

**TUFFALOY MULTIPLE WELDING**

**QUICKEST WAY TO CUT WELDING COSTS**

Increased productivity without capital investment or increased labor costs just has to spell PROFIT. Hundreds of resistance welding users are profiting from the TUFFALOY methods of multiple welding, to produce almost any assembly requiring closely spaced welds.

The key is to **“think multiple!”** Whenever the welding machine goes through a cycle, have it do more than one weld at a time. It’s easy and practical with one of the TUFFALOY multiple welding devices: The Teeter-Tip dual tip adapter, the Equatip dual tip holder, the Equa-Press dual tip holder, or the Tri-Spacer.

They’re ready to go to work, cutting costs and increasing production efficiency for you.

Study the multiple welding holders and adapters in this section. Learn their capabilities, **“think multiple,”** and you’ll probably see many ways in which TUFFALOY multiple welding can improve your operation. Remember that TUFFALOY is prepared to provide any special fixturing you need. Show our engineers what you require, and they’ll design a set-up to do it.

**TEETER-TIP DUAL TIP ADAPTERS**

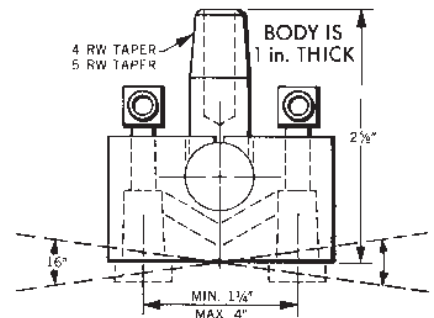
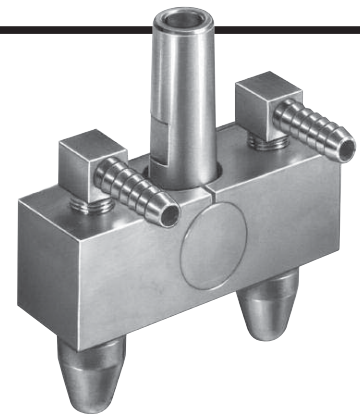
*U.S. Pat. 3,356,821*

You can spot or projection weld in half the time by doubling the number of welds per machine stroke. Use Teeter-Tip dual tip adapters, which come with water-coolant fittings to beat high heat build-up. These adapters transmit total pressures of 1000 lbs., and deliver equal current and pressure to each tip. They compensate for normal electrode wear, imperfect tip dressing, and work variations up to .060”.

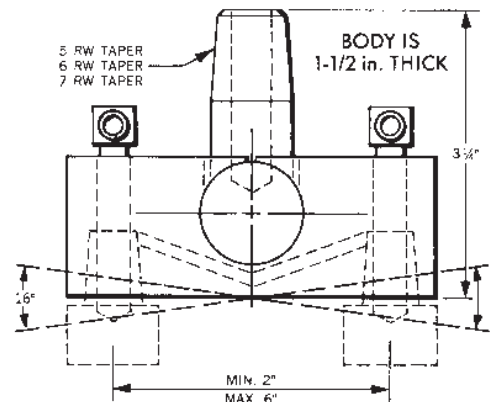
**LIGHT-DUTY** adapters have no. 4 or 5 RW shanks, tip spacing to 4 inches, tip sockets for 1/2” or 5/8” diameter male Tuffcap caps, or 4 RW tips (5/8” cap sockets are standard).

**HEAVY-DUTY** adapters have shanks from 5 to 7 RW size, tip spacing to 6 inches, tip sockets for 1/2” or 5/8” diameter male Tuffcap caps, or 4 or 5 RW tips (4 RW sockets are standard). These adapters have a deeper, stronger body.

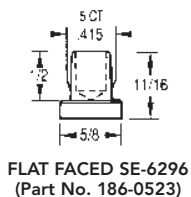
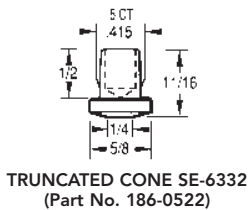
Two low-height 5/8” dia. cap-type tips are shown below. They are recommended for use in these adapters. Other standard caps, both 5/8” & 1/2” dia., are tabled on the next page. You must specify the size tip sockets you want, or the standard socket will be supplied.



LIGHT DUTY



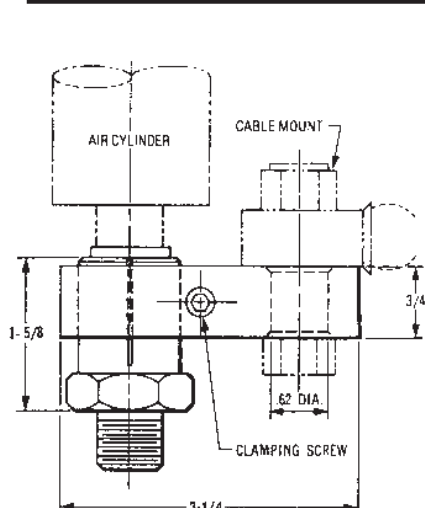
HEAVY DUTY



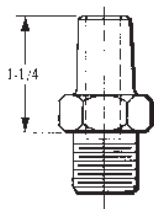
Style	Shank Taper	Description*	Tip Spacing Range (inches)	Socket Taper
LIGHT Duty	4RW	TT-1408	1-1/4 to 2	4RW 4CT 5CT
	4RW	TT-1416	2 to 4	4RW 4CT 5CT
	5RW	TT-1508	1-1/2 to 2	4RW 4CT 5CT
	5RW	TT-1516	2 to 4	4RW 4CT 5CT
HEAVY Duty	5RW	TT-15516	2 to 4	4RW 5RW 4CT 5CT
	5RW	TT-15524	4 to 6	4RW 5RW 4CT 5CT
	6RW	TT-15616	2 to 4	4RW 5RW 4CT 5CT
	6RW	TT-15624	4 to 6	4RW 5RW 4CT 5CT
	7RW	TT-15716	2 to 4	4RW 5RW 4CT 5CT
	7RW	TT-15724	4 to 6	4RW 5RW 4CT 5CT

\*When ordering, also state exact tip spacing and tip socket size, Example: TT - 1508 - 1-1/2 - 5CT. (5CT means 5/8” diameter cap, 4CT means 1/2” diameter cap.)





Cylinder-mounting adapter shank, Part No. 195-7063; clamp, Part No. 194-2040, not included



5 RW taper adapter shank, Part No. 195-5680



## EQUATIP DUAL TIP HOLDERS

U.S. Pat. No. 3,558,847

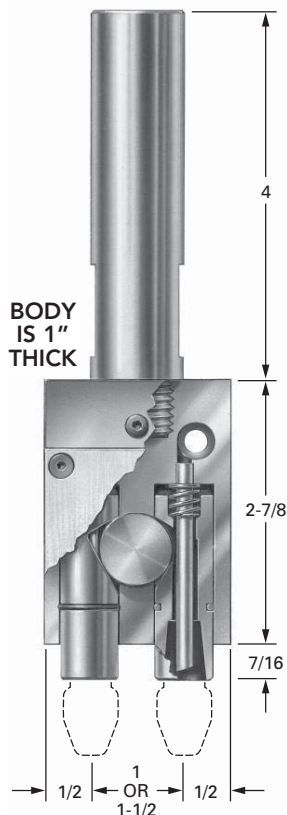
The Equatip dual tip holder is a smaller version of the Equa-Press holder (on next page). It is more compact, and is more economical for those applications where it will work equally well. An even smaller device, the Equatip adapter (not water-cooled) is shown in box below.

Using the Equatip holder, both tips contact the work squarely, because tip axes remain parallel to direction of force (unlike the Teeter-Tip adapters). An internal roller equalizes current and pressure between the two electrodes, and will compensate for work height variations up to 1/16".

The holders are ordered with either 1" or 1-1/2" spacing between barrels, and with tip sockets to accept either male Tuffcap caps (5/8" dia.) or straight No. 4 RW electrodes. (Bent tips are not recommended.) The distance between welds can be varied by rotating offset-nose tips in the barrels.

Equatip holders can be supplied with straight shanks for arm mounting, a tapered adapter shank for holder mounting, or a cylinder adapter shank to be clamped to a cylinder rod.

Equatip holders can be used with forces up to 1000 lbs.



BODY IS 1" THICK

5/8" DIA. TUFFCAP CAPS (5 CT)			
Nose Style	Alloy Class	Description	Part No.
Pointed	1	TA-15	111-0015
	2	TA-25	112-0025
Dome	1	TB-15	113-0015
	2	TB-25	114-0025
Flat	1	TC-15	115-0015
	2	TC-25	116-0025
	1	TD-15	117-0015
	2	TD-25	118-0025

Those caps are fully dimensioned on page 6.

EQUATIP HOLDERS					
Tip Spacing & Mounting Style	For 5/8" Dia. Tuffcap Caps		For No. 4 RW Tips		
	Description	Part No.	Description	Part No.	
<b>ONE-INCH SPACING:</b>	1-in. shank	4050	350-4050	4055	350-4055
	1-1/4-in. shank	4051	350-4051	4056	350-4056
	1-1/2-in. shank	4052	350-4052	4057	350-4057
	5RW adapter	4053	350-4053	4058	350-4058
	Cylinder adapter*	4054	350-4054	4059	350-4059
<b>1-1/2-INCH SPACING:</b>	1-in. shank	4150	350-4150	4155	350-4155
	1-1/4-in. shank	4151	350-4151	4156	350-4156
	1-1/2-in. shank	4152	350-4152	4157	350-4157
	5RW adapter	4153	350-4153	4158	350-4158
	Cylinder adapter*	4154	350-4154	4159	350-4159

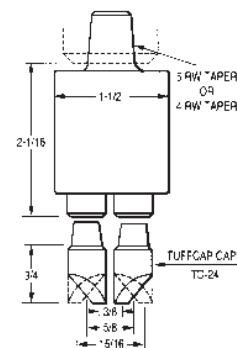
\*Without clamp

## For light-duty welding EQUATIP ADAPTER

The Equatip dual tip adapter works like the Equatip holder, but it is not water-cooled and is meant for less demanding jobs. It costs less, and is a little smaller, barrels being 5/8" apart. Its straight tips are TUFFCAP caps, 1/2" in diameter.

1/2" DIA. TUFFCAP CAPS (4 CT)			
Nose Style	Alloy Class	Description	Part No.
Pointed	1	TA-14	111-0014
	2	TA-24	112-0024
Dome	1	TB-14	113-0014
	2	TB-24	114-0024
Flat	1	TC-14	115-0014
	2	TC-24	116-0024
Offset	1	TD-14	117-0014
	2	TD-24	118-0024

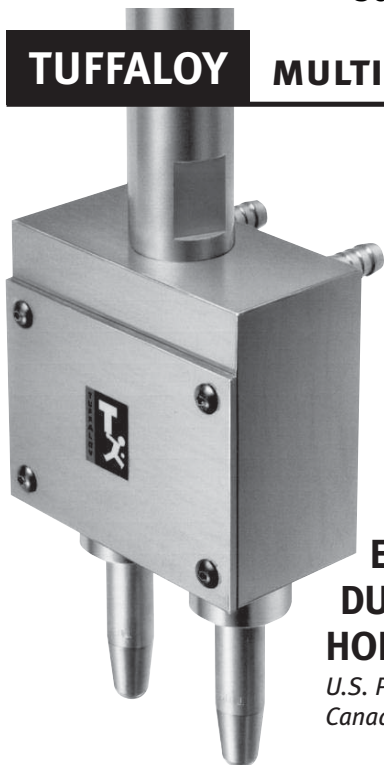
Those caps are fully dimensioned on page 6.



4045, Part No. 350-4045-5RW  
4046, Part No. 350-4046-4RW



**TUFFALOY** **MULTIPLE WELDING**



**EQUA-PRESS™  
DUAL TIP  
HOLDERS**

U.S. Pat. No. 2,979,599  
Canada Pat. 637470

The Equa-Press Holder makes two identical welds at once. When it contacts the workpiece, the forging pressure is automatically equalized between the two electrodes, regardless of variations in work thickness, or electrode wear (up to 3/16"). The two tip-holding barrels are sliding pistons, whose movements are controlled by a mechanical equalizing slide in the housing (see cutaway drawings). The spring's only function is to return the barrels to a fully extended position when there is no work contact. Maximum conductivity is maintained through sturdy copper alloy working parts. Spacing can vary up to 4 inches, using TUFFALOY bent offset tips in Equa-Press holders having the standard barrel spacing of two inches (shown).

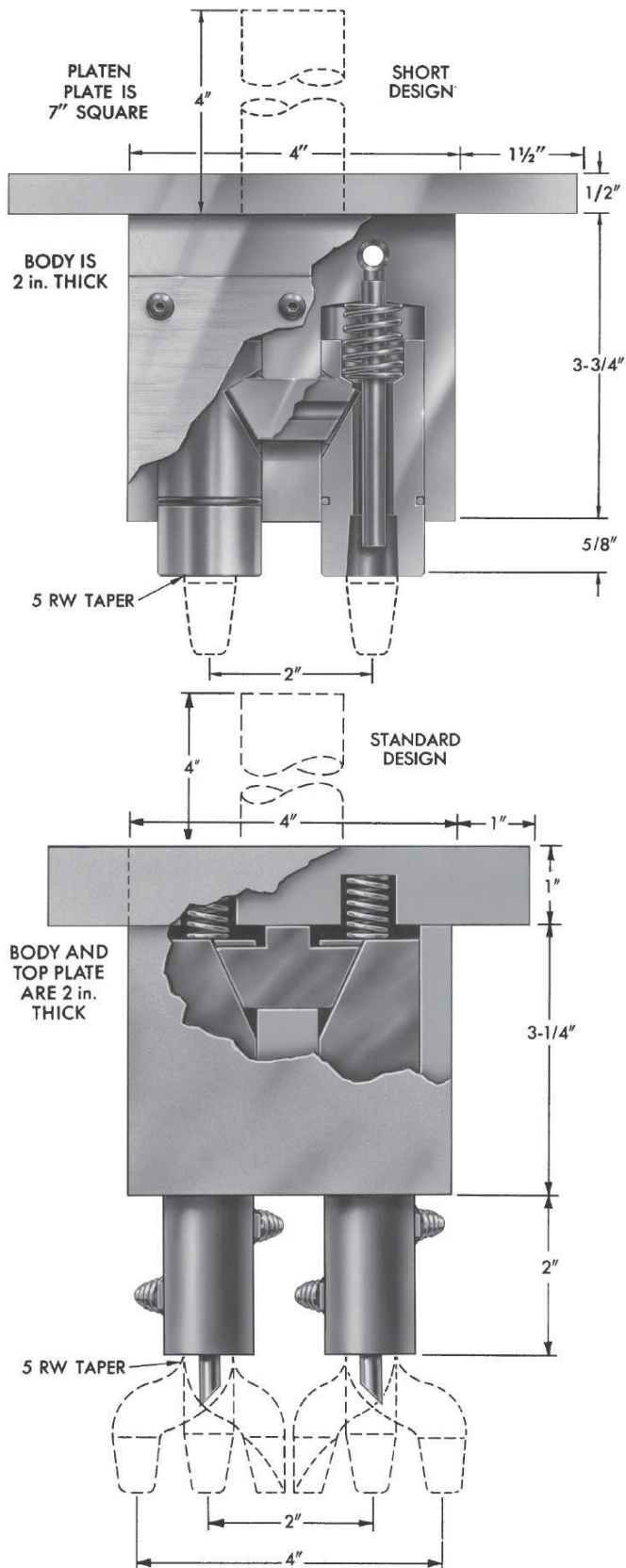
Barrel spacing up to six inches is available as semi-standard (see price list). These are drilled to order from stock components. To order you must give the barrel spacing desired, along with the Item number (from table).

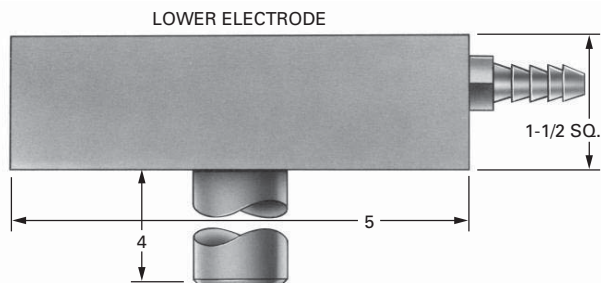
Equa-Press Holders are made in two mounting styles: platen models to mount directly to the platen on press-type welding machines, and shank models for rocker arm machines. All are available in two designs: the standard and the short (close-coupled) type. The short design is internally flood-cooled and takes up less space in the welder.

Equa-Press holders can be used with forces up to 1500 lbs.

Mounting Style	Standard Design		Short Design	
	Descrip-tion	Part No.	Descrip-tion	Part No.
1-in. shank	4010	350-4010	4015	350-4015
1-1/4-in. shank	4011	350-4011	4016	350-4016
1-1/2-in. shank	4012	350-4012	4017	350-4017
Platen	4013	350-4013	4018	350-4018

Note: For best results, position the holder so that a line drawn through the electrode centers is at, or nearly at, right angles to the direction of the welder arms. Otherwise, the magnetic field between the arms can cause an excess of current to flow through the inboard electrode.

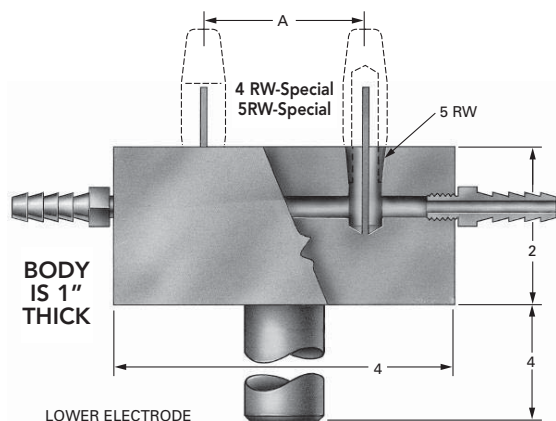




LOWER ELECTRODES		
Shank Diameter	Description	Part No.
1	4020	350-4020
1-1/4	4021	350-4021
1-1/2	4022	350-4022

### LOWER HOLDERS AND ELECTRODES FOR USE WITH EQUA-PRESS HOLDER

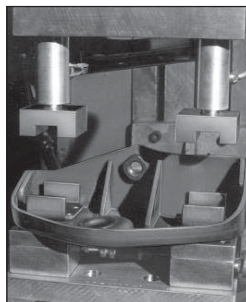
A lower, fixed, dual tip holder is offered for use with Equa-Press Holders. Like the Equa-Press, it has a standard two-inch tip spacing and helps make two welds at once, precisely alike. The standard trans-verse bar electrode shown is used when work geometry doesn't require tips on the lower side. They are water-cooled.



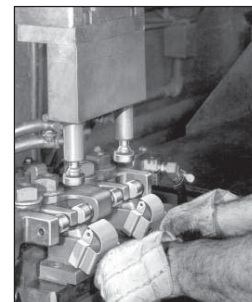
STANDARD LOWER HOLDER - 2" SPACING 5 RW		
Shank Diameter	Lower Holder Description	Part No.
1	4030	350-4030
1-1/4	4031	350-4031
1-1/2	4032	350-4032

SPECIAL LOWER ELECTRODES			
Style	Shank Diameter (inches)	Description*	A Tip Spacing Range (inches)
4" Body	1	4030	1-1/4 to 2-7/8
	1-1/4	4031	1-1/4 to 2-7/8
	1-1/2	4032	1-1/4 to 2-7/8
8" Body	1	8030	3 to 6
	1-1/4	8031	3 to 6
	1-1/2	8032	3 to 6

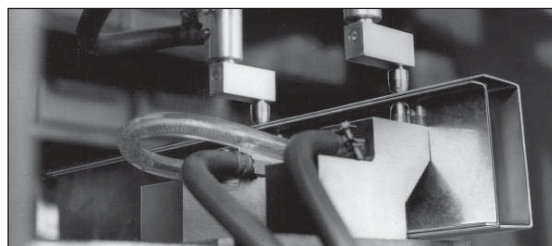
\* When ordering specify center distance and either 4RW or 5RW sockets



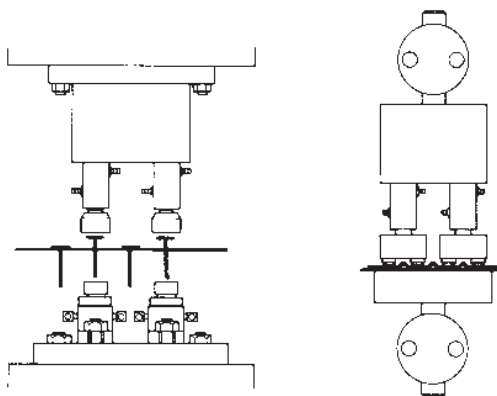
*A Case History: Projection welding brackets to automotive frame assemblies is twice as fast with an Equa-Press dual tip holder. Lower welding fixture acts as an inspection device, so warped parts are discovered before welding. Inspection time and scrap loss are both reduced.*



*A Case History: Joining a piece of metal to itself is always tough. This job was done with an Equa-Press holder - two at a time. Lower clamp faces, carrying current, contact parts near the weld areas to avoid current bypassing weld projections. Two standard swivel tips make four welds, two per part.*



*A Case History: Dual spot welding of panelled wall sections reduced welding costs enough to justify buying welding machine to do the job in-plant. Equa-Press holder with 5-inch spacing, and special (but simple) tooling to provide two offset tip adapters and matching holders were used. Electrodes are standard TUFFCAP caps.*



*In this drawing, two studs are projection welded in each welder stroke, using an Equa-Press dual holder over a pair of studwelding electrodes held in PM-style holders.*

*Here, four spot welds are made simultaneously on a corrugated part. An Equa-Press dual holder is used to hold two Teeter-Tip dual tip adapters.*

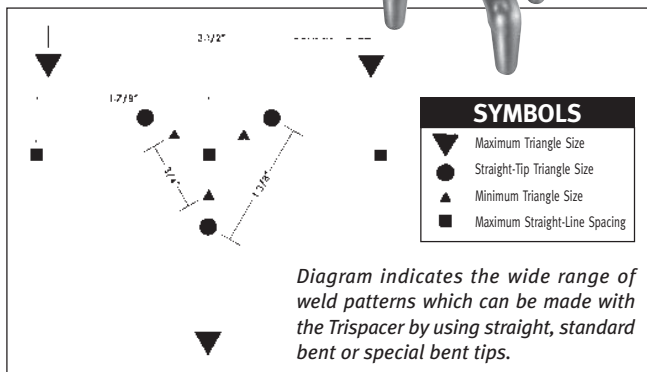


**TUFFALOY**

**MULTIPLE WELDING**

**TRISPACER HOLDER**

Mounting Style	Description	Part No.
1-in. shank	4040	350-4040
1-1/4-in. shank	4041	350-4041
1-1/2-in. shank	4042	350-4042
Platen	4043	350-4043



**TRISPACER™ TRIPLE TIP HOLDER**

*U.S. Pat. No. 3,558,848*

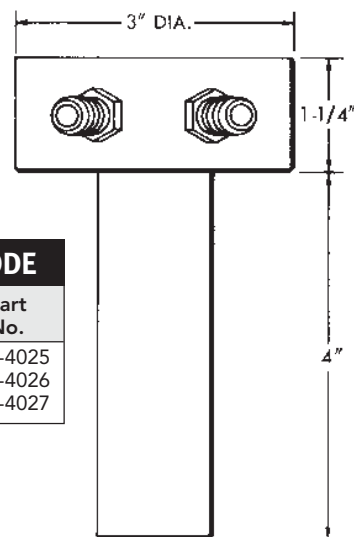
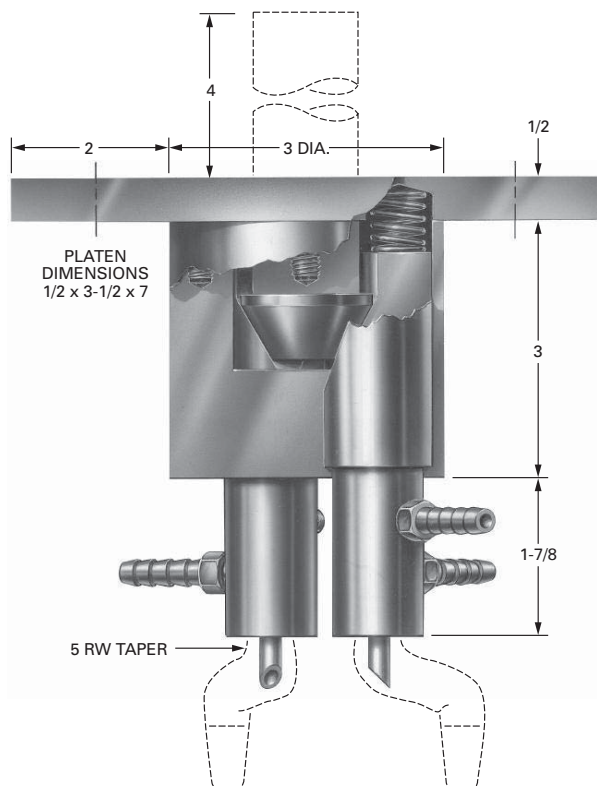
The Trispacer tip holder will make three spot welds at one time, automatically splitting the current and the pressure equally between the three tips. In doing so, it compensates for variations in work thicknesses and electrode wear-up to 3/16-in.

The three tip-holder barrels (#5 RW) are equidistant from one another, all falling on a 1-5/8-in. diameter circle (in the standard model shown). Using straight tips the weld pattern would form an equilateral triangle. However, the weld pattern can be widely varied by using standard or special bent tips. In fact, the three welds can be made in a straight line.

The Trispacer Holder works in the same simple, mechanical way as the Equa-Press Holder: The tip-holding barrels have a limited up-and-down movement, to accommodate work conditions, and are adjusted to deliver equal pressure by the cone-shaped equalizing device in the housing. All current-carrying parts are made of RWMA copper alloys. It is made in two styles: to mount directly to the platen of press-type welders, and with shanks to fit in welder arms.

**LOWER ELECTRODE**

A simple, water-cooled lower electrode is made for use with the Trispacer holder. Its three-inch-diameter face makes it usable with any weld pattern that may be developed for the Trispacer. It comes in three shank diameter models.

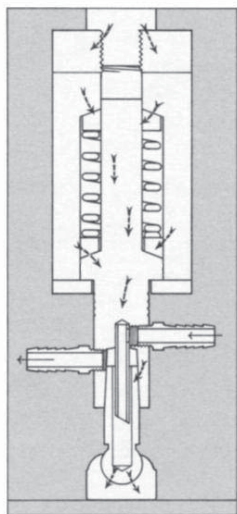


**LOWER ELECTRODE**

Shank Dia.	Description	Part No.
1	4025	350-4025
1-1/4	4026	350-4026
1-1/2	4027	350-4027



**FAST-FOLLOW-UP HOLDERS TUFFALOY**



Current flow follows dashed arrow through the outer body, two split contact rings, tapered tip socket, and to the electrode.

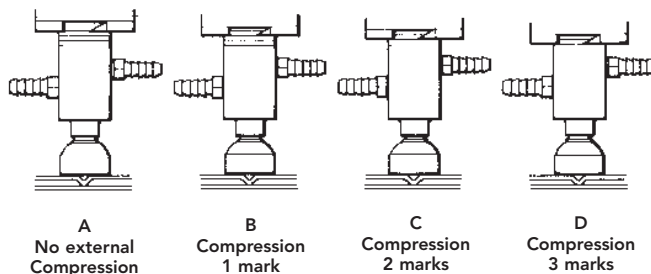
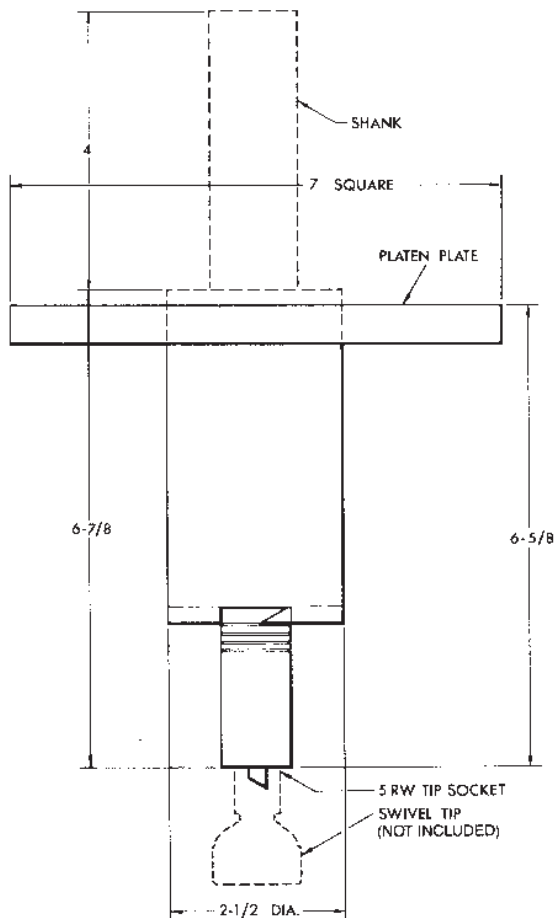
U.S. Pat. No. 3,632,958 Canada Pat. No. 902,189

TUFFALOY fast-follow-up (low inertia) holders solve the problem of maintaining adequate weld pressure on rapidly collapsing projection welds-with fewer set-up problems and reduced maintenance.

These holders can be set to deliver fast-follow-up forces of from 140 to 1300 pounds, a range covering 90% of all projection welding operations. They are compact, water cooled, and easy to maintain.

Plus features of the TUFFALOY fast-follow-up holder include: (1) wider range of pressures than any competitive make (2) no flexible shunt-a common cause of holder failure (3) use of standard, unmodified die springs, so if you need a spring of different strength, it's easily available (4) spring forces available are clearly indicated, so it's easy to set up for a specific force (5) three shank sizes, or it can be platen-mounted-the only fast-follow-up holder that can (6) extremely low height permits use where larger units can't be used.

TUFFALOY fast-follow-up holders can be used to limit the weld pressure of any spot welding machine regardless of cylinder size or air pressure. This is better than reducing air pressure, which slows the return stroke and retards production.



For every one-eighth of an inch that a fast-follow-up is compressed when setting up, a known amount of force is provided, to quickly follow up any reduction in work thickness. Example: at position B, a type MH spring would delivery 310 lb, at C, 440 lb, etc.

**FAST-FOLLOW-UP FORCE CHART (LBS.)**

Spring Type	1/8-in. Compression	1/4-in. Compression	3/8-in. Compression	1/2-in. Compression
M (300 lbs. max.)	140	200	250	300
MH (680 lbs. max.)	310	440	560	680
H (1300 lbs. max.)	600	840	1070	1300

Mounting Style	300 LBS. MAX. (M SPRING)		680 LBS. MAX. (MH SPRING)		1300 LBS. MAX. (H SPRING)	
	Description	Part No.	Description	Part No.	Description	Part No.
1" Shank	4620	350-4620	4621	350-4621	4622	350-4622
1-1/4" Shank	4623	350-4623	4624	350-4624	4625	350-4625
1-1/2" Shank	4626	350-4626	4627	350-4627	4628	350-4628
Platen-Mtd.	4629	350-4629	4630	350-4630	4631	350-4631

