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## INSTRUCTIONS FOR USING THE MOTION PRO #08-0134 TORQUE ADAPTOR WRENCH

The Motion Pro torque adaptor wrench is designed to be used with a torque wrench to accurately tighten the cylinder base nuts on two-stroke engines that you cannot reach with a socket wrench.

### How to use the Torque Adaptor Wrench:

When you mount the adaptor onto a torque wrench, it effectively lengthens the torque wrench. Therefore, the torque value set on the torque wrench will not be the actual torque that you apply to the fastener. Before using the torque adaptor, you must recalculate the torque specification listed in the engine's service manual. To recalculate your torque wrench when using the Motion Pro adaptor, use the extension formula included with these instructions.

After recalculating the torque specification, write it down here for future reference.

### TORQUE ADAPTOR CORRECTION CHART

MODEL	Ft.-lb.	N-m

To make conversions from one form to another, use the following torque conversion table:

MULTIPLY	BY	TO OBTAIN
foot-pounds (ft-lb.)	1.356	Newton-meters
foot-pounds	0.1383	kilogram-meters
foot-pounds	12.0	inch-pounds
inch-pounds (in.-lb.)	0.01152	kilogram-meters
inch-pounds	0.1130	Newton-meters
inch-pounds	0.08333	foot-pounds
kilogram-meters (kg-m)	7.233	foot-pounds
kilogram-meters	86.79	inch-pounds
kilogram-meters	9.806	Newton-meters
Newton-meters (N-m)	0.7375	foot-pounds
Newton-meters	8.851	inch-pounds
Newton-meters	0.1020	kilogram-meters

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## TORQUE ADAPTOR EXTENSION FORMULA

To recalculate a torque specification when using the Motion Pro torque adaptor, use the following formula:

$$\text{Corrected torque reading} = \frac{\text{Torque required} \times \text{wrench length}}{\text{Wrench length} + \text{extension length}}$$

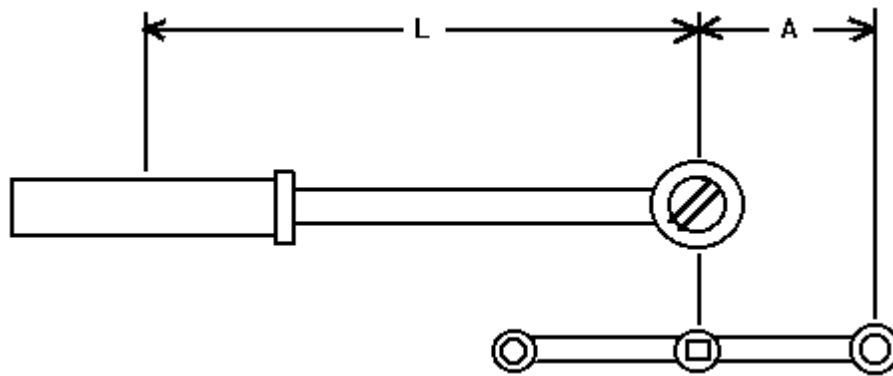
$$R = \frac{T \times L}{L + A}$$

T = Actual torque reading as listed in the service manual.

L = Torque wrench lever length. This is the lever length of your torque wrench--center of grip to center of drive (see drawing). Refer to the instruction sheet that came with your torque wrench on how to determine this length.

A = Torque adaptor extension length. When using the Motion Pro torque adaptor, the torque adaptor length is 3 inches (See note below).

R = Corrected torque reading. (Indicated torque value to set on torque wrench.)



**NOTE:** When using 3 inches for distance “A”, torque wrench and torque adaptor must be in line. If the adaptor is positioned at an angle to the torque wrench, distance “A” will be decreased. When the adaptor is at a 90-degree angle to the torque wrench, distance “A” will be equal to zero (0).

**Example:** To tighten an engine’s cylinder base nuts to 20 ft.-lb. with the torque adaptor, and a torque wrench with a lever length of 12 inches, compute the extension formula as follows:

1. List all of the known formula variables:

T = 20 ft.-lb. (actual torque specification)

L = 12 in. (torque wrench lever length)

A = 3 in. (torque adaptor extension length)

2. Plug-in each of the formula variables into the extension formula:

$$R = \frac{T \times L}{L + A} = \frac{20 \times 12}{12 + 3}$$

3. Thus, you can solve the formula as follows:

$$R = \frac{20 \times 12}{12 + 3} = \frac{240}{15} = 16 \text{ ft.-lb.}$$

**Solution:** In this example, your torque wrench would register 16 ft.-lb., but the cylinder base nuts would be tightened to 20 ft.-lb.