

General Information

The DeWut?! 3-speed gearmotor kit turns a DeWalt 18 volt drill motor and 3 speed drill transmission into a robust selectable-speed-range geared motor, complete with ball bearing supported shaft.

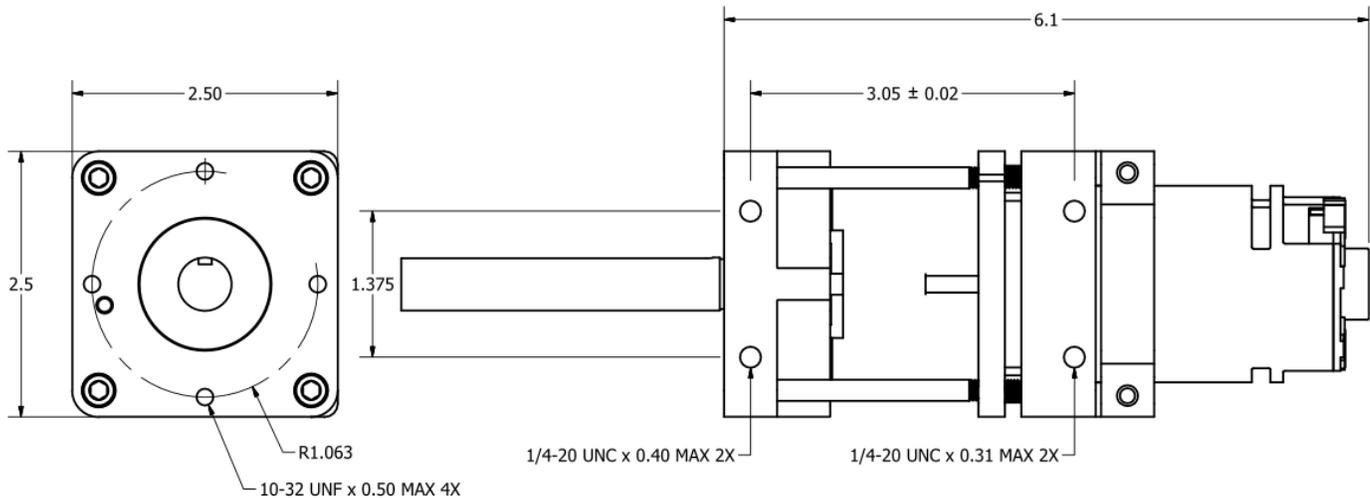
Compatible Motors and Gearboxes

- DeWalt 396505-20 through -22 motors
- DeWalt 629151-00 through -02 motors
- DeWalt 397892 series transmission

Specifications

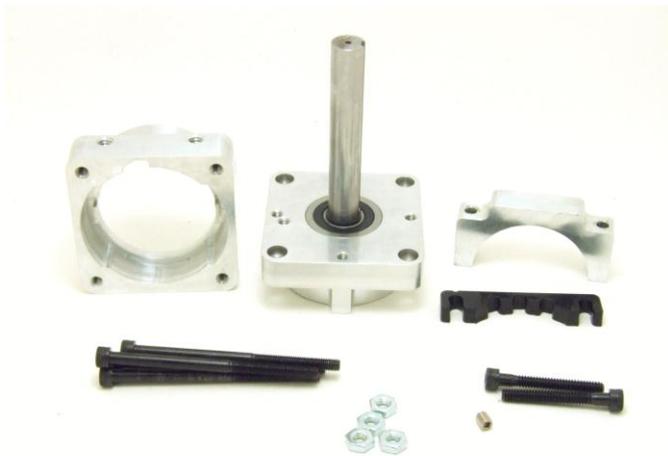
Dimensions	2.5" square, 6.1" long without shaft 3" standard shaft
Weight	2.9lb fully assembled, without wires
Ratios	Low: 51.2:1 Middle: 17.1:1 High: 12.8:1
Shaft	½" OD with 1/8" keyway, 3"long, 1566 alloy steel
Case Material	CNC machined 6061 aluminum ASTM A574 socket hardware Delrin gear selector retainer
Output Speed	(nominal, 18v motor) Low: 450 RPM Middle: 1450 RPM High: 2000 RPM

DeWut Mounting and Exterior Dimensions



Assembly Instructions

1. Modify the DeWalt transmission



The kit contains the following items. From left to right:

- Rear transmission mount
- Output assembly, with ½" shaft
- Motor clamp ring
- Delrin gear selector retainer

The included hardware:

- (4) #10-32 x 3" socket head cap screw
- (4) #10-32 machine hex nut
- (1) #10-32 x ¼" set screw
- (2) #10-24 x 1.5" socket head cap screw

Be sure you have the following tools:

- 5/32" hex wrench
- 3/32" hex wrench
- 3/8" open wrench or needle-nose pliers
- Rubber mallet or arbor press

If you did not buy the fully assembled or partially assembled kits, you must supply a DeWalt 396505 or 629151 series motor and a DeWalt 397892 series 3-speed transmission. This mount is **not** compatible with other series of motors and transmissions not listed here.



Remove the black plastic front cover from the 397892 transmission by gently bending the two clips molded into the casing. The five anti-backdrive roller pins and 5-sided output coupler will be visible.



Remove and discard the roller pins, the 5-sided output coupler, and the black steel shim. Reinstall the black plastic cover in the same orientation it was removed from. After this step, the output of the transmission will be a 5-sided socket.

2. Press the transmission into the output assembly



The transmission only fits into the output assembly in one orientation. Use the torque clutch adjustment plunger to align the transmission.



Gently push the transmission into the output assembly while rotating the output shaft with your hand to line up the output spline with the 5-sided output socket.

You may elect to use a rubber mallet or small arbor press. **Do not** force the transmission – double check that all the features are aligned and the spline has mated with the output socket.

3. Press the transmission into the rear transmission mount



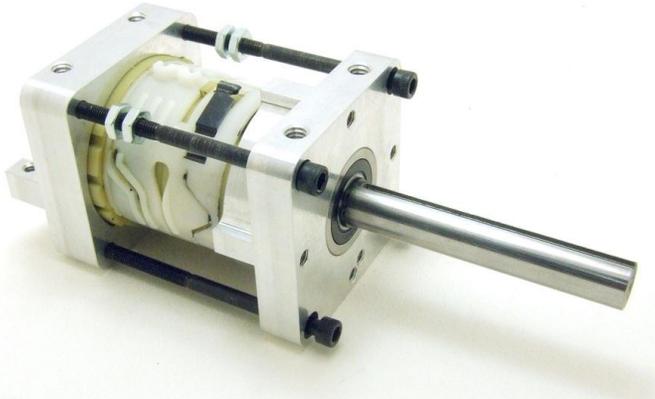
The transmission only fits into the rear transmission mount in one orientation. Line up the notch on the rear transmission mount with the protrusion on the side of the transmission.



Using gentle pressure, push the rear of the transmission into the mount. Approximately 1/8" of the rear portion of the transmission will be visible.

4. Secure the transmission with #10-32 x 3" cap screws

Tips for squareness



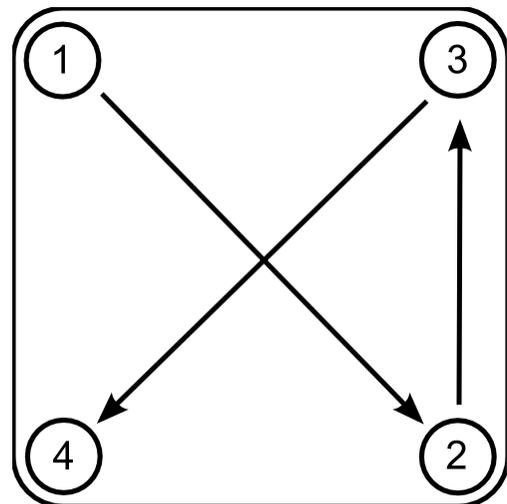
Insert the 4 #10-32 x 3" screws into the output assembly holes, but do not tighten yet. Thread on two #10-32 machine hex nuts onto the top **two** screws nearest to the gear selector, spaced 1/2" from the end of the screw.



Use a 5/32" hex wrench to tighten the face mounting screws. To maintain squareness, do not tighten one screw "all the way" first.

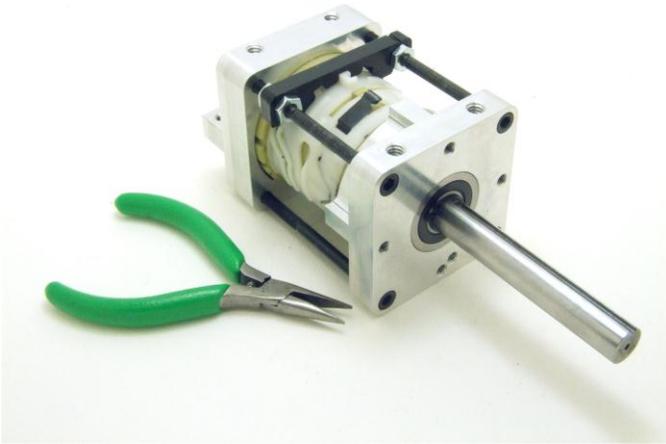
Install the transmission on a smooth, level surface you can use to check that the mounting faces are square and the front and rear are not twisted. Squareness is essential to smooth and reliable operation – forcing the gearbox to be clamped between nonsquare faces will shorten gear life and increase operating noise.

- Ensure that the output assembly and rear transmission mounts are both pressed on as far as they can go
- Drive, but do not tighten, all screws to be flush with the output assembly's front face first.
- Incrementally tighten the screws in steps of 1/8" turn each, in a "corner to corner" fashion:



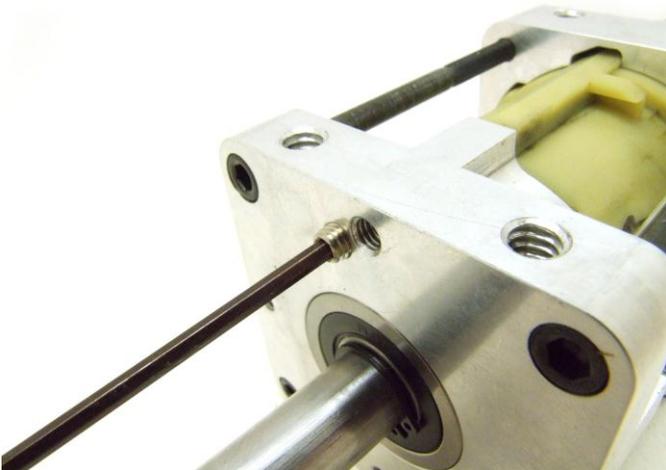
- Each screw should not be tightened more than 1 full turn.
- Double check the final assembly using a flat surface and a machinist's square or construction square. If the gearbox has significant 'wobble' when sitting on a flat surface, the process should be redone.

5. Install the gear selector retainer



Space apart the two nuts and slide in the gear selector retainer, choosing a speed to set the transmission. You may need to rotate the shaft slightly to get the sliding gears to mesh. Using a 3/8" wrench or a set of needle-nose pliers, tighten the nuts against the gear selector retainer.

6. Install the torque clutch set screw



Using a 3/32" hex wrench, screw in the #10-32 x 1/4" set screw into the off-center hole found on the front of the output assembly. As you tighten the screw, the torque clutch plunger will begin moving.

To lock the clutch completely, depress the plunger until the set screw stops moving from gentle thumb pressure. **Do not** overtighten the set screw.

The slipping torque of the clutch is dependent on the amount that the plunger is depressed. However, it is also dependent on how quickly the load changes and also the lubrication condition of the gearbox. Therefore, empirical adjustment must be performed on your load to determine any intermediate clutch setting.

7. Modify the motor



The DeWalt motor has four crimps on the front mounting face which are 1mm larger in diameter than the motor body.

Sand, grind, or file off the **radially** protruding portion of the crimps. The motor will not fit into its mount unless these crimps are properly adjusted.

8. Mount the motor

Installation and Usage Tips



With the crimps adjusted, slide the motor into the rear transmission mount. Rotate the motor slightly to engage the planetary gears. Push in the motor until the forward case vents are barely flush with the face of the rear transmission mount, as shown. The motor can be installed in any orientation.



Finally, install the motor clamp ring and the two #10-24 x 1.5" screws using a 5/32" hex wrench. Take care to tighten the screws evenly, and do not exceed more than $\frac{1}{4}$ turn per screw from a hand-tight position. When fully tightened, the gap between the motor clamp ring and the transmission mount is approximately 0.025".

- **Caution!** Heavily loading the gearbox shaft at its end can severely damage the output shaft and bearings. We recommend not exceeding the following radial load limits:

Distance from Bearing	Load
< 1"	100 lbf
1" to 2"	50 lbf
2" to 2.5"	25 lbf
> 2.5"	Not recommended

- **Do not** overtighten the motor clamping screws – you can literally squash the motor causing damage to the magnets.
- These transmissions are not designed to shift under power. Shifting while the motor is applying torque can damage the transmission.
- Only mounting the motor by the face mount screws may result in damage to the gearbox and motor under heavy shock loads. Use the four top and bottom mounting holes when possible to maximize the rigidity of the system.
- Wrap a cable tie around the grooved gear selector sleeve on the transmission for maximum protection against falling out of gear under heavy shock loads.
- Threadlocking adhesive is recommended for all 4 case screws, the torque clutch adjustment set screw, and the 2 motor clamping screws.