



Manual Post Drivers for 8- to 10-Foot-Long Metal Posts

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The Missoula Technology and Development Center (MTDC) is testing various fence enclosures to keep deer, elk, and moose out of overgrazed aspen and willow tree groves. These enclosures involve constructing 7- to 8-foot tall fences using 10-foot-long metal T-posts (figure 1). Typical manual post drivers



Figure 1—This moose enclosure near the Middle Fork of Rock Creek in Montana uses 10-foot-long metal T-posts driven 2½ feet deep to support polypropylene mesh fencing.

found at the local hardware or farm supply store require the operator to stand on a raised platform, a ladder, or in the back of a truck to drive 10-foot-long posts (figure 2). Doing so usually takes too long, is impractical in remote areas, and is unsafe in steep terrain.



Figure 2—Standard fence post drivers require the operator to stand on a ladder or raised platform to drive a 10-foot-long metal T-post.

Available Equipment

Mechanized drivers that mount on tractors or other mobile equipment are limited to relatively accessible terrain and are only cost effective on larger jobs. These drivers are typically powered by hydraulics or compressed air (figure 3).





Figure 3—A hydraulic fence post driver.

MTDC designed and fabricated its own version of a manual post driver for installing several experimental fence enclosures. MTDC also purchased several commercially available post drivers to test their ability to drive 10-foot-long metal T-posts safely and easily (figure 4). Other models of manual drivers are available,

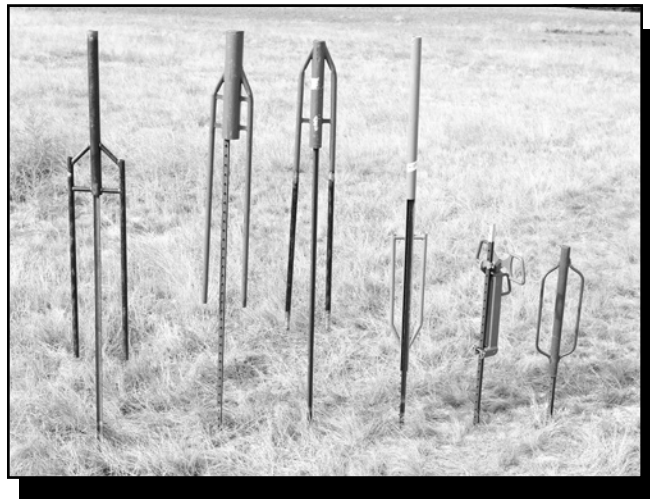


Figure 4—The manual post drivers tested (left to right): MTDC PD-2, Standard-Signs NO8, Standard-Signs NO4, MTDC PD-1, PostMate, and a typical driver used for shorter fence posts.

but were not tested by MTDC. Some commercially available, portable, air-operated drivers are not much larger than MTDC’s manual driver, but they require a compressor and are relatively expensive (figure 5). The air-operated drivers were not tested by MTDC but are listed in the manufacturer/vendor section.



Figure 5—An air-powered, portable fence post driver.

Products Tested

Standard-Signs, Model NO4—When this driver arrived, it did not have extended handles for driving longer posts as anticipated. MTDC modified the NO4 design by extending the handles 38 inches for a total length of 70 inches, increasing the weight to 33 pounds. The barrel’s inside diameter is 2½ inches, with a maximum stroke of 22 inches. The handles extend down from the barrel and have an outside diameter of about 1⅞ inches.

Standard-Signs, Model NO8—This heavy-duty model is designed to drive large-diameter posts. This driver is the heaviest tested, weighing 35 pounds. Its overall length is 64 inches. The inside diameter of the barrel is $3\frac{3}{4}$ inches. It allows a 21-inch maximum stroke. The $1\frac{3}{8}$ -inch-diameter handles extend down from the lower section of the barrel.

MTDC PD-1 (Slotted Design)—This model was redesigned a couple of times during its development. The final product weighs 28 pounds and is 78 inches long. The inside diameter of the barrel is 2 inches. The upper portion of the barrel is 38 inches long. The lower slotted section is 40 inches long. Its maximum stroke length is 36 inches. The 1-inch diameter handles are welded to the lower, slotted portion of the driver. Design drawing MTDC-1027, *Slotted Post Driver PD-1*, is available from MTDC.

MTDC PD-2 (Simple Design)—This design was put together after the other four drivers had been tested. It combines the light weight and long stroke of the MTDC slotted design, but uses the handle design of the Standard-Signs models. This design eliminates the tedious shop time required to cut a slot. The driver is 78 inches long overall and weighs 30 pounds. The 38-inch-long barrel, which is 2 inches in diameter, allows a 36-inch stroke. The $1\frac{3}{8}$ -inch-diameter handles extend down from the lower section of the barrel. Design drawing MTDC-1026, *Post Driver PD-2*, is available from MTDC.

Post Mate—This model has a two-piece assembly, which is different than the other drivers tested. The lower section of the driver engages the metal studs on a T-post then locks in place with a pin. The upper section with the attached handles strikes the lower section, driving the post into the ground. This driver can be used to pull a post out of the ground by quickly sliding the weighted handles upward. The unit weighs 34 pounds and is 30 inches long, the shortest of the drivers tested. The maximum stroke length is 14 inches. The D-shaped handles are fabricated from $\frac{7}{8}$ -inch-diameter bar stock.

Using the Drivers

Using any one of the four one-piece drivers is similar to using the others. The models tested would work best on steel U-shaped, T-shaped, round, or square posts

that are 8 to 10 feet long; they are not really suitable for 12-foot posts. After the post has been slid into the driver, the post and driver are raised to a vertical position for driving. The post is driven into the ground by lifting the driver upward with the handles and pulling swiftly down, striking the top of the post with the plug welded into the end of the barrel (figure 6). Once the



Figure 6—Driving a 10-foot T-post into the ground with the Standard-Signs NO4 driver.

post has been driven to the proper height, the driver barrel is lifted so the driver can be slipped off the top of the post (figure 7). This design uses the same operating principle as a standard T-post driver.

The two-piece Post Mate driver is designed to clamp to studded 1.33- and 1.50-pound-per-foot steel T-posts. This driver could be used on virtually any length of post. The driving height is adjustable because the driver clamps anywhere along the side of the post (figure 8). Once the driver is clamped to the post, the upper section of the driver is lifted to the top of its stroke and pulled down swiftly, striking the lower



Figure 7—The driver is being lifted off the top of a post after the Standard-Signs NO4 post has been set.

section. The driver can be used in reverse to pull posts out of the ground.

Cost

The commercially available drivers cost from \$173 to \$270, fairly expensive compared to standard impact drivers, which typically cost from \$20 to \$80. The materials for the MTDC drivers cost about \$24 with roughly 8 hours of shop labor needed to fabricate the PD-1 (slotted design) and 4 hours to fabricate the PD-2. The air-powered units listed in the manufacturers' section cost from \$450 to \$1,750 without compressors.

Discussion

MTDC tested the five manual post drivers by setting 10-foot-long, 1.33-pound-per-foot T-posts 2 feet into a clayey-loam soil that was mostly free of rock. The drivers all performed this task. However, it was somewhat awkward to load posts into the drivers and raise them into a vertical position for driving.

The two Standard-Signs models have a short barrel length and stroke. This increases the operator's tendency to push the driver off the top of the post on the upstroke, especially as the operator begins to tire. This could be a safety concern and potential source of injuries. It would be easy to lengthen the barrel, but doing so would increase the weight of the drivers by about 5 pounds. A longer stroke also would allow the operator to hit the top of the post with more force. T-posts fit loosely in the large barrel of the heavy-duty driver (NO8), making it awkward for the operator to stand and drive the post straight. The loose fit allows the handles to contact the post and might allow the operator's hands to be injured. Both models lifted easily off the post after it was driven to the proper depth.

The MTDC drivers are somewhat lighter and easier to handle than the Standard-Signs drivers. The small-diameter barrel keeps the handles away from the post while driving and helps hold the post vertical, allowing the post to be driven straighter. The longer barrel reduces the worry that the operator might lift the driver



Figure 8—The PostMate driver clamped to a steel T-post.