

Tube Bending Operation

Figure 6.0 — Figure 6.0 shows the back view of the Tube Bender Assembly.

Figure 7.0 — Figure 7.0 shows the Front View of the Tube Bender Assembly.

Figure 8.0 — Tube Bending Operation

- Note:** One end of the jack handle will be used to lock the valve on the base of the jack. The other end is used as a jack handle.
- a) Place the steel tube between the Follower Die and the Bending Die. Slide the tube through the U-shape tube guide at one end of the Bending Die. If the U-shape guide is too tight, loosen the nut to slide the tube into the tube guide.
 - b) Place the Jack Handle into the side holder of the jack. Apply pressure to compensate any slack from the assembly.
 - c) Start bending the tube by applying bending pressure to the jack. The Bending Die will rotate and begin to bend the tube. Use the angle mark on the forming die to determine the bend angle.
 - d) After the tube is bent, use the flattened end of the Jack Handle to release the pressure of the jack. The Forming Die will return to its original position and the bent tube can be removed from the Forming Die.

| GENERAL III TUBING BENDER BILL OF MATERIALS-910-84112 | | | |
|--|---------------|---|------|
| ITEM NO. | PART NO. | DESCRIPTION | QTY. |
| 1 | 910-84108 | 8-TON BOTTLE JACK | 1 |
| 2 | 910-84112-2-1 | 1/2"-13X3¼" LG. GR. 8 HEX CAP SCREW | 1 |
| 3 | 910-84112-2-2 | 1/2"-13 GR C HEX LOCKNUT | 1 |
| 4 | 910-84112-2-3 | 1/4"-20 X 1/2" LG. GR. 5 HEX CAP SCREW | 2 |
| 5 | 910-84112-2-4 | #10-32 X 1/2" STAINLESS BUTTON HEAD ALLEN SCREW | 2 |
| 6 | 910-84112-2-5 | 1/2" RUE CLIP - (REF P/N: 940-1002) | 2 |
| 7 | 910-84112-2-6 | 1" RUE CLIP - (REF P/N: 910-84102-10) | 4 |
| 8 | 910-84112-3 | 3RD. GEN. TUBE BENDER FRAME ASSEMBLY | 1 |
| 9 | 910-84112-3-2 | JACK SADDLE ASSEMBLY | 1 |
| 10 | 910-84112-3-3 | JACK RAM RETAINER CUP | 1 |
| 11 | 910-84112-3-4 | DIA. 1.00" DIE PIVOT SHAFT | 2 |
| 12 | 910-84112-3-5 | DIA. 0.50" JACK PIVOT SHAFT | 1 |
| 13 | 910-84112-3-6 | 1½" O.D. X 10" LG. FORMING DIE RETURN SPRING | 1 |
| 14 | 910-84112-3-7 | DIA. 1/8" SPRING SAFETY CABLE | 1 |
| 15 | 910-84112-3-8 | JACK PUMP HANDLE | 1 |
| 16 | 910-84114 | BENDING DIE ASSEMBLY | 1 |
| 17 | 910-84115 | FOLLOWER DIE | 1 |

Tube Bending Tip from "Speedy" Bill Smith

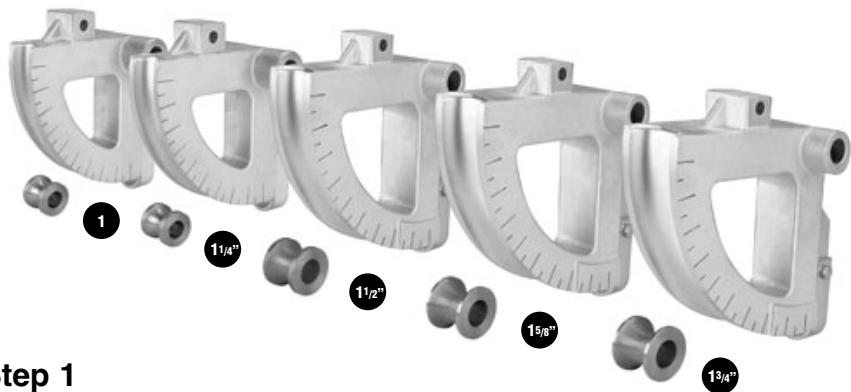
In order to bend a smooth, galding free tube, “Speedy” Bill has the following recommendations:

- 1) Pour a small amount of clean, No.10 weight oil into a shallow pan.
- 2) Put in several 3” to 5” wide strips of newspaper, (rag style, not color printed advertising paper) in the pan and allow the oil to soak the newspaper.
- 3) Remove the newspaper from the pan. Squeeze off excess oil. The newspaper should not be over saturated with oil.
- 4) Place the oiled newspaper between the Bending die and the tube. Start bending the tube with the newspaper in place. The lubrication will help to prevent any galding or wrinkling of the tube.
- 5) Before bending the actual tube, it is best to try this method on a shorter, scrap tube to perfect the bending motion. One may decide to use multiple layers of oiled newspaper to provide a better cushion between the die the tube.
- 6) Mounting holes are provided on the base of the bender to allow the customer to bolt the bender to a heavy duty workbench. If only a few bends are needed, CLAMP the bender to a heavy duty work bench.

Tube Bender Assembly
910-84112 (Rev. #2)

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INSTRUCTIONS



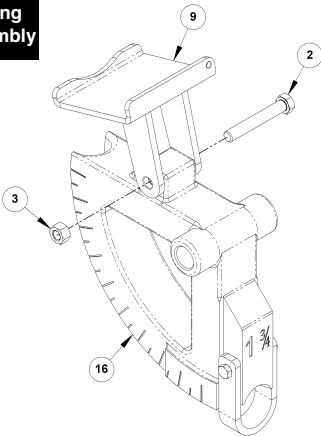
Step 1
Jack Saddle/Bending Die Assembly

- a) Locate the Bending Die Assembly (Item # 16), the Jack Saddle Assembly (Item #9), the 1/2"-13 Hex Bolt (Item #2), and the 1/2"-13 Nyloc Nut (Item #3).
- b) Position the Jack Saddle to the Bending Die Assembly as shown in Figure 1.0. Note that the large radius cutout in the Jack Saddle Assembly should be facing the back side of the Bending Die Assembly. Align the mounting holes and fasten the two pieces with the Hex Bolt and Nyloc Hex Nut. Do not over-tighten the assembly, as it may prevent the Bending Die Assembly from rotating freely.



ASSEMBLY INSTRUCTION
The Tube Bender Assembly is the latest design by Speedway Motors. It consists of a Tube Bender Frame; an 8 Ton Hydraulic Jack and a Bending Die.

Figure 1.0
Jack Saddle
& Bending
Die Assembly



IMPORTANT

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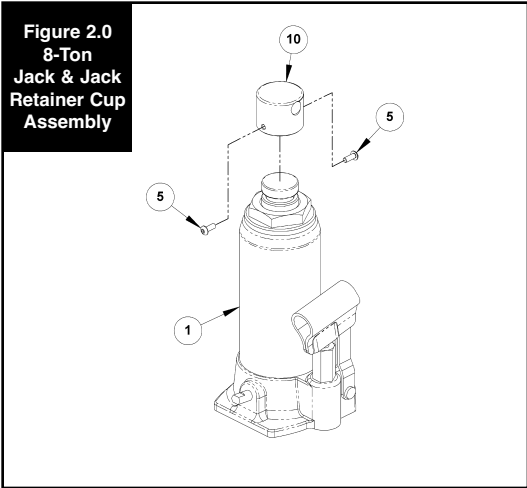
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Before assembly, please read the assembly instructions carefully. Refer to the parts list to ensure all components are included.

NOTE: The Tube Bender can be mounted on the work bench or a stand. 4 Mounting holes are provided at the base of the Tube Bender for mounting the Tube Bender.

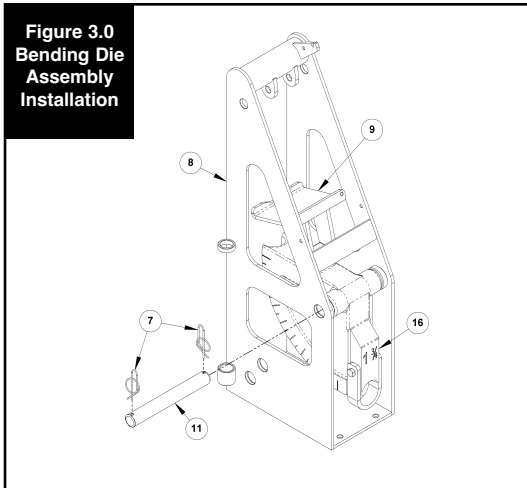
Step 2
8-Ton Jack & Jack Ram Retainer Cup Assembly

- a) Locate the 8-Ton Bottle Jack (Item #1), the Jack Ram Retainer Cup (Item #10), and the two (2) #10-32 Button Head Allen Screws (Item #5).
- b) On the 8-Ton Bottle Jack, extend the Jack Ram up by screwing the Jack Ram out. The Jack Ram should be approx. 11/16” to 3/4” above the flat surface on top of the large hex of the Bottle Jack.
- c) Place the Jack Ram Retainer Cup on top of the Jack Ram and align the hole in the Retainer Cup as **shown in Figure 2.0**. The bottom surface of the Retainer Cup should just touch the flat surface on top of the large hex of the Bottle Jack. If it does not touch, remove the Retainer Cup and screw in the Jack Ram until the Retainer Cup touches. This insures the Bottle Jack will achieve maximum stroke.
- d) Using the two (2) #10-32 Button Head Allen Screws, secure the Retainer Cup to the Jack Ram. The screws may not completely bottom out on the Retainer Cup, this is normal, as long as they are secured tightly.



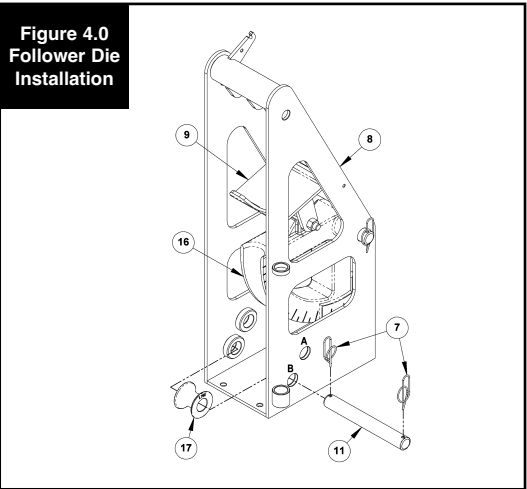
Step 3
Bending Die Assembly Installation

- a) Locate the Tube Bender Frame Assembly (Item #8), one of the 1” Die Pivot Shafts (Item #11), and two (2) of the 1” Rue Clips (Item #7).
- b) Carefully locate the Bending Die Assembly/Jack Saddle Assembly from **Step #1** into the Tube Bender Frame Assembly as **shown in Figure 3.0**.
- c) Apply a small amount of lightweight oil to the 1” Die Pivot Shaft.
- d) Align the pivot mounting hole of the Bending Die Assembly with the mounting holes in the Tube Bender Frame. Insert the Die Pivot Shaft into the mounting holes to fasten the Bending Die Assembly to the Tube Bender Frame.
- e) Insert the Rue Clips into both ends of the Die Pivot Shaft.



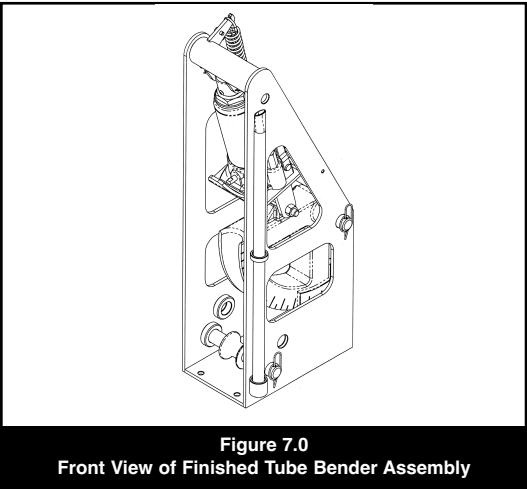
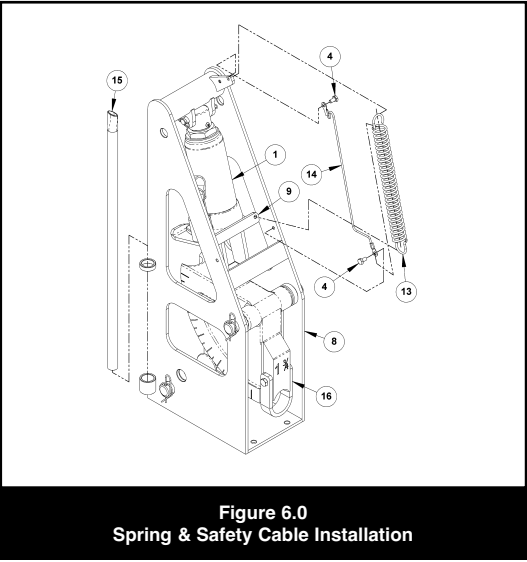
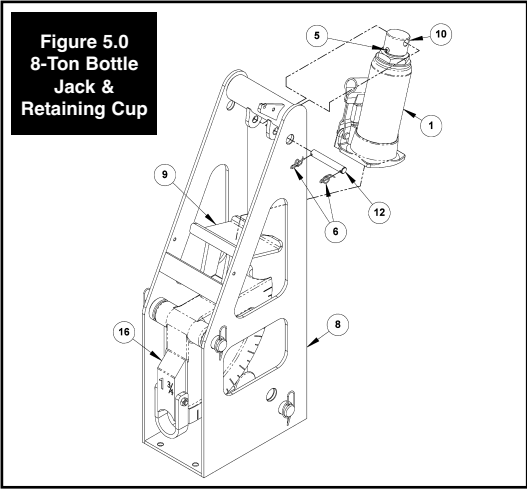
Step 4
Follower Die Installation

- a) Locate the Follower Die (Item #17), the remaining 1” Die Pivot Shaft (Item #11), and the remaining two (2) 1” Rue Clips (Item #7).
- b) Apply a small amount of lightweight oil to the Die Pivot Shaft.
- c) Insert the Follower Die inside of the Tube Bender Frame. Insert the 1” Die Pivot Shaft through the appropriate (*) mounting hole in the Tube Bender Frame, through the Follower Die, and through the corresponding hole in the other side of the Tube Bender Frame as **shown in Figure 4.0**.
NOTE: (*) Use the hole marked “A” for the 1.00” and the 1.25” Follower Dies. Use the hole marked “B” for the 1.50”, 1.625” and the 1.75” Follower Dies.
- d) Insert the Rue Clips into both ends of the Die Pivot Shaft.



Step 5
8-Ton Bottle Jack & Retaining Cup Installation

- a) Locate the 1/2” Jack Pivot Shaft (Item #12), and the two (2) 1/2” Rue Clips (Item #6).
- b) Position the Bottle Jack & Retaining Cup Assembly from **Step #2** into the Tube Bender Frame as **shown in Figure 5.0** with the Retaining Cup between the two mounting ears on the top side of the Tube Bender Frame. Note orientation of the Bottle Jack with respect to the Tube Bender.
- c) Apply a small amount of lightweight oil to the 1/2” Jack Pivot Shaft.
- d) Insert the Jack Pivot Shaft through one of the outside holes in the Tube Bender Frame. Then through the first mounting ear and finally through the Jack Ram Retaining Cup and last mounting ear.
- e) Insert the 1/2” Rue Clips into both ends of the Jack Pivot Shaft.
- f) Position the Bottle Jack onto the Jack Saddle Assembly as **shown in Figure 5.0**.
- g) Speedway Motors recommends match drilling a hole through the Bottle Jack base into the Jack Saddle assembly. This will allow for the installation of a 1/4” bolt and nut (not included) to secure the Bottle Jack to the Jack Saddle(*).
NOTE: Customer may use a small C-Clamp or Vice Grip to clamp the Bottle Jack to the Jack Saddle Assembly. This is only required if it is not possible to install the 1/4" bolt and nut after match drilling the Bottle Jack and Jack Saddle Assembly as indicated in **5-g**.



Step 6
Spring & Safety Cable Installation

- a) Locate the Forming Die Return Spring (Item #13), the Spring Safety Cable (Item #14), two (2) 1/4”-20 Hex Bolts, (Item #7) and the Jack Pump Handle (Item #15).
- b) Feed the Spring Safety Cable through the Forming Die Return Spring.
- c) Attach one end of the Forming Die Return Spring through the spring mounting hole in the Jack Saddle Assembly as **shown in Figure 6.0**.
- d) Pull the opposite end of the spring up and slide it over the Spring Hook on the Tube Bender Frame as **shown in Figure 6.0**. (Be certain the Forming Die Return Spring is hooked into the groove on the Spring Hook.)
- e) Fasten the upper end of the Spring Safety Cable to the threaded hole on the Spring Hook using one (1) of the 1/4”-20 Hex Bolts. Fasten the lower end of the Spring Safety Cable to the threaded hole in the Tube Bender Frame with the remaining 1/4”-20 Hex Bolt as **shown in Figure 6.0**.
- f) Place the Jack Pump Handle into the Handle Retaining Rings on the side of the Tube Bender Frame as shown.

