62 | 11.83 | 11.53 | 13.80 | 10.39 |
| 8-08 | 4.37 | 5.13 | 3.96 | 14.29 | 16.76 | 13.02 | 12.57 | 14.80 | 11.43 |
| 8-09 | 4.72 | 5.52 | 4.32 | 15.42 | 18.02 | 14.19 | 13.61 | 15.90 | 12.47 |
| 8-10 | 5.07 | 5.87 | 4.68 | 16.56 | 19.15 | 15.36 | 14.65 | 16.90 | 13.51 |
| 8-11 | 5.46 | 6.22 | 5.04 | 17.80 | 20.29 | 16.53 | 15.69 | 17.90 | 14.55 |
| 8-12 | 5.80 | 6.57 | 5.40 | 18.90 | 21.42 | 17.69 | 16.73 | 18.90 | 15.59 |
| 8-13 | 6.15 | 6.95 | 5.76 | 20.03 | 22.68 | 18.85 | 17.77 | 20.00 | 16.63 |
| 8-14 | 6.52 | 7.29 | 6.12 | 21.29 | 23.81 | 20.02 | 18.81 | 21.00 | 17.67 |

* -3 diameter only available in CR2662 and CR2663.

WIREDRAW CHERRYLOCK® RIVET

RIVET SELECTION

| Head Style | NAS Number | Cherry Number | Rivet Material | Stem Material |
|--|------------|---------------|-------------------------|-----------------|
| Universal Head MS20470  | NAS 1398B | CR2263 | 5056 Aluminum | 7075 Aluminum |
| | — | CR2643 | A-286 CRES | A-286 CRES, STA |
| | — | CR2653 | A-286 CRES | A-286 CRES |
| | NAS 1398C | CR2663 | A-286 CRES | A-286 CRES |
| | NAS 1398CW | CR2663CW | A-286 CRES, Cad. Plt'd. | A-286 CRES |
| | NAS 1398D | CR2163 | 2017 Aluminum | 7075 Aluminum |
| | NAS 1398M | CR2563M | Monel | Monel |
| | NAS 1398MS | CR2563S | Monel, Silver Plt'd. | Monel |
| | NAS 1398MW | CR2563 | Monel, Cad. Plt'd. | Monel |
| | | | | |
| Countersunk Head (MS20426)  | NAS 1399B | CR2262 | 5056 Aluminum | 7075 Aluminum |
| | — | CR2642 | A-286 CRES | A-286 CRES, STA |
| | — | CR2652 | A-286 CRES | A-286 CRES |
| | NAS 1399C | CR2662 | A-286 CRES | A-286 CRES |
| | NAS 1399CW | CR2662CW | A-286 CRES, Cad. Plt'd. | A-286 CRES |
| | NAS 1399D | CR2162 | 2017 Aluminum | 7075 Aluminum |
| | NAS 1399M | CR2562M | Monel | Monel |
| | NAS 1399MS | CR2562S | Monel, Silver Plt'd. | Monel |
| | NAS 1399MW | CR2562 | Monel, Cad. Plt'd. | Monel |
| | | | | |
| Countersunk Head (NAS1097)  | — | CR2164 | 2017 Aluminum | 7075 Aluminum |
| | — | CR2564M | Monel | Monel |
| | — | CR2664 | A-286 CRES | A-286 CRES |
| | — | CR2664CW | A-286 CRES, Cad. Plt'd. | A-286 CRES |
| | | | | |

MINIMUM BLIND SIDE MATERIAL DATA

The wiredrawing type rivet is designed to give the best hole filling of any blind rivet and as such must be limited to applications where the blind side substructure has sufficient **bearing strength** to withstand the wiredrawing installation loads. When blind side substructure is made up of **thin or soft** material, then the **bulb type** blind rivets would be the **recommended** rivet selection.

Wiredrawing type rivets not recommended for double-dimple applications.

Listed are the **recommended rivet material types** and minimum thicknesses for use with the **wiredrawing type** blind rivets.

| Rivet Material | Rivet Dia. | Blind Side | |
|--------------------|------------|-----------------------|------------------------|
| | | Mat. Thickness (Min.) | Material |
| ALUMINUM | -4 | .030 | 2024 Alum. or stronger |
| ALUMINUM | -5 | .040 | 2024 Alum. or stronger |
| ALUMINUM | -6 | .050 | 2024 Alum. or stronger |
| ALUMINUM | -8 | .060 | 2024 Alum. or stronger |
| MONEL & A-286 CRES | -4 | .040 | 7075 Alum. or stronger |
| MONEL & A-286 CRES | -5 | .050 | 7075 Alum. or stronger |
| MONEL & A-286 CRES | -6 | .060 | 7075 Alum. or stronger |
| MONEL & A-286 CRES | -8 | .080 | 7075 Alum. or stronger |

WIREDRAW CHERRYLOCK® RIVET

NAS1398 UNIVERSAL HEAD

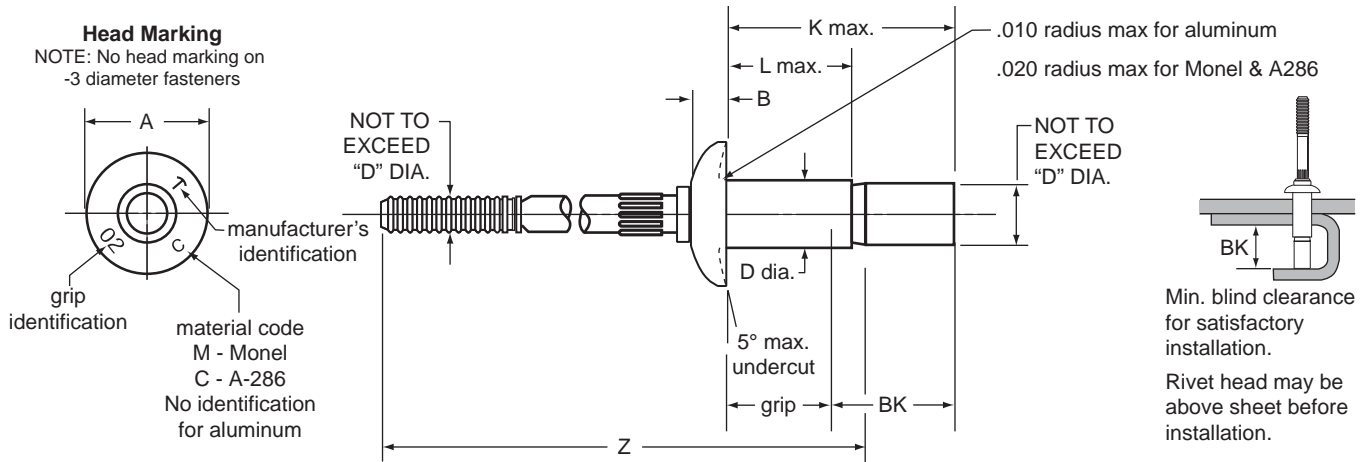


TABLE A

| Dia. Dash No. | Dia. +.003 -.001 | A | B +.010 -.000 | Z (REF) A Group | Z (REF) B Group | Z (REF) C Group |
|---------------|------------------|-------------|---------------|-----------------|-----------------|-----------------|
| -3 | .094 | .187 ± .009 | .040 | 1.78 | — | — |
| -4 | .125 | .250 ± .012 | .054 | 1.79 | — | — |
| -5 | .156 | .312 ± .016 | .067 | 1.81 | 2.06 | — |
| -6 | .187 | .375 ± .019 | .080 | 1.85 | 2.10 | — |
| -8 | .250 | .500 ± .025 | .107 | 1.97 | 2.22 | 2.47 |

| Rivet Diameter | -01 Minimum Grip |
|----------------|------------------|
| 3/32 | .020 |
| 1/8 | .025 |
| 5/32 | .031 |
| 3/16 | .037 |

| Grip Limits 1/16" Range | | 3/32" Diameter* | | | | 1/8" Diameter | | | | 5/32" Diameter | | | | 3/16" Diameter | | | | 1/4" Diameter | | | |
|-------------------------|-----|-----------------|---|---|----|---------------|---|---|----|----------------|---|---|----|----------------|---|---|----|---------------|---|---|----|
| Min | Max | Dash No | L | K | BK | Dash No | L | K | BK | Dash No | L | K | BK | Dash No | L | K | BK | Dash No | L | K | BK |

Rivet Group A ††

| See Table A | .062 | 3-01 | .166 | .33 | .24 | 4-01 | .198 | .39 | .30 | 5-01 | .201 | .38 | .28 | 6-01 | .225 | .44 | .27 | — | — | — | — |
|-------------|------|------|------|------|-----|------|------|------|-----|------|------|------|-----|------|------|------|-----|------|------|------|-----|
| .063 | .125 | 3-02 | .229 | .43 | .28 | 4-02 | .260 | .51 | .35 | 5-02 | .263 | .49 | .34 | 6-02 | .287 | .55 | .32 | 8-02 | .323 | .57 | .37 |
| .126 | .187 | 3-03 | .291 | .53 | .31 | 4-03 | .323 | .63 | .41 | 5-03 | .326 | .61 | .39 | 6-03 | .350 | .67 | .37 | 8-03 | .385 | .69 | .43 |
| .188 | .250 | 3-04 | .354 | .63 | .35 | 4-04 | .385 | .75 | .46 | 5-04 | .388 | .73 | .45 | 6-04 | .412 | .79 | .43 | 8-04 | .446 | .81 | .48 |
| .251 | .312 | 3-05 | .416 | .73 | .39 | 4-05 | .448 | .87 | .52 | 5-05 | .451 | .85 | .50 | 6-05 | .475 | .91 | .48 | 8-05 | .510 | .93 | .54 |
| .313 | .375 | 3-06 | .479 | .83 | .42 | 4-06 | .510 | .98 | .57 | 5-06 | .513 | .97 | .56 | 6-06 | .537 | 1.03 | .54 | 8-06 | .573 | 1.04 | .60 |
| .376 | .437 | 3-07 | .542 | .97 | .47 | 4-07 | .573 | 1.11 | .63 | 5-07 | .576 | 1.09 | .62 | 6-07 | .600 | 1.15 | .60 | 8-07 | .635 | 1.16 | .65 |
| .438 | .500 | 3-08 | .605 | 1.11 | .51 | 4-08 | .635 | 1.23 | .69 | 5-08 | .638 | 1.20 | .67 | 6-08 | .662 | 1.27 | .65 | 8-08 | .698 | 1.28 | .71 |

Rivet Group B ††

| | | | | | | | | | | | | | | | | | | | | | |
|------|------|---|---|---|---|---|---|---|---|------|------|------|-----|------|------|------|-----|------|------|------|------|
| .501 | .562 | — | — | — | — | — | — | — | — | 5-09 | .701 | 1.38 | .78 | 6-09 | .725 | 1.44 | .76 | 8-09 | .760 | 1.46 | .82 |
| .563 | .625 | — | — | — | — | — | — | — | — | 5-10 | .763 | 1.50 | .84 | 6-10 | .787 | 1.56 | .82 | 8-10 | .823 | 1.58 | .88 |
| .626 | .687 | — | — | — | — | — | — | — | — | — | — | — | — | 6-11 | .850 | 1.68 | .88 | 8-11 | .885 | 1.70 | .94 |
| .688 | .750 | — | — | — | — | — | — | — | — | — | — | — | — | 6-12 | .912 | 1.81 | .94 | 8-12 | .948 | 1.83 | 1.00 |

Rivet Group C ††

| | | | | | | | | | | | | | | | | | | | | | |
|------|------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|------|-------|------|------|
| .751 | .812 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 8-13 | 1.010 | 1.95 | 1.06 |
| .813 | .875 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 8-14 | 1.073 | 2.07 | 1.12 |

Please see following page for material and finish specifications

WIREDRAW CHERRYLOCK® RIVET

NAS1398 UNIVERSAL HEAD

| Rivet Number | NAS 523 Code | Material † | | | Finish | | |
|-----------------------|--------------|-----------------------|-----------------------|-------------------------|---|-------------------------------------|------------|
| | | Sleeve | Stem | Lock Ring | Rivet | Stem | Lock Ring |
| CR2163 NAS1398D | RL | 2017-T4 QQ-A-430 | 7075 QQ-A-430 | 5056-H38 QQ-A-430 | NATURAL COLOR MIL-A-8625 OR MIL-C-5541 | MIL-C-5541 | NONE ** |
| CR2263 NAS1398B | RK | 5056 QQ-A-430 | 7075 QQ-A-430 | 5056-H38 QQ-A-430 | ORANGE COLOR MIL-A-8625 OR MIL-C-5541 | MIL-C-5541 | NONE ** |
| CR2563 NAS1398MW | TK | MONEL QQ-N-281 | MONEL QQ-N-281 | MONEL QQ-N-281 | CADMIUM PLATE QQ-P-416 TYPE II CLASS 2 | NONE | NONE |
| CR2563M NAS1398M | RM | MONEL QQ-N-281 | MONEL QQ-N-281 | MONEL QQ-N-281 | NONE | NONE | NONE |
| CR2563S NAS1398MS | TL | MONEL QQ-N-281 | MONEL QQ-N-281 | MONEL QQ-N-281 | SILVER PLATE QQ-S -365 | NONE | NONE |
| CR2643 *** ††† | RH | A-286 CRES AMS5731 | A-286 CRES AMS5731 | MONEL QQ-N-281 | PASSIVATE PER AMS 2700 | COPPER COAT (FOR IDENTIFICATION) | NONE |
| CR2653 ††† | ACY | A-286 CRES AMS5731 | A-286 CRES AMS5731 | INCONEL 600 AMS 5687 | PASSIVATE PER AMS 2700 | PASSIVATE PER AMS 2700 | NONE |
| CR2663 NAS1398C | RN | A-286 CRES AMS5731 | A-286 CRES AMS5731 | MONEL QQ-N-281 | PASSIVATE PER AMS 2700 | PASSIVATE PER AMS 2700 | NONE |
| CR2663CW NAS1398CW | TM | A-286 CRES AMS5731 | A-286 CRES AMS5731 | MONEL QQ-N-281 | CADMIUM PLATE QQ-P-416 TYPE II CLASS 2 | PASSIVATE PER AMS 2700 | NONE |

* 3/32" diameter available in A-286 only (CR2663).

** May have beige color to identify 5056 material.

*** 95KSI fastener for use in high bearing strength materials such as steel, CRES, titanium, etc. Not suitable in aluminum structures.

† For chemical composition only.

†† Rivet group refers to shift-point setting of riveter. Longer grip lengths will require the use of a G686B-S or G689 power riveter.

††† Not covered by NAS1398.

NOTES: Do not clean or degrease prior to installation. All of the rivets above ARE lubricated in accordance with NAS 1400. Lubricant must not be removed!

DESIGN NOTE: Wiredraw CherryLOCK® rivets provide complete hole-fill making them especially well suited for applications requiring sealing capabilities.

An additional benefit of wiredraw CherryLOCK® rivets are their ability to be installed in stack-ups totaling 1/16" less than the noted minimum for a given grip. This, in effect, increases the total grip range to 1/8" rather than 1/16". This is not recommended as a regular practice since a weight penalty is incurred. However, there is no degradation of joint integrity.

Use bulbed CherryLOCK® rivets for improved performance in thin sheets.

WIREDRAW CHERRYLOCK® RIVET

NAS1399 COUNTERSUNK HEAD

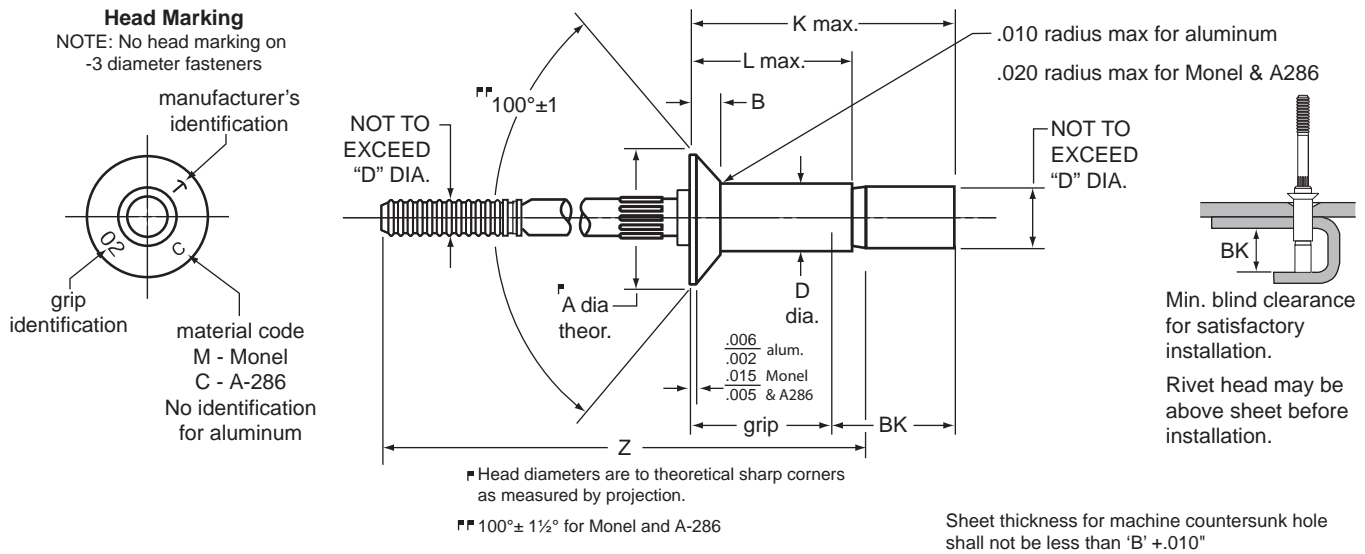


TABLE A

| Dia. Dash No. | Dia. +.003 -.001 | MS20426 Head A ±.004 | B (REF) | Z (REF) A Group | Z (REF) B Group | Z (REF) C Group |
|---------------|------------------|----------------------|---------|-----------------|-----------------|-----------------|
| -3 | .094 | .179 | .036 | 1.78 | — | — |
| -4 | .125 | .225 | .042 | 1.79 | — | — |
| -5 | .156 | .286 | .055 | 1.81 | 2.06 | — |
| -6 | .187 | .353 | .070 | 1.85 | 2.10 | 2.35 |
| -8 | .250 | .476 | .095 | 1.97 | 2.22 | 2.47 |

| Rivet Diameter | -01 Minimum Grip |
|----------------|------------------|
| 3/32 | .063 |
| 1/8 | .063 |
| 5/32 | .075 |
| 3/16 | .090 |

| Grip Limits 1/16" Range | | 3/32" Diameter* | | | | 1/8" Diameter | | | | 5/32" Diameter | | | | 3/16" Diameter | | | | 1/4" Diameter | | | |
|-------------------------|-----|-----------------|---|---|----|---------------|---|---|----|----------------|---|---|----|----------------|---|---|----|---------------|---|---|----|
| Min | Max | Dash No | L | K | BK | Dash No | L | K | BK | Dash No | L | K | BK | Dash No | L | K | BK | Dash No | L | K | BK |

Rivet Group A ††

| | | | | | | | | | | | | | | | | | | | | | |
|-------------|------|------|------|-------|-----|------|------|------|-----|------|------|------|-----|------|------|------|-----|------|------|------|-----|
| See Table A | .125 | 3-02 | .229 | .390 | .24 | 4-02 | .260 | .45 | .30 | 5-02 | .263 | .44 | .28 | 6-02 | .287 | .48 | .26 | — | — | — | — |
| .126 | .187 | 3-03 | .291 | .505 | .29 | 4-03 | .323 | .57 | .35 | 5-03 | .326 | .56 | .34 | 6-03 | .350 | .60 | .32 | 8-03 | .385 | .63 | .37 |
| .188 | .250 | 3-04 | .354 | .620 | .34 | 4-04 | .385 | .69 | .41 | 5-04 | .388 | .67 | .39 | 6-04 | .412 | .72 | .37 | 8-04 | .448 | .75 | .43 |
| .251 | .312 | 3-05 | .416 | .735 | .39 | 4-05 | .448 | .81 | .46 | 5-05 | .451 | .79 | .45 | 6-05 | .475 | .83 | .43 | 8-05 | .510 | .87 | .48 |
| .313 | .375 | 3-06 | .479 | .850 | .44 | 4-06 | .510 | .93 | .52 | 5-06 | .513 | .91 | .50 | 6-06 | .537 | .95 | .48 | 8-06 | .573 | .99 | .54 |
| .376 | .437 | 3-07 | .542 | .965 | .49 | 4-07 | .573 | 1.05 | .57 | 5-07 | .576 | 1.03 | .56 | 6-07 | .600 | 1.07 | .54 | 8-07 | .635 | 1.11 | .60 |
| .438 | .500 | 3-08 | .605 | 1.080 | .54 | 4-08 | .635 | 1.17 | .63 | 5-08 | .638 | 1.15 | .62 | 6-08 | .662 | 1.19 | .60 | 8-08 | .698 | 1.23 | .65 |
| .501 | .562 | 3-09 | .668 | 1.195 | .60 | 4-09 | .698 | 1.29 | .68 | 5-09 | .701 | 1.27 | .67 | 6-09 | .725 | 1.31 | .65 | 8-09 | .760 | 1.34 | .71 |

Rivet Group B ††

| | | | | | | | | | | | | | | | | | | | | | |
|------|------|---|---|---|---|---|---|---|---|------|------|------|-----|---------|------|------|-----|------|-------|------|------|
| .563 | .625 | — | — | — | — | — | — | — | — | 5-10 | .763 | 1.44 | .78 | 6-10 | .787 | 1.48 | .76 | 8-10 | .823 | 1.52 | .82 |
| .626 | .687 | — | — | — | — | — | — | — | — | — | — | — | — | 6-11 | .850 | 1.60 | .82 | 8-11 | .885 | 1.64 | .88 |
| .688 | .750 | — | — | — | — | — | — | — | — | — | — | — | — | 6-12 | .912 | 1.72 | .88 | 8-12 | .948 | 1.77 | .94 |
| .751 | .812 | — | — | — | — | — | — | — | — | — | — | — | — | 6-13††† | .975 | 1.83 | .94 | 8-13 | 1.010 | 1.89 | 1.00 |

Rivet Group C ††

| | | | | | | | | | | | | | | | | | | | | | |
|------|------|---|---|---|---|---|---|---|---|---|---|---|---|---------|-------|------|------|------|-------|------|------|
| .813 | .875 | — | — | — | — | — | — | — | — | — | — | — | — | 6-14††† | 1.037 | 1.95 | 1.00 | 8-14 | 1.073 | 2.01 | 1.06 |
|------|------|---|---|---|---|---|---|---|---|---|---|---|---|---------|-------|------|------|------|-------|------|------|

Please see following page for material and finish specifications

WIREDRAW CHERRYLOCK® RIVET

NAS1399 COUNTERSUNK HEAD

| Rivet Number | NAS 523 Code | Material † | | | Finish | | |
|-----------------------|--------------|-----------------------|-----------------------|-------------------------|---|-------------------------------------|-----------|
| | | Sleeve | Stem | Lock Ring | Rivet | Stem | Lock Ring |
| CR2162 NAS1399D | RP | 2017-T4 QQ-A-430 | 7075 QQ-A-430 | 5056-H38 QQ-A-430 | NATURAL COLOR MIL-A-8625 OR MIL-C-5541 | MIL-A-8625 OR MIL-C-5541 | NONE** |
| CR2262 NAS1399B | RO | 5056 QQ-A-430 | 7075 QQ-A-430 | 5056-H38 QQ-A-430 | ORANGE COLOR MIL-A-8625 OR MIL-C-5541 | MIL-A-8625 OR MIL-C-5541 | NONE** |
| CR2562 NAS1399MW | TO | MONEL QQ-N-281 | MONEL QQ-N-281 | MONEL QQ-N-281 | CADMIUM PLATE QQ-P-416 TYPE II CLASS 2 | NONE | NONE |
| CR2562M NAS1399M | RR | MONEL QQ-N-281 | MONEL QQ-N-281 | MONEL QQ-N-281 | NONE | NONE | NONE |
| CR2562S NAS1399MS | TP | MONEL QQ-N-281 | MONEL QQ-N-281 | MONEL QQ-N-281 | SILVER PLATE QQ-S -365 | NONE | NONE |
| CR2642 *** ††† | RJ | A-286 CRES AMS5731 | A-286 CRES AMS5731 | MONEL QQ-N-281 | PASSIVATE PER AMS 2700 | COPPER COAT (FOR IDENTIFICATION) | NONE |
| CR2652 ††† | — | A-286 CRES AMS5731 | A-286 CRES AMS5731 | INCONEL 600 AMS 5687 | PASSIVATE PER AMS 2700 | PASSIVATE PER AMS 2700 | NONE |
| CR2662 NAS1399C | RS | A-286 CRES AMS5731 | A-286 CRES AMS5731 | MONEL QQ-N-281 | PASSIVATE PER AMS 2700 | PASSIVATE PER AMS 2700 | NONE |
| CR2662CW NAS1399CW | TR | A-286 CRES AMS5731 | A-286 CRES AMS5731 | MONEL QQ-N-281 | CADMIUM PLATE QQ-P-416 TYPE II CLASS 2 | PASSIVATE PER AMS 2700 | NONE |

* 3/32" diameter available in A-286 only (CR2662).

** May have beige color to identify 5056 material.

*** 95KSI fastener for use in high bearing strength materials such as steel, CRES, titanium, etc. Not suitable in aluminum structures.

† For chemical composition only.

†† Rivet group refers to shift-point setting of riveter. Longer grip lengths will require the use of a G686B-S or G689 power riveter.

††† Not covered by NAS1399.

NOTE: Do not clean or degrease prior to installation. All of the rivets above ARE lubricated in accordance with NAS 1400. Lubricant must not be removed!

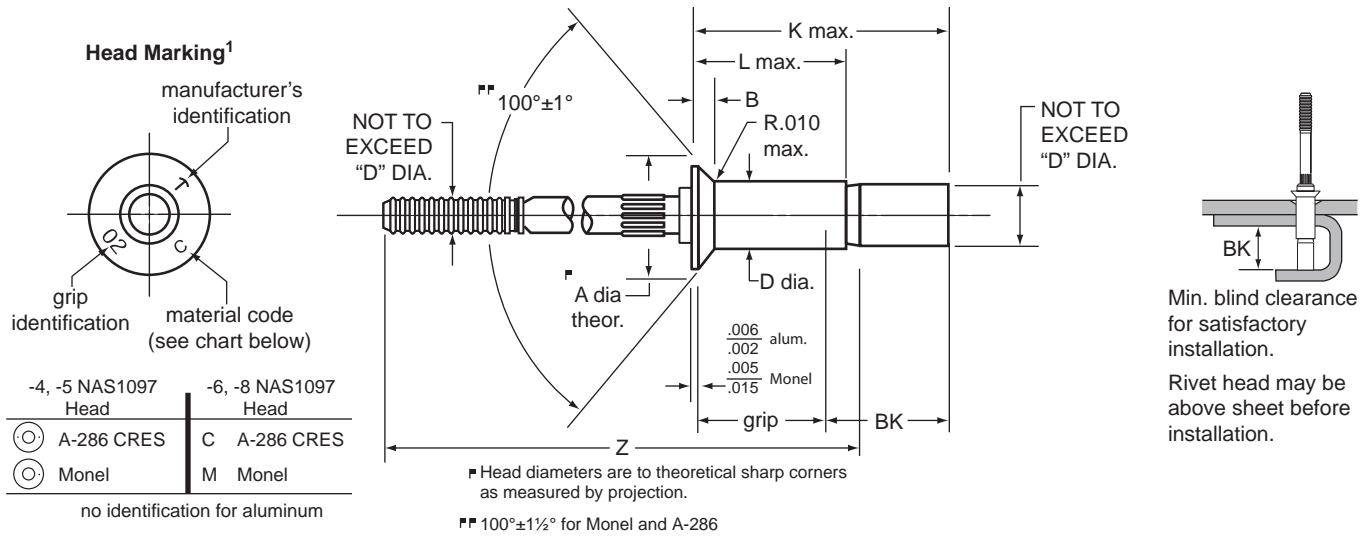
DESIGN NOTE: Wiredraw CherryLOCK® rivets provide complete hole-fill making them especially well suited for applications requiring sealing capabilities.

An additional benefit of wiredraw CherryLOCK® rivets are their ability to be installed in stack-ups totaling 1/16" less than the noted minimum for a given grip. This, in effect, increases the total grip range to 1/8" rather than 1/16". This is not recommended as a regular practice since a weight penalty is incurred. However, there is no degradation of joint integrity.

Use bulbed CherryLOCK® rivets for improved performance in thin sheets.

WIREDRAW CHERRYLOCK® RIVET

NAS1097 REDUCED FLUSH HEAD



| Dia. Dash No. | Dia. +.003 -.001 | A | B +.010 -.000 | Z (REF) A Group | Z (REF) B Group | Z (REF) C Group |
|---------------|------------------|------|---------------|-----------------|-----------------|-----------------|
| -4 | .125 | .192 | .028 | 1.79 | — | — |
| -5 | .156 | .243 | .037 | 1.81 | 2.06 | — |
| -6 | .187 | .299 | .046 | 1.85 | 2.10 | 2.35 |
| -8 | .250 | .392 | .060 | 1.97 | 2.22 | 2.47 |

| Grip Limits 1/16" Range | | 1/8" Diameter | | | | 5/32" Diameter | | | | 3/16" Diameter | | | | 1/4" Diameter | | | |
|-------------------------|-----|---------------|---|---|----|----------------|---|---|----|----------------|---|---|----|---------------|---|---|----|
| Min | Max | Dash No | L | K | BK | Dash No | L | K | BK | Dash No | L | K | BK | Dash No | L | K | BK |

Rivet Group A †

| | | | | | | | | | | | | | | | | | |
|------|------|------|------|------|-----|------|------|------|-----|------|------|------|-----|------|------|------|-----|
| .063 | .125 | 4-02 | .250 | .45 | .30 | 5-02 | .250 | .44 | .28 | 6-02 | .250 | .44 | .26 | — | — | — | — |
| .126 | .187 | 4-03 | .313 | .57 | .35 | 5-03 | .313 | .56 | .34 | 6-03 | .313 | .55 | .32 | 8-03 | .375 | .63 | .37 |
| .188 | .250 | 4-04 | .375 | .69 | .41 | 5-04 | .375 | .67 | .39 | 6-04 | .375 | .67 | .37 | 8-04 | .438 | .75 | .43 |
| .251 | .312 | 4-05 | .438 | .81 | .46 | 5-05 | .438 | .79 | .45 | 6-05 | .438 | .78 | .43 | 8-05 | .500 | .87 | .48 |
| .313 | .375 | 4-06 | .500 | .93 | .52 | 5-06 | .500 | .91 | .50 | 6-06 | .500 | .90 | .48 | 8-06 | .563 | .99 | .54 |
| .376 | .437 | 4-07 | .563 | 1.05 | .57 | 5-07 | .563 | 1.03 | .56 | 6-07 | .563 | 1.02 | .54 | 8-07 | .625 | 1.11 | .60 |
| .438 | .500 | — | — | — | — | 5-08 | .625 | 1.15 | .62 | 6-08 | .625 | 1.14 | .60 | 8-08 | .688 | 1.23 | .65 |
| .501 | .562 | — | — | — | — | 5-09 | .688 | 1.27 | .67 | 6-09 | .688 | 1.26 | .65 | 8-09 | .750 | 1.34 | .71 |

Rivet Group B †

| | | | | | | | | | | | | | | | | | |
|------|------|---|---|---|---|------|------|------|-----|------|------|------|-----|------|-------|------|------|
| .563 | .625 | — | — | — | — | 5-10 | .750 | 1.44 | .78 | 6-10 | .750 | 1.43 | .76 | 8-10 | .813 | 1.52 | .82 |
| .626 | .687 | — | — | — | — | — | — | — | — | 6-11 | .813 | 1.55 | .82 | 8-11 | .875 | 1.64 | .88 |
| .688 | .750 | — | — | — | — | — | — | — | — | 6-12 | .875 | 1.67 | .88 | 8-12 | .938 | 1.77 | .94 |
| .751 | .812 | — | — | — | — | — | — | — | — | 6-13 | .938 | 1.79 | .94 | 8-13 | 1.000 | 1.89 | 1.00 |

Rivet Group C †

| | | | | | | | | | | | | | | | | | |
|------|------|---|---|---|---|---|---|---|---|------|-------|------|------|------|-------|------|------|
| .813 | .875 | — | — | — | — | — | — | — | — | 6-14 | 1.000 | 1.91 | 1.00 | 8-14 | 1.063 | 2.01 | 1.06 |
|------|------|---|---|---|---|---|---|---|---|------|-------|------|------|------|-------|------|------|

WIREDRAW CHERRYLOCK® RIVET

NAS1097 REDUCED FLUSH HEAD

| Rivet Number | NAS 523 Code | Material † | | | Finish | | |
|--------------|--------------|-----------------------|-----------------------|-------------------------|---|-----------------------------|-----------|
| | | Sleeve | Stem | Lock Ring | Rivet | Stem | Lock Ring |
| CR2164 | ADD | 2017-T4 QQ-A-430 | 7075 QQ-A-430 | 5056-H38 QQ-A-430 | NATURAL COLOR MIL-A-8625 OR MIL-C-5541 | MIL-A-8625 OR MIL-C-5541 | NONE** |
| CR2564 | ADE | MONEL QQ-N-281 | MONEL QQ-N-281 | MONEL QQ-N-281 | CADMIUM PLATE QQ-P-416 TYPE II CLASS 2 | NONE | NONE |
| CR2564M | — | MONEL QQ-N-281 | MONEL QQ-N-281 | MONEL QQ-N-281 | NONE | NONE | NONE |
| CR2664 | ADF | A-286 CRES AMS5731 | A-286 CRES AMS5731 | INCONEL 600 AMS 5687 | PASSIVATE PER AMS 2700 | PASSIVATE PER AMS 2700 | NONE |
| CR2664CW | — | A-286 CRES AMS5731 | A-286 CRES AMS5731 | INCONEL 600 AMS 5687 | CADMIUM PLATE QQ-P-416 TYPE II CLASS 2 | PASSIVATE PER AMS 2700 | NONE |

* For chemical composition only.

** May have beige color to identify 5056 material.

† Rivet group refers to shift-point setting of riveter. Longer grip lengths will require the use of a G686B-S or G689 power riveter.

NOTE: Do not clean or degrease prior to installation. All of the rivets above are lubricated. Lubricant must not be removed!

Reduced flush head rivet not covered by NAS Standard. Quoted on request.

TOOLING NOTE: Requires H681-()S series pulling head.

DESIGN NOTE: Wiredraw CherryLOCK® rivets provide complete hole fill, making them especially well suited for applications requiring sealing capabilities. An additional benefit of wiredraw CherryLOCK® rivets are their ability to be installed in stack-ups totaling 1/16" less than the noted minimum for a given grip. This, in effect, increases the total grip range to 1/8" rather than 1/16". This is not recommended as a regular practice since a weight penalty is incurred. However, there is no degradation of joint integrity.

The low-profile head per NAS1097 is designed for thin top sheet applications to eliminate the knife-edge condition associated with a deep countersink in thin sheets.

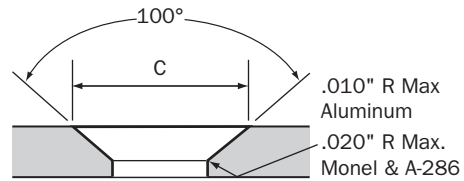
Use bulbed CherryLOCK® rivets for improved performance in thin sheets.

CHERRYLOCK® RIVET

RIVET INSTALLATION & INSPECTION

HOLE PREPARATION

Recommended drill sizes, hole sizes and countersunk diameter limits. Do not chamfer blind side of hole.



| Rivet Dia. | CherryLOCK® | | Bulbed CherryLOCK® | | Countersinking Dimensions | | | | | | | |
|------------|-------------|------|--------------------|------------|---------------------------|------|-------------------|--------|-------------------|--------|--------|--------|
| | | | | | 100° MS20426 Head | | 100° NAS1097 Head | | 100° Unisink Head | | | |
| | Drill Size | Min. | Max. | Drill Size | Min. | Max. | C Min. | C Max. | C Min. | C Max. | C Min. | C Max. |
| 3/32" | #40 | .097 | .100 | — | — | — | .176 | .182 | — | — | — | — |
| 1/8" | #30 | .129 | .132 | #27 | .143 | .146 | .222 | .228 | .189 | .195 | .167 | .173 |
| 5/32" | #20 | .160 | .164 | #16 | .176 | .180 | .283 | .289 | .240 | .246 | .210 | .216 |
| 3/16" | #10 | .192 | .196 | #5 | .205 | .209 | .350 | .356 | .296 | .302 | .252 | .258 |
| 1/4" | F | .256 | .261 | — | — | — | .473 | .479 | .386 | .395 | — | — |

NOTE: Sheet thickness for machine countersunk hole shall not be less than "B" (rivet head thickness) +.010".

PLACING RIVET IN HOLE

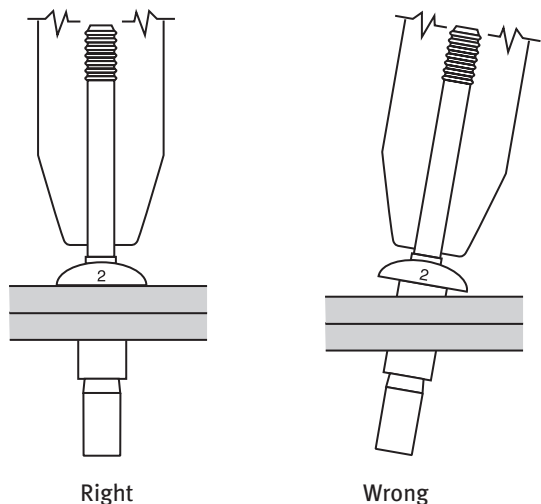
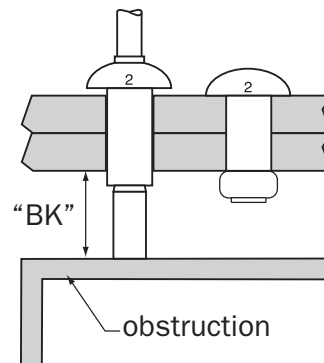
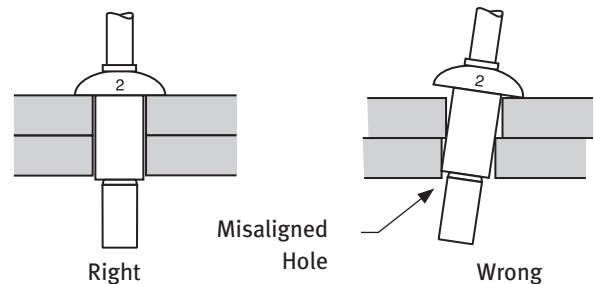
Select the proper pulling head to conform to the diameter and head style of CherryLOCK® rivet being installed. The rivet is now ready to be placed in the hole.

The holes in the sheets to be fastened must be of correct size and aligned properly. Do not force the rivet into the hole.

In limited blind clearance applications, the manufactured head of the standard CherryLOCK® rivet can protrude above the top sheet and will pull down to the sheet as the stem is pulled in. The minimum blind clearance is the "BK" dimension. Refer to the Standards Pages for specific dimensional values.

PLACING PULLING HEAD ON RIVET STEM

Hold the riveter and pulling head in line with the axis of the rivet, while holding the riveter in a light and flexible manner.



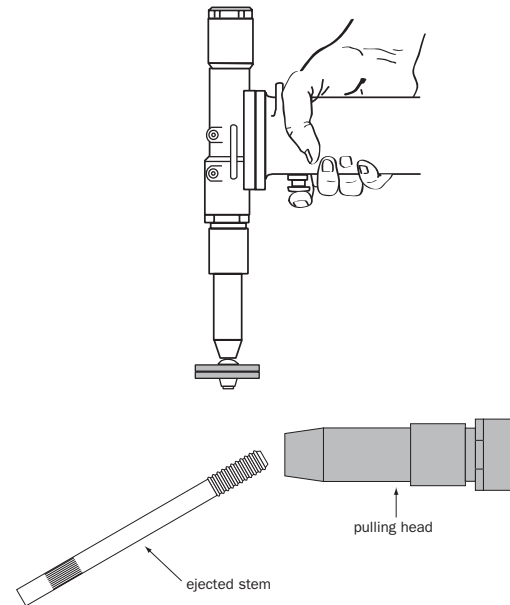
ACTUATING RIVETER

1. The pulling head will pull down and seat against the rivet head.
2. The rivet clamping action will pull the sheets together and seat the rivet head.
3. The action of the rivet will automatically help to bring the riveter and pulling head into proper alignment with the rivet axis.

Pressing down with force will not allow the rivet and the riveter to align themselves with the hole, and this may limit the head seating action of the rivet.

When installing CherryLOCK® rivets, hold the riveter in line with the rivet as accurately as possible, and, applying a **steady but light pressure**, pull the trigger and let the rivet do the work.

When the rivet is completely installed, release the trigger and the pulling head will automatically eject the pulling portion of the stem through the front end. Controlled stem release into receptacle will control F.O.D. problems.



INSPECTION

Inspect installed rivet flushness to break-off limits of NAS1400 and NAS1740

| | Diameter Dash No. | | | | |
|--------|-------------------|------|------|------|------|
| | -3 | -4 | -5 | -6 | -8 |
| A Max. | .015 | .015 | .020 | .025 | .030 |
| B Max. | .010 | .010 | .010 | .015 | .020 |

A slight collar "flash" (figure 1) caused by the pressures necessary to drive the collar is acceptable within the limit shown.

If the rivet stem and collar are flush within the limits described, it can be safely concluded that a satisfactory blind head and lock has been formed.

CherryLOCK® rivets have the grip length marked on the rivet head (figure 2) (except 3/32" diameter, and 1/8" and 5/32" in NAS1097 head style) to provide positive inspection from the visible side to show that the rivets have been installed with the correct grip.

Superficial stretch marks on the blind side (figure 3) which may appear in the rivet sleeve are not detrimental to rivet strength and are acceptable. Due to the self-inspecting feature of the CherryLOCK® rivet, it is unnecessary to inspect the blind head formation.

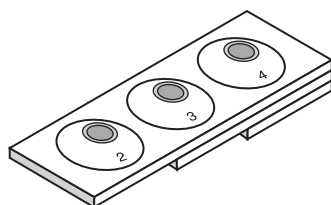


Figure 2

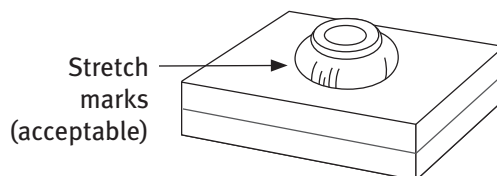
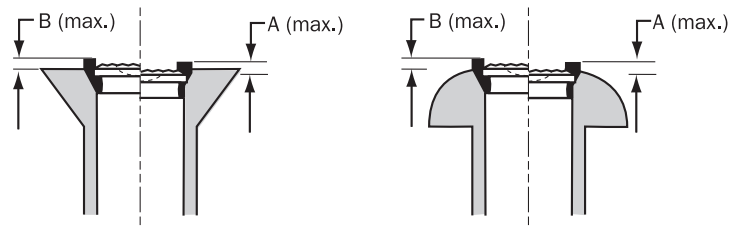


Figure 3

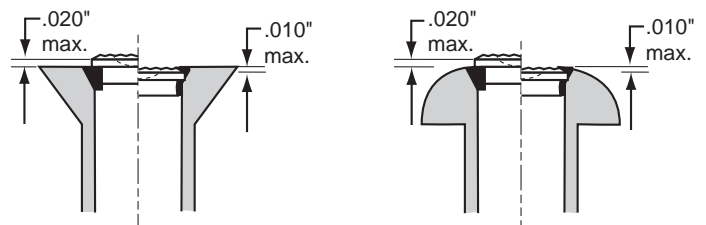
Collar Protrusion Limits within NAS1400 and 1740

A-MAX. IS THE DISTANCE BETWEEN STEM BREAK-NOTCH AND TOP OF COLLAR

B-MAX. IS THE DISTANCE BETWEEN TOP OF RIVET HEAD AND TOP OF COLLAR.



Stem Protrusion Limits within NAS1400 and 1740



Distance between top of rivet head and stem break-notch

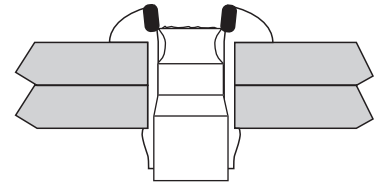
Distance between top of collar and stem break-notch

PROBLEM: RIVET STEM BREAKS LOW (COLLAR DOES SET)

Rivet stem breaks below rivet head but collar is set.

A. Wrong pulling head

Only tools shown in this catalog will install CherryLOCK® rivets. Do not use other types of tools.



PROBLEM: LOCKING COLLAR DOES NOT SET

Rivet stem breaks near flush but collar does not set.

A. Rivet installed in over maximum grip

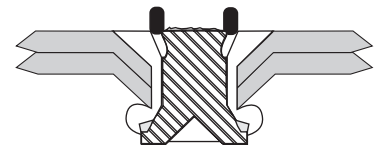
Use longer grip rivet.

B. Chips prevent anvil from setting collar

Chips, burrs and dry sealant will build up on pulling head anvil and restrict forward thrust necessary to set collar. Clean thoroughly and readjust.

C. Rivet installed in undersize hole

Drill out hole to proper size.



PROBLEM: POOR HEAD SEATING

Rivet head does not seat properly against top sheet or in countersink.

A. Holes slanted or misaligned

Use more care to obtain holes which are properly aligned and normal to the sheets.

B. Countersink not concentric with hole

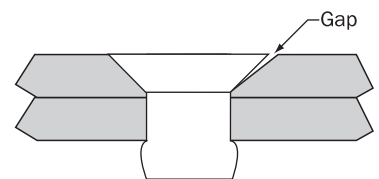
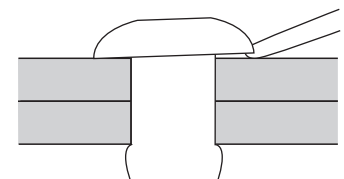
Use countersink pilot which is close to hole size.

C. Installer “cocks” pulling head and rivet head during installation

Installer should hold tool and pulling head in a flexible manner, so rivet can clamp head down properly.

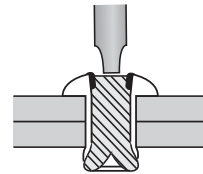
D. Lock ring anvil protrudes too far

Anvil must be flush within specific limits. Replace with correctly fitted anvil.

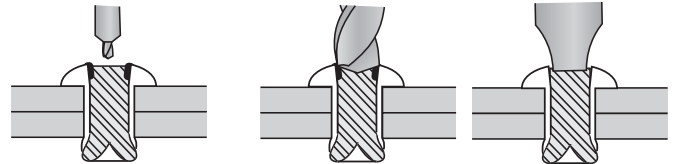


Should it be necessary to remove an installed CherryLOCK® rivet, the following procedures are recommended:

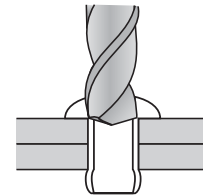
1. In thick material remove the lock by driving out the rivet stem, using a pin punch.



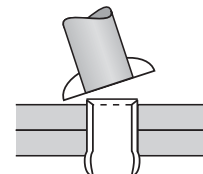
2. If the rivets have been installed in thin sheets, driving out the locked stem may damage the sheets. It is recommended that the stem be center punched first and a small center drill be used to provide a guide for a larger drill on top of the rivet stem. The larger drill can then be used to drill away the lock. Finally, use a pin punch to drive out the stem.



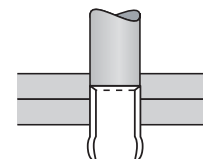
3. Drill nearly through the head of the rivet, using a drill the same size as the rivet shank. **Do not drill completely through rivet head.**



4. Break off rivet head, using a pin punch as a pry.



5. Drive out the remaining rivet shank with a pin punch having a diameter equal to the rivet shank.



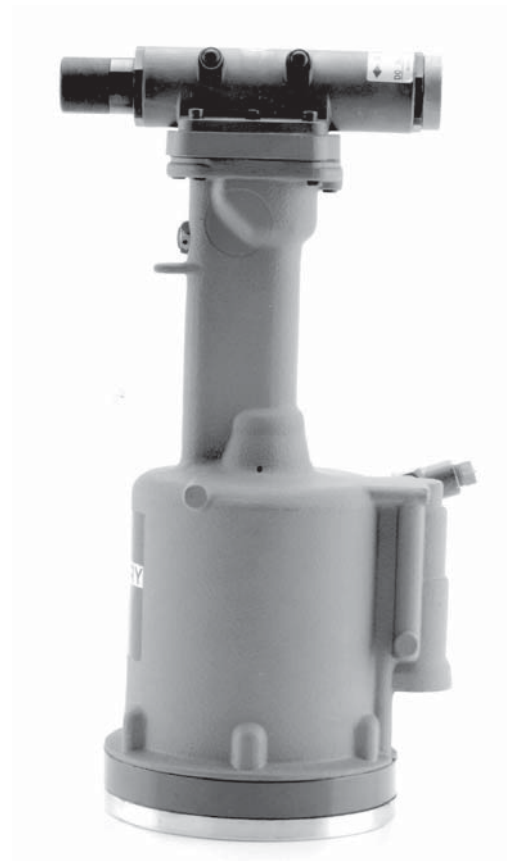
CAUTION: Never drill completely through the rivet sleeve to remove a rivet as this will tend to enlarge the hole.



Lightweight
G700
5-3/4 pounds



Universal
G784
8 pounds



Heavy Duty
G689
13 pounds

The following pages illustrate the various tools and accessories required to install CherryLOCK® rivets. Pulling heads are not furnished with the riveters and must be ordered separately.

Each CherryLOCK® riveter is designed to do a specific task in an economical and efficient manner. Properly selected, CherryLOCK® tools are the most advanced fastener installation equipment available; they are lightweight, simple and have one of the broadest pulling capacities available. They are of heavy duty design for long life

in the shop environment and incorporate a separate locking-collar driving feature to ensure head seating and a flush rivet installation without stem shaving. Complete assembly and component data is available to assist your tool crib in maintaining and overhauling these tools.

All CherryLOCK® installation tools are manufactured exclusively by Cherry Aerospace, who also engineered the CherryLOCK® riveting system. For superior installation results, use with CherryLOCK® and bulbed CherryLOCK® locked spindle rivets.

TOOL SELECTION CHART

The numbers shown in the rivet columns below are the maximum grip length that can be installed with these tools.
A dash (–) indicates those rivet sizes which cannot be installed in any grip length.

| Tool Type | Tool Model | Pulling Head | Rivet Dia. ** | Bulbed CherryLOCK® NAS 1738 & 1739 | | | | Standard CherryLOCK® NAS 1398 & 1399 | | | | | |
|-------------|------------|--------------|---------------|---------------------------------------|-----------------------|---------------------------------------|---------------------------------------|---|---------------------------------------|---------------|-----------------------|---------------------------------|---|
| | | | | Aluminum | | Monel & Inconel | | Aluminum | | Monel | | A-286 CRES | |
| | | | | 2235 2239 2245 2249 Univ. | 2238 2248 Ctsk. | 2539 2545 2839 2845 Univ. | 2538 2540 2838 2840 Ctsk. | 2163 2263 Univ. | 2162 2164 2262 2264 Ctsk. | 2563 Univ. | 2562 2564 Ctsk. | 2643 2653 2663** Univ. | 2642 2652 2662** 2664 Ctsk. |
| Hydro-Shift | G700 | H681 | -3 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | ALL | ALL |
| | | | -4 | ALL | ALL | ALL | ALL | 8 | 9 | 8 | 9 | 8 | 9 |
| | | | -5 | — | — | — | — | 8 | 9 | 8 | 9 | 8* | 9* |
| | | | -6 | — | — | — | — | — | — | — | — | — | — |
| | | | -8 | N/A | N/A | N/A | N/A | — | — | — | — | — | — |
| | G784 | H681 | -3 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | ALL | ALL |
| | | | -4 | ALL | ALL | ALL | ALL | ALL | ALL | ALL | ALL | ALL | ALL |
| | | | -5 | ALL | ALL | ALL | ALL | 8 | 9 | 8 | 9 | 8 | 9 |
| | | | -6 | ALL | ALL | ALL | ALL | 8 | 9 | 8 | 9 | 8 | 9 |
| | | | -8 | N/A | N/A | N/A | N/A | 8 | 9 | — | — | — | — |
| | G686B-S | H681 | -4 | ALL | ALL | ALL | ALL | ALL | ALL | ALL | ALL | ALL | ALL |
| | | | -5 | ALL | ALL | ALL | ALL | ALL | ALL | ALL | ALL | ALL | ALL |
| | | | -6 | ALL | ALL | ALL | ALL | ALL | ALL | ALL | ALL | ALL | ALL |
| | | | -8 | N/A | N/A | N/A | N/A | ALL | ALL | ALL | ALL | — | — |
| | G689 | H681 | -4 | ALL | ALL | ALL | ALL | ALL | ALL | ALL | ALL | ALL | ALL |
| | | | -5 | ALL | ALL | ALL | ALL | ALL | ALL | ALL | ALL | ALL | ALL |
| | | | -6 | ALL | ALL | ALL | ALL | ALL | ALL | ALL | ALL | ALL | ALL |
| | | | -8 | N/A | N/A | N/A | N/A | ALL | ALL | ALL | ALL | ALL | ALL |
| | G695B | H690 | -4 | ALL | ALL | ALL | ALL | 4 | 4 | 4 | 4 | 4 | 4 |
| | | | -5 | ALL | ALL | ALL | ALL | 4 | 4 | 4 | 4 | 4 | 4 |
| | | | -6 | ALL | ALL | ALL | ALL | 4 | 4 | 4 | 4 | — | — |
| | | | -8 | N/A | N/A | N/A | N/A | 4 | 4 | — | — | — | — |

* May require 95 PSI air pressure at tool.

**3/32" A-286 (CR2662 & CR2663) rivets may be installed with any Cherry Aerospace hydro-shift riveter equipped with an H681-3C pulling head.

G700 LIGHTWEIGHT POWER RIVETER

The G700 lightweight CherryLOCK® riveter is a compact pneumatic-hydraulic tool designed specifically for fast, efficient installation of CherryLOCK® rivets. It weighs only 5 3/4 lbs. and can be operated in any position with one hand.

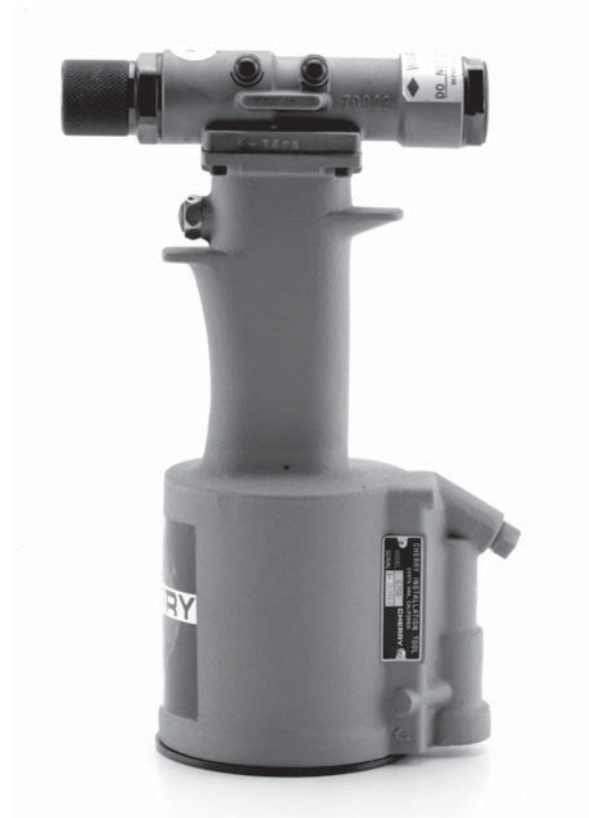
The G700 has a 29/32" stroke and develops a minimum of 1220 lbs. pull on 90 to 110 psi of air pressure at the tool.

See the Tool Selection Chart on page 27 for complete tool capacity information.

Pulling Heads

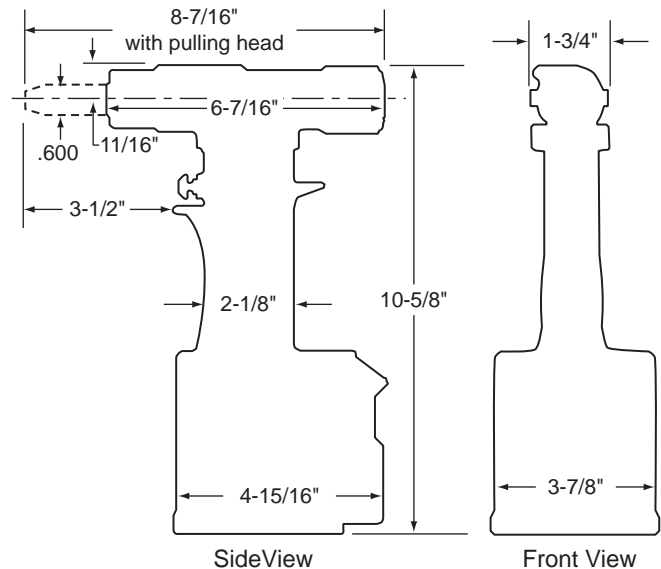
Pulling heads are not furnished with this tool but must be ordered separately. In ordering heads, be sure to specify the shank diameter and head style of the rivets to be installed.

H681 Series pulling heads fit directly on this tool to install both bulbed and standard CherryLOCK® rivets. Other types of pulling heads may be used on these riveters by using adapters listed on page 33.



Specifications

| | |
|-----------------|-------------------------------|
| Air Pressure | 90 – 110 psi |
| Stroke | .906" |
| Pulling Force | 1,220 lbs. |
| Weight | 5.75 |
| Noise Level | 69 dB(A) |
| Vibration | Less than 2.5m/s ² |
| Air Consumption | .25 SCF/Cycle (7.08 L/cycle) |



G784 UNIVERSAL POWER RIVETER

The G784 Universal CherryLOCK® riveter is a pneumatic-hydraulic installation tool designed specifically for the most efficient installation of most diameters and strength levels. It weighs only 8 lbs. and can be operated in any position with one hand.

The G784 has a 7/8" stroke and generates a minimum of 2600 lbs. of pull on 90 to 110 psi of air pressure at the tool. It will install nearly all diameters of CherryLOCK® rivets up to a half-inch grip. ("A" group only).

See the Tool Selection Chart on page 27 for complete tool capacity information.

Pulling Heads

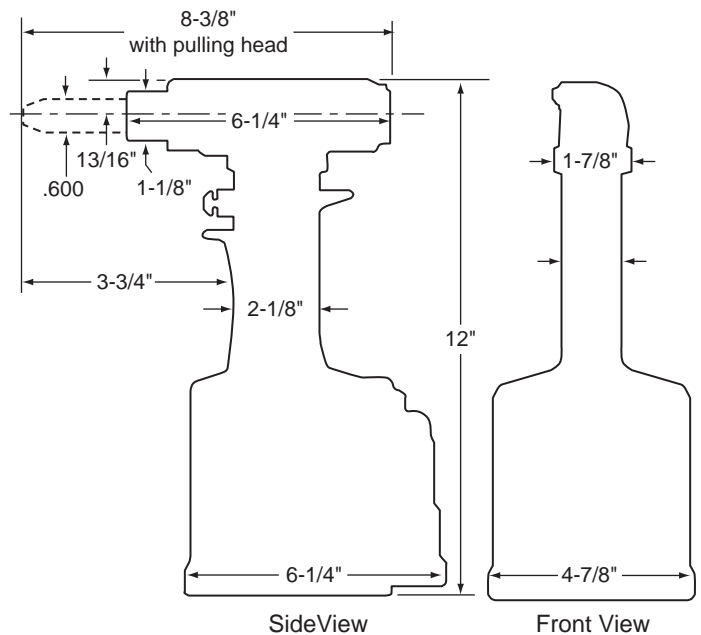
Pulling heads are not furnished with this tool but must be ordered separately. In ordering heads, be sure to specify the shank diameter and head style of the rivets to be installed.

H681 Series pulling heads fit directly on this tool to install both bulbed and standard CherryLOCK® rivets. Other types of pulling heads may be used on these riveters by using adapters listed on page 33.



Specifications

| | |
|-----------------|--|
| Air Pressure | 90 PSI (6.2 bar) min./110 PSI (7.6 bar) max. |
| Stroke | 7/8 inch (22.2 mm) |
| Pulling Force | 2,600 lbs. (11.57 kN) @ 90 PSI (6.2 bar), |
| Weight | 8 lbs. (3.63 kg) |
| Noise Level | 69.7 dB (A) |
| Vibration | less than 2.5 m/s ² |
| Air Consumption | .27 SCF/cycle (7.65 L/cycle) |



G686B-S LIMITED ACCESS POWER RIVETER

The G686B-S split CherryLOCK® riveter is designed specifically for the easiest and most efficient installation of CherryLOCK® rivets. In using these “split” tools, the power unit rests on the floor and transmits its power through 8 feet of hose to a light-weight pistol-grip handle; this facilitates rivet installation in many limited access areas and also greatly reduces operator fatigue.

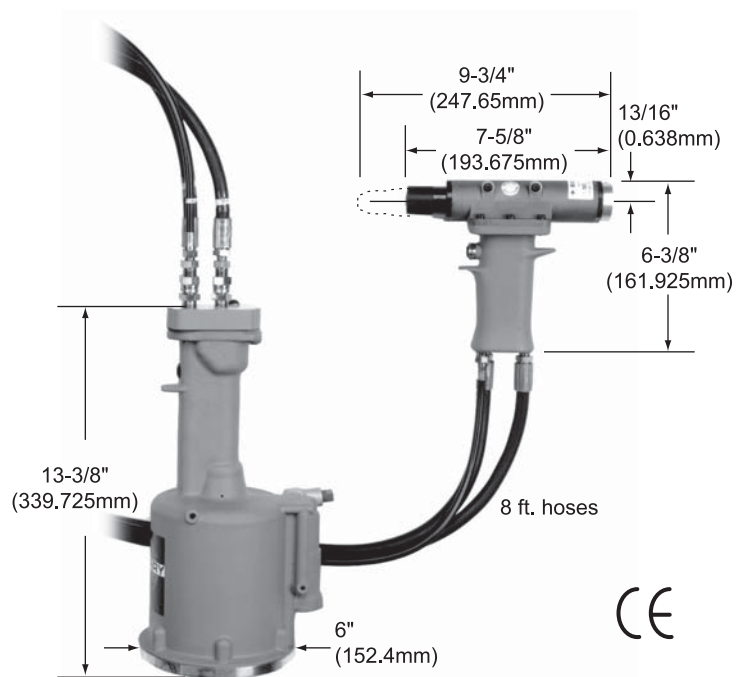
The G686B-S riveter operates on 90 to 110 psi of air pressure at the tool.

See the Tool Selection Chart on page 27 for complete tool capacity information.

Pulling Heads

Pulling heads are not furnished with this tool but must be ordered separately. When ordering heads, be sure to specify the shank diameter of the rivets to be installed.

H681 Series pulling heads fit directly on these tools to install both bulbed and standard CherryLOCK® rivets. Other types of pulling heads may be used on these riveters by using adapters listed on page 33.



Specifications

| | |
|-----------------|---|
| Air Pressure | 90 PSI (6.2 bar) min./110 PSI (7.6 bar) max. |
| Stroke | 1-7/16 inch (36.5 mm) |
| Pulling Force | 2,600 lbs. (11.57 kN) @ 90 PSI (6.2 bar) |
| Weight | Total: 17 lbs. (7.71 kg) Head Only: 5.0 lbs. (2.27 kg) |
| Noise Level | 74.5 dB (A) |
| Vibration | less than 2.5 m/s ² |
| Air Consumption | .5 SCF/cycle (14.2 L/cycle) |

G689 HEAVY-DUTY POWER RIVETER

The G689 heavy-duty CherryLOCK® riveter is a pneumatic-hydraulic tool designed specifically for the installation of all CherryLOCK® rivets. It weighs only 13 lbs.

The G689 is 15 1/2" high, has a 1.475" stroke and generates a minimum of 3,800 lbs. of pull on 90 to 110 psi of air pressure at the tool.

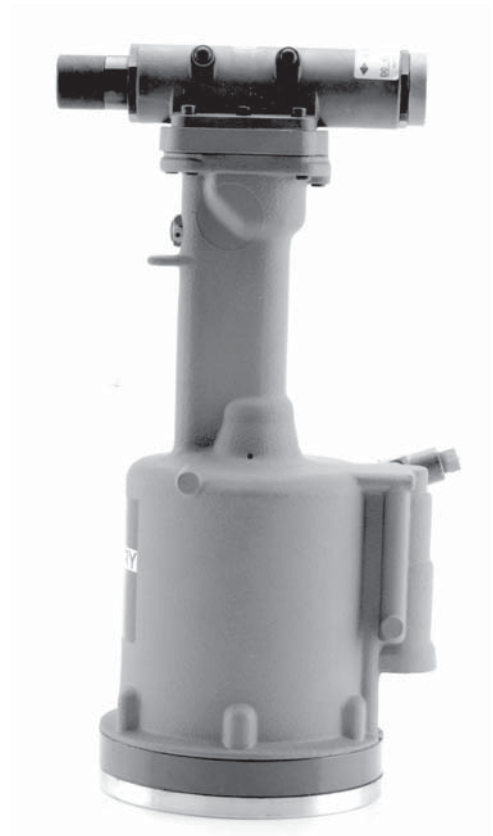
See the Tool Selection Chart on page 27 for complete tool capacity information.

Pulling Heads

Pulling heads are not furnished with this tool but must be ordered separately. In ordering heads, be sure to specify the shank diameter and head style of the rivets to be installed.

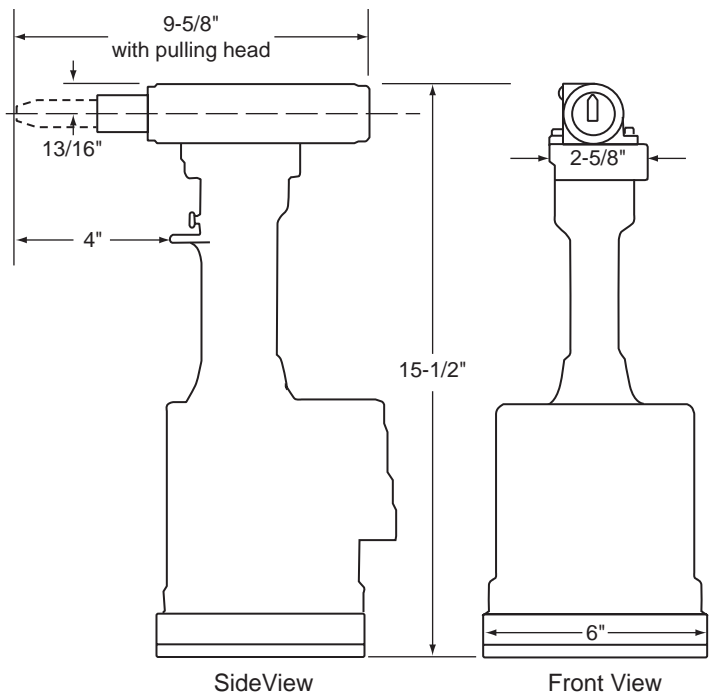
H681 Series pulling heads fit directly on this tool to install both bulbed and standard CherryLOCK® rivets.

Other types of pulling heads may be used on these riveters by using adapters listed on page 33.



Specifications

| | |
|-----------------|--|
| Air Pressure | 90 PSI (6.2 bar) min./ 110 PSI (7.6 bar) max. |
| Stroke | 1.475 inch (37.47 mm) |
| Pulling Force | 3,800 lbs. (16.9 kN) @ 90 PSI (6.2 bar) |
| Weight | 12.85 lbs. (5.90 kg) |
| Noise Level | 74.1 dB (A) |
| Vibration | less than 2.5 m/s ² |
| Air Consumption | .50 SCF/cycle (14.2 L/cycle) |



CHERRYLOCK® RIVET

INSTALLATION TOOLING

G695B RIGHT ANGLE POWER RIVETER

The G695B right angle riveter is designed specifically for installing CherryLOCK® rivets in limited access areas. The G695B riveter develops a minimum of 2000 lbs. of pulling power on 90 to 110 psi of air pressure at the tool, and has a 5/8" stroke. The power unit rests on the floor and is connected to the right angle unit with 8 feet of hose which further increases the flexibility of this tool.

See the Tool Selection Chart on page 27 for complete tool capacity information.

Pulling Heads

Pulling heads are not furnished with this tool but must be ordered separately. In ordering heads, be sure to specify the shank diameter and head style (universal or countersunk) of the rivets to be installed.

H690 Series pulling heads fit directly on this tool to install both bulbed and standard CherryLOCK® Rivets.

Specifications

| | |
|-----------------|--------------------------------|
| Air Pressure | 90 – 110 PSI |
| Stroke | .625" |
| Pulling Force | 2,000 lbs. |
| Weight | 17 lbs. |
| Noise Level | 74.1 dB(A) |
| Vibration | Less than 2.5 m/s ² |
| Air Consumption | .50 SCF/cycle (14.2 l/cycle) |

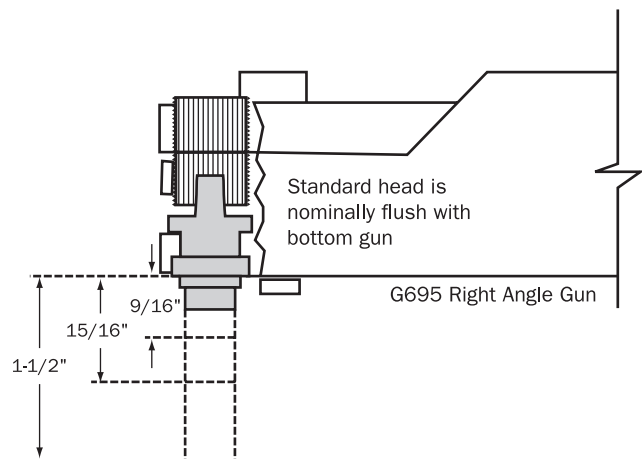
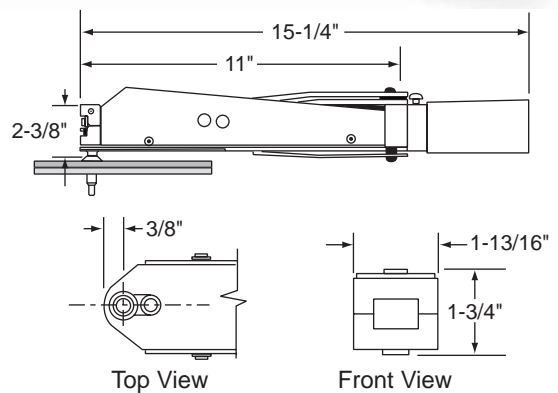
NOTE: Maximum grip length capacity when using wiredraw fastener is .250". No limitation for grip length when using CherryLock Bulb rivets.

H690 Series

There is a separate pulling head required for each head style (universal or countersunk) and each shank diameter of CherryLOCK® rivets. These heads fit directly on G695B right angle riveters.

| Rivet Diameter | Pulling Head Number | Rivet Head |
|----------------|---------------------|------------------|
| 1/8" | H690-4U | Universal Head |
| | H690-4C | Countersunk Head |
| 5/32" | H690-5U | Universal Head |
| | H690-5C | Countersunk Head |
| 3/16" | H690-6U | Universal Head |
| | H690-6C | Countersunk Head |
| 1/4" | H690-8U | Universal Head |
| | H690-8C | Countersunk Head |

NOTE: These pulling heads are also available in 9/16", 15/16" and 1-1/2" extensions. To order, specify proper pulling head and add length of extension to part number; e.g. H690-4U-15/16".



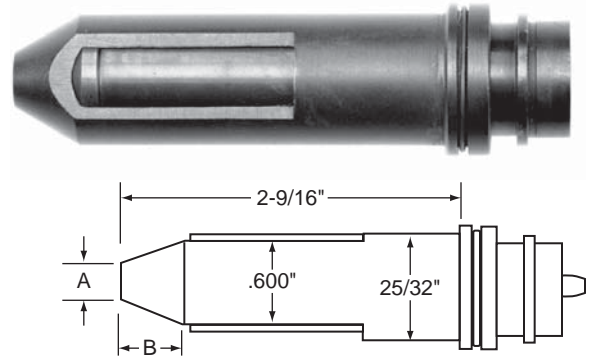
PULLING HEADS

H681 Series (Replaces H680 Series)

A separate pulling head is required for each diameter CherryLOCK® rivet. It is acceptable for countersunk (C) pulling heads be used for installing both universal and countersunk head CherryLOCK® rivets. These heads fit directly on all Cherry hydro-shift riveters.

H681 pulling heads may be obtained in four extended lengths to reach into difficult access areas. These are 2", 6", 12" and 24" extensions added to the normal head length of 2-9/16".

To order extension heads, specify correct pulling head number from chart on previous page and add extension length required. For example, H681-6C-E2 or H681-6C-E12, etc.



PULLING HEAD SELECTION CHART

| Rivet Dia. | Pulling Head Number | Rivet Head | Dimensions | |
|------------|---------------------|-----------------------------|------------|------|
| | | | A | B |
| 3/32" | H681-3C | Universal Head | .163 | .332 |
| | | Countersunk Head (MS 20426) | | |
| 1/8" | H681-4C | Universal Head | .208 | .341 |
| | | Countersunk Head (MS 20426) | | |
| 1/8" | H681-4F | Countersunk Head (156°) | .43 | .358 |
| | H681-4S | Countersunk Head (NAS 1097) | .174 | .341 |
| | H681B166-4 | Uni-Sink Head | .250 | .359 |
| 5/32" | H681-5C | Universal Head | .269 | .352 |
| | | Countersunk Head (MS 20426) | | |
| 5/32" | H681-5F | Countersunk Head (156°) | .535 | .338 |
| | H681-5S | Countersunk Head (NAS 1097) | .225 | .352 |
| | H681B166-5 | Uni-Sink Head | .313 | .377 |
| 3/16" | H681-6C | Universal Head | .335 | .386 |
| | | Countersunk Head (MS 20426) | | |
| 3/16" | H681-6F | Countersunk Head (156°) | .625 | .367 |
| | H681-6S | Countersunk Head (NAS 1097) | .281 | .386 |
| | H681B166-6 | Uni-Sink Head | .375 | .419 |
| 1/4" | H681-8C | Universal Head | .458 | .398 |
| | | Countersunk Head (MS 20426) | | |
| 1/4" | H681-8S | Countersunk Head (NAS 1097) | .374 | .398 |

CHERRYLOCK® RIVET

ADAPTERS & EXTENSIONS

226 Adapter

This adapter converts the screw-on heads H615B or H642 (15 series), now obsolete, to the snap-on type necessary to fit the G740A non-standard riveter.



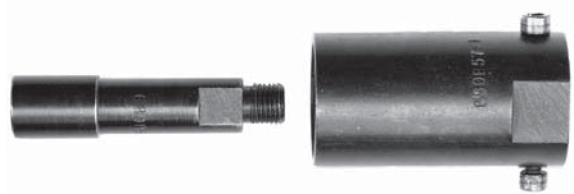
680B46 Adapter

This adapter fits all Cherry Aerospace hydroshift riveters to permit the use of the now obsolete H615B and H642 (15 series). It also permits the use of H9015 pulling heads for installation of “MS” style rivets.



680B57 Adapter

This adapter fits all Cherry Aerospace hydroshift riveters to permit the use of the now obsolete H640B and H642 for the installation of CherryLOCK® rivets. It also permits the use of H9040 pulling heads for the installation of “MS” style rivets.



MAINTENANCE ITEMS

GAGES

269C3 Grip Gage

A simple, self-explanatory gage for determining material thickness and proper rivet grip length.



T172 Rivet Hole Size Gage

These are precision ground, go no-go gages used to check holes drilled for Cherry blind rivets. They are made in all standard rivet diameters plus the oversize rivet diameters.



| Rivet Diameter | Wiredraw CherryLOCK® | Bulbed CherryLOCK® |
|----------------|----------------------|--------------------|
| 3/32" | T172-3 | — |
| 1/8" | T172-4 | T172-400 |
| 5/32" | T172-5 | T172-500 |
| 3/16" | T172-6 | T172-600 |
| 1/4" | T172-8 | — |

GAGES, CONTINUED

628 Setting Gages

These gages are used to adjust the shift point and lock ring anvil settings on the now obsolete CherryLOCK® mechanical pulling heads, H615B, H640B, H642 and H690. A separate gage is required for each rivet diameter and the correct gage is furnished with each new pulling head along with instructions for its use.

- 1/8" diameter #628-4 (green)
- 5/32" diameter #628-5 (red)
- 3/16" diameter #628-6 (blue)
- 1/4" diameter #628-8 (alum.)



680A159 Setting Gage

This gage is used to adjust the shift point setting on Cherry Aerospace hydroshift riveters. One of these gages is furnished with each new hydroshift riveter, along with instructions for its use.



Anvil Gages

These go no-go gages are used to check the hole diameters of lock ring anvils in all CherryLOCK® pulling heads, H615B, H640B, H642, H681 and H690. Their use will help eliminate installation problems caused by worn, oversized anvils.



A separate gage is required for each rivet diameter:

- 3/32" diameter P913
- 1/8" diameter P856
- 5/32" diameter P857
- 3/16" diameter P858
- 1/4" diameter P859

700A77 Air Bleeder

To keep CherryLOCK® hydraulic tools operating at peak efficiency, it is absolutely essential that the hydraulic systems be kept full of fluid and free of air.

Based on the same principle used in bleeding the hydraulic brake system of an automobile, the 700A77 air bleeder will quickly and easily remove all air and assure the complete filling of the tool with hydraulic fluid. It may be used in the tool crib or right on the production line, since it requires but a few minutes to perform this vital function. The air bleeder is a small item, but does a really big job: it prevents downtime.



Dexron III automatic transmission fluid is recommended for CherryLOCK® tools.

SERVICE KITS

An assortment of O-rings, seals, screws, washers and gaskets, likely to need replacing in time, is available in kit form for each CherryLOCK® power tool. To avoid unnecessary downtime, it is advisable to have these kits on hand for the tools being serviced.

| Tool | Service Kit Part No. |
|---------|----------------------|
| G700 | G700KS |
| G784 | G784KS |
| G685B-S | G685B-S/G686B-SKS |
| G686B-S | G685B-S/G686B-SKS |
| G689 | G689KS |
| G695 | G695KS |

