TECHNICAL MANUAL

OPERATOR'S, ORGANIZATIONAL, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE MANUAL INCLUDING REPAIR PARTS LIST FOR RIVETING MACHINE MODELS 1AN, 1%2BN, and 2AN (NSN 3448-00-703-4049)

HEADQUARTERS, DEPARTMENT OF THE ARMY

AUGUST 1980

Technical Manual

No. 9-3448-210-14&P,

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, DC, 15 August 1980

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REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this manual. If you find any mistakes or know of a way to improve the procedures, please let us know. Mail your DA Form 2028 (Recommended Changes to Publications and Blank Forms), or DA Form 2028-2, located in the back of this manual direct to: Commander, US Army Armament Materiel Readiness Command, ATTN: DRSAR-MAS, Rock Island, IL 61299. A reply will be furnished directly to you.

NOTE

This manual is published for the purpose of identifying an authorized commercial manual for the use of the personnel to whom this riveting machine is issued.

Manufactured by: High Speed Hammer Co., Inc.
313 Norton Street
Rochester, NY 14621

Procured under Contract No. DAAA09-78-C-5149

This technical manual is an authentication of the manufacturers' commercial literature and does not conform with the format and content specified In AR 310-3. Military Publications. This technical manual does, however, contain available information that is essential to the operation and maintenance of the equipment.

INSTRUCTIONS FOR REQUISITIONING PARTS NOT IDENTIFIED BY NSN

When requisitioning parts not identified by National Stock Number, it is mandatory that the following information be furnished the supply officer.

1 - Manufacturer's Federal Supply Code Number - 28626
2 - Manufacturer's Part Number exactly as listed herein.
3 - Nomenclature exactly as listed herein, including dimensions, if necessary.
4 - Manufacturer's Model Number - Model 1AN, 1-1/2BN, and 2AN
5 - Manufacturer's Serial Number (End Item)
6 - Any other information such as Type, Frame Number, and Electrical Characteristics, if applicable.
7 - If DD Form 1348 is used, fill in all blocks except 4, 5, 6, and Remarks field in accordance with AR 725-50.
Complete Form as Follows:

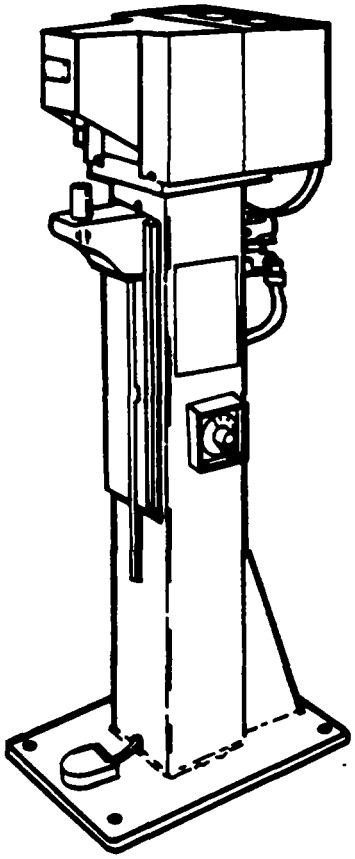
(a) In blocks 4, 5, 6, list manufacturer's Federal Supply Code Number 28626 followed by a colon and manufacturer's Part Number for the repair part.

(b) Complete Remarks field as follows:

Noun:	(nomenclature of repair part)
For:	NSN: 3448-00-703-4049
Manufacturer:	High Speed Hammer Co., Inc.

Model: 1AN 1-1/2BN, and 2AN
Serial: (of end item)
Any other pertinent information such as Frame Number, Type, Dimensions, etc.

INSTRUCTION MANUAL



MODELS: **1AN, 11/2BN and**

2AN

NSN: 3448-00-703-4049
CONTRACT: DAAA09-78-C-5149
TM 9-3448-210-14&P

FSCM 28626

INSTALLATION

Hammer should be placed on a substantial foundation. Be sure to operate hammer in direction as indicated below.

Motor pulley should be aligned so that belt bears on outside flange of main drive pulley; this allows clutch to disengage properly, and prevents running or creeping of Hammer when foot Is removed from foot treadle. Maintain proper belt tension to prevent slippage. Do not adjust "V" belts too tightly.

Do not operate Hammer without having work between point of pein 'J' and anvil 'K: This avoids breaking the hardened tools.

Connect motor to circuit. Ram must rotate counterclockwise facing clutch side of hammer. Main drive pulley must rotate counterclockwise.

ADJUSTMENT

All Hammers are inspected and correctly adjusted when shipped.

ADJUSTMENT OF ANVIL BLOCK "D' There Is only one adjustment necessary It is very Important that Anvil Block "D' at all times be adjusted low enough to allow the run to deliver maximum blow. This gives best results, avoids choking, and prevents undue strain on all working parts.

Adjust as follows:

1st. Turn machine over by hand until pein 'J' is at low point.

2nd. Place the rivet to be used in anvil "K, as3 shown on cut.

3rd. Loosen Screws 'E" and 'F" and adjust anvil block 'D, ' so that there will be a clearance between the face of peon *J' and the top end of rivet, which should equal approximately the diameter of the shank of the rivet to be used.

Distance "X" must be maintained See cut and table. It is Important to check this at reasonable intervals, especially after replacing any working pits. Raise or lower nuts at 'BE and 'C' to bring helve in proper position. Be sure that check nuts are properly locked against rubber retainers to hold them against rubbers with just sufficient pressure to prevent rubbers from turning by hand. I

OPERATION

To obtain best riveting results, slowly depress the foot treadle, allowing partial formation of the rivet head, then bring hammer into full power and when head is almost completely formed, slowly release foot treadle pressure to obtain slightly finished head.

Direction of Rotation - Looking at hammer as shown on cut, pulley "H" should rotate counterclockwise.

Lubrication - Hammer should be lubricated thoroughly every four hours when in continuous operation. Use Lubricant No. 110 grease or equal.

Changing Tools - *Peins* To remove Pein 'J" which has Left Hand threads, unscrew by means of wrench. To remove taper type Peins, use Pein drift.

Anvils - Anvils are press fit In anvil stem. To remove anvil 'K, " use drift rod through hole in bottom of anvil stem "L."

To remove anvil stem 'L," remove cap screw with washer; then anvil stem can be lifted out-

Peins and anvils of proper design must be employed for each riveting operation. See pages 7 and 8.

RIVETING TOOLS

The Peins and Anvils most often used have been standardized as to overall body dimensions. The threaded or tapered shanks of Peins are ground accurately to size. It has not been practicable to specify stand and sizes for the cuppings or working edges due to the immense variety of applications. rivet sizes. and lengths encountered, each of which may require different dimensions to produce best results.

MODEL 2AN RIVETIG MACHINE

TROUBLESHOOTING SUGGESTIONS

1. Overheating: Backshaft and ram.
   Check lubrication schedule and types of lubricant. Head should be lubricated every four operating hours. Use Lubricate 110 or equal. Check grease fittings for plugs.

2. Motor overheats or kicks out.
   Turn backshaft over manually by rotating the #348 pulley. Be sure power is off Backshaft should turn freely with a slight bind at top and bottom ram positions. Check for proper input voltage.

3. Loss of power.
   Check for proper belt tension. Belt should flex about 'I. Check cork friction washer #36 and friction surfaces on parts #343 eccentric shaft assembly and #347 main drive pulley. Surfaces should be clean and free from grease. Check clutch plate. screw #25; shoulder should be against bracket. Check tension of #32 rear rubbers; the *307 end caps should be drawn down snugly but should not cause rubber to bulge.

4. Hammer continues to run after foot treadle is released.
   Check alignment of #314 main drive belt. Motor pulley #117 should be approximately %" out of line to the right when facing the front of the machine from the #347 main drive pulley to draw it out of its engagement.

5. Riveting pein backs out of ram.
   Check motor rotation. Main drive belt #314 should run towards the front of the machine. Check condition of threads on both pein and ram.

SAFETY PRECAUTIONS

1. Guard must always be in place before machine is operated.
2. Do not engage clutch without a workpiece in position.

3. Keep fingers or anything foreign well away from pein and anvil even with power off.

4. When designing tools make provisions for holding the part so that the operator's hands need not be placed near the riveting point.

5. Always turn power off when making any adjustments or changing tools.

LUBRICATION & CLEANING

Lubricate all grease fittings every four operating hours; at beginning of shift and after lunch break with Lubricate 110 or equal. Avoid heavy or fibrous lubricants. Avoid excessive lubricating; one or. two pumps with a grease gun should suffice.

Once a day four or five drops of a good grade of machine oil should be applied to the ram where it enters the upper bushing.

Once a week two drops of machine oil should be applied to thrust bearings to hold in their jacket.

About every three months, or if clutch begins to slip, depending on use, clean clutch surfaces. Wash clutch surfaces with solvent and replace cork friction washer if required. Reassemble and lubricate.

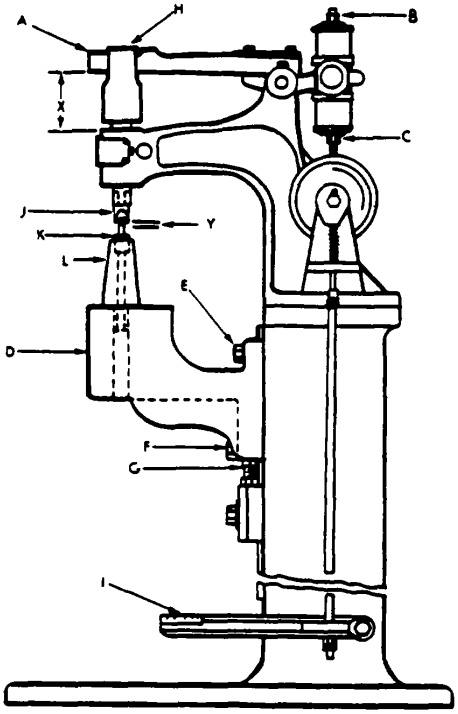


TABLE FOR DIMENSION "X"

Size	"X"	Recommend Speed	Motor Required
1AN	1-1/2	3200	1/4 H P
1 1/2 BN	1-5/8	3200	1/4 H.P
1 1/2 BN Deep Throat	1-5/8	3200	1/4 H.P
2AN	2-7/16	2600	3/4 H P
2AN Deep Throat	3-1/4	2600	3/4 H.P

Distance "X" - As specified in the above table should be measured when the Pein 'J' is at Its lowest point.

Distance 'Y', which is the distance between the top of the rivet to be headed and the peining tool, should equal approximately the diameter of the rivet to be headed and should be measured when the Pein "J" 15 at its lowest point.

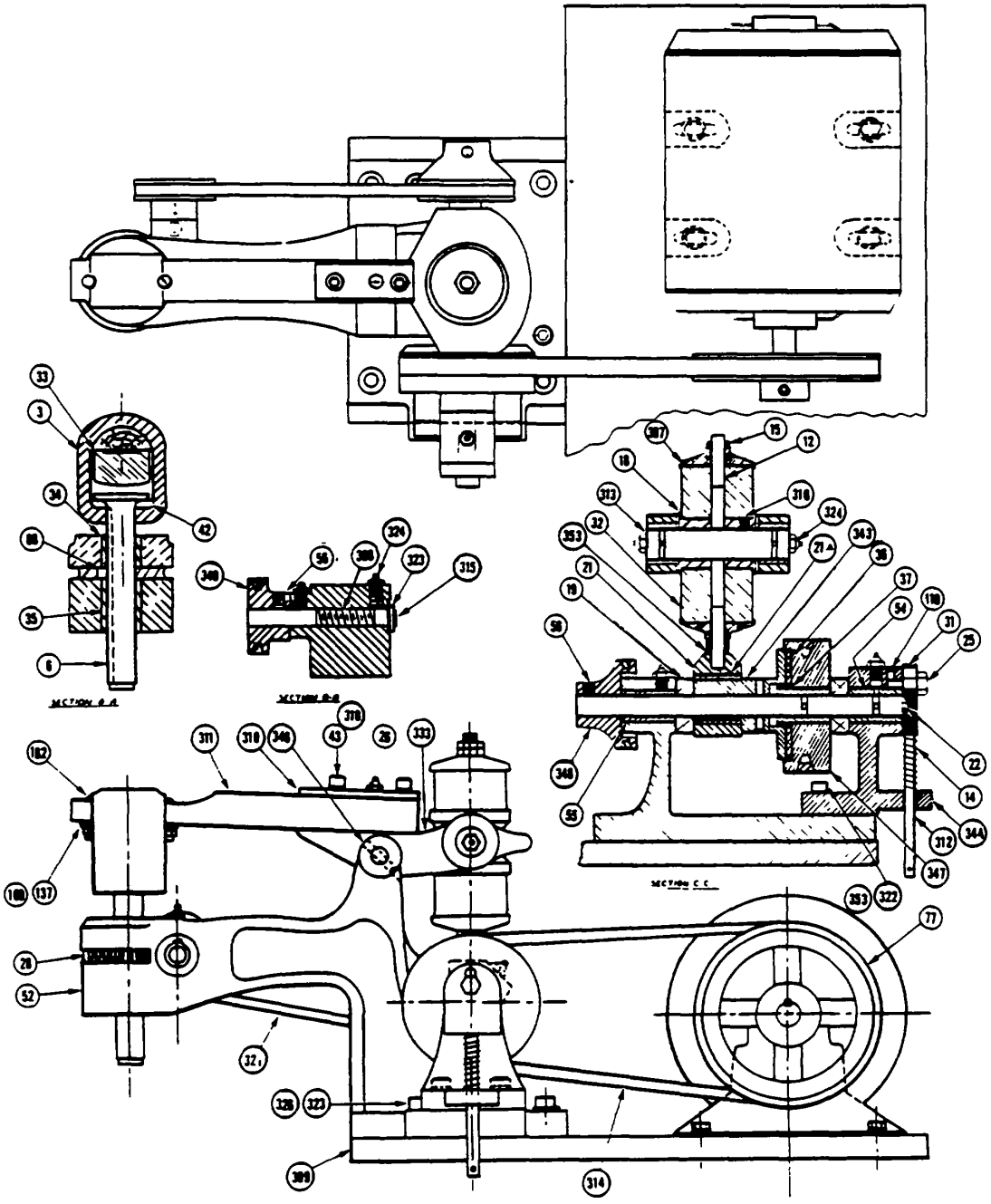
"X"' and "Y" dimensions must be maintained to avoid abnormal wear.

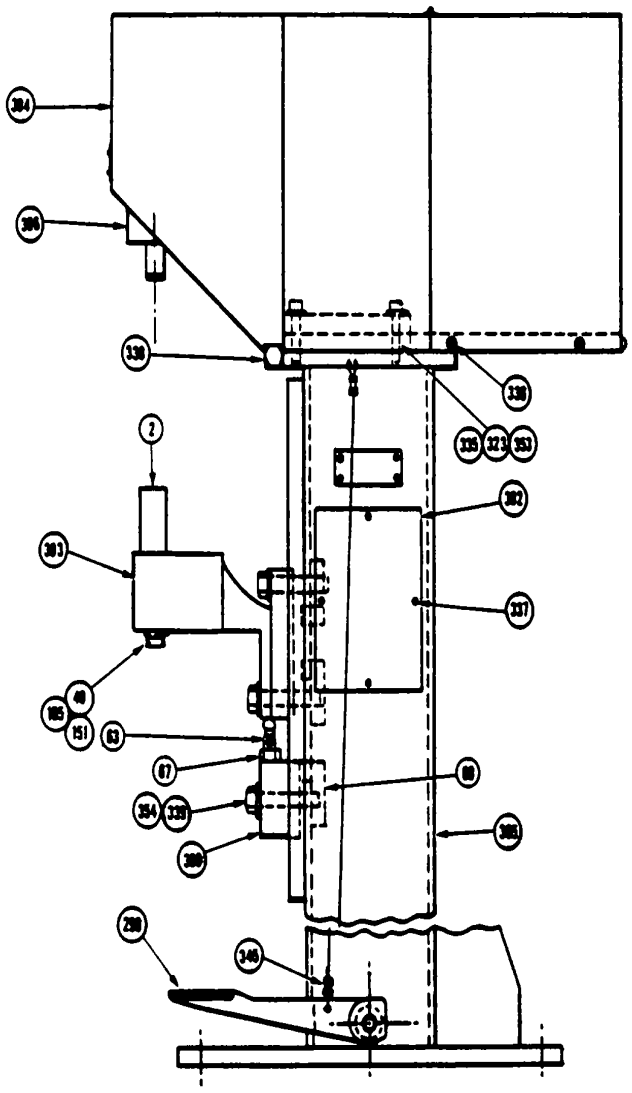
GENERAL SPECIFICATIONS

	1AA	**I - 128**	**2AHD**
Capacity, Pivet Dia.	1/64 to 1/16	1/16 to 1/8	1/8 to 3/16
Pedestal Height	39"	39"	36"
Horizontal Gap	3"	3"	6"
Vertical Gap	12"	12"	17"
Diameter of Ram	.437	625	.750
floor Space	12 x 18	12 x 18	12 x 18
Shipping Weight with Motor	290	290	475
Shipping weight Arranged for Motor Drive	265	265	405

Capacities are based on standard annealed mild steel rivets.

WORKING PARTS FOR 1AN, 11/2BN AND 2AN





Front Assembly:

33 - Ram Rubber
3 - Ram Strap with washer
42 - Fiber washer
34 - Bronze Ram Bushing
35 - Bronze Ram Bushing
6 - Ram
28 - Worm Gear
308 - Worm Shaft
349 - Pulley, Worm Shaft
315 - Ring, Retainer
323 - Washer

Vibrator Assembly

21 - Eccentric Strap
12 - Connecting Rod
353 - Lock Washer
15 - Lock Nuts
307 - End Retainer
32 - Rear Rubber
333 - Vibrator
311 - Helve
310 - Helve Plate
43 - Bolts
26 - Shaft, Vibrator
313 - Wrist Pin

Rear Assembly

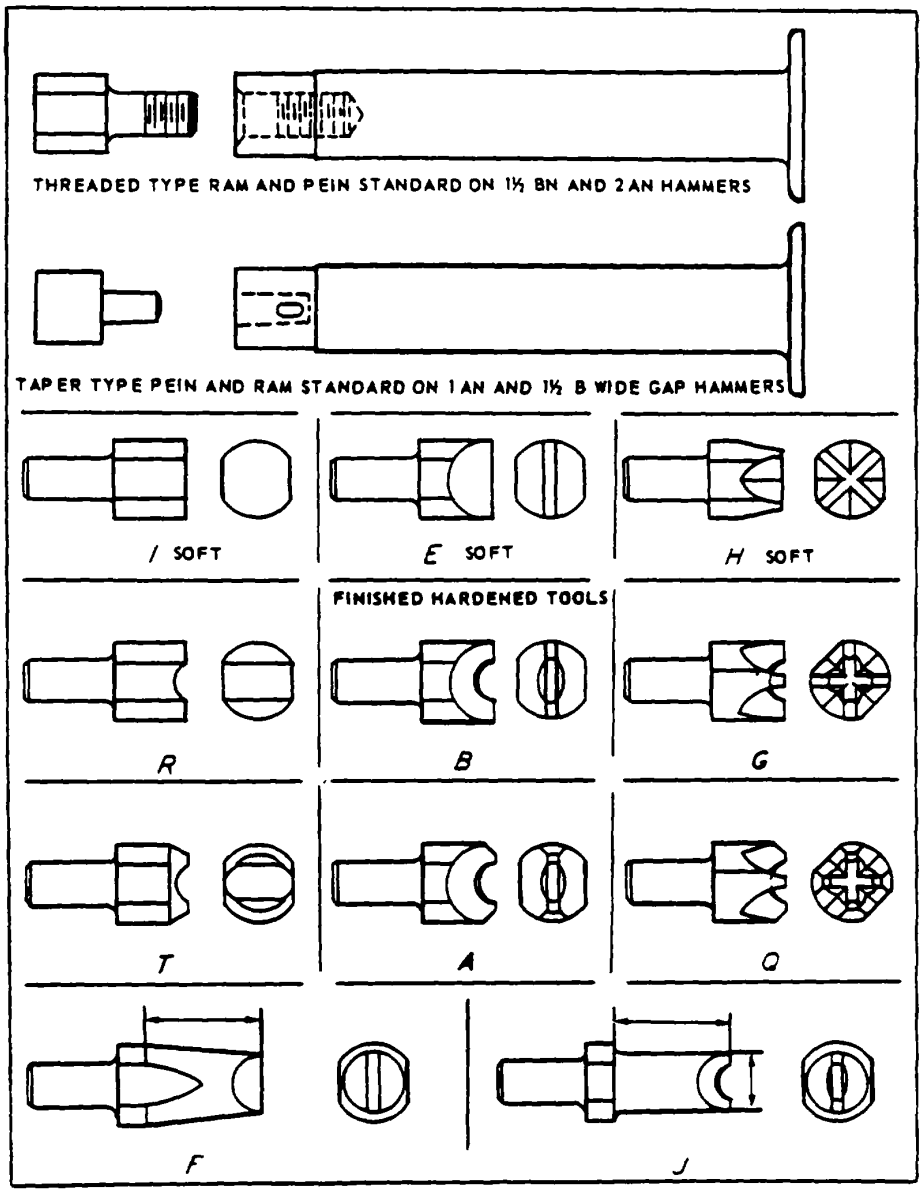
343 - Eccentric shaft assembly
344 - Bracket with bushing
312 - Rod, Clutch Plate
14 - Spring, Clutch Plate
31 - Clutch Plate
25 - Screw, Clutch Plate
22 - Pins, Clutch Plate
347 - Main Drive Pulley
36 - Cork Washer
343 - Eccentric Shaft Assembly
19 - End Thrust Bearings
348 - Worm Drive Pulley

Bushings and Miscellaneous

34 - Upper Ram Bushing
35 - Lower Ram Bushing
54 - Bracket Bushing
55 - Heed Bushing
37 - Drive Pulley Bushing
21A - Eccentric Bushing (2 AN only)
4A - Vibrator bushing
324 - Grease Fitting
321 - Worm Drive Belt
314 - Main Drive Belt
2 - Anvil m
332 - Cable with fittings

The standard 1AN #6 Ram is taper type, see page 7. Rams for 1-1/2BN and 2AN are threaded type.

STANDARD RAMS AND PEINS



RIVETING TOOLS
TYPES OF PEINS

I - *Standard Blank Pein*, finished for flush or Rat heads. Can be supplied soft for machining to other shapes.
R - *Standard Straight Cut Pein*, finished for round or oval heads.
F - *Standard Straight Cut Chamfered Pein*, finished for round or oval head.
E - *Standard Two-Prong Pein*, finished for flush or flat head. Can be supplied soft for cupping to round or oval shapes.
B - *Standard Two-Prong Pein*, finished for round or oval head.
A - *Standard Two-Prong Chamfered Pein*, finished for round or oval head.
H - *Standard Four-Prong Pein*, finished for flush or flat head. Can be supplied soft for cupping to round or oval shapes.
G - *Standard Four-Prong Pein*, finished for round or oval shapes.
Q - *Standard Four-Prong Chamfered Pein*, finished for round or oval head.
F - *Special Long Chamfered Pein*, two-prong or four-prong, finished for round, oval or flush head. Lengths and diameters as specified.
J - *Special Long Shouldered Pein*, two-prong or four-prong, finished for round, oval or flush head. Lengths and diameters, as specified.

Many other types of Special Purpose Peins are available such as Pilot, Cup, Relieved Cup, Cone, Pan. etc. Pilot Peins are generally employed to form hollow oval head on tubular rivets, nuts, and plain or threaded bushings

ANVILS

Standard Anvils are those ordinarily designed to fit standard rivets or heads of similar size in which the character of the work does not require any special length of clearance.

COLD RIVETING

Following are some fundamental rules and general practices for Cold Riveting with Riveting Hammers. The information, tables, (See next page) and advice following are given so that any individual may determine rivet lengths required for average jobs. based on the use of mild steel annealed rivets. It is assumed that holes for rivets fit closely to the rivet shank. A clearance of .005", to .015", depending on rivet diameter. is an ideal condition. This clearance may be less. or drive fit. Greater clearance is sometimes necessary when registering of holes would be difficult. or when the diameter of the rivet is quite large. On the next page are some general rules for rivets of average size--- $^{1/8}$ to $^{3/4}$ inclusive.

COLD RIVETING

Forming Round or Cone Heads

Leave an amount of stock for heading equal to the diameter of the rivet to be headed.

Forming Oval Heads

Leave an amount of stock equal to 50% to 60% of the diameter of the rivet to be headed.

Forming Hollow Oval Heads (Tubular Type Rivets)

Leave an amount of stock equal to 25% to 50% of the diameter of the rivet to be headed.

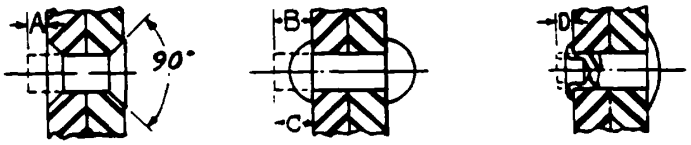
Forming Flush Heads Filling Countersink—90° Included Angle

Leave an amount of stock equal to 25% to 50% of the diameter of the rivet to be headed.

Good strong heads, formed solidly , will result if the above suggestions are followed. Provided proper tools (peins and anvils) are employed.

Monel Metal. Stainless Steel or Alloy Steel rivets, treated or untreated. May also be headed, following the general rules as give above and as shown in reference table. Aluminum, duraluminum, treated or untreated. Brass, copper and other non-ferrous rivets are also headed satisfactorily though some variations in the amount of stock left for heading are necessary. Plastic rivets which are ductile can be headed.

The following table may be used for general reference to determine in advance the length of rivets most satisfactorily for the work.



Rivet Dia.				1/8		1/4		3/8		1/2	5/8	3/4	1	1 1/2	2
A—Csk. Hd.						1/8				1/8	1/4	1/4	3/8	3/8	3/8
B—Round Hd.	.025			1/8		1/4		3/16		1/2	3/4	3/4	3/4	1	1
C—Oval Hd					1/8			1/4		3/8			1/2	1/2	1/2
D—Hollow Oval Hd.										1/4			1/4	3/8	3/4

By Order of the Secretary of the Army

E. C. MEYER
General United States Army
Chief of Staff

Official:

J. C. PENNINGTON
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