

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

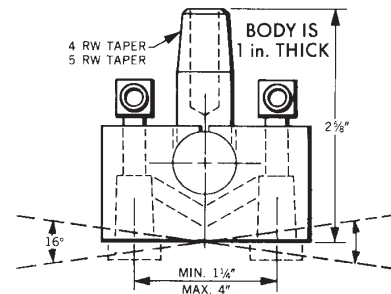
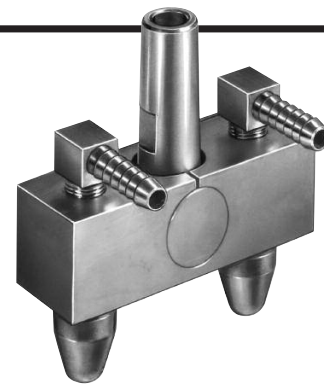
U.S. Pat. 3,356,821

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".

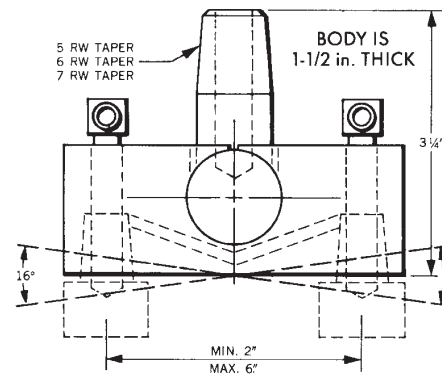
LIGHT-DUTY adapters have no. 4 or 5 RW shanks, tip spacing to 4 inches, tip sockets for 1/2" or 5/8" diameter male Tuffcap caps, or 4 RW tips (5/8" cap sockets are standard).

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.

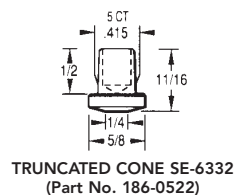
Two low-height 5/8" dia. cap-type tips are shown below. They are recommended for use in these adapters. Other standard caps, both 5/8" & 1/2" dia., are tabled on the next page. You must specify the size tip sockets you want, or the standard socket will be supplied.



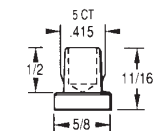
LIGHT DUTY



HEAVY DUTY



TRUNCATED CONE SE-6332
(Part No. 186-0522)



FLAT FACED SE-6296
(Part No. 186-0523)

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.)



EQUATIP DUAL TIP HOLDERS

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

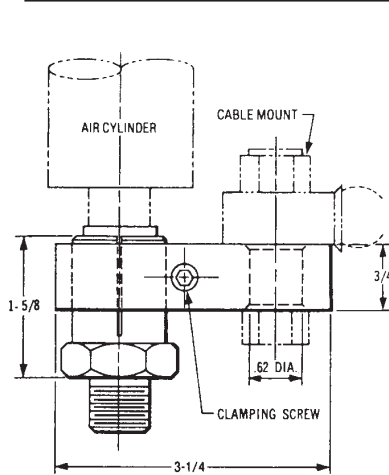
The Equatip dual tip holder is a smaller version of the Equa-Press holder (on next page). It is more compact, and is more economical for those applications where it will work equally well. An even smaller device, the Equatip adapter (not water-cooled) is shown in box below.

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".

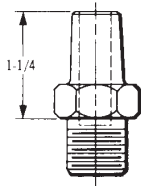
The holders are ordered with either 1" or 1-1/2" spacing between barrels, and with tip sockets to accept either male Tuffcap caps (5/8" dia.) or straight No. 4 RW electrodes. (Bent tips are not recommended.) The distance between welds can be varied by rotating offset-nose tips in the barrels.

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.

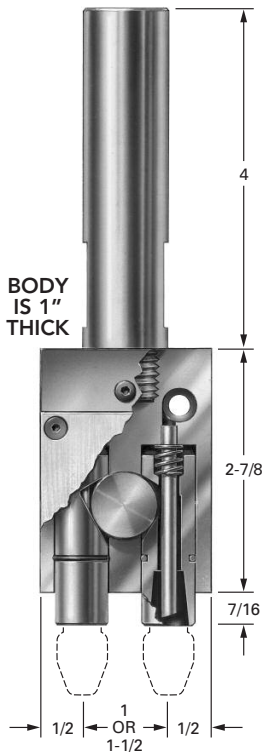
Equatip holders can be used with forces up to 1000 lbs.



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



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



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
Offset	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.
ONE-INCH SPACING:	1-in. shank	4050	4055	350-4055
	1-1/4-in. shank	4051	4056	350-4056
	1-1/2-in. shank	4052	4057	350-4057
	5RW adapter	4053	4058	350-4058
	Cylinder adapter*	4054	4059	350-4059
1-1/2-INCH SPACING:	1-in. shank	4150	4155	350-4155
	1-1/4-in. shank	4151	4156	350-4156
	1-1/2-in. shank	4152	4157	350-4157
	5RW adapter	4153	4158	350-4158
	Cylinder adapter*	4154	4159	350-4159

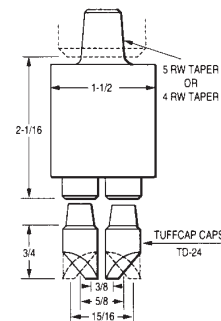
*Without clamp

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.

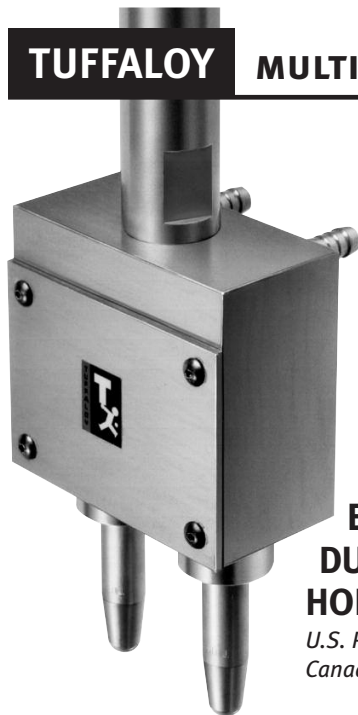


4045, Part No. 350-4045-5RW
4046, Part No. 350-4046-4RW



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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).

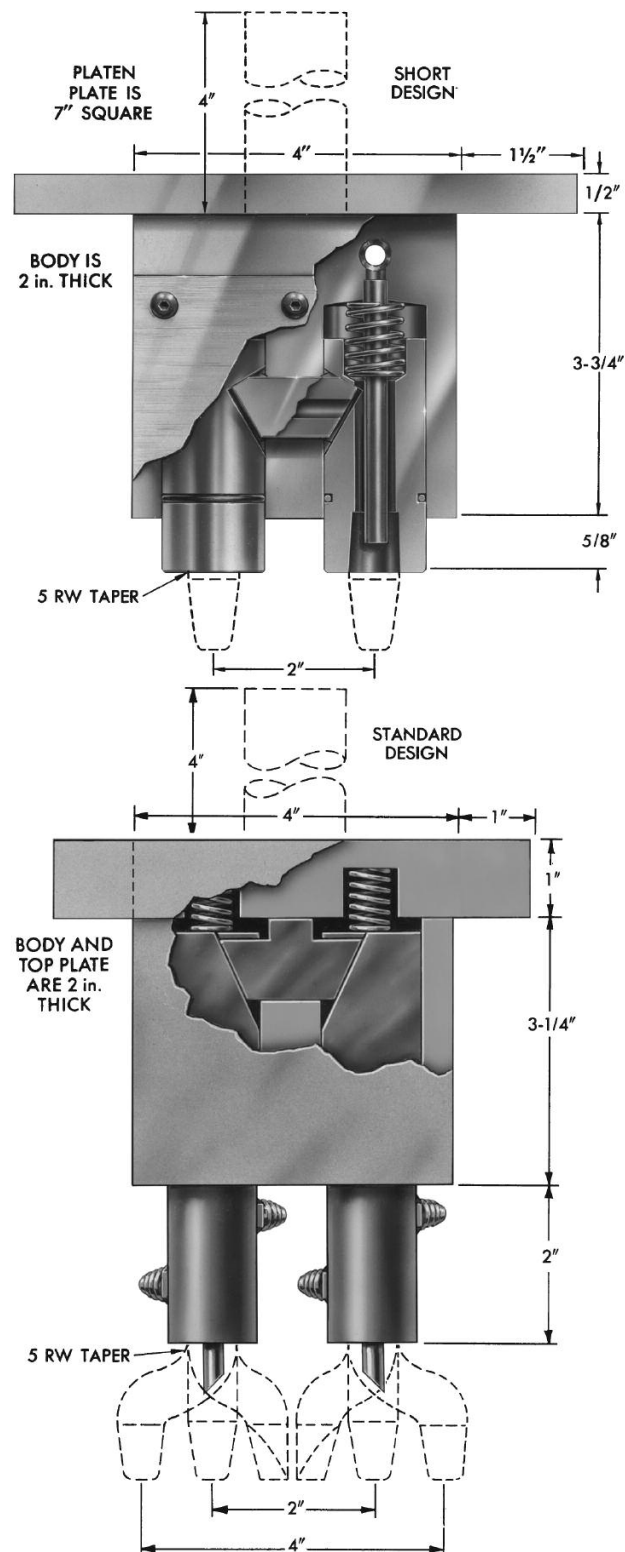
Barrel spacing up to six inches is available as semi-standard (see price list). These are drilled to order from stock components. To order you must give the barrel spacing desired, along with the Item number (from table).

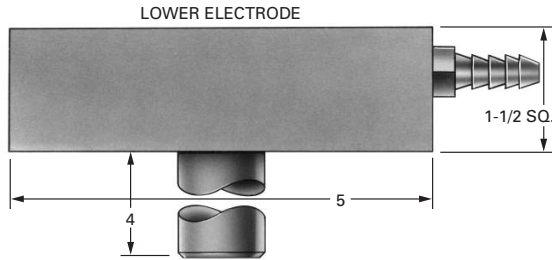
Equa-Press Holders are made in two mounting styles: platen models to mount directly to the platen on press-type welding machines, and shank models for rocker arm machines. All are available in two designs: the standard and the short (close-coupled) type. The short design is internally flood-cooled and 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	
	Description	Part No.	Description	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.

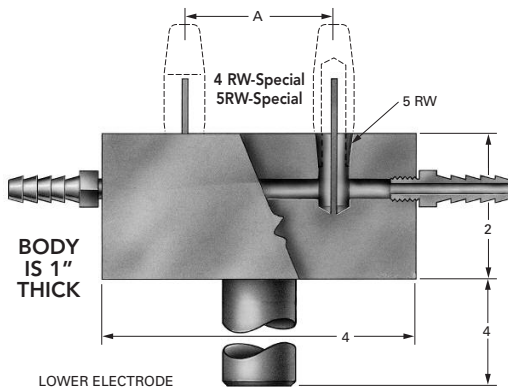




LOWER ELECTRODES		
Shank Diameter	Description	Part No.
1	4020	350-4020
1-1/4	4021	350-4021
1-1/2	4022	350-4022

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 transverse bar electrode shown is used when work geometry doesn't require tips on the lower side. They are water-cooled.



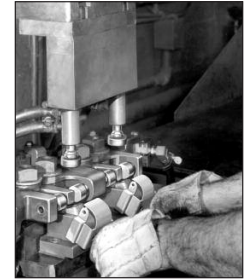
STANDARD LOWER HOLDER - 2" SPACING 5 RW		
Shank Diameter	Description	Part No.
1	4030	350-4030
1-1/4	4031	350-4031
1-1/2	4032	350-4032

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

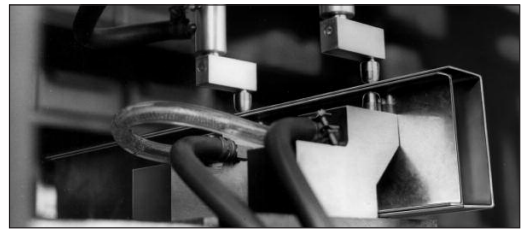
* When ordering specify center distance and either 4RW or 5RW sockets



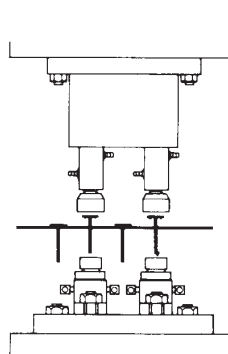
A Case History: Projection welding brackets to automotive frame assemblies is twice as fast with an Equa-Press dual tip holder. Lower welding fixture acts as an inspection device, so warped parts are discovered before welding. Inspection time and scrap loss are both reduced.



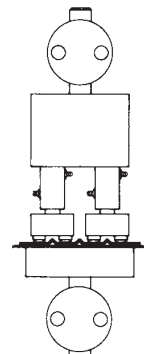
A Case History: Joining a piece of metal to itself is always tough. This job was done with an Equa-Press holder - two at a time. Lower clamp faces, carrying current, contact parts near the weld areas to avoid current bypassing weld projections. Two standard swivel tips make four welds, two per part.



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.



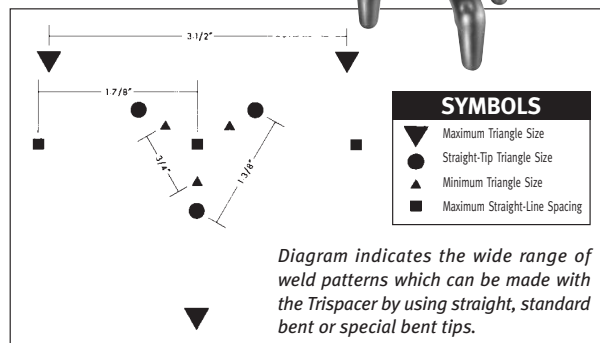
Here, four spot welds are made simultaneously on a corrugated part. An Equa-Press dual holder is used to hold two Teeter-Tip dual tip adapters.



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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

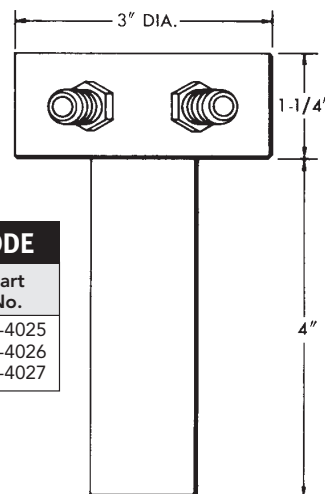
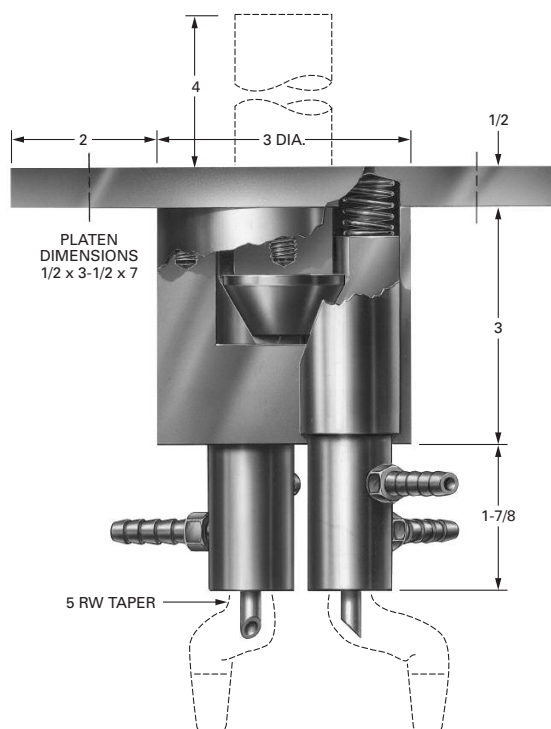
The Trispacer tip holder will make three spot welds at one time, automatically splitting the current and the pressure equally between the three tips. In doing so, it compensates for variations in work thicknesses and electrode wear-up to 3/16-in.

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





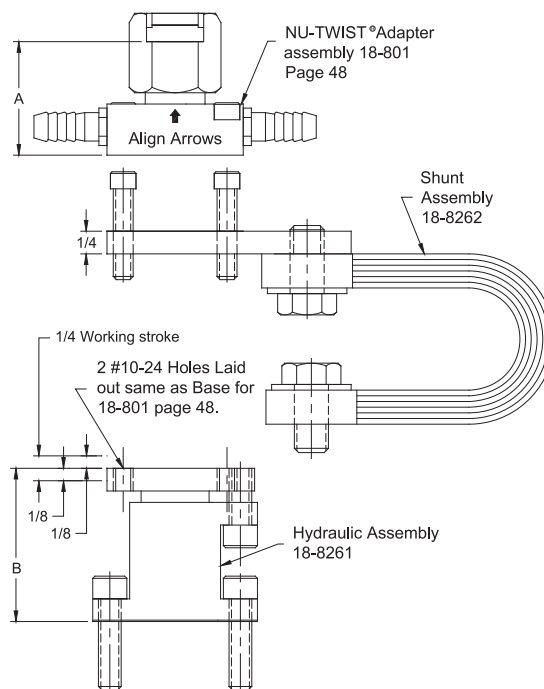
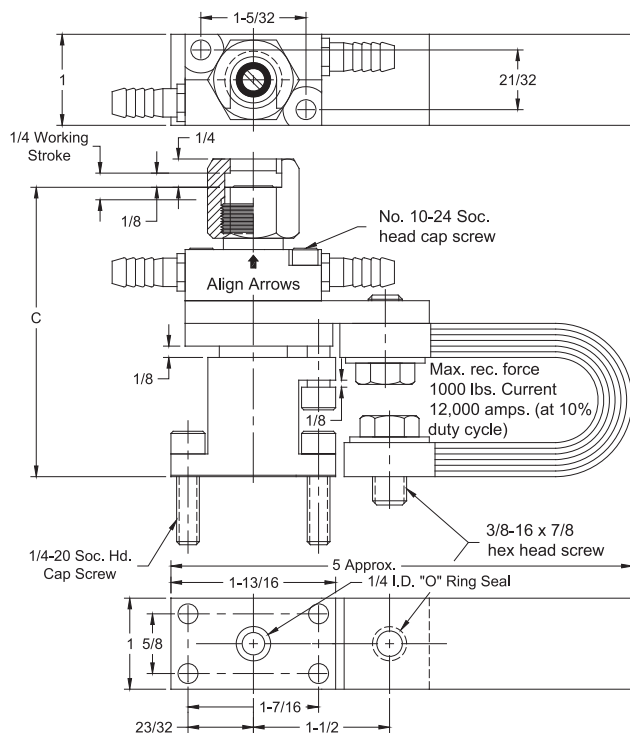
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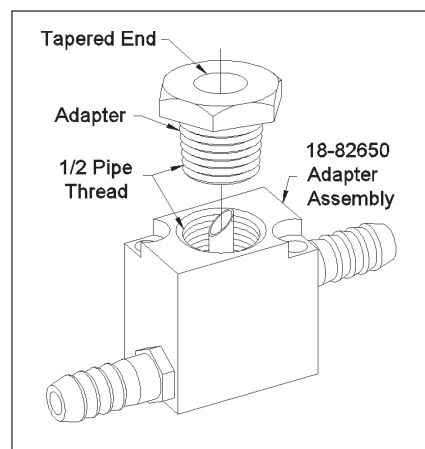
HYDRAULIC EQUALIZING ADAPTERS AND ASSEMBLIES

CMW Hydraulic Equalizing adapter units are used to equalize the weld force when two or more welds are required simultaneously. The equalizing action is developed in a closed hydraulic system - and is accomplished by hydraulically interconnecting two or more units. We recommend using fire resistant hydraulic fluid compatible with BUNA "N" such as HOUGHTO-SAFE #620, 1120 or equivalent. Consult your local industrial lubricant distributor.

18-826 #1 SIZE UNIT WITH NU-TWIST® SHOWN



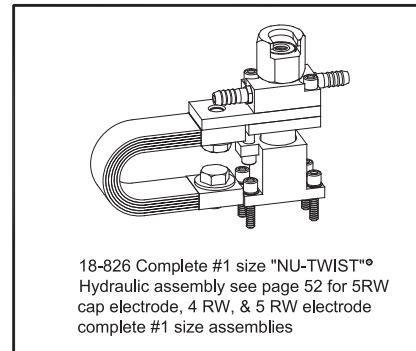
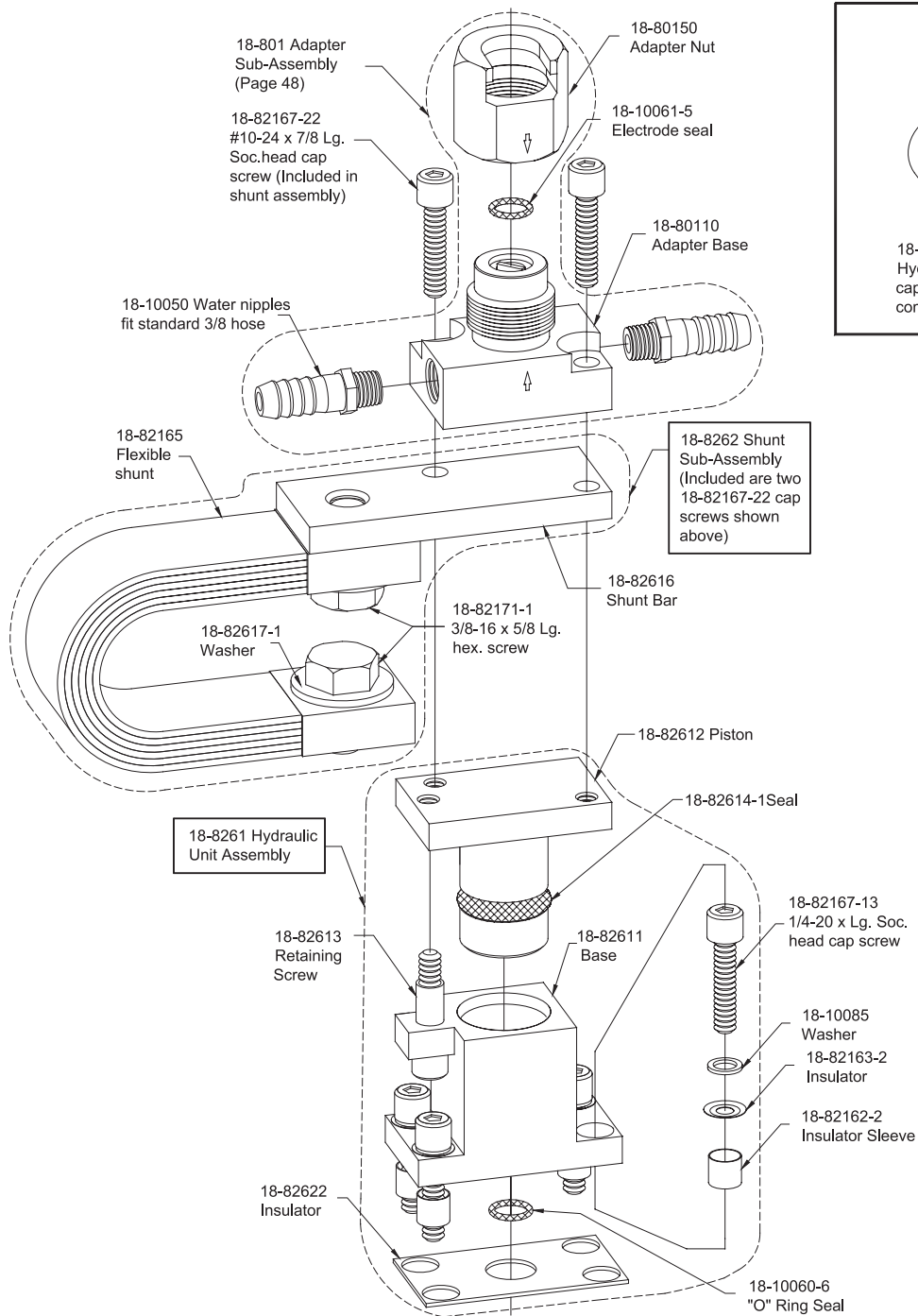
Complete Unit Part No.	Unit Size.	Electrode Attachment	Included Tapered Adapters	Height A	Mean Height B	Mean Electrode Engagement Height C
18-826	#1	NU-TWIST®	--	1-1/4		3-13/64
18-82650	#1	1/2-14 Pipe Thd.	--	1-1/2		3-29/64
18-82651	#1 with adapters	5 RW Male cap	18-7465-07	1-59/64	1-43/64	3-7/8
18-82652		4 RW	18-746-07	1-51/64		3-3/4
18-82653		5 RW	18-747-07	1-51/64		3-3/4





HYDRAULIC EQUALIZING ADAPTERS AND ASSEMBLIES

18-826 COMPLETE #1 SIZE "NU-TWIST"® ASSEMBLY

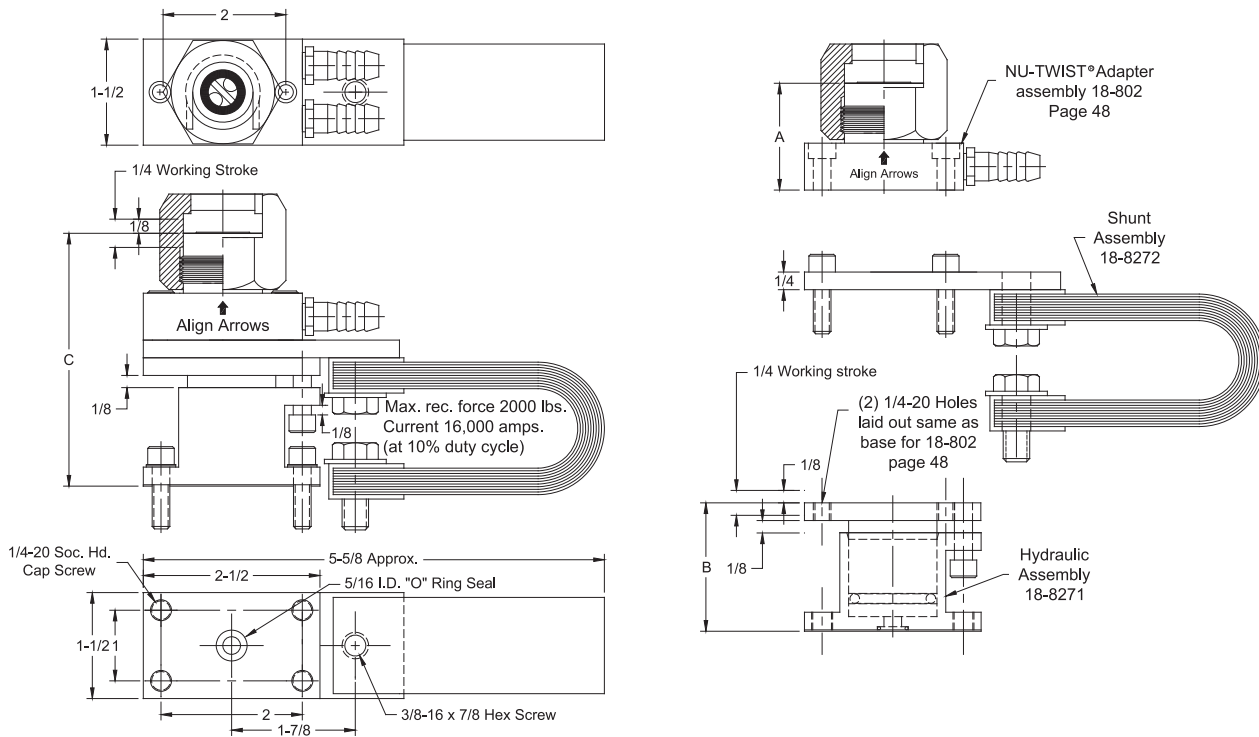




HYDRAULIC EQUALIZING ADAPTERS AND ASSEMBLIES

CMW Hydraulic Equalizing adapter units are used to equalize the weld force when two or more welds are required simultaneously. The equalizing action is developed in a closed hydraulic system - and is accomplished by hydraulically interconnecting two or more units. We recommend using fire resistant hydraulic fluid compatible with BUNA "N" such as HOUGHTO-SAFE #620, 1120 or equivalent. Consult your local industrial lubricant distributor.

18-827 #2 SIZE UNIT WITH "NU-TWIST"® SHOWN

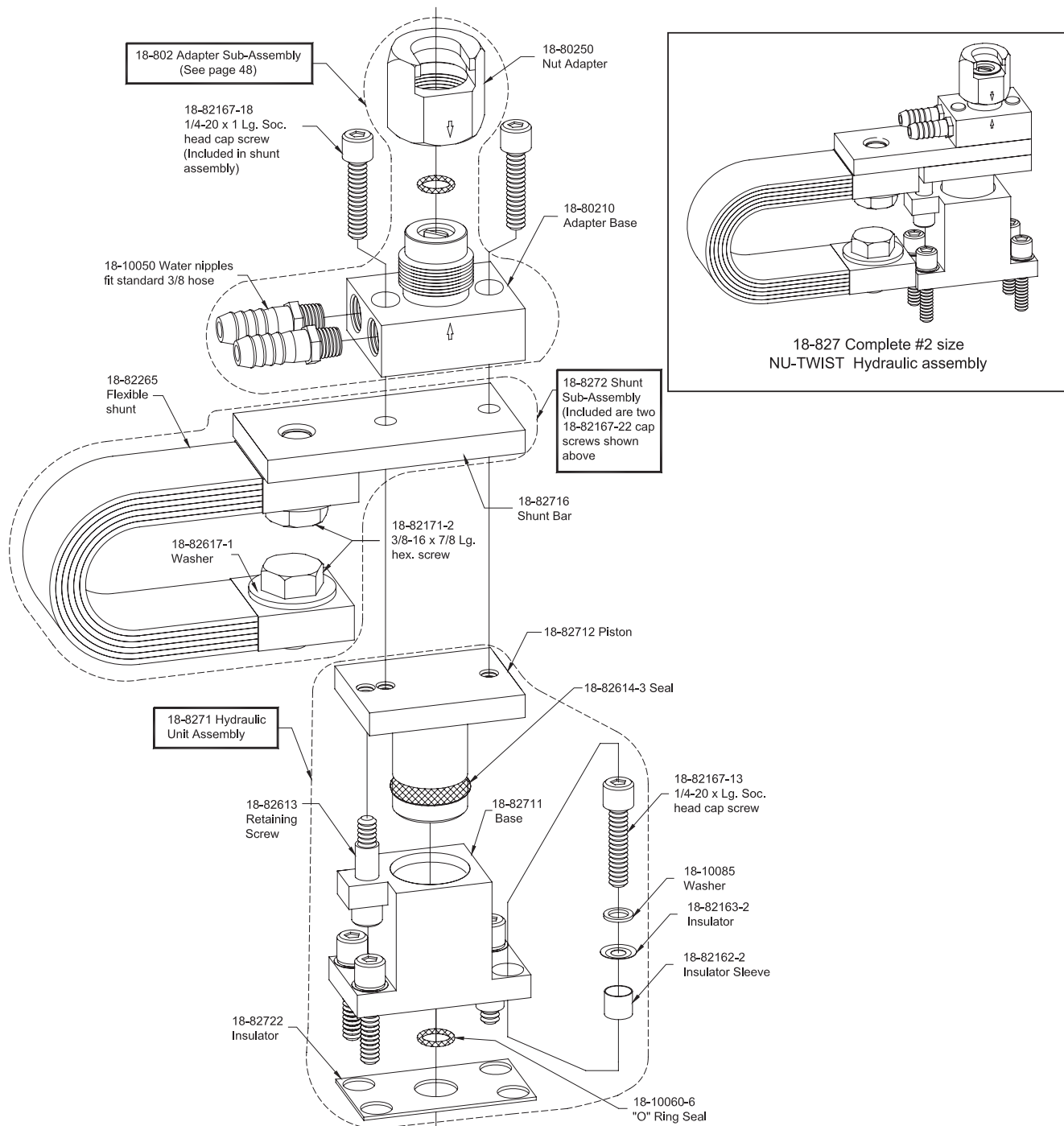


Complete Unit Part No.	Unit Size.	Electrode Attachment	Height A	Mean Height B	Mean Electrode Base Height C
18-827	#2	NU-TWIST	1-13/16	1-49/64	3-53/64



HYDRAULIC EQUALIZING ADAPTERS AND ASSEMBLIES

18-827 COMPLETE #2 SIZE "NU-TWIST"® ASSEMBLY





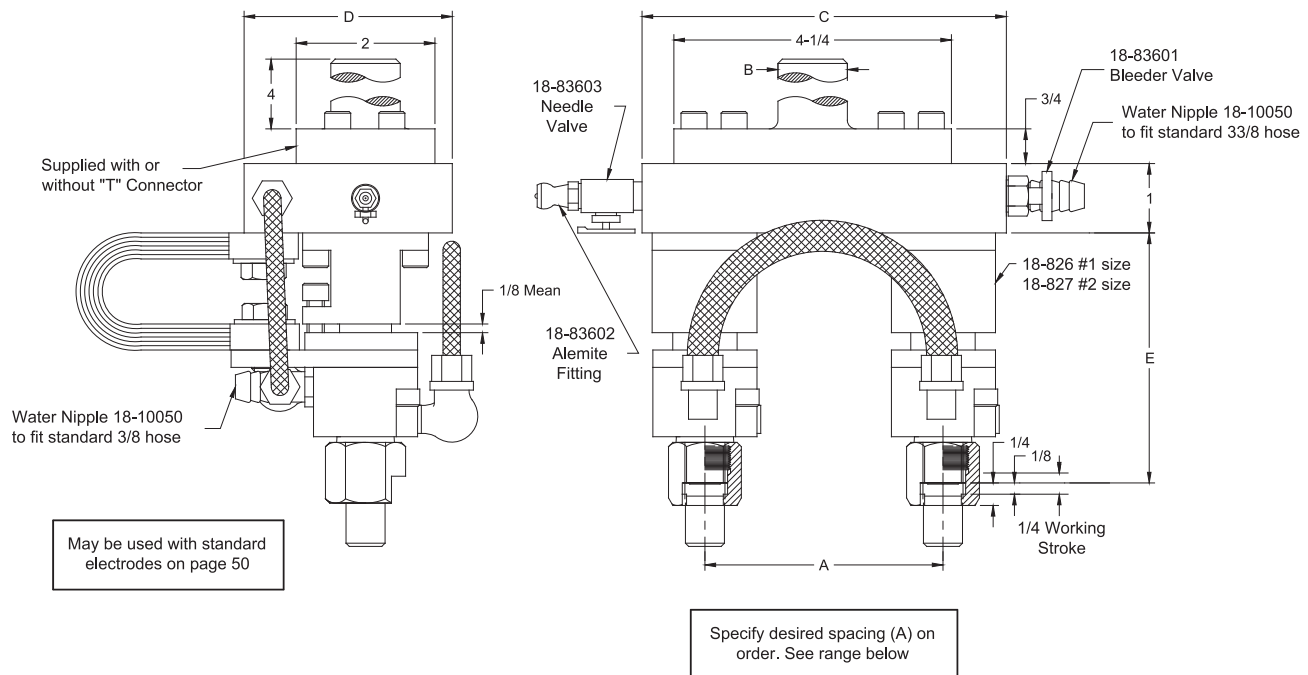
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FIXED UNIT HYDRAULIC EQUALIZING ASSEMBLIES

CMW Hydraulic Equalizing adapter units are used to equalize the weld force when two or more welds are required simultaneously. The equalizing action is developed in a closed hydraulic system - and is accomplished by hydraulically interconnecting two or more units. We recommend using fire resistant hydraulic fluid compatible with BUNA "N" such as HOUGHTO-SAFE #620, 1120 or equivalent. Consult your local industrial lubricant distributor.

TWO #1 OR #2 SIZE HYDRAULIC UNITS MOUNTED TO CUSTOMER'S DESIRED ELECTRODE SPACING.*



Assembly Unit Part No.	Unit Size	"T" Connector Shank Dia. B	Base Plate Length C	Base Plate Width D	Spacing* (Specify on Order) A	Max. Recommended Weld force Per Electrode LBS	Mean Height to Electrode Base E
18-846 18-84601-01	#1	None 1"	6	3	1-1/32" to 5"	1000 (12,000 Amps @ 10% duty cycle)	3-13/64
18-84601-02 18-84601-03		1-1/4" 1-1/2"					
18-847 18-84701-01		None 1"					
18-84701-02 18-84701-03	#2	1-1/4" 1-1/2"	7-1/2	3-1/2	1-3/4" to 6"	2000 (16,000 Amps @ 10% duty cycle)	3-61/64

Note:

- Multiple units of 2-8 can also be supplied on custom designed base plates with or without "T" Connectors.
- Units may be modified with adapters for RW tapered caps and electrodes

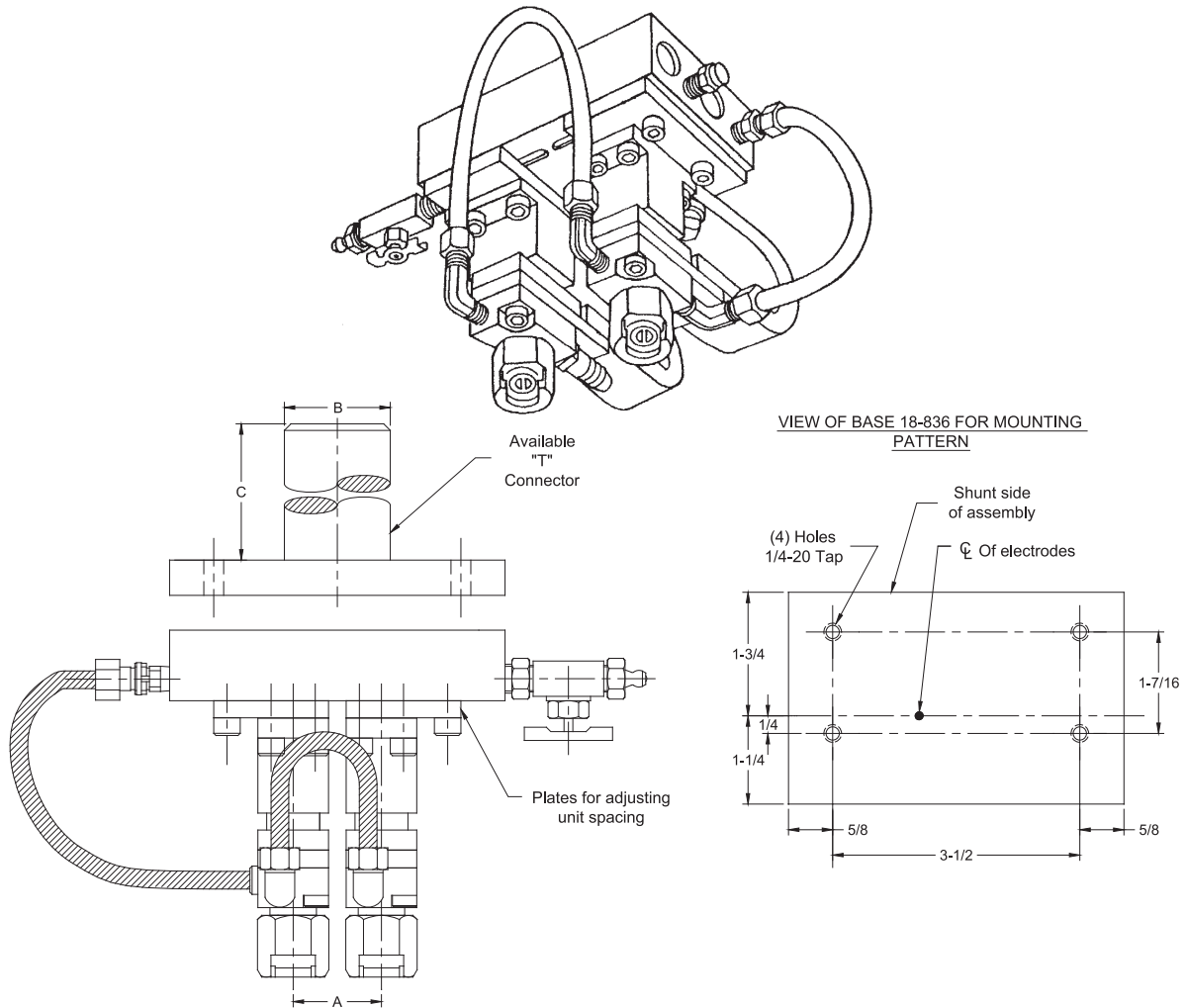


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ADJUSTABLE HYDRAULIC EQUALIZING ASSEMBLY 18-836

Part No. 18-836 (shown below) is a typical assembly using two 18-826 assemblies set up as a complete self-contained unit for making two spot welds at one time. **This unit is so arranged as to allow the center distances to be readily adjusted from 1-3/32" centers to 2-1/4" centers or by rearrangement of the same parts centers may be adjusted from 2-1/4" to 3-1/2".** This setup also include facilities for filling and bleeding the hydraulic units. "T" Mounting 18-83614 is available to order for assembly 18-836. We recommend using fire resistant hydraulic fluid compatible with BUNA "N" such as HOUGHTON-SAFE #620, 1120 or equivalent. Consult your local industrial lubricant distributor.



Assembly Part No.	Hydraulic Unit Size	Electrode Attachment ***	Adjustable Spacing Range A	"T" Connector			Max. Recommended Weld force Per Electrode LBS
18-836	#1	#1 NU-TWIST®	1-1/32 - 2-1/4 2-1/4 - 3-1/2"	NONE			1000 (12000 AMPS @ 10% Duty Cycle)
				Available	Dia. B	Length C	
				18-83614-01	**	4	
				18-83614-03	**	**	

* Partial disassembly, rearrangement of plates, and bleeding of unit will be necessary to switch centerline ranges.

** Customer must specify dimensions desired.

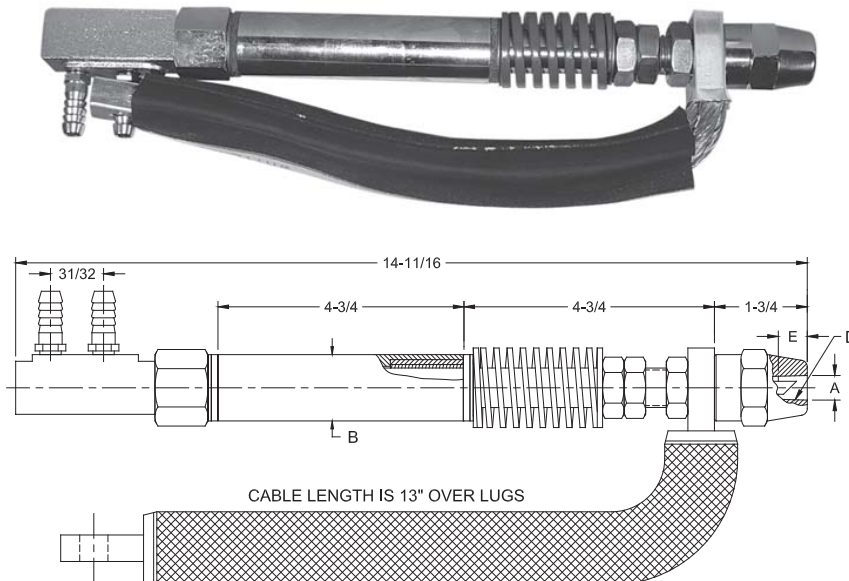
*** Other attachments available on request



SPOTWELD, INC.

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1100 SERIES ADJUST-A-PRESSURE WATER COOLED LOW INERTIA ELECTRODE HOLDERS



Like other low-inertia holders the heavy duty Adjust-A-Pressure Holders are used for multiple spot and projection welding, and are excellent for indirect welding when mounted in the Adjust-A-Angle Adapter.

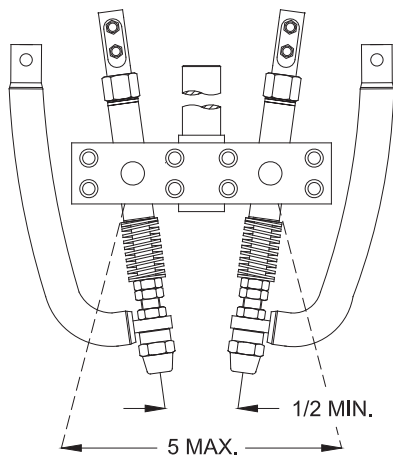
Electrical current is conducted through heavy flexible cables and holder is installed to prevent any damaging effects to the spring mechanism. Light duty springs supplied to order.

Part No. Holder Assy.*	Major Taper Dia. A	Barrel Dia. B	Taper D	Standard Electrode Taper Engagement E	Pressure Range (Pounds)
18-1101	.463	1-1/4	4 RW	1/2	to 500
18-1102	.625		5 RW	3/4	
18-1103	.463	1-1/2	4 RW	1/2	to 1000
18-1104	.625		5 RW	3/4	

* Standard holder uses 18-110006-1 spring. A heavy duty holder is available with spring 18-110006-2 for pressure to 1000 lbs.

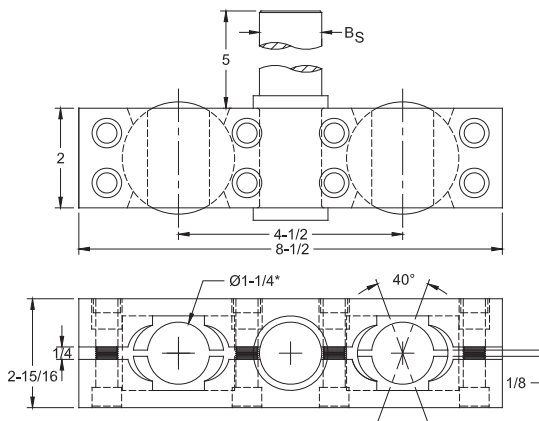
For additional holder information and replacement parts see page 59.

1150 SERIES ADJUST-A-ANGLE ADAPTERS



1100 SERIES HOLDERS ASSEMBLED IN 1150 SERIES ADAPTER

1150 SERIES ADJUST-A-ANGLE ADAPTERS ARE ADAPTABLE FOR USE WITH SPRING TYPE LOW INERTIA HOLDERS 1100 SERIES AS WELL AS STRAIGHT HOLDERS 100, 200, AND 300 SERIES.



Adapter Assembly Part No.	Shank Dia. B _S
18-1154	1
18-1155	1-1/4
18-1156	1-1/2

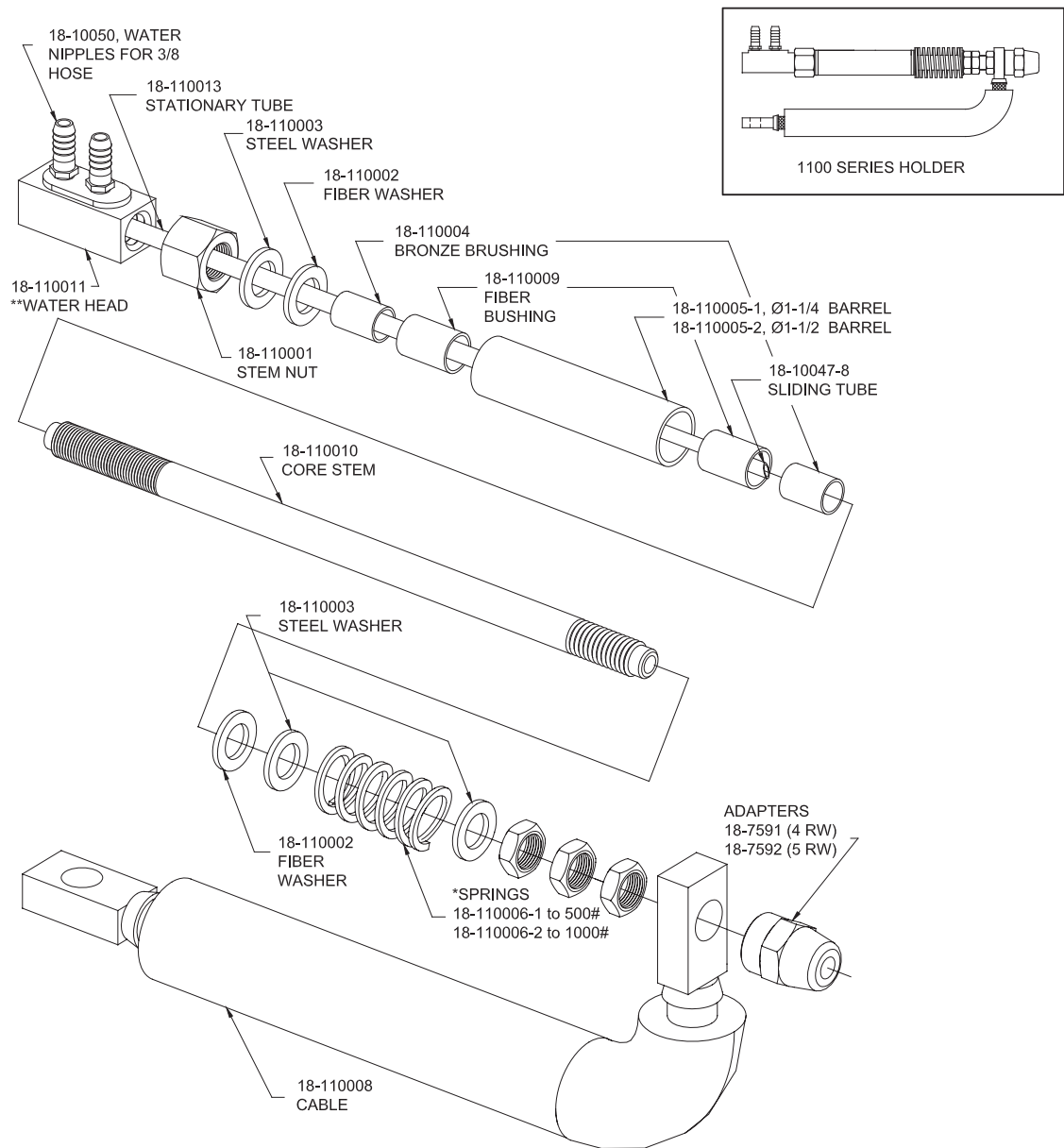
* Adapters for barrel sizes other than 1-1/4 dia. available as special order



SPOTWELD, INC.

Excellence in Resistance Welding

1100 SERIES ADJUST-A-PRESSURE WATER COOLED LOW INERTIA ELECTRODE HOLDERS



** INCLUDES 18-110013, 18-10050, 18-10047-8

* SPRINGS: 500# SPRING IS PAINTED BLUE; 1000# SPRING IS PAINTED YELLOW

Part No. Holder Assy.*	Barrel	Adapter	Adjust -A- Angle Adapters
18-1101 18-1102	18-110005-1	18-7591 18-7592	Select from 1150 Series Chart page 58
18-1103 18-1104	18-110005-2	18-7591 18-7592	Special order

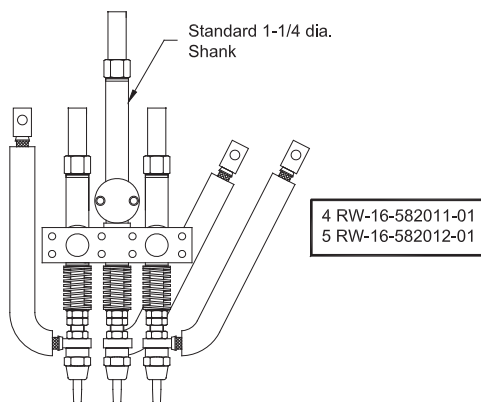
* See page 58 for more information



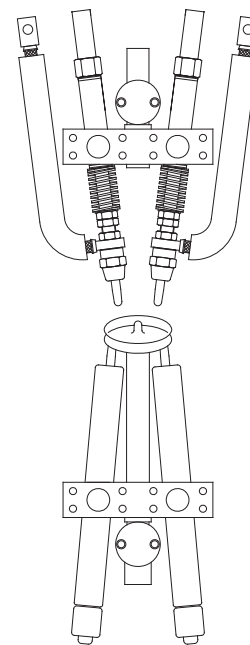
APPLICATION SHEET FOR TYPICAL MULTIPLE SPOT WELDING SETUPS

Typical Set Up For
3 Spots at a time in Parallel

1 CMW Std. 1150 Series Adapter
2 CMW Std. 1100 Series Holders
1 CMW Special 1100 Series Holder

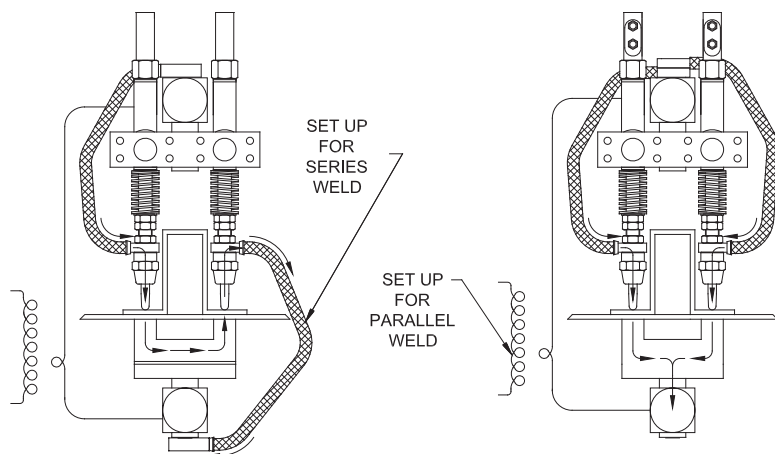


Typical Set Up For
2 spots simultaneously
in parallel



Upper
2-1100 Series Holders
1-1150 Series Adapter

Lower
2-100,200 or 300 Series Holders
1-1150 Series Adapter with special
center shank



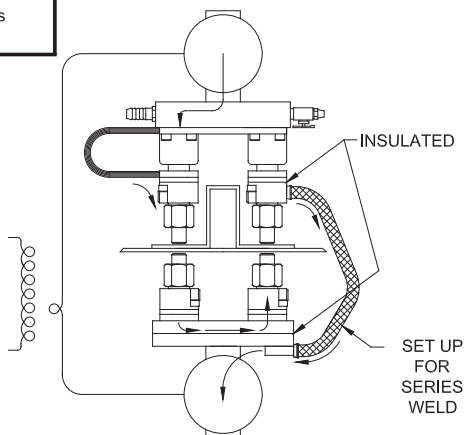
Contact Factory

All above items
priced and made
to special order

Illustrations
only

TYPICAL SET UP OF 800 SERIES "NU-TWIST"® UNITS

For dual spot welding using hydraulic "Nu-Twist"® Pressure equalizing subassemblies
and surface mounted adapters as basic building blocks



Upper
two
18-826
hydraulic
unit assemblies
mounted on
fixed centers
(See Pages
52, 53, 56)

Lower
two
18-801
surface
mounted
"Nu-Twist"®
Adapters
(See page 48)

