

# Idler Gears

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## QUESTION

What is the point of using two idler gears in a geartrain?

**Expert response provided by Octave A. LaBath and Charles D. Schultz:** Idler gears are used when a different direction of rotation is needed on the output gear of the geartrain. An idler gear can also be used when a larger center distance than the required ratio and gear size for the transmitted load is needed between the input gear and the output gear of the geartrain.

There are several reasons that two idler gears are used instead of one idler gear in a geartrain. Two idler gears may require less width on the geartrain with respect to the gear diameters. Two idlers may also have less total weight. Another reason to use two idler gears is when you need two more pads for accessory units that are to be driven by the geartrain.

I can recall an example gearbox where we had designed a gearbox with one idler gear to match the required center distance between the input shaft and the output shaft. When we presented our proposal, the potential customer rejected the design because it required that the output shaft rotate in the same direction as the input shaft. We were able to redesign the proposal geartrain sketch while we were still at the customer facility by using a copy machine, scissors, and white-out to show using two smaller idler gears in place of the larger single idler gear. While we were doing this the engineers back at the company were checking the rating on the two smaller idler gears for their strength rating.

The new design was approved, our company got the order, and we eventually built over 100 gearboxes with this design. Incidentally, most of the gearboxes are still operating on a U.S. Navy vessel. ⚙️

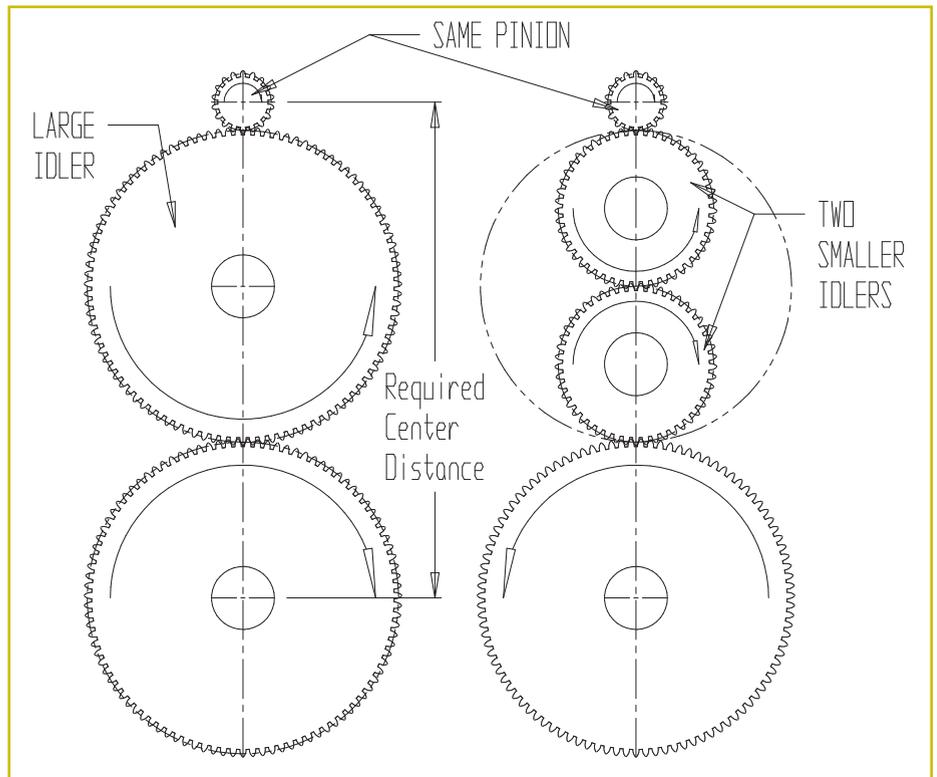


Figure 1 Single Idler

Figure 2 Two Idlers

Drawing provided by Charles D. Schultz.

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