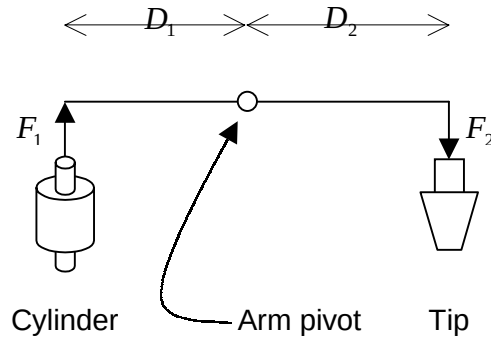


How to Compute Tip Force of a Rocker Arm Spot Welder

Example Data

PSI of the compressed air in the cylinder: 30 lb/in²
 Diameter of the cylinder: 4 inches
 D₁ (Pivot point to the cylinder) 10 inches
 D₂ (distance from the tip to the pivot point also known as the Throat Depth) 20 inches



Step 1 – Compute the force exerted by the cylinder.

Need to Know:

Formulas:	$Area = \pi \left(\frac{D}{2} \right)^2$	$F_1 = (PSI) \times (Area)$
	$Area = 3.14 \left(\frac{4}{2} \right)^2$	$F_1 = (30 \text{ lb/in}^2) \times (12.56 \text{ in}^2)$
	$= 12.56 \text{ in}^2$	$= 376.8 \text{ lbs}_f$

Step 2 – Compute the sum of the moments around the pivot point to calculate the force at the tip (F_2).

Formula:	$F_1 D_1 = F_2 D_2$
Solve for F_2 :	$F_2 = \frac{F_1 D_1}{D_2}$
Plug in Numbers:	$F_2 = \frac{(376.8 \text{ lb}_f)(10 \text{ in})}{20 \text{ in}} = 188.4 \text{ lbs}$

The answer 188.4 lbs. assumes the force applied at the tip to be a point force (not spread over a wide tip).



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