27. A dead battery is charged by connecting it to the live battery of another car with jumper cables (Fig. P28.27). Determine the current in the starter and in the dead battery.

Using Kirchhoff’s rules,

\[ 12.0 - (0.010 \times 0) \times I_1 - (0.060 \times 0) \times I_3 = 0 \]
\[ 10.0 + (1.00) \times I_2 - (0.060 \times 0) \times I_3 = 0 \]

and

\[ I_1 = I_2 + I_3 \]

Solving simultaneously,

\[ I_2 = \frac{0.283 \text{ A down and}}{\text{in the dead battery}} \]
\[ I_3 = \frac{171 \text{ A down and}}{\text{in the starter}} \]

The currents are forward in the live battery and in the starter, relative to normal starting operation. The current is backward in the dead battery, tending to charge it up.