

## **TAUMEL ASSEMBLY SYSTEMS**

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*Designed by Shelbourne America Inc., Brewster, New York © 1996*

# ORBITAL HEADFORMING



# TAUMEL

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## TAUMEL ORBITAL HEADFORMING

**T**AUMEL, the pioneers of Orbital Headforming, are proud to present their renowned machines and equipment.

The range was designed to combine the best in today's technology with the high quality and precision which you expect from Taumel.

The streamlined design lends itself to modern manufacturing methods and allows us to build high-performance equipment at competitive prices.

**Taumel Orbital Headforming** is a noiseless radial forming and fastening system which replaces conventional riveting, staking, spinning, hammering, pressing, peening, rolling, welding, upsetting and coldheading operations—all with one machine.

Taumel orbital headforming machines use speedily changed single- or MultiSpindle Taumel heads to hold forming tools at a constant angle. The tools orbit a stationary workpiece but do not spin. As the tools follow their orbital path, their tips press on the workpiece on a line radiating from its center. With all of the pressure applied on this line, a flowing wave of material forms ahead of the orbiting tool.

The material has time to flow properly because only a minute quantity is displaced during each revolution and, as friction is minimal, no tearing of the workpiece occurs. This results in a clean, polished, non-porous surface on the formed material. There is no measurable change in molecular structure, and rivet heads, joints and flanges of maximum strength are created.

**Taumel machines** incorporate easily-read scales for greater accuracy and repeatability. Stroke and pressure are fully adjustable and can be precisely maintained at your chosen level. Pressure, for forming, is generated by either pneumatic or hydraulic power—depending on the required heading force.

Taumel Orbital Headforming relies on precisely controlled dwell-times and tool-pressure to form the shapes that you want. The machines make perfectly formed rivet heads, and other shapes, from both round and non-round stock manufactured from malleable materials.

Taumel machines can flare, flange, join and swage. They also assemble pins, studs, shafts, axles and hubs with unvarying accuracy and repeatability.

The strength, finished appearance and batch-to-batch uniformity of Taumel Headformed assemblies remain unmatched by other systems.



**Taumel's Orbital Headforming** machines include a comprehensive range of bench and floor models as well as independent modular units. And all of them can be speedily alternated between single- and multi-spindle operations.

Taumel builds machines for processing miniature parts in fragile materials and it builds sturdy workhorses which can form heads from 1.5" solid steel stock or flange 4" diameter tubes.

Throughout the range, one thing predominates—the design, engineering and workmanship remain unsurpassed. Taumel machines are built to work flawlessly day after day (and year after year). And they do—some have been in constant use for decades.

## MINIATURE HEADFORMING

Taumel's smaller machines are specially designed to process miniature parts in fragile materials (such as glass, ceramics, beryllium, phenolics or carbon).

To provide the ultimate in efficiency for the assembly of tiny and delicate parts, they can be set-up to work with index tables or sliders. And their freedom from vibration makes the precise automatic positioning of parts a snap.

Taumel heads can be changed quickly to provide either single- or multi-spindle operation.

Infinitely adjustable pressure (within a range of 0–100 psi) provides low pressure for delicate and miniature parts and freely moving swing joints; or high pressure to swell rivet shanks where needed.

Easy-to-read micrometer provides tool-stroke accuracy to within 0.001" .

Taumel machines offer both automatic and semi-automatic cycling with infinitely adjustable cycle times.



## TAUMEL WORKHORSES

Taumel bench machines are precision engineered to ensure that they will perform with unfailing speed, accuracy and consistent repeatability—as well as having the power to form-out tough materials.

Taumel machines will safely form all kinds of malleable materials, including plated and case-hardened surfaces.

Quiet electric motors drive the silent orbital movement of the tool-holding head. And the same machine, using suitable tools, can flare, flange, join and swage. It can also assemble pins, studs, shafts, axles and hubs.

Pressure, for headforming, is generated by either pneumatic or hydraulic power (depending on the capacity of the machine) and is fully adjustable.

Variable pressure allows you to join parts with any degree of built-in resistance (from freely moving swing-joints to rigid high torque assemblies).

Taumel machines are perfect for all your assembly tasks: the assemblies which they produce are superior in strength, appearance and uniformity to those made by any other method.



## TAUMEL FLOOR MACHINES

Taumel Floor Machines are the tools of choice for obtaining top-quality output, as well as high productivity, when assembling bulky workpieces.

Heavy-duty steel frames provide exceptional stability to the pedestals of the six machines in this group which includes some which are capable of forming heads up to 1.50" in diameter in solid 1010 steel.

The free-standing machines, with built-in height-adjustable tables, provide comfortable work-positioning and unrestricted access. The design has resulted in tough, stable machines with remarkably small footprints.

Quiet electric motors drive the silent orbital movement of the machines' heads.

Headforming pressure is produced hydraulically on the two most powerful machines: the others are pneumatically powered. Pressure can be set at any level between zero and the capacity of the machine and is precisely maintained.

All machines are fitted with Taumel's renowned trouble-free control system for precise and repeatable results.



## TAUMEL MODULAR UNITS

Taumel Modular Units are the machines of choice for flexible automation and systems integration.

All of Taumel's Orbital Headforming machines are available in modular form.

These units, operated by their separate remote-control panels, can be built into automated systems or incorporated in multi-station assembly lines for many widely varying applications.

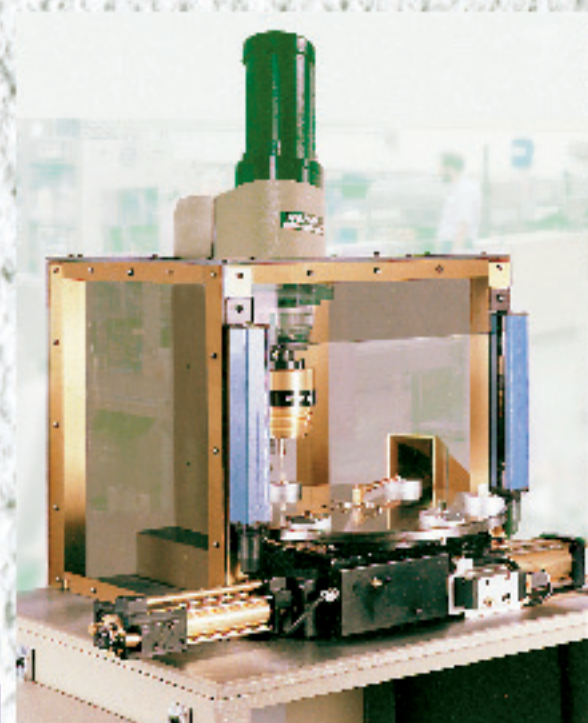
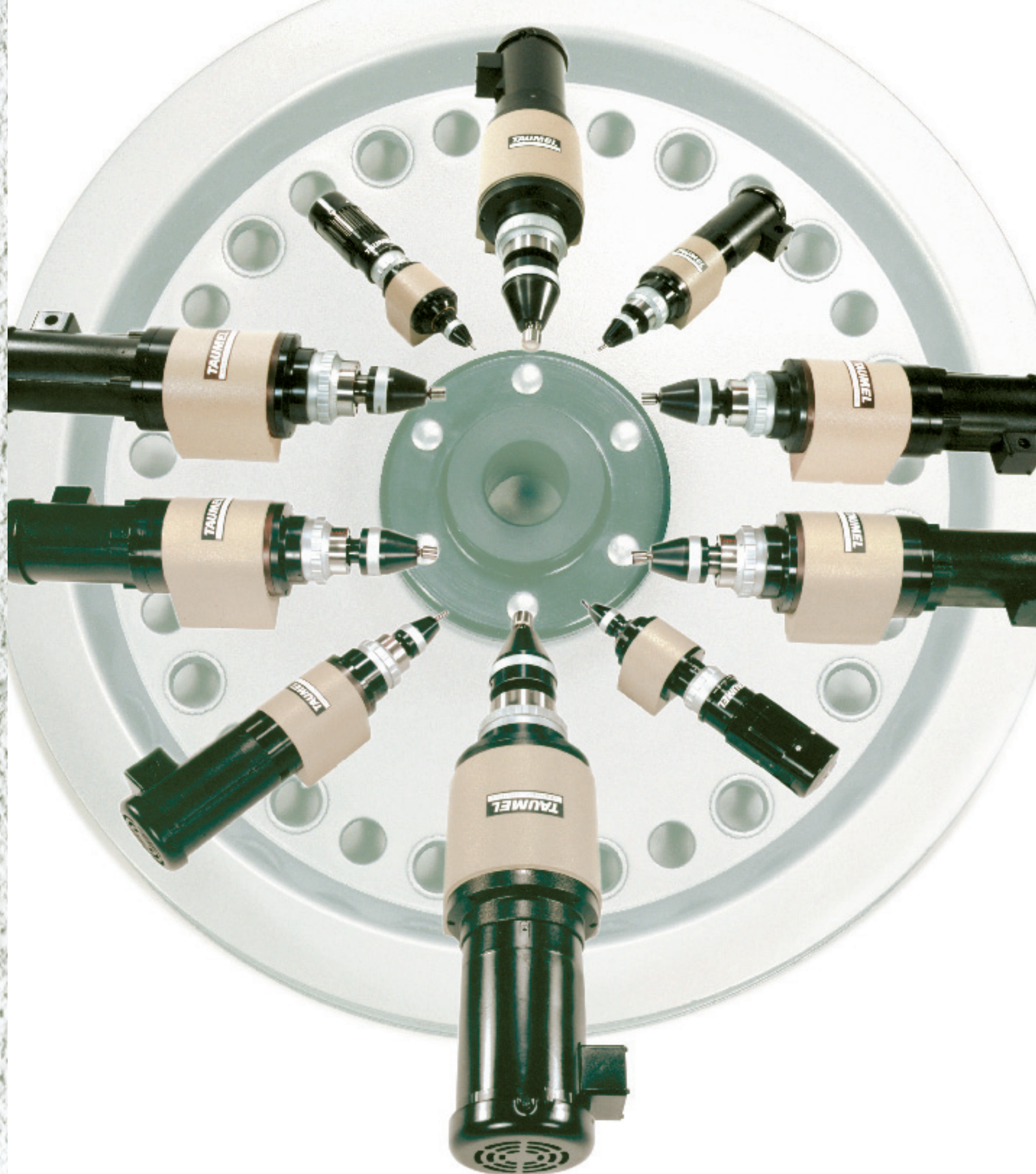
Modular units can also be combined with rotary and in-line transfer equipment.

Taumel modular units are designed to be operated at any angle (even upside down) and are frequently used as opposing pairs for two-ended assembly. Used in this way, they can form both ends of a shaft simultaneously—invaluable for assembling reels, axles and hubs.

Modular units can also be mounted on special frames for such deep-throat constructional requirements as the manufacturing of aircraft, automobiles and mass-transit vehicles.

Heading pressure is provided hydraulically on the two most powerful machines and pneumatically on the others.

The separate control panels govern all machine functions and ensure reliable and accurate operation.



## TAUMEL MULTISPINDLES

Taumel MultiSpindle headforming is the smart answer to faster production.

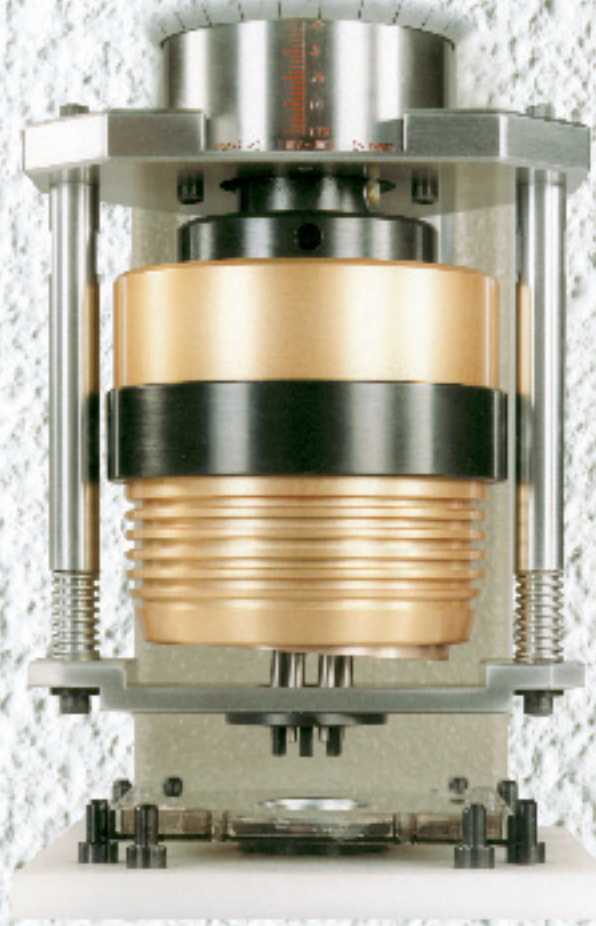
Do the whole job in a single pass. When another task must be done, quickly change over to another pre-aligned MultiSpindle tooling set or to a single spindle head.

One tooling head can hold any number of tools—as close as 0.18" apart.

Another multi-point system can handle many different components, all of different heading heights or even recessed in cavities, during one machine cycle.

Adjustable MultiSpindle Attachments are another option. They permit two, three or four separate operations on one (or several) parts at the same time. The distance between centers is infinitely variable (within the specifications for each model) and is adjusted and locked in position to suit the required forming pattern.

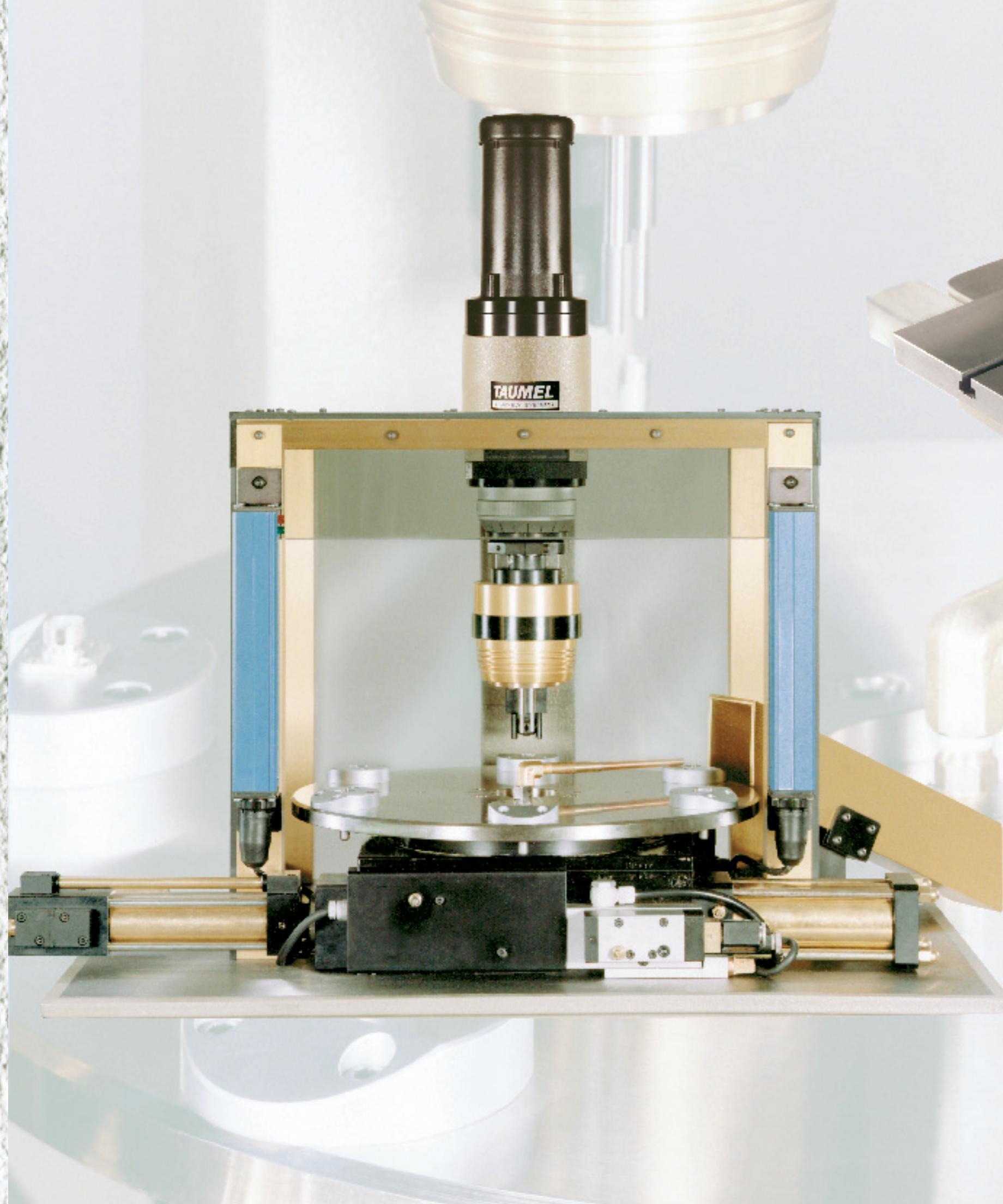




## TAUMEL FIXTURES

Taumel provides parts-handling devices to suit your application: Automatic Indexing Systems with infra-red safety barriers; Sliders (both automatic and manual) and internal and external Compression devices.

Whether you need a simple fixed jig or an elaborate automatic station, we can provide it. Just send us samples of the parts that you need to assemble and we will design the workpiece holding device which is most suitable for your task.





## TAUMEL FORMING TOOLS

Taumel tools can form taper, flat, pan and crown heads and they flange, flare, curl, crimp and caulk.

Taumel provides a large range of both standard and special tools to suit your particular task.

Taumel has unmatched expertise and capabilities in the designing and building of customized forming tools.

*Tool-shape schematics are shown on page 16.*



## SPECIAL PURPOSE TOOLS

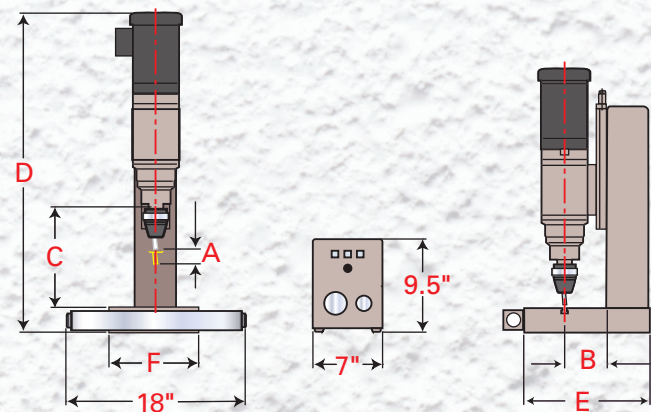
Special C-shaped tools can work beneath obstructions; notched-shank tools work in recesses with limited access and deep-throat tools headform in deep and narrow places.



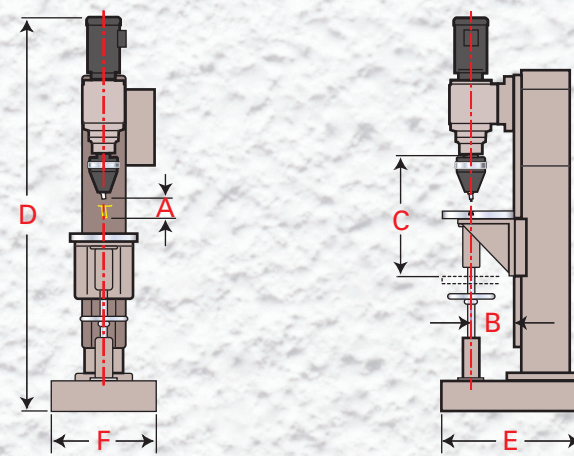
# TAUMEL

## ADVANTAGES

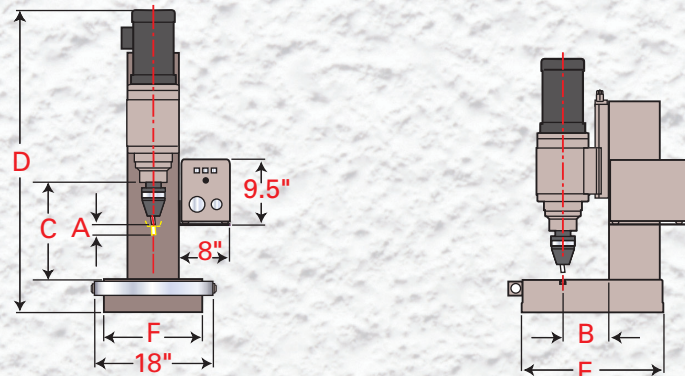
- ❖ The largest and most comprehensive range of equipment in the industry.
- ❖ Streamlined design for extended machine and tool life under rugged conditions.
- ❖ Slimline design of modular units permits operations in confined and restricted areas.
- ❖ Scales and readouts designed for precision set-up.
- ❖ The same machine forms solid connections or accurate swing joints.
- ❖ Works safely on delicate parts: will not fracture brittle materials like ceramics, glass or carbon.
- ❖ Perfect forming of all types of malleable materials (even with plated or case-hardened surfaces) as well as many thermoplastics.
- ❖ Forms round, square, hexagonal and rectangular stock.
- ❖ Automatic electronic controls.
- ❖ Infinitely adjustable and accurate stroke, speed and pressure setting.
- ❖ Fully automatic cycle controlled by proximity touch pads or twin hand-buttons.
- ❖ Vibration-free coldforming process.
- ❖ Snap-in tooling and quick set-up.
- ❖ Speedy changes between single-spindle and multi-spindle heads.
- ❖ Easy lubrication and machine maintenance.
- ❖ Consistent high quality results, even with minimum operator skills.
- ❖ Quiet and easy operation reduces operator fatigue.
- ❖ Meets latest OSHA requirements for safety and noise level.



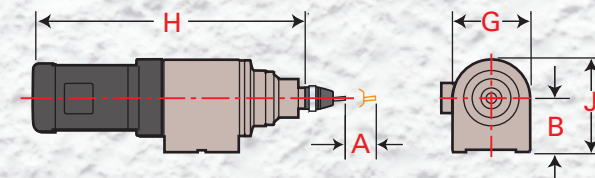
T-161 & T-251 ORBITAL HEADFORMING MACHINES



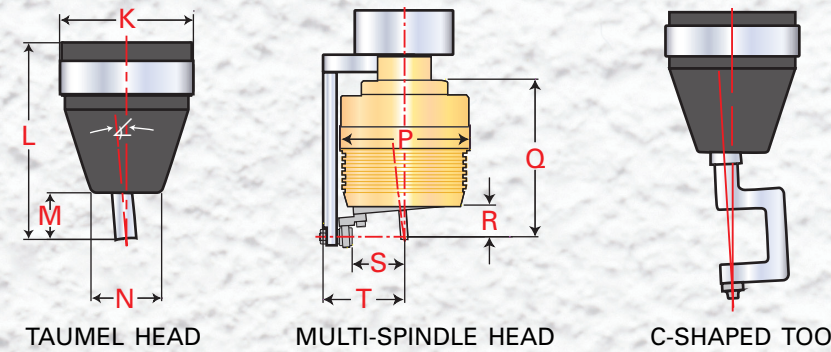
PEDESTAL ORBITAL HEADFORMING MACHINES



T-321, T-401, T-501 & T-626 ORBITAL HEADFORMING MACHINES



MODULAR ORBITAL HEADFORMING UNITS



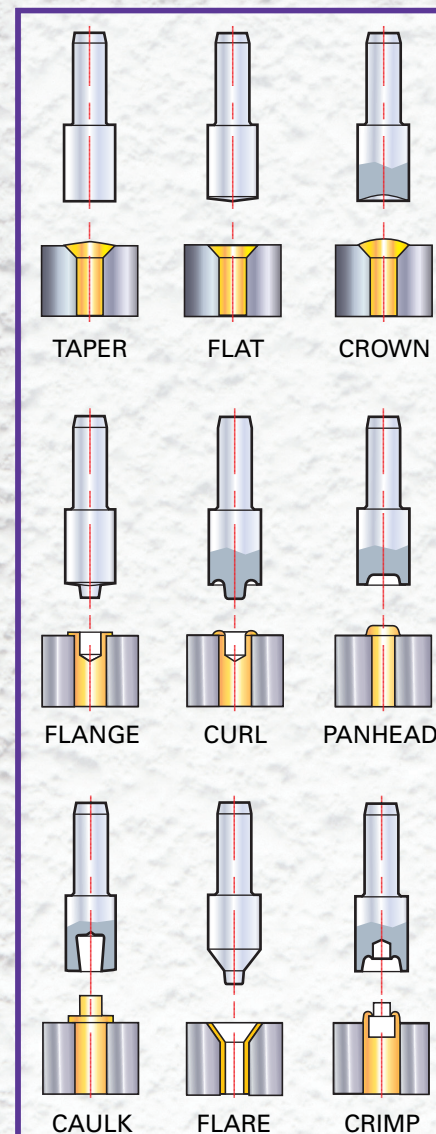
TAUMEL HEAD MULTI-SPINDLE HEAD C-SHAPED TOOL

TAUMEL HEADS	DIMENSIONS					USE WITH
SIZE	∠	K	L	M	N	TAUMEL MACHINES
T - 8	5	1.70	2.76	0.79	0.80	T-161, T-251
T - 83	3	1.70	4.33	2.36	0.80	
T - 84	4	1.70	3.35	1.38	0.80	
T - 10	5	1.80	3.23	0.87	1.00	T-161, T-251
T - 103	3	1.80	5.82	3.43	1.00	
T - 104	4	1.80	4.30	1.87	1.00	
T - 1283	3	2.15	6.02	3.35	1.20	T-251
T - 1284	4	2.15	4.57	1.89	1.20	
T - 123	3	2.15	6.02	3.35	1.20	T-321, T-401
T - 124	4	2.15	4.57	1.89	1.20	
T - 145	5	2.25	4.00	1.20	1.25	T-251, T-321
T - 205	5	3.25	4.80	1.25	1.80	T-321, T-401
T - 213	3	3.55	7.44	3.70	1.85	T-321, T-401, T-501
T - 214	4	3.55	5.87	2.13	1.85	
T - 245	5	3.56	5.25	1.25	1.88	T-321, T-401, T-501
T - 25	5	4.55	7.29	1.93	2.15	T-626
T - 27	5	4.55	7.29	1.93	2.15	
T - 253	3	4.55	11.30	5.95	2.15	
T - 254	4	4.55	8.82	3.47	2.15	
T - 30	5	5.95	8.74	1.73	2.50	T-751, T-1000
T - 303	3	5.95	14.17	7.17	2.50	
T - 304	4	5.95	10.95	3.94	2.50	
T - 36	5	6.12	8.75	1.73	3.00	T-1000

TAUMEL MACHINE MODEL	Type	Capacity	A*	B	C	D	E	F	G	H	J	Wt. Lbs	Motor HP
T-161	P	.16	1.25	4.1	8.5	27.5	11.3	7.0				88	.12
T-251	P	.25	1.25	4.1	9.5	32.0	12.7	9.0				140	.17
T-321	P	.32	1.50	6.6	12.5	42.0	20.8	14.8				465	.50
T-401	P	.40	1.50	6.6	12.5	42.0	20.8	14.8				465	.50
T-501	P	.55	1.50	6.6	12.5	43.5	20.8	14.8				485	.75
T-626	P	.63	1.75	7.0	16.3	50.0	20.8	14.8				620	1.50
T-321 F	P	.32	1.50	7.0	22.0	78.0	24.0	19.0				820	.50
T-401 F	P	.40	1.50	7.0	22.0	78.0	24.0	19.0				820	.50
T-501 F	P	.55	1.50	7.0	22.0	80.0	24.0	19.0				860	.75
T-626 F	P	.63	1.75	7.0	19.0	83.0	24.0	19.0				980	1.50
T-751 FH	H	.75	1.75	9.0	16.2	82.0	29.0	22.0				1290	2.00
T-1000 FH	H	1.00	1.75	9.0	16.2	88.0	29.0	22.0				1350	3.00
T-161 M	P	.16	1.25	3.25					4.5	16.5	5.5	25	.12
T-251 M	P	.25	1.25	3.25					4.8	19.8	5.6	42	.17
T-321 M	P	.32	1.50	4.88					7.0	24.5	8.5	89	.50
T-401 M	P	.40	1.50	4.88					7.0	24.5	8.5	90	.50
T-501 M	P	.55	1.50	4.88					7.6	26.0	8.8	110	.75
T-626 M	P	.63	1.75	5.25					9.0	28.6	9.8	195	1.50
T-751 MH	H	.75	1.75	5.25					9.0	32.0	9.8	255	2.00
T-1000 MH	H	1.00	1.75	5.25					9.0	35.2	9.8	290	3.00

Machine Type: P= Pneumatic; H= Hydraulic  
\*Longer stroke is available on request

Electrical: T-161 =115 VAC-1-60. Others =230/460 VAC-3-60  
Heading Capacity: Value is based on solid mild steel



TAUMEL TOOL SHAPES

Multipoint Heads	DIMENSIONS							USE WITH TAUMEL MACHINES
SIZE	Centers Min	Centers Max	P	Q	R	S	T	
MS - 60	.200	1.750	4.00	5.00	0.875	1.50	2.50	T-251, T-321,
MS - 63	.200	1.750	4.00	6.00	1.875	1.50	2.50	& T-401
MS - 80	.200	2.500	4.625	5.50	1.00	1.875	2.875	T-321, T-401,
MS - 83	.200	2.500	4.625	6.625	2.125	1.875	2.875	& T-501
MS - 100	.200	3.625	6.375	7.00	1.125	2.875	3.875	T-501, T-626
MS - 103	.200	3.625	6.375	7.00	2.00	2.875	3.875	T-626, T-751

All data given in this catalogue are subject to change without prior notice