

<div> <div>MODULE <i>Motor</i></div> <div> EXTENDS <i>Naturals</i> VARIABLE <i>pulse, holes, unit, fluidLevel</i> </div> </div>
<div> <div> <div> <div><i>MotorInvariant</i></div> <div>\triangleq</div> <div> $\wedge pulse \in \{0, 1\}$ $\wedge unit \in (1 \dots 100)$ $\wedge holes \in (1 \dots 60)$ $\wedge fluidLevel = \{ \text{"Empty"}, \text{"NonEmpty"} \}$ </div> </div> <div> <div><i>PushFluid</i></div> <div>\triangleq</div> <div> IF <i>unit</i> = 0 THEN $\wedge fluidLevel' = \text{"Empty"}$ ELSE $\wedge unit' = unit - 1$ </div> </div> <div> <div><i>Rotate</i></div> <div>\triangleq</div> <div> $\wedge pulse = 1$ $\wedge PushFluid$ \wedge IF <i>holes</i> = 60 THEN <i>holes'</i> = 1 ELSE <i>holes'</i> = <i>holes</i> + 1 </div> </div> <div> <div><i>CheckEmpty</i></div> <div>\triangleq</div> <div>$\wedge fluidLevel = \text{"Empty"}$</div> </div> <div> <div><i>Refill</i></div> <div>\triangleq</div> <div> $\wedge fluidLevel = \text{"Empty"}$ $\wedge unit = 0$ $\wedge fluidLevel' = \text{"NonEmpty"}$ $\wedge unit' = 100$ </div> </div> <div> <div><i>Next</i></div> <div>\triangleq</div> <div><i>Rotate</i> \vee <i>PushFluid</i> \vee <i>Refill</i></div> </div> <div> <div><i>StartMotor</i></div> <div>\triangleq</div> <div> $\wedge pulse = 0$ $\wedge holes = 0$ $\wedge fluidLevel = \text{"NonEmpty"}$ </div> </div> <div> <div><i>MotorSpec</i></div> <div>\triangleq</div> <div><i>StartMotor</i> $\wedge \Box Next$</div> </div> </div> </div>
<div> <div>THEOREM <i>MotorSpec</i> $\Rightarrow \Box MotorInvariant$</div> </div>