ASSEMBLY SOLUTIONS GUIDE

Send Us Your Assembly Application
10 Forming/Fastening Processes = AN UNBIASED APPROACH
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All of our products are organized into groups by process. If you would like more information regarding a process or machine described in this catalog, visit www.orbitform.com or call (517) 787-9447 to speak with your Regional Sales Managers.
Orbitform designs and builds assembly equipment solutions for manufacturing including: orbital forming, radial forming, impact riveting, roller forming, pressing, hot upset forming and flush self-piercing riveting as well as palletized and table top conveying systems. Orbitform's services include assembly analysis, tooling development, batch production runs, and machine services.

Since 1984, Orbitform has delivered over 9,000 assembly machines and custom assembly systems to a wide range of customers and industries around the world. Orbitform also manufactures a standard line of powerheads and assembly system components for machine integrators. All Orbitform systems, machine components, spare parts and tooling are made in the USA, within our 120 thousand square-foot manufacturing facility, located in Jackson, Michigan.

What sets Orbitform apart from the competition, is our unbiased approach. With Orbitform, you’re not restricted to a single product line or assembly process. It all starts with the customer’s part in the state-of-the-art assembly solutions lab, where your sample parts are assembled to define, verify, and optimize the process that best meets your quality, functional and aesthetic requirements. Orbitform offers a wide range of solutions, to provide you the product, process, or service that’s right for your application. What sets us apart the most is the engineering department, manufacturing, machine build, service department, spare parts and tooling are all under one roof.

So, whether you need a powerhead, bench machine, multi-process workstation, multi-station work cell, or fully automated assembly system, Orbitform is your one-stop shop. Increase throughput, improve quality, reduce scrap and maximize profits.

Orbitform… solutions delivered.
UNDER ONE ROOF

By having our assembly solutions lab, engineering, manufacturing, machine build, service department, and spare parts and tooling all under one roof creates an amazing customer experience. Instead of managing multiple companies and contractors Orbitform can design and build your machine from the base, up. Our application engineers, machine designers, and machine builders work together to create some of the highest quality assembly equipment in the industry. Every aspect of your machine will be created in our 120 thousand square-foot manufacturing facility, located in Jackson, Michigan.

ASSEMBLY ANALYSIS

At Orbitform it all starts with the customer’s part in our assembly solutions lab. Our applications engineers know the best way to optimize an assembly process, is by assembling your sample parts. The team of highly knowledgeable lab technicians will examine, discuss options and decide on the best process to assemble your part. Once the process is decided, a lab technician will modify one of the lab machines to test the process. Product engineers receive invaluable feedback, suggestions for part features, and a more efficient and cost effective machine or tooling concept to assemble your part.

TOOLING DEVELOPMENT

If your tooling isn't made right, your part isn't made right. Orbitform application engineers have extensive experience developing orbital, radial and impact tooling. Proper design, along with testing in our assembly solutions lab is critical, as each peen, driver, anvil and roll-set is as unique as your application. All peens are polished to 6 microns to reduce galling and produce a lustrous head form. Our application engineers can recommend special coatings, to reduce wear and extend tooling life. All of our standard tooling is made in-house, factory-direct, where we control the delivery and quality. In addition, Orbitform stands behind our tooling, providing our customers access to Orbitform assembly diagnostic and troubleshooting support. We can also make tooling for competitor equipment.

BATCH PRODUCTION RUNS

When you need a small batch of parts assembled, Orbitform’s assembly solutions lab can be a cost effective option. We have both the assembly equipment and the know-how. With over 30 years of assembly experience, our application engineers are the assembly experts. They know how to fabricate the proper tooling, and how to correctly fixture parts for a consistent and repeatable form. Orbitform customers are welcome to visit our lab and observe the assembly process in action.

MACHINE SERVICES

Our highly trained service team performs: system installations, in-house and on-site training, preventative maintenance, troubleshooting and technical support. Orbitform has you covered from concept to installation, delivering a full line of standard and custom-engineered assembly solutions.
ASSEMBLY SOLUTIONS LAB

At Orbitform, it all starts with the customer’s part in our Assembly Solutions Lab. Our application engineers know the best way to optimize an assembly process is by assembling your sample parts. Product engineers receive invaluable feedback, suggestions for part features, and a more efficient and cost effective process. What sets us apart is our unbiased approach, as you’re not restricted to a single assembly process. Orbitform offers a range of assembly processes, including: orbital, radial, impact, hot upset, rollerforming, pressing, and flush self-piercing riveting.

IT ALL STARTS WITH THE CUSTOMER’S PART

SEND US YOUR SAMPLE PARTS FOR ASSEMBLY ANALYSIS
ORBITAL FORMING

Orbital forming is a cold forming process using a peen tool held at a fixed angle to create a sweeping line of pressure around the part progressively forming the material with each rotation. This process reduces the amount of forming force required by approximately 80% of a standard press.

KEY FEATURES

• **Smooth, Non-Impact** Rivets are formed using around 80% less force than when using a standard press. This requires less power consumption, allowing plants to run more efficiently on Orbitform Machines.

• **Articulating Joints** Orbital forming allows for the creation of articulating hinge joints. With less downforce on the rivet, there is minimal rivet shank swell, allowing finished parts to articulate smoothly.

• **Process Monitoring** Reduce scrap and malformed parts to increase throughput and efficiency. See page 16 for more information about Orbitform’s Process Monitoring.

• **Aesthetic Appeal** All aspects of orbital forming produce high quality and visually appealing joints. With a wide variety of forming peen options, Orbitform engineers will develop tooling to best suit your needs.

SPEED UP YOUR PRODUCTION WITH MULTI-FORMING

Reduce costs and increase throughput by using Orbitform’s Multi-Form machines. Form multiple rivets at the same time for a boost in efficiency. Every machine is custom designed to fit the customer’s specific forming needs, making sure your process goes as quickly and as smoothly as possible.

ORBITAL FORMING SEQUENCE

[Images of orbital forming sequence]

[Diagram of orbital forming process]

[Images of Orbitform machines]
RADIAL FORMING

The radial forming and riveting process is similar to the orbital riveting and forming process, but with radial riveting and forming the material is displaced from the center outward in a rosette or rose curve pattern. The radial riveting process is often the optimal assembly solution when working with small rivet shank diameters, delicate rivet materials, or unsupported rivet assembly applications. Orbitform will help you define the appropriate riveting process, whether radial or orbital.

KEY FEATURES

• **Small Parts** Radial riveting is well suited for rivets with a diameter of 1/8” and smaller. In fact the radial forming process was originally developed for watch making applications where tiny rivets are formed.

• **Delicate Materials** In the radial riveting process the forming peen is driven so no scuffing or galling occurs thus radial riveting is well suited for embossing applications. Also, little side force is applied during the radial riveting process due to displacing of material outwardly from the center.

• **Flexibility** Exchangeable cartridges allow you to simply convert an Orbitform orbital riveting powerhead into an Orbitform radial riveting powerhead, and vice-versa. This offers you versatility and performance.

• **Controlled Forming** The radial process allows the rivet to fill "D" type tabs and other irregular sections since material is displaced radially outward. The forming peen is driven so no scuffing or galling occurs thus radial riveting is well suited for embossing applications.

• **Less Side Force** Less side force is applied during the radial riveting process than with the orbital process due to the displacing of material outwardly from the center using an 11 sided radial pattern. Thus the radial process is ideal for delicate materials.

• **Process Intelligence** Reduce scrap to increase your throughput and production efficiency.
FLEXIBLE ASSEMBLY SOLUTIONS

Orbitform bench and pedestal machines are modular and designed for use across many industries and applications. The flexible design allows components to be added to support many applications. Dependent upon capacity, precision, and speed required for your applications, these machines are powered by pneumatics, hydraulics, or servo. All orbital bench and pedestal machines include an orbital head which fits the machine. (Special orbital heads available to suit many applications.)

For more information about powerheads, orbital heads, and orbital bench and pedestal machines, visit our website at www.orbitform.com or call (517) 787-9447.

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**B-125**

<table>
<thead>
<tr>
<th><strong>POWER</strong></th>
<th>Pneumatic</th>
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<tbody>
<tr>
<td><strong>POWERHEAD</strong></td>
<td>M-125</td>
</tr>
<tr>
<td><strong>HEAD FORMING CAPACITY</strong></td>
<td>0.125&quot; (3.2 mm)</td>
</tr>
<tr>
<td><strong>MAX STROKE</strong></td>
<td>1.5&quot; (38 mm)</td>
</tr>
<tr>
<td><strong>MAX DOWNWARD FORCE</strong></td>
<td>590 lbs @ 100 psi</td>
</tr>
<tr>
<td><strong>WEIGHT</strong></td>
<td>150 lbs (68 kg)‡</td>
</tr>
</tbody>
</table>

‡ Measurements based on standard features and operation. For reference only.

**ORBITAL HEAD INCLUDED**

HS-250

| A - Width | 6.88" (174.8 mm) |
| B - Depth | 13.0" (330.2 mm) |
| C - Throat Depth | 3.5" (89 mm) |
| D - Height | 30.0" (762 mm) |
| E - Base Height | 1.88" (47.8 mm) |

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**B-240**

<table>
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<th><strong>POWER</strong></th>
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<td><strong>POWERHEAD</strong></td>
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<tr>
<td><strong>HEAD FORMING CAPACITY</strong></td>
<td>0.236&quot; (6 mm)</td>
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<tr>
<td><strong>MAX STROKE</strong></td>
<td>1.75&quot; (44.5 mm)</td>
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<tr>
<td><strong>MAX DOWNWARD FORCE</strong></td>
<td>1460 lbs @ 100 psi</td>
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<tr>
<td><strong>WEIGHT</strong></td>
<td>250 lbs (113.4 kg)‡</td>
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</table>

‡ Measurements based on standard features and operation. For reference only.

**ORBITAL HEAD INCLUDED**

HS-310

| A - Width | 8.75" (222.3 mm) |
| B - Depth | 14.75" (374.7 mm) |
| C - Throat Depth | 4.5" (114.3 mm) |
| D - Height | 35.75" (908.1 mm) |
| E - Base Height | 4.0" (101.6 mm) |
### B-310

**POWER**
- Pneumatic

**POWERHEAD**
- M-310

**HEAD FORMING CAPACITY**
- 0.312" (8 mm)

**MAX STROKE**
- 2.0" (51 mm)

**MAX DOWNWARD FORCE**
- 2120 lbs @ 100 psi

**WEIGHT**
- 580 lbs (263.1 kg)

‡ Measurements based on standard features and operation. For reference only.

### B-500

**POWER**
- Pneumatic

**POWERHEAD**
- M-500

**HEAD FORMING CAPACITY**
- 0.500" (12.7 mm)

**MAX STROKE**
- 2.5" (63.5 mm)

**MAX DOWNWARD FORCE**
- 4400 lbs @ 100 psi

**WEIGHT**
- 1000 lbs

‡ Measurements based on standard features and operation. For reference only.

### B-503

**POWER**
- Pneumatic

**POWERHEAD**
- M-503

**HEAD FORMING CAPACITY**
- 0.500" (12.7 mm)

**MAX STROKE**
- 3.0" (76.2 mm)

**MAX DOWNWARD FORCE**
- 4400 lbs @ 100 psi

**WEIGHT**
- 1000 lbs (453.6 kg)

‡ Measurements based on standard features and operation. For reference only.
<table>
<thead>
<tr>
<th>Model</th>
<th>Power</th>
<th>Powerhead</th>
<th>Forming Capacity</th>
<th>Max Stroke</th>
<th>Max Downward Force</th>
<th>Weight @ 100 psi</th>
<th>Additional Info</th>
</tr>
</thead>
<tbody>
<tr>
<td>B-506</td>
<td>Pneumatic</td>
<td>M-506</td>
<td>0.500&quot; (12.7 mm)</td>
<td>6.0&quot; (152.4 mm)</td>
<td>4400 lbs</td>
<td>1200 lbs (544.3 kg)‡</td>
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<tr>
<td>B-750</td>
<td>Pneumatic</td>
<td>M-750</td>
<td>0.750&quot; (19.1 mm)</td>
<td>2.5&quot; (63.5 mm)</td>
<td>7510 lbs @ 100 psi</td>
<td>1100 lbs (499 kg)‡</td>
<td>Measurements based on standard features and operation. For reference only.</td>
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<tr>
<td>B-840</td>
<td>Pneumatic</td>
<td>M-840</td>
<td>0.840&quot; (21.33 mm)</td>
<td>2.5&quot; (63.5 mm)</td>
<td>12,700 lbs @ 100 psi</td>
<td>1200 lbs (544.3 kg)‡</td>
<td>Measurements based on standard features and operation. For reference only.</td>
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<tr>
<td>Model</td>
<td>Power</td>
<td>Powerhead</td>
<td>Head Forming Capacity</td>
<td>Max Stroke</td>
<td>Max Downward Force</td>
<td>Weight</td>
<td>Saddle Range</td>
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</tr>
<tr>
<td>P-500</td>
<td>Pneumatic</td>
<td>M-500</td>
<td>0.500” (12.7 mm)</td>
<td>2.5” (63.5 mm)</td>
<td>4400 lbs @ 100 psi</td>
<td>850 lbs‡</td>
<td>36.0-48.0” (914.4-1219.2 mm)</td>
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<tr>
<td>P-506</td>
<td>Pneumatic</td>
<td>M-506</td>
<td>0.500” (12.7 mm)</td>
<td>6.0” (152.4 mm)</td>
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<td>1050 lbs‡</td>
<td>36.0-48.0” (914.4-1219.2 mm)</td>
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<tr>
<td>P-750</td>
<td>Pneumatic</td>
<td>M-750</td>
<td>0.750” (19.1 mm)</td>
<td>2.5” (63.5 mm)</td>
<td>7510 lbs @ 100 psi</td>
<td>950 lbs‡</td>
<td>36.0-48.0” (914.4-1219.2 mm)</td>
</tr>
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</table>

‡ Measurements based on standard features and operation. For reference only.
P-840

**POWER** Pneumatic

**POWERHEAD** M-840

**HEAD FORMING CAPACITY** 0.840" (21.3 mm)

**MAX STROKE** 2.5" (63.5 mm)

**MAX DOWNWARD FORCE** 12,500 lbs @ 100 psi

**WEIGHT** 1200 lbs (544.3 kg)

**SADDLE RANGE** 36.0-48.0" (914.4-1219.2 mm)

‡ Measurements based on standard features and operation. For reference only.

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**P-1000**

**POWER** Hydraulic

**POWERHEAD** M-1000

**HEAD FORMING CAPACITY** 1.0" (25.4 mm)

**MAX STROKE** 2.5" (63.5 mm)

**MAX DOWNWARD FORCE** 18,000 lbs @ 1000 psi

**WEIGHT** 1150 lbs (521.6 kg)

**SADDLE RANGE** 36.0-48.0" (914.4-1219.2 mm)

‡ Measurements based on standard features and operation. For reference only.

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**P-1006**

**POWER** Hydraulic

**POWERHEAD** M-1006

**HEAD FORMING CAPACITY** 1.0" (25.4 mm)

**MAX STROKE** 6.0" (152.4 mm)

**MAX DOWNWARD FORCE** 18,000 lbs @ 1000 psi

**WEIGHT** 1150 lbs (521.6 kg)

**SADDLE RANGE** 36.0-48.0" (914.4-1219.2 mm)

‡ Measurements based on standard features and operation. For reference only.
Through proper care and maintenance, it is possible to keep your powerheads running as smoothly as the day you bought them. With our lubed-for-life powerheads, you know the performance will stay optimal for years to come.

In orbital forming, the peen is the tool that contacts the part being formed, doing the actual forming work. It fits into the orbital head and is typically retained via set screw or magnet.

There are a wide variety of standard peens that are used with orbital heads, each with a different purpose. Some ensure a certain aesthetic appearance while others are capable of flaring or crimping. Contact our engineers to get expert advice on choosing the right peen.

Orbitform offers spare parts and tooling for all your assembly application needs. We even make setting tools for non-Orbitform machines. No matter what make or model, Orbitform can supply tooling with higher quality than the original.

Send us a print or a tool and we’ll get right back to you with a quote and delivery information. If it is an Orbitform part or tool, don’t forget to mention the part number stamped or etched on the piece. We also can work with you on a stocking program or blanket order approach to assure quick response to your order.

When it comes to forming and fastening, we understand each set of tooling is precision made for one particular application. For that reason, we always urge you to keep spares on hand to guarantee uninterrupted production.
1. **THRU-SPINDLE PRESSURE PAD FOR ROLLER HEADS:** Compress part prior to forming to ensure proper assembly and maintain consistency.

2. **OFFSET MOTOR MOUNT:** Offset the motor from the powerhead, freeing up space for more mounting options or thru-spindle pressure pad.

3. **CLUTCH BRAKE:** Stop the spindle from spinning without shutting down the powerhead motor.

4. **GEAR REDUCER:** Finely tune your powerhead speed to better control the process.

5. **PROGRAMMABLE HEIGHT SENSING PRESSURE PAD:** Works with other process monitoring to provide precision when compressing stacked parts.

6. **LVDT STROKE MONITORING:** Monitor stroke distance and increase precision and consistent head forming.

7. **ANTI-ROTATE DEVICE:** Keep the peen from rotating, without eliminating orbital motion.

8. **LOADCELL FORCE MONITORING:** Force readouts and process optimization.

9. **REMOTE STROKE ADJUST:** Allows for access to the stroke adjust knob when the standard location is difficult to reach.

10. **SERVO ADJUSTABLE HARD STOP:** Automatically set the stroke length with a servo and adjust stroke between cycles.
POWERHEAD OPTIONS

RIVETING | FORMING | CONVEYORS | SYSTEMS | HOT UPSET | ASSEMBLY ANALYSIS

ASSEMBLY SOLUTIONS GUIDE

STANDARD ORBITAL HEADS (HS)  LONG REACH ORBITAL HEADS (HL)  GOLD SERIES ORBITAL HEADS (GS)  C-FRAME ORBITAL HEADS  MULTI-POINT HEADS  MULTI-SPINDLE HEADS

RADIAL HEAD  ARTICULATING ROLLER FORMING  STATIC ROLLER FORMING  STATIC-45° ROLLER FORMING

PEEN CONFIGURATIONS FOR A VARIETY OF HEADFORMS

STANDARD ADJUSTABLE COLUMN  PEDESTAL COLUMN  FABRICATED STRAIGHT COLUMN  FABRICATED C-FRAME COLUMN  MOUNTING PLATE

BASE DRAWER OPTIONS (STANDARD, ONE, TWO)
STATIC ROLLER FORMING

Roller Forming is a non-impact process using a spinning rollerhead with two or more rollers to apply a symmetrical force to form the part. Used when forming a lip around a cylindrical part, static roller heads use spinning rollers and down-force to create an aesthetically pleasing lip on a surface. The non-impact nature combined with precision and accuracy make it possible to form delicate and brittle materials. Static roller heads provide consistency and efficiency to your forming process.

KEY FEATURES

- **Replaces Crimping** Form the end of cylindrical parts with roller forming. Increase efficiency and accuracy with a process designed to create aesthetically pleasing lips and/or grooves in parts. Eliminate stress cracks by replacing multi-point crimping with 360° of retention.

- **Can Form a Range of Diameters** Roller Forming can be used to form parts ranging in size from 1/8” to over 10”. Form parts large or small and make your prototypes a reality. The team at Orbitform can help determine the right machine for your process.

- **Fixed Rollers for Lip Forming** Form lips on the end of cylindrical parts with spinning rollers and applied down force. With the use of a seal or gasket, you can create sealed parts with our rollerforming process.

- **Precision Control** Get the most out of your forming process: Reduce ruined parts and scrap with Orbitform’s Process Intelligence.
ARTICULATING ROLLER FORMING

Used when forming a groove in a part or when there are obstructions to clear in order to form a lip, articulating roller heads come in from the side to create the formed area. 360° contact means a consistent action for the entire time the part is being formed. These roller heads can deliver forming forces up to 5,000 lbs. @ 100 psi.

KEY FEATURES

• **Forming Grooves** Form from the side with articulating rollers to create grooved parts.

• **Navigating Obstructions** Roller heads can clear the obstructions before closing in on the part to be formed.

• **Infinite Adjustment** Roller heads are available with adjustable center distances, allowing up to a 3" diameter increase along with analog readouts accurate to .001" of an inch. With the proper fixtures, you can run parts with different diameters on the same machine.

• **Process Intelligence** Reduce scrap to increase your throughput and production efficiency.
PROCESS INTELLIGENCE

Orbitform offers optional process monitoring and process control solutions on all of our systems. Our customers can select the process monitoring and or process control package that best fits their application. Monitor force output, stack up height, dwell time, rivet height, forming height, and detect rivet presence to assure every form is done correctly and within your spec. With process control, let Orbitform’s knowledge of industry leading technology work for you. Form to force, form to distance, form to an offset are all potential process control options.

KEY FEATURES

- **Process Intelligence** Force Output, Rivet Presence Detection, Dwell Time, Rivet Height, Forming Height, Stack Up Height
- **Process Control** Form to Force, Form to Distance, Form to Height, Form to Collapsed Position, Vary Ramp Rate
- **Process Monitoring** Force Monitoring, Form Height, Form Collapse, Part Presence

"INITIAL HEIGHT FINAL FORM STACK UP HEIGHT"

"LVDT LOAD CELL"

"MACHINE AT HOME"

"SHAFT SENSOR THREAD SENSOR"

"NO FAULTS AUTO ENABLED MODE RESET ENABLE MANUAL SELECT SCREEN"

"MACHINE FAULT AUTO ENABLED MODE RESET ENABLE MANUAL SELECT SCREEN"

"PEAK FORCE HIGH LIMIT Collapsible LOW LIMIT Thread Sensing"

"LAST FORM DATA PEAK FORCE COLLAPSE THREAD SENSE"

"CURRENT MEASUREMENTS PEAK FORCE COLLAPSE THREAD SENSE"
**HEIGHT SENSING**

- Consistent Form Height
- Adjusts to variations in part stack-up
- Switch controls retract, no dwell time
- Accuracy depends on flow control and sustained line pressure*

**HARD STOP**

- Hard stop maintains repeatability
- Switch controlled dwell time
- Part must withstand the Powerhead Force

**PROGRAMMABLE HEIGHT SENSING**

- Measure part stack up
- Measure rivet stick up
- Form to height
- Accuracy depends on flow control and sustained line pressure*

**STANDARD**

- Compress parts during forming
- Engineered nose piece available

* For greater accuracy a Programmable Servo Z is recommended to eliminate variations in air supply inherent with height sensing pressure pads.
SERVO DRIVEN POWERHEAD

Orbitform’s Servo Driven Powerhead offers precision control, variable advance and retract rates, and a variety of forming forces—from delicate to robust.

KEY FEATURES

• Reduces cycle time, can advance and retract up to 4 inches per second
• Process validation
• Form to a force and a distance
• Save multiple programmed heights
• Alternative to pneumatic or hydraulic
• High precision forming
• Precision programmed dwell in both position and time to reduce spring-back after forming
• Perfect for precision articulating joints

OPTIONS INCLUDE

• Pressure Pads (part clamping and height sensing)
• Columns with height adjustment
• Multiple tooling configurations
• Turn-key systems available

---

SERVO DRIVEN POWERHEAD

Forming Force

From 1 to over 12,000 lbs.*

Forming Capacity (Mild Steel Solid Rivet)

From < .030" to > .84"

Stroke

2.5"

Advance/Retract Rates

From .005" to 4" per second

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IMPACT RIVETING

Impact Riveting is an assembly process using force to fasten two things together permanently. There are a wide variety of rivet and material possibilities such as solid or semi-tubular rivets. Cycle time is fast and operation is simple, giving you an assembly advantage.

KEY FEATURES

• **Automatic Rivet Feeding** Save time and money with impact riveting and automatic rivet feeding. Minimize cycle times to increase throughput and lower operating expenses.

• **Single and Multi-Point Riveting** Keep your throughput up with multi-point riveting. With the ability to form multiple rivets at the same time at a fixed distance, parts can be formed much faster. All fixturing and machining is custom designed to fit your specific impact riveting needs.

• **Safety Options Available** With safety features and control options available, machine operators have a safer working environment. Dual palm buttons, Lexan guarding, light curtains, and/or obstruction detection rings ensure safety throughout the forming cycle. Orbitform has developed 2 safety ring options to meet your application needs.

• **Rivet Variety Meets Versatility** Orbitform’s wide range of riveters can form semi-tubular, solid, and self-piercing rivets, giving you the widest range of forming capabilities possible. With machines ranging from electro-mechanical, pneumatic, and hydro-pneumatic, Orbitform riveters have the power and range to meet your needs.
**IMPACT MACHINE FEATURES**

**ROTARY HOPPER - STANDARD**
Quickly feed rivets for shorter cycle times and faster production.

**QUICK-CHANGE RACEWAY (QCR)**
Shortened set-up time when running rivets of different diameters and lengths.

**DRIVER (RIVET SET)**
Interchangeable tooling that is matched to the diameter of the rivets being used. Easily switch out to run different sized rivets on the same machines.

**JAWS**
Jaws and jaw springs are sold separately to reduce operating and replacement part costs. Orbitform Jaws are CNC Machined in house for precision and consistency.

**ROLLSET (ANVIL)**
Standard rollset is a spring loaded plunger pin. Optional upgrade is the pneumatically actuated rollset.

**VIBRATORY BOWL - OPTIONAL**
When very short or very long rivets have difficulty feeding through a standard rotary hopper, a vibratory bowl may be the solution. Able to hold more rivets for extended run times.

**FLYWHEEL**
Spinning parts are guarded by covers to provide maximum operator safety.

**ANVIL BRACKET (ROLLSET HOLDER)**
Multiple configurations are available per machine to add flexibility in running different parts with the same rivet. Each anvil bracket is custom built per application needs.

**PEDESTAL & BASE**
Cast columns are used for strength and stability. Standard pedestals are in stock and ready to be developed into full machines.

**ORBITFORM PARTS & TOOLING**
Perishable tooling on Orbitform Impact Riveters include the Jaws, Drivers, and Rollsets. These should be replaced periodically. Call us to determine the proper size and type of tooling for your machine.
Semi-tubular impact riveting

Milford machines utilize semi-tubular impact riveting. Semi-tubular riveting requires less force and allows longer rivets to be used without buckling the rivet shank. A semi-tubular rivet is a rivet with a hollow end whose hole depth is slightly deeper than material stack-up. (A tubular rivet is any rivet whose hole depth is greater than that.)

The parts being assembled are slightly compressed under this load. Most of the joint strength is compressive between the rivet head and rivet clinch (formed end). Rivet shank expansion is minimal. Rivet insertion force is typically less than 40% of that required for a solid rivet of the same shank diameter & material.

Solid impact riveting

In solid impact riveting, a compressive load is applied to the end of the rivet shank, causing the shank to swell within the desired part stack-up as it shortens under the load. Solid rivets are used for permanent assembly of heavy duty joints such as bed frames, shelving, and automotive components. Milford impact riveters can set solid mild steel rivets up to 1/8" in diameter, and larger diameters for softer metals such as aluminum and brass, forming ability varies based on rivet specifications.

For setting electrical contacts, the Milford 56-CS contact setter is specifically designed for smaller contacts often made from copper coated in silver or gold. The 56-CS features a vibratory hopper bowl designed to protect expensive electrical coatings from being chipped or scratched. In addition, the Milford 56-CS has a rivet underfeed system to protect the contact surface from damage, assuring good electrical contact.

For solid rivets requiring more force, Orbitform offers the R-Series and RHV-Series of Heavy Duty Impact Riveters and the Hydra Pneumatic powered press. These riveters are capable of setting solid mild steel rivets up to .437” in diameter.

Fixed center–double riveters

Orbitform’s fixed center riveters are compact special purpose machines designed to set two rivets simultaneously on very close centers. The minimum distance is dependent only on the size of the rivet heads. Maximum rivet spacing with these machines is up to four inches. Joined parts that need two rivets to secure them, can benefit from very low costs as compared to two machines.
### Model 56/57/58

<table>
<thead>
<tr>
<th>POWER</th>
<th>PNEUMATIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>MODEL</td>
<td>56  57  58</td>
</tr>
<tr>
<td>MAX RIVET DIAMETER</td>
<td>0.125&quot; (3.2 mm) 0.187&quot; (4.8 mm) 0.25&quot; (6.4 mm)</td>
</tr>
<tr>
<td>MAX RIVET LENGTH</td>
<td>0.562&quot; (14.3 mm) 0.75&quot; (19 mm) 0.75&quot; (19 mm)</td>
</tr>
<tr>
<td>THROAT DEPTH</td>
<td>9.0&quot; (228.6 mm) 12.0&quot; (304.8 mm) 12.0&quot; (305 mm)</td>
</tr>
<tr>
<td>STROKE</td>
<td>2.0&quot; (50.5 mm) 3.0&quot; (76.2 mm) 3.0&quot; (76.2 mm)</td>
</tr>
<tr>
<td>WEIGHT</td>
<td>90 lbs (41 kg) 230 lbs (104.3 kg) 230 lbs (104.3 kg)</td>
</tr>
</tbody>
</table>

*A Option: Up to 3" inch rivet lengths are available.*

‡ Measurements based on standard features and operation. For reference only.

---

### Model 63/64

<table>
<thead>
<tr>
<th>POWER</th>
<th>ELECTRO-MECHANICAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>MODEL</td>
<td>63  64</td>
</tr>
<tr>
<td>MAX RIVET DIAMETER</td>
<td>0.093&quot; (2.4 mm) 0.156&quot; (4 mm)</td>
</tr>
<tr>
<td>MAX RIVET LENGTH</td>
<td>0.562&quot; (14.3 mm) 0.75&quot; (19 mm)</td>
</tr>
<tr>
<td>THROAT DEPTH</td>
<td>6.25&quot; (159 mm) 6.25&quot; (158.8 mm)</td>
</tr>
<tr>
<td>STROKE</td>
<td>2.0&quot; (50.8 mm) 2.0&quot; (50.8 mm)</td>
</tr>
<tr>
<td>WEIGHT</td>
<td>235 lbs (106.6 kg) 235 lbs (106.6 kg)</td>
</tr>
</tbody>
</table>

‡ Measurements based on standard features and operation. For reference only.

---

### Model 255/256

<table>
<thead>
<tr>
<th>POWER</th>
<th>ELECTRO-MECHANICAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>MODEL</td>
<td>255  256</td>
</tr>
<tr>
<td>MAX RIVET DIAMETER</td>
<td>0.125&quot; (3.2 mm) 0.156&quot; (4 mm)</td>
</tr>
<tr>
<td>MAX RIVET LENGTH</td>
<td>0.562&quot; (14.23 mm) 0.75&quot; (19 mm)</td>
</tr>
<tr>
<td>THROAT DEPTH</td>
<td>12.0&quot; (305 mm) 12.0&quot; (305 mm)</td>
</tr>
<tr>
<td>STROKE</td>
<td>2.5&quot; (63.5 mm) 2.5&quot; (63.5 mm)</td>
</tr>
<tr>
<td>WEIGHT</td>
<td>535 lbs (242.7 kg) 550 lbs (249.5 kg)</td>
</tr>
</tbody>
</table>

‡ Measurements based on standard features and operation. For reference only.
## Model 305/310/313

**Power** | Electro-Mechanical
---|---
**Model** | 305 310 313
**Max Rivet Diameter** | .187" (.4.7 mm) .187" (.4.7 mm) .187" (.4.7 mm)
**Max Rivet Length** | .75" (19 mm) 1.0" (25.4 mm) 1.375" (35 mm)
**Throat Depth** | 12.0" (305 mm) 12.0" (305 mm) 12.0" (305 mm)
**Stroke** | 3.5" (89 mm) 3.5" (89 mm) 3.5" (89 mm)
**Weight** | 690 lbs (313 kg) 715 lbs (324.3 kg) 755 lbs (342.5 kg)

Also Available with a Long 24" Throat Depth ‡ Measurements based on standard features and operation. For reference only.

## Model 405/410/413

**Power** | Electro-Mechanical
---|---
**Model** | 405 410 413
**Max Rivet Diameter** | .25" (6.4 mm) .25" (6.34 mm) .25" (6.34 mm)
**Max Rivet Length** | .75" (19 mm) 1.0" (25.4 mm) 1.375" (35 mm)
**Throat Depth** | 12.0" (305 mm) 12.0" (305 mm) 12.0" (305 mm)
**Stroke** | 3.5" (89 mm) 3.5" (89 mm) 3.5" (89 mm)
**Weight** | 755 lbs (342.5 kg) 870 lbs (395 kg) 900 lbs (408.2 kg)

Also Available with a Long 24" Throat Depth ‡ Measurements based on standard features and operation. For reference only.

## Model 423

**Power** | Electro-Mechanical
---|---
**Model** | 423
**Max Rivet Diameter** | .25" (6.354 m)
**Max Rivet Length** | 3.0" (76.2 mm)
**Throat Depth** | 12.0" (305 mm)
**Stroke** | 5.5" (140 mm)
**Weight** | 7900 lbs (4082 kg)

Also Available with a Long 24" Throat Depth ‡ Measurements based on standard features and operation. For reference only.
## R–Series

<table>
<thead>
<tr>
<th>Power</th>
<th>Electro-Mechanical</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max Rivet Diameter</td>
<td>0.25&quot; (6.34 mm)</td>
</tr>
<tr>
<td>Max Rivet Length</td>
<td>2.0&quot; (51 mm)</td>
</tr>
<tr>
<td>Throat Depth</td>
<td>8.0&quot; (203.2 mm)   (Custom Option)</td>
</tr>
<tr>
<td>Max Stroke</td>
<td>5.0&quot; (127 mm)</td>
</tr>
</tbody>
</table>

## RHV–Series

<table>
<thead>
<tr>
<th>Power</th>
<th>Electro-Mechanical</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max Rivet Diameter</td>
<td>0.375&quot; (9.5 mm)</td>
</tr>
<tr>
<td>Max Rivet Length</td>
<td>2.0&quot; (51 mm)</td>
</tr>
<tr>
<td>Throat Depth</td>
<td>8.0&quot;–12.0&quot; (203.2 mm–305 mm)</td>
</tr>
<tr>
<td>Max Stroke</td>
<td>5.0&quot; (127 mm)</td>
</tr>
</tbody>
</table>

## HP–Series

<table>
<thead>
<tr>
<th>Power</th>
<th>Hydra/Pneumatic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max Rivet Diameter</td>
<td>0.437&quot; (11.1 mm)</td>
</tr>
<tr>
<td>Max Rivet Length</td>
<td>1.5&quot; (38.1 mm)</td>
</tr>
<tr>
<td>Throat Depth</td>
<td>18&quot; (457.2 mm)</td>
</tr>
<tr>
<td>Max Stroke</td>
<td>4.0&quot; (101.6 mm)</td>
</tr>
</tbody>
</table>
Flush Self-Piercing Riveting is an ideal solution for replacing riveting, welding and clinching. There is no need to pre-punch parts for assembly, which can lower cycle times as a result of not needing to realign holes. The fasteners can be pre-painted to match the material and eliminate costly touch ups and refinishing. Unlike welding there is no plating bleed out or chemical changed in the metals due to heat.

**KEY FEATURES**

- **Self-Piercing** No pre-punching or drilling and aligning of holes during assembly
- **Joins Dissimilar Metals** without changing molecular structure of both metals
- **Pre-Painted** Rivets can be pre-painted to avoid touch ups and refinishing
- **Multiple Layers** can be joined up to a thickness of 0.360“
- **Steel/Aluminum Rivets** available to support functional requirements of the joint
- **Watertight Seal** In most cases material coined into the rivet creates a water tight seal around the rivet
HOT UPSET

The Hot Upset riveting and forming process uses heat and pressure to form the fastener. The material being formed becomes malleable and collapses under pressure applied by the powerhead. Using this process, it is possible to form a round fastener into a square hole, creating very high torque joints. This makes the process excellent for forming parts that will incur high vibrational fatigue.

KEY FEATURES

• **Hardened Rivets** Form harder rivets than cold forming processes due to the nature of the hot upset process.

• **High Torque Joints** Due to the increased hole fill with hot upset, it is possible to create joints that will not fail even under very high torque situations. The rivet expands to fill the hole and prevents rotation even under high stress.

• **High Push/Pull Force Joints** Create highly durable and long lasting joints with the hot upset process.

• **Increased Hole Fill** Through heat and pressure rivets fill the hole they are entering, giving you some of the most solid fasteners possible. Make your process last with maximum durability in your fasteners.

• **Resistant to Vibrational Fatigue** Harder rivets, increased hole fill, and torque resistance make these rivets extremely resistant to vibrational fatigue. Outlast the competition with Orbitform’s hot upset forming.
ASSEMBLY AUTOMATION

When you need to optimize your production process, Orbitform is the industry leader. With a wide range of fastening capabilities along with third-party integration, Orbitform assembly automation systems are turn-key production solutions. Orbitform systems can integrate with automatic feeder systems, part washers, greasing systems, machine centers, and many other applications. Our unbiased approach assures you will get the right assembly-system-solution to fit your needs.

KEY FEATURES

• **Designed and Built In-House** All of our systems and machines are designed and built in-house. That means every piece of Orbitform equipment was manufactured right here in the USA, and you get the unbiased expert approach from Orbitform.

• **Single & Multi-Station Workcells** Automate between different machines and processes with Orbitform. Let our knowledge take you a step ahead of the competition. Reduce set-up times and increase throughput with multi-station workcells.

• **Process Intelligence** Monitor force output, monitor stack up height, dwell time, rivet height, forming height, and detect rivet presence to assure every part formed is done correctly and within your specifications.

• **Greater Production** Multiple operations and processes reduce set-up times and increase production speeds.

ORBITFORM OFFERS

• Modular Designs

• Flexible Systems

• Process intelligence

• Custom integrations

• Standard Components

IN-HOUSE

• Assembly Analysis

• Engineering

• Project Management

• Machine Build

• Tooling Design

• Machine Run-Off

• Technical Support

• Machining & Fabricating
PALLETIZED CONVEYORS

Orbitform specializes in conveyor system design. Our palletized conveyor line uses pallets with fixtures to carry each part between stations, even allowing assembly operations to be performed on the conveyor. Orbitform is experienced in complex controls, trafficking technology, and RFID integration.

KEY FEATURES

• **High Volume Production** Keep production levels up with the high capacity of palletized conveyors. Integrate with third-party equipment to ensure high capacities.

• **Part Buffering** Reliable part buffering technology ensures that parts will be ready for assembly on the conveyor line.

• **No Part to Part Contact** Parts ride on individual pallets to eliminate contact with surrounding parts on the line.

• **Form Parts Directly on the Line** With accurate pallet stopping technology, lines can feed parts into assembly stations located directly on the conveyor line.
TABLE TOP CONVEYOR

Using table top conveyors—steel, plastic, low back pressure (LBP)—parts ride directly on a densely populated array of rollers. The parts flow freely with very low friction and exert minimal force on adjacent parts. Orbitform has installed table top conveyors in some of the world’s largest facilities, and we have the skill to adapt to any circumstance.

Mechanical and controls engineers analyze each aspect of motion to provide speed and efficiency. Orbitform’s customized systems are robust and reliable. When you partner with Orbitform, you get a complete integration solution.

KEY FEATURES

- **High Volume Production** Keep production levels up with the high capacity of LBP Conveyors. Integrate with third-party equipment to ensure high capacities.
- **Part Buffering** Reliable part buffering technology ensures that parts will be ready for assembly on the conveyor line.
- **Minimal Contact Force** Parts exert very little force on each other as they move down the line. The force of movement comes from the belt itself.
- **Flat Belt Configurations** Flat belt configurations are available. Contact us for more information.