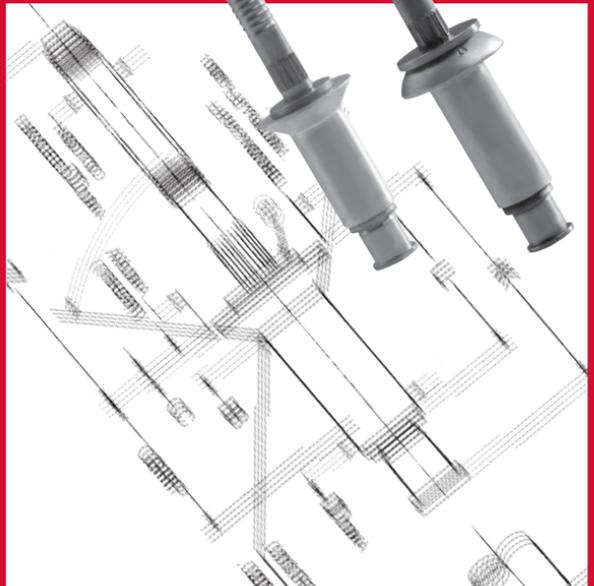


CHERRYMAX® PROCESS MANUAL



CHERRY®
AEROSPACE

SPS Fastener Division, a PCC Company

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ATTENTION: Blind fasteners are not always interchangeable with non-blind fasteners.
Consult with the aircraft Original Equipment Manufacturer for proper application of this product.

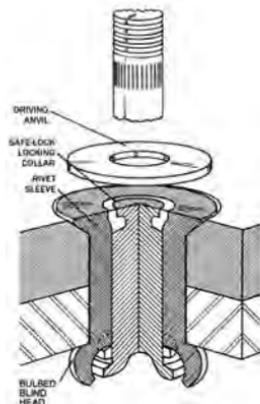
CHERRYMAX® RIVET BENEFITS

DRIVING ANVIL

A driving anvil is part of each CherryMAX® rivet assembly. This driving anvil eliminates wear and replacement of expendable installation tool components, considerably extending the life of the installation tool.

It also allows one pulling head to install:

- 1/8", 5/32" and 3/16" nominal and oversize diameter rivets, all head styles
- Protruding, 100° flush and 100° flush shear, unisink, and 120° flush head styles
- All bulbed CherryMAX® rivet grip lengths
- All bulbed CherryMAX® rivet sleeve/stem material combinations



LOCKING COLLAR

The CherryMAX® rivet features the “safe-lock” locking collar which enhances joint integrity and reliability. The “safe-lock” locking collar is pre-formed to the stem during a subassembly operation, then deforms into the rivet sleeve head recess during installation, locking the rivet sleeve and stem together.

The “safe-lock” locking collar

- Is visible and inspectable after installation
- Installs flush with the rivet sleeve head
- Is approved for use in engine inlets and components

RIVET

The CherryMAX® rivet is available in both nominal and 1/64” oversize shank diameters and is available in four material combinations:

- 5056 aluminum sleeve/alloy steel (50KSI shear)
- 5056 aluminum sleeve/CRES stem (50KSI shear)
- Monel sleeve/CRES stem (75KSI shear)
- INCO 600 sleeve/INCO X-750 stem (75KSI shear)*

TOOLING SIMPLICITY

- Lightweight, non-shifting installation tools require no adjusting.
- Limited access capability with right angle and offset pulling heads and extensions for greater reach and “split” tools for special applications including automation and robotics

BULBED BLIND HEAD

- Provides a large bearing surface area on the blind side of structure, giving dependable results, even when installed in difficult thin sheet stack-up applications

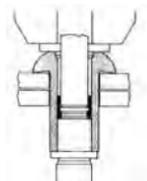
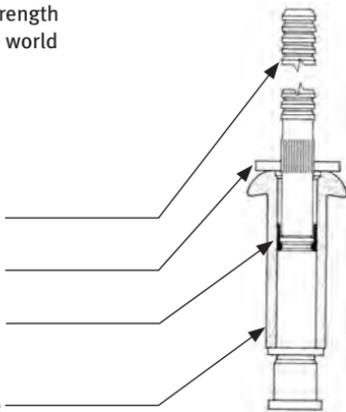
* Oversize only.

CHERRYMAX[®] RIVET FEATURES

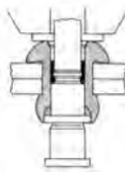
The CherryMAX[®] rivet is the most reliable, high strength structural fastener with visual inspectibility in the world today. It features the “safe-lock” locking collar for more reliable joint integrity. Meets requirements of PS-CMR-3000.

A CherryMAX[®] rivet consists of four components assembled as a single unit:

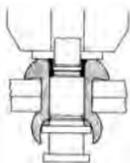
1. A fully serrated stem with break notch, shear ring and integral grip adjustment cone.
2. A driving anvil to insure a visible mechanical lock with each fastener installation.
3. A separate, visible and inspectable locking collar that mechanically locks the stem to the rivet sleeve.
4. A rivet sleeve with recess in the head to receive the locking collar.



1. The CherryMAX[®] rivet is inserted into the prepared hole. The pulling head (installation tool) is slipped over the rivet's stem. Applying a firm, steady pressure, which seats the rivet head, the installation tool is then actuated.



2. The pulling head holds the rivet sleeve in place as it begins to pull the rivet stem through the rivet sleeve. This pulling action causes the stem shear ring to upset the rivet sleeve and form the “bulbed” blind head.



3. The continued pulling action of the installation tool causes the stem shear ring to shear from the main body of the stem as the stem continues to move through the rivet sleeve. This action allows the fastener to accommodate a maximum of 1/16" variation in structure thickness. The locking collar then contacts the driving anvil. As the stem continues to be pulled by the action of the installation tool, the “safe-lock” locking collar deforms into the rivet sleeve head recess. Formation of the rivet sleeve's “bulbed” blind head is complete.



4. The “safe-lock” locking collar fills the rivet sleeve head recess, locking the stem and rivet sleeve securely together. Continued pulling by the installation tool causes the stem to fracture at the break notch, providing a flush, burr-free, inspectable installation.

SELECTING THE RIVET

NUMBERING SYSTEM

CR3243 -4 -04



Countersunk Head	Universal Head	Rivet Material	Stem Material
Nominal CherryMAX®		Nominal CherryMAX®	
CR3212	CR3213	5056 AL	ALLOY STEEL
CR3222	CR3223	5056 AL	CRES
CR3522	CR3523	MONEL	CRES
Oversize CherryMAX®		Oversize CherryMAX®	
CR3242	CR3243	5056 AL	ALLOY STEEL
CR3252	CR3253	5056 AL	CRES
CR3552	CR3553	MONEL	CRES
CR3852	CR3853	INCO 600	INCO X-750

GRIP LENGTH

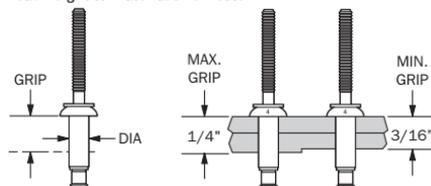
The grip range of all CherryMAX® rivets is in increments of 1/16 of an inch, with last dash number indicating the maximum grip in 1/16ths. (Example: -04 grip rivet has a grip range of 3/16 inch to 1/4 inch). See table below.

Rivet Grip No.	Material Thickness Range (in.)	
	Min	Max
-01	*	.062
-02	.062	.125
-03	.126	.187
-04	.188	.250
-05	.251	.312
-06	.313	.375
-07	.376	.437
-08	.438	.500
-09	.501	.562
-10	.563	.625
-11	.626	.687
-12	.688	.750

*See -01 minimum grip guidelines

-01 Minimum Grip Guidelines			
Rivet Dia	CherryMAX® Universal Head	CR3242 CR3252 CR3552 MS20426 Flush Head	CR3245 CR3255 CR3555 Unisink Head
1/8"	.025	.045	.033
5/32"	.031	N/A	N/A
3/16"	.037	N/A	N/A

NOTE: For double dimpled sheets, add countersink head height to material thickness.



CHERRYMAX® TOOLING

CherryMAX® is more than just an advancement in blind fastener design: it is a whole fastening system, consisting of fasteners and installation tooling. To obtain optimum advantage of the system it is recommended that CherryMAX® tooling be used.

The CherryMAX® tooling shown in this manual is faster, lighter and less expensive to purchase and maintain than other tools. It provides much better accessibility through use of the right angle, offset and extended pulling heads pictured on page 7.

G750A HAND RIVETER

The Cherry® G750A hydraulic hand riveter features a unique 2-step hydraulic power cylinder design. The ergonomic design allows the user to easily squeeze the handle throughout the increase power requirement, without strain normally endured during high strength fastener installations. The tool weighs just 1.9 lbs. and is only 7.5" long.

The G750A includes a straight pulling head. For other available pulling heads, see page 7.

CAPACITY

The G750A has a .75" pulling stroke, and has a rated pull load of 3,800 lbs. Installs 1/8", 5/32" 3/16", and 1/4" diameter rivets.



CHERRYMAX® TOOLING

G747 POWER RIVET

The Cherry® G747 is a pneumatic-hydraulic tool designed specifically for the most efficient installation of CherryMAX® rivets. It weighs just over 3 1/2 lbs. and can be operated in any position with one hand.

The G747 consumes approximately 1.9 cubic feet of air at 20 cycles per minute and its maximum noise level under load does not exceed 85 dB(A).

Pulling heads are not furnished with this riveter and must be ordered separately. For available pulling heads, see page 7.

*Stem deflector may be removed for use in limited access areas.

CAPACITY

The G747 has a stroke of .437" and a pulling capacity of 2100 lbs. on 90 psi per pressure at the air inlet. Normal operating air pressure range is 90-110 psi at the inlet.

The G747 riveter, equipped with any of the pulling heads listed, will install all 1/8", 5/32", and 3/16" diameter CherryMAX® rivets, in all materials, head styles and grip lengths.



CHERRYMAX® TOOLING

G704B POWER RIVETER

The Cherry® G704B is a pneumatic-hydraulic tool designed specifically for the most efficient installation of CherryMAX® rivets. It weighs just over 4-1/2 lbs. and can be operated in any position with one hand.

The G704B consumes approximately 3.9 cubic feet of air at 20 cycles per minute and its maximum noise level under load does not exceed 85 dB(A).

Pulling heads are not furnished with this riveter and must be ordered separately.

The G704B has a stroke of .518 and a pulling capacity of 3136 lbs. on 90 psi per pressure at the air inlet. Normal operating air pressure range is 90-110 psi at the inlet.

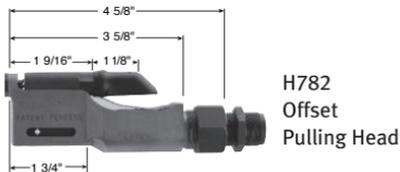
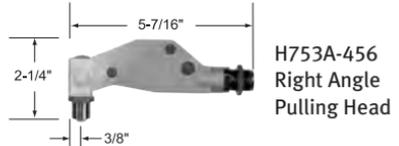
The G704B riveter, equipped with any of the three pulling heads listed, will install at 1/8", 5/32", and 3/16" diameter CherryMAX® rivets, in all materials, head styles and grip lengths.

*Stem deflector may be removed for use in limited access areas.



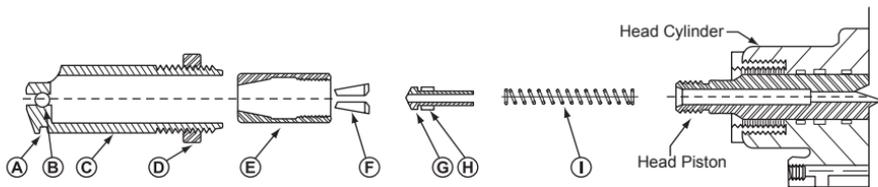
PULLING HEADS

Any of the four pulling heads shown here will install all 1/8, 5/32, and 3/16 inch diameter CherryMAX® rivets in all material, heads styles and grip lengths, Their overall "reach" can be extended by use of one of the 704A12 extensions shown on page 10. These heads fit directly on the G704B, G701A, G747, G746A riveters and fit the G750A riveter with a 750A-088 adapter.



CHERRYMAX® PULLING HEAD INSTALLATION

INSTALLING H701B-456 PULLING HEAD ON RIVETER

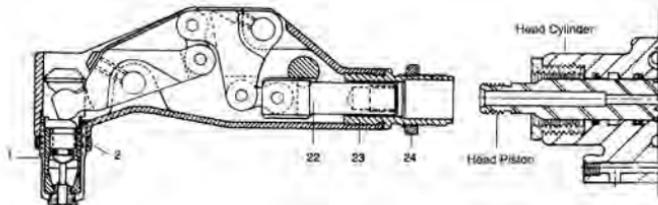


1. Insert spring I into head piston.
2. Place jaws F inside collet E. Place bumper H over jaw follower G and place this assembly in collet against jaws. Make sure tapered end of jaw follower G is aligned properly in the bevel in back of jaws F. Screw this assembly onto end of head piston. Tighten securely, using wrenches on flats.
3. Thread outer sleeve C, which controls jam nut D, snugly into end of head cylinder. Tighten jam nut D securely.
4. In case of damage to the pulling head, dismantle and replace with parts selected from the list below.

Ref.	Part No.	Description	Qty. Req.
A	701B25	Retaining Ring	1
B	701B24	Stem Stops	2
C	701B21	Sleeve	1
D	671A16	Jam Nut	1
E	701B29A	Collet	1
F	701B18	Jaws (set of 2)	1
G	753A14A	Jaw Follower (.61" shk. lg.)	1
H	701A33	Bumper	1
I	P1155	Spring (1-1/2" long)	1

CHERRYMAX® PULLING HEAD INSTALLATION

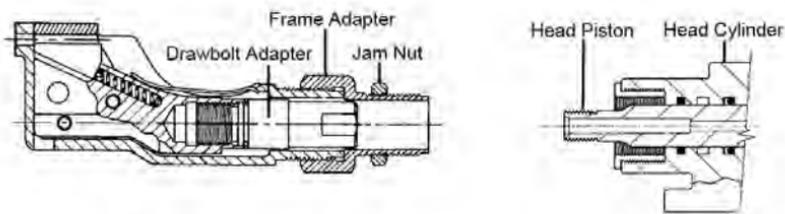
INSTALLING H753A-456 PULLING HEAD ON RIVETER



Engage 1 or 2 threads of drawbolt (22) onto head piston, then insert adapter fitting (23) into end of head cylinder and turn clockwise until snug. Rotate pulling head to the position to be used and tighten jam nut (24) securely.

After attaching the H753A-456 to the riveter adjust sleeve (1) by loosening jam nut (2), then insert largest diameter CherryMAX® to be installed into sleeve. Rotate sleeve until the jaws start to grab the rivet stem. Tighten the jam nut (2) securely. By this sleeve adjustment, the pulling head can be made to release or hold the stem after installation.

INSTALLING H781-456 PULLING HEAD ON RIVETER



Thread **DRAWBOLT ADAPTER** clockwise onto end of riveter head piston completely, then insert **FRAME ADAPTER** into end of riveter head cylinder. As the pulling head is threaded onto the riveter and **DRAWBOLT ADAPTER** seats on piston, resistance to turning will become greater. Continue turning until **FRAME ADAPTER** seats in head cylinder. Rotate pulling head to the position to be used and tighten **JAM NUT** securely. Use a gap between the frame and the saddle of 0.160" for 1/8" CherryMAX® rivets. This gap may be decreased for 5/32" and 3/16" CherryMAX® rivets.

Note: Before installing any head on a pneumatic-hydraulic power riveter, the riveter should be attached to an air source. Ensure that the piston is fully extended.

CHERRYMAX® PULLING HEAD INSTALLATION

ADAPTERS



704A12 EXTENSIONS

These extensions help reach many restricted installation areas by increasing the overall length of the pulling head. They fit directly on the G704B, G746A and G747 CherryMAX® riveters and will accept any of the CherryMAX® pulling heads shown on page 7. There are four extension lengths offered: 704A12-2 which extends the pulling head 2", 704A12-4 (4"), 704A12-6 (6") and 704A12-12 (12").



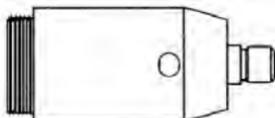
704A6 ADAPTER

This adapter fits either the G704B, G746A, or G747 CherryMAX® riveters to permit the use of H9040 pulling heads for installation of MS-type blind rivets.



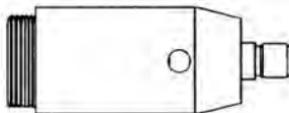
704A9 ADAPTER

This adapter fits either the G704B, G746A, or G747 CherryMAX® riveters to permit the use of H9015 pulling heads for installation of MS-type blind rivets, and H9055 heads for installation of CherryLOCK® "A" Code rivets.



750-117 ADAPTER

This adapter fits the G750A riveter to permit the use of H9015 pulling heads for installation of MS-type blind rivets, and H9055 pulling heads for installation of CherryLOCK® "A" Code rivets.

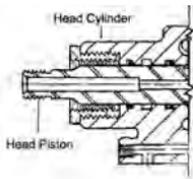
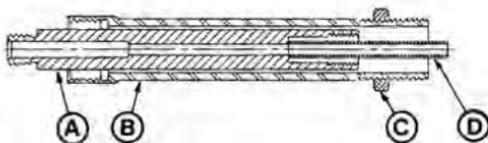


750A-088 ADAPTER

This adapter fits the G750A riveter to permit the use of the right angle (H753A-456), offset (H781-456 and H782) pulling heads and 704A12 extensions.

CHERRYMAX® PULLING HEAD INSTALLATION

INSTALLING 704A12 EXTENSIONS



1. Insert tube D, which replaces spring, into head piston.
2. Screw drawbolt extension A onto end of head piston. Tighten securely.
3. Thread sleeve extension B snugly into end of head cylinder.
4. Tighten jam nut C securely.
5. Install H701B-456 or H753A-456 or H781-456 as described in the pulling head installation section on pages 8 – 9.

CHERRYMAX® TOOLING ACCESSORIES – GAGES



269C3 GRIP GAGE

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



T-172 RIVET HOLE SIZE GAGES

These are precision ground, go/no-go gages used to check holes drilled for CherryMAX® rivets. They are made in both nominal and oversize rivet diameters.

Rivet Diameter	Hole Gage Part Numbers	
	Nominal	Oversize
1/8	T172-4	T172-400
5/32	T172-5	T172-500
3/16	T172-6	T172-600
1/4	T172-8	T172-800



670A20 STEM CATCHER BAG NSN 5130-01-154-1141

The stem catcher bag is a convenient accessory which helps eliminate stems from the shop floor. This heavy bag snaps over the stem deflector of the G704B, G746A, G747, G83 and G84 CherryMAX® riveters to catch the spent stems as they are ejected from the rear of the riveter head.

CONVERTING CHERRYLOCK® TOOLS



G700



G784

Existing CherryLOCK® hydro-shift riveters, G700 (1/8" rivets only) and G784 may be used "as is" to install CherryMAX® rivets by using H680B200A pulling head. By using a 680B205 adapter, either the H781-456 CherryMAX® offset pulling head or H753A-456 right angle head will also fit the hydro-shift tools.



680B205 ADAPTER



H680B200A

CherryMAX® pulling head will pull 1/8", 5/32" and 3/16" diameters.

SELECTING CHERRYMAX® TOOLS

The tool and pulling head combinations shown below will pull the diameter rivets (all head styles) indicated by the shaded areas in all grip lengths of CherryMAX® rivets. For more information regarding installation tooling combinations, please contact Technical Service, Cherry Aerospace, CA at 714- 850-6022.

Type of Tool	Cherry® Riveter Model	Pulling Head	All Grip Lengths								
			Nominal Rivet Diameters				Oversize Rivet Diameters				
			-4	-5	-6	-8	-4	-5	-6	-8	
CherryMAX®	G27*	-									
	G704B	H701B-456									
	G744	H744A-8									
		H846A-456									
	G746A	H701B-456									
	G747	H701B-456									
	G83	H701B-456**									
		H84A-8									
	G84	H701B-456**									
		H84A-8									
G750A*	-										
	H750A-8										
CherryLOCK®	G700	H680B200A		†							
	G784	H680B200A									
MS Type Riveter	G740Att	H9040-4C									
		H9040-5C									
	G715Att	H9015-3C									
		H9015-4C									
		H9015-5C				†					†

* Hand riveters

† Will install aluminum fasteners only

** Requires use of 744-300 adapter

†† Nonstandard

HOLE PREPARATION

Proper hole preparation is very important in obtaining a strong, rigid and reliable riveted joint.

HOLE SIZE

CherryMAX® rivets are designed to function within a specified hole size range.

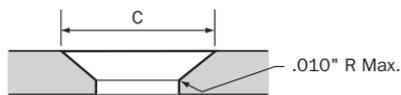
Drilling Dimensions The hole size limits, along with suggested drill sizes, are listed below.

DRILLING DIMENSIONS

Rivet Dia.	Drill Size	Min.	Max.
Nominal Diameter CherryMAX®			
1/8	#30	.129	.132
5/32	#20	.160	.164
3/16	#10	.192	.196
1/4	F	.256	.261
Oversize Diameter CherryMAX®			
1/8	#27	.143	.146
5/32	#16	.176	.180
3/16	#5	.205	.209
1/4	I	.271	.275

Rivet Dia.	C Min.	C Max.
1/8	.222	.228
5/32	.283	.289
3/16	.350	.356
1/4	.473	.479

Countersinking Dimensions (100°)



The above drill sizes are those which normally produce holes within the specified limits. Holes should be checked with a Cherry® go no-go gage to assure drilling accuracy.

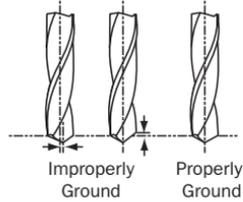


Rivet Dia.	Hole Gage Part Numbers	
	Nominal	Oversize
1/8	T172-4	T172-400
5/32	T172-5	T172-500
3/16	T172-6	T172-600
1/4	T172-8	T172-800

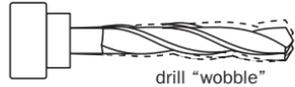
HOLE PREPARATION

DRILLING PROCEDURE

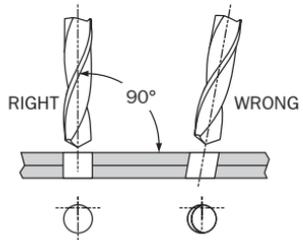
Use a clean, sharp, properly ground drill. Improperly ground drills will create oval or oversize holes.



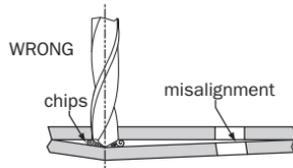
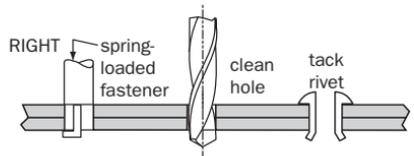
Center the drill in the chuck so that the drill will run true. A “wobble” in the drill will create an oversize hole.



Hold the drill perpendicular to the surface being drilled. Do not force the drill through the material.



To ensure proper hole alignment and to prevent burrs and chips from lodging between the sheets, the materials to be riveted should be clamped tightly together. Hole-filling hollow tack rivets should be used in conjunction with spring-loaded fasteners to prevent material creep and hole misalignment during the drilling operation.



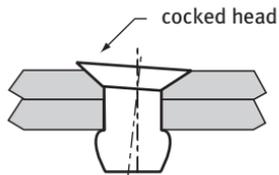
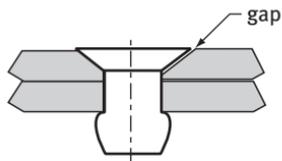
HOLE PREPARATION

COUNTERSINKING

Accurate countersinking is of primary importance to the structural integrity of a flush riveted joint. Standard countersinking procedures as used with solid rivets are also applicable to CherryMAX® rivets. The following points, however, should be carefully noted.

The countersink pilot should be no more than .001" smaller than the hole diameter. A greatly undersized pilot will produce a countersink which is not concentric with the hole, creating head gap problems.

An undersize countersink pilot which is too small may also create a countersink whose axis is not in line with the axis of the drilled hole. This will create a "cocked" rivet head condition.

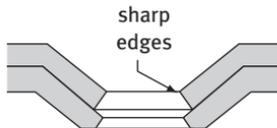


DIMPLING

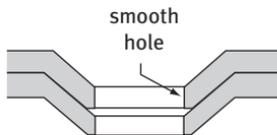
Normal dimpling procedures stretch and enlarge the pilot holes in thin sheet applications. The sheets (as dimpled) provide only sharp edges within the hole.

To overcome the problems inherent in this type of application, the dimple should first be prepared with a hole size which will allow for subsequent reaming.

The hole should then be reamed to the dimensions specified for the size rivet being installed. The CherryMAX® rivet is especially recommended for this application.



As Dimpled



Hole Reamed

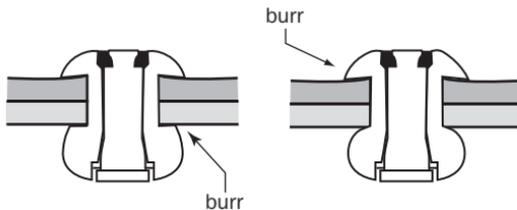
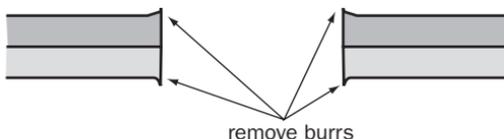
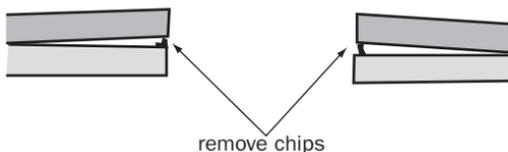
HOLE PREPARATION

DE-BURRING

All drilling operations cause burrs to form on each end of the hole being drilled, as well as between the sheets. Whenever possible, all burrs should be removed. Do not remove edge of hole on blind side of sheet as this will affect clamp-up.

However, CherryMAX® rivets can compensate for minor burrs remaining on the sheets.

When using a drill or reamer to remove burrs, care must be taken to remove **only** the burr. Do not countersink the sheets, as this may materially affect the strength of the riveted joint, particularly with respect to the blind sheet.



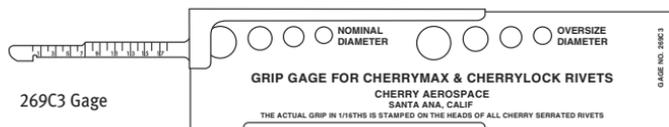
Poor



Good

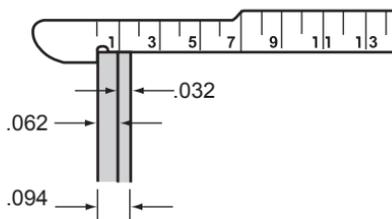
GRIP GAGE USE

To determine the proper grip rivet to use, measure the material thickness with a 269C3 grip gage as shown below. Insert the grip gage into the prepared hole, draw gage back until lip contacts backside of structure and read where front side of structure coincides with numbers and lines on gage. Always read to the next higher number (if reading is directly on a line you may use either that grip or the next higher one).



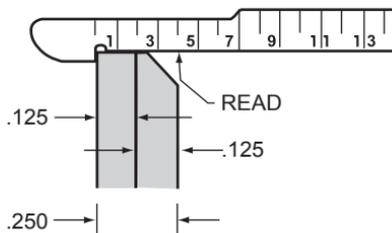
PROTRUDING HEAD

Correct rivet grip is a -02, since grip range of a -02 rivet is .062 to .125.



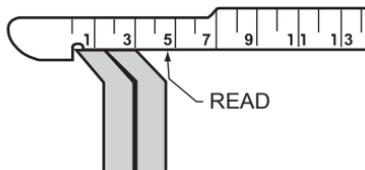
MACHINE COUNTERSINK

Read correct rivet grip to top of sheet. Grip is sheet thickness plus rivet head height. Since this example is on the line, use either -04 or -05 grip.



DOUBLE DIMPLE

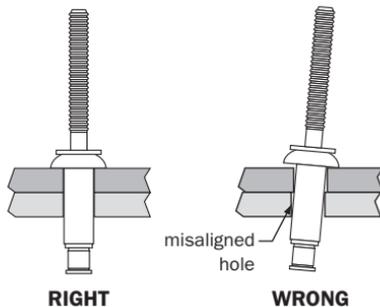
Read correct rivet grip to top of sheet. Grip is sheet thickness plus rivet head height. This example would require a -05 grip.



CHERRYMAX® INSTALLATION

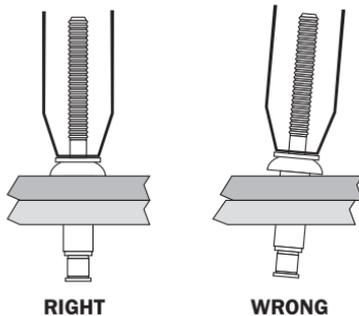
PLACING THE RIVET IN THE HOLE

The holes in the sheets to be fastened must be of correct size and aligned properly. Do not force the rivet into the hole! Tack rivets and/or spring-loaded fasteners are recommended to minimize material creep and sheet gap.



PLACING THE PULLING HEAD ON THE RIVET STEM

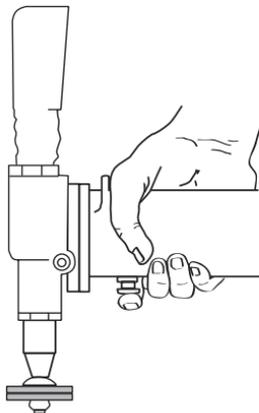
Hold the riveter and pulling head in line with the axis of the rivet. Press firmly against head of rivet to minimize head gapping and sheet gap.



CHERRYMAX® INSTALLATION

Holding the riveter in line with the rivet as accurately as possible, apply a steady, firm pressure and pull the trigger. The rivet clamping action will pull the sheets together, seat the rivet head and break the stem flush with the head of the rivet.

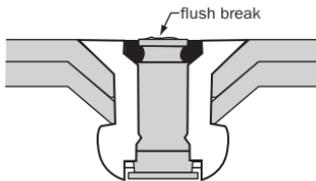
When the rivet is completely installed, release the trigger and the stem will be ejected back through the riveter head. A stem catcher bag, part no. 670A20 may be obtained to collect the spent stems. (see page 11).



RIVET SHAVING

Normal shop practice will result in countersunk rivet sleeves which are essentially flush with the aircraft skin. Further secondary operations are not normally necessary.

As long as the stem is installed within the prescribed inspection limits, the stem may be shaved down to the top of the rivet sleeve.

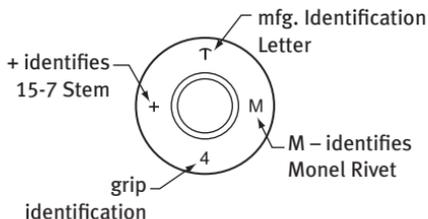


CHERRYMAX® INSPECTION

Inspection for the proper installation of CherryMAX® rivets can be made from the visible side of the work.

INSTALLED RIVET IDENTIFICATION

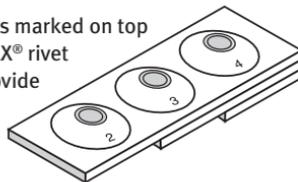
CherryMAX® rivets are “self-Inspecting”



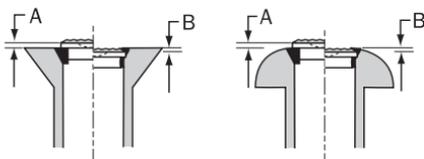
Note:

1. Driving anvil is gold color to identify nominal diameter rivet.
2. Driving anvil is silver color to identify oversize diameter rivet.
3. Head markings on flush head rivet are visible after installation.

Grip length is marked on top of CherryMAX® rivet heads to provide positive inspection.



STEM AND COLLAR FLUSHNESS



Shown is a typical installed fastener flushness acceptance criteria. Locking collar is to be flush with the top surface of the rivet head. Collar flash permissible is .005 max. Stem flushness shall be as indicated.

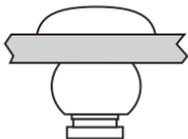
Rivet Dia.	A Max.	B Max.
-4 (1/8")	.010"	.015"
-5 (5/32")	.010"	.020"
-6 (3/16")	.010"	.020"
-8 (1/4")	.015"	.025"

CHERRYMAX® INSPECTION

TYPICAL BLIND HEAD

If the grip marking indicates the rivet has been installed in the proper grip, and the stem and collar are flush within prescribed limits, blind heads typical of those illustrated will be obtained.

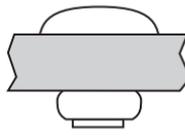
ACCEPTABLE BLIND HEAD FORMATIONS



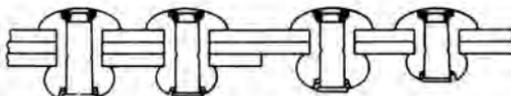
Typical Min. Grip



Irregular Formation Min. Grip



Typical Max. Grip

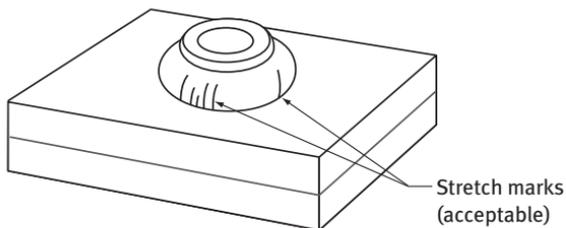


Aluminum Monel
Max. Grip

Aluminum Monel
Min. Grip

NOMINAL AND OVERSIZE CHERRYMAX® RIVETS

Superficial stretch marks which may appear in the rivet sleeve are not detrimental to rivet strength and are acceptable (bulbed blind head shown).



RIVET TROUBLESHOOTING

The correct installation of CherryMAX® rivets requires that the instructions contained in this manual regarding hole preparation, tools and installation technique be carefully followed.

It is imperative that the pulling heads and jaws be clean, free from chips, burrs and dry sealant, and are in proper adjustment and mechanical repair.

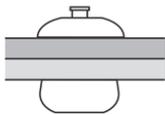
When problems occur, the source of the trouble could be the installer, the tools, or the application. Consequently, the following trouble shooting guide will consider several sources for each problem and a solution for each.

RIVET STEM BREAKS HIGH

Rivet stem break notch pulls to .030" or higher above rivet head.
Stem **may** or **may not** break.

SOURCE OF PROBLEM

- A. Rivet installed in oversized hole – use correct drill size for rivet.
Check material thickness and rivet grip length.

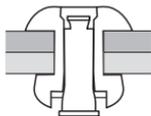


RIVET STEM BREAKS LOW (collar does not set)

Rivet stem breaks well below maximum allowed dimensions below head and collar does not set.

SOURCE OF PROBLEM

- A. Rivet installed in undersize hole – drill out holes to proper size.
- B. Rivet installed in over maximum grip – use longer grip rivet.
- C. Holes slanted or misaligned – use more care to obtain holes which are properly aligned and normal to the sheets.
- D. Installer “cocks” pulling head – use more care to align tool and keep arm flexible to allow rivet to align itself.

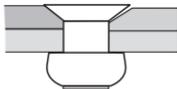
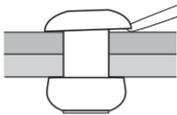


POOR HEAD SEATING

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

SOURCE OF PROBLEM

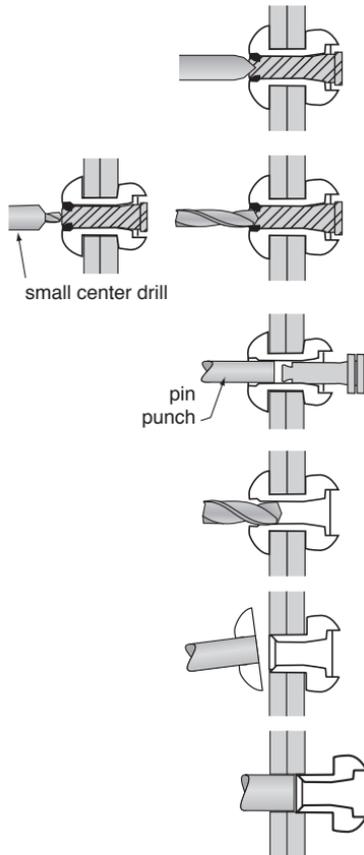
- A. Holes slanted or misaligned – holes must be perpendicular to the work surface.
- B. Countersink not concentric with hole. – use countersink pilot which is .001" under hole size.
- C. Installer “cocks” pulling head and rivet head during installation – installer should hold tool and pulling head in a flexible manner, so rivet can clamp head down properly.



RIVET REMOVAL

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

1. Center punch stem.
2. It is recommended that a small center drill be used to provide a guide for a larger drill on top of the rivet stem, and the upper portion of the stem be drilled away to destroy the lock.
3. Drive out the rivet stem using a steel pin punch.
4. Drill nearly through the head of the rivet using a drill the same size as the rivet shank.
5. Break off rivet head using a pin punch as a pry.
6. Drive out the remaining rivet shank with a pin punch.

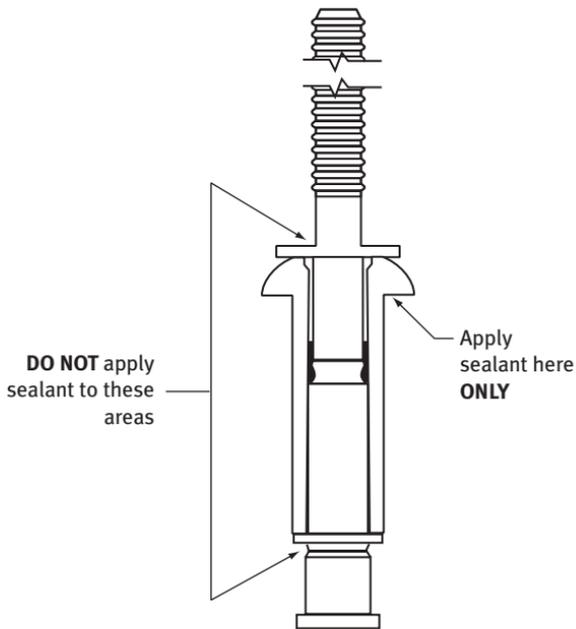


Caution: DO NOT drill completely through the rivet sleeve to remove a rivet as this may enlarge the hole.

PROPER SEALANT APPLICATION

Blind rivets depend on a balance of lubricity to friction, compression and radial expansion during installation. In the manufacturing process, lubricants are typically used to ensure the blind rivet installs correctly.

Sealant should be applied **ONLY** around the rivet sleeve (see illustration). It is critical that the sealant does not touch the exposed areas of the stem.



When sealant is applied to the fastener incorrectly, two conditions may occur. Either the stem of the fastener will pull high or all the way through the rivet sleeve, or the stem will break prematurely and will be too deep in the rivet sleeve to be properly locked by the lock collar. In either case, the rivet must be removed and replaced. Initial care in the application of sealant will eliminate this replacement process.

POWER RIVETERS

The G704B, G746A and G747 installation tools are manufactured to give maximum service with minimum care. In order to accomplish this, follow these recommendations.

1. The hydraulic system should be full of Automatic Transmission Fluid (ATF) and free of air at all times. Cherry recommends Dextron III ATF.
2. Keep excessive moisture and dirt out of the air supply to prevent wear.
3. Do not pound on the rear of the tool head to force rivets into holes, as this will damage the tool.
4. Make sure the pulling head is correctly and securely attached.

TROUBLESHOOTING

1. Check air line for correct pressure at the tool. IT MUST BE 90 TO 110 PSI.
2. Check tool for lack of Automatic Transmission Fluid (ATF).
3. Check for ATF leakage.
 - A. ATF leaking around the cap screws **2** in the head indicates that the screws are loose or the washer gaskets **3** need replacing.
 - B. If ATF should leak through the by-pass hole at the base of the handle **34** the O-rings are worn or damaged.
 - C. ATF leaking from the front of the head **1** indicates that O-rings are worn or damaged.
4. Check valve **45** for air leakage. If air is escaping without depressing trigger **29** O-rings are worn or damaged.
5. Check movement of piston. If it does not move freely or is slow in operation:
 - A. O-rings may be damaged and require replacement.
 - B. Piston may be mechanically locked due to damaged parts.
 - C. Tool may be low on ATF fluid.
 - D. Muffler or air filter inside spool **45** may be plugged with dirt. Have them cleaned thoroughly with normal solvent and back-blow with compressed air.



HAND RIVETERS

The G750A Hydraulic Hand Riveter is manufactured to give maximum service with minimum care. In order to accomplish this, follow these recommendations:

1. The hydraulic system should be full of Dextron III Automatic Transmission Fluid (ATF) and free from air at all times.
2. Make sure the pulling head is correctly and securely attached.

TROUBLESHOOTING

1. Check tool for lack of ATF fluid. Fill and bleed the tool. Refer to the G750A Tool Repair Manual for maintenance instructions on filling and bleeding instructions.
2. Check for ATF leakage. If worn or damaged O-rings require replacement, **use only Cherry® replacement parts.** (Refer to the G750A Tool Repair Manual for maintenance instructions on the replacement of worn or damaged O-rings.)

When re-attaching the H750A-456 pulling head to the G750A, it is necessary to align the jaws.

To align the jaws, first pump the handle several times. Second, place a rivet stem into the H750A-456 pulling head. Last, fully retract the piston while the rivet stem is in the H750A-456 pulling head.



AIR BLEEDERS

700A77 AIR BLEEDER

To keep Cherry® rivet hydraulic installation 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 principal used in bleeding the hydraulic brake system of an automobile, the 700A77 Cherry® air bleeder will quickly and easily remove all air and assure the complete filling of the system with ATF 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 it does a really big job: it prevents downtime.

The bottle is molded from pure polycarbonate, the toughest of all thermoplastic materials, and is virtually unbreakable. All other components are precision machined for long life. Replacement parts may be obtained in case of loss or damage.

The 700A77 Cherry® air bleeder may be used on any of the Cherry® power riveters.



700A77 Air Bleeder

NOTE: Only use Dextron III ATF in Cherry® power riveters.

745A45 AIR BLEEDER FOR G750A AND G749A HAND TOOLS ONLY

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

The 745A45 Cherry® air bleeder will quickly and easily remove all air and assure the complete filling of the system with transmission fluid. The air bleeder is a small item but it does a really big job: it prevents downtime!

The 745A45 air bleeder has a strong plastic construction with an aluminum plunger. Replacement parts may be obtained in case of loss or damage.



745A45 Air Bleeder

SPECIAL ASSEMBLY TOOLS

TOOL KIT

To completely dismantle and reassemble Cherry® power riveters, it is advisable to use certain special wrenches designed for that purpose.

The following chart shows available tool kits:

Cherry® Tool	Tool Kit
G701A	G701/G704KT
G704B	G701/G704KT
G746A	G701/G704KT
G747	G701/G704KT
G744	G740KT

For complete list of tools in each tool kit, contact Cherry Aerospace Technical Services.



SERVICE KIT

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

For complete list of parts in each service kit, contact Cherry Aerospace Technical Services.

Cherry® Tool	Service Kit Number
G704B	G704KS
G744	G744KS
G746A	G746AKS
G747	G747KS
G83	G83KS
G84	G84KS

DECIMAL EQUIVALENT CHART

Nom.	M/M	Dec.	Nom.	M/M	Dec.	Nom.	M/M	Dec.	Nom.	M/M	Dec.	Nom.	M/M	Dec.
—	.1	.0039	1/16	—	.0625	21	—	.1590	K	—	.2810	9/16	—	.5625
—	.2	.0079	52	—	.0635	20	—	.1610	9/32	—	.2812	37/64	—	.5781
—	.3	.0118	51	—	.0670	19	—	.1660	L	—	.2900	—	15.0	.5906
80	—	.0135	50	—	.0700	18	—	.1695	M	—	.2950	19/32	—	.5937
79	—	.0145	49	—	.0730	11/64	—	.1719	19/64	—	.2969	39/64	—	.6094
1/64	—	.0156	48	—	.0760	17	—	.1730	N	—	.3020	5/8	—	.6250
—	.4	.0157	5/64	—	.0781	16	—	.1770	5/16	—	.3125	—	16.0	.6299
78	—	.0160	47	—	.0785	15	—	.1800	—	8.0	.3150	41/64	—	.6406
77	—	.0180	—	2	.0787	14	—	.1820	O	—	.3160	21/32	—	.6562
—	.5	.0197	46	—	.0810	13	—	.1850	P	—	.3230	—	17.0	.6693
76	—	.0200	45	—	.0820	3/16	—	.1875	21/64	—	.3281	43/64	—	.6719
75	—	.0210	44	—	.0860	12	—	.1890	Q	—	.3320	11/16	—	.6875
74	—	.0225	43	—	.0890	11	—	.1910	R	—	.3390	14/84	—	.7031
—	.6	.0236	42	—	.0935	10	—	.1935	11/32	—	.3437	—	18.0	.7087
73	—	.0240	3/32	—	.0937	9	—	.1960	S	—	.3480	23/32	—	.7187
72	—	.0250	41	—	.0960	—	5.0	.1968	—	9.0	.3543	47/64	—	.7344
71	—	.0260	40	—	.0980	8	—	.1990	T	—	.3580	—	19.0	.7480
—	.7	.0276	39	—	.0995	7	—	.2010	23/64	—	.3594	3/4	—	.7500
70	—	.0280	38	—	.1015	13/64	—	.2031	U	—	.3680	49/54	—	.7656
69	—	.0292	37	—	.1040	6	—	.2040	3/8	—	.3750	25/32	—	.7812
68	—	.0310	36	—	.1065	5	—	.2055	V	—	.3770	—	20.0	.7874
1/32	—	.0312	7/64	—	.1094	4	—	.2090	W	—	.3860	51/64	—	.7969
—	.8	.0315	35	—	.1100	3	—	.2130	25/64	—	.3906	13/16	—	.8125
67	—	.0320	34	—	.1110	7/32	—	.2187	—	10.0	.3937	—	21.0	.8268
66	—	.0330	33	—	.1130	2	—	.2210	X	—	.3970	53/64	—	.8281
65	—	.0350	32	—	.1160	1	—	.2280	Y	—	.4040	27/32	—	.8437
—	.9	.0354	—	3.0	.1181	A	—	.2340	13/32	—	.4062	55/64	—	.8594
64	—	.0360	31	—	.1200	15/64	—	.2344	Z	—	.4130	—	22.0	.8661
63	—	.0370	1/8	—	.1250	—	6.0	.2362	27/64	—	.4219	7/8	—	.8750
62	—	.0380	30	—	.1285	B	—	.2380	—	11.0	.4331	57/64	—	.8906
61	—	.0390	29	—	.1360	C	—	.2420	7/16	—	.4375	—	23.0	.9055
—	1	.0394	28	—	.1405	D	—	.2460	29/64	—	.4531	29/32	—	.9062
60	—	.0400	9/64	—	.1406	1/4	—	.2500	15/32	—	.4687	59/64	—	.9219
59	—	.0410	27	—	.1440	E	—	.2500	—	12.0	.4724	15/16	—	.9375
58	—	.0420	26	—	.1470	F	—	.2570	31/64	—	.4844	—	24.0	.9449
57	—	.0430	25	—	.1495	G	—	.2610	1/2	—	.5000	61/64	—	.9531
56	—	.0465	24	—	.1520	17/64	—	.2656	—	13.0	.5118	31/32	—	.9687
3/64	—	.0469	23	—	.1540	H	—	.2660	33/64	—	.5156	—	25.0	.9842
55	—	.0520	5/32	—	.1562	I	—	.2720	17/32	—	.5312	63/64	—	.9844
54	—	.0550	22	—	.1570	—	7.0	.2756	35/64	—	.5469	1	25.4	1.0000
53	—	.0595	—	4.0	.1575	J	—	.2770	—	14.0	.5512	—	—	—

NAS VS. CHERRYMAX[®] CROSS-REFERENCE LIST

NAS	Cherry [®]
NAS9301B-x-x	CR3213-x-x
NAS9301E-x-x	CR3223-x-x
NAS9302B-x-x	CR3212-x-x
NAS9302E-x-x	CR3222-x-x
NAS9303B-x-x	CR3214-x-x
NAS9303E-x-x	CR3224-x-x
NAS9304B-x-x	CR3243-x-x
NAS9304E-x-x	CR3253-x-x
NAS9305B-x-x	CR3242-x-x
NAS9305E-x-x	CR3252-x-x
NAS9306B-x-x	CR3245-x-x
NAS9306E-x-x	CR3255-x-x
NAS9307M-x-x	CR3523-x-x
NAS9307ML-x-x	CR3523P-x-x
NAS9307MN-x-x	CR3523EE-x-x
NAS9307MP-x-x	CR3523P-x-x or CR3523EE-x-x
NAS9308M-x-x	CR3522-x-x
NAS9308ML-x-x	CR3522P-x-x
NAS9308MN-x-x	CR3522EE-x-x
NAS9308MP-x-x	CR3522P-x-x or CR3522EE-x-x
NAS9309M-x-x	CR3524-x-x
NAS9309ML-x-x	CR3524P-x-x
NAS9309MN-x-x	CR3524EE-x-x
NAS9309MP-x-x	CR3524P-x-x or CR3524EE-x-x
NAS9310C-x-x	CR3853-x-x
NAS9310M-x-x	CR3553-x-x
NAS9310ML-x-x	CR3553P-x-x
NAS9310MN-x-x	CR3553EE-x-x
NAS9310MP-x-x	CR3553P-x-x or CR3553EE-x-x
NAS9311C-x-x	CR3852-x-x
NAS9311M-x-x	CR3552-x-x
NAS9311ML-x-x	CR3552P-x-x
NAS9311MN-x-x	CR3552EE-x-x
NAS9311MP-x-x	CR3552-x-x or CR3552EE-x-x
NAS9312M-x-x	CR3555-x-x
NAS9312ML-x-x	CR3555P-x-x
NAS9312MN-x-x	CR3555EE-x-x
NAS9312MP-x-x	CR3555P-x-x or CR3555EE-x-x

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.

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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

Blind fasteners are not always a suitable substitute for solid shank fasteners. 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."



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