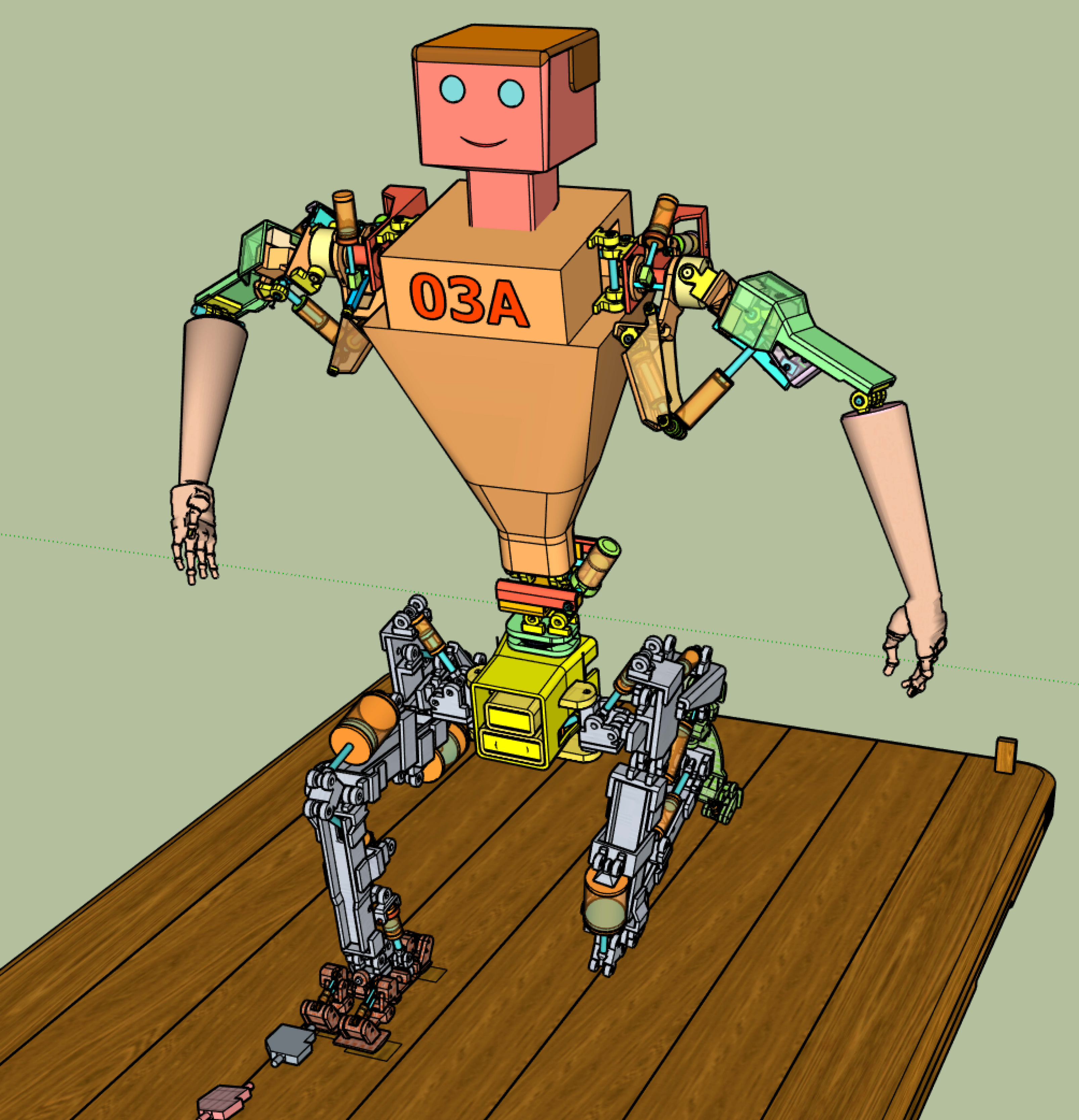






Wattage of Walking

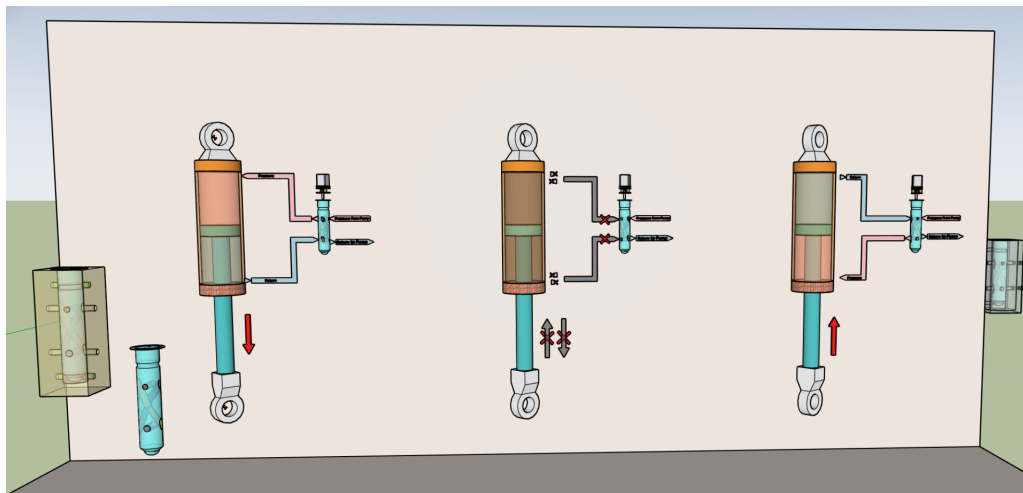
Cross-Connections vs No Cross-Connections

Note: the control valve that controls extension/retraction of a hydraulic cylinder is the same type of valve throughout in its mechanism of flow direction management. Some valves may have larger flow channels than others. We will use the name: control valve

Here is an image of the valve

three positions of the stem are shown these three stem settings adjust the flow direction to cause either piston rod extension or no flow allowed or piston rod retraction

A stepper motor/gearhead turns the stem, giving the robot cpu digital control of each valve



No Cross-Connections:

- 1) each individual hydraulic cylinder is connected to a single control valve via two tubes
- 2) there are no connections to the cylinder otherwise and these tubes have no interconnections
- 3) the control valve has 4 tubing connections,
 - a) two tubing connections to the hydraulic cylinder this valve controls
 - b) one tube connected to the “aorta” (pressure/supply) of the robot’s hydraulic pump setup
 - c) one tube connected to the “vena cava (suction/return) of the robot’s hydraulic pump setup

Cross-Connections: the specifics of the cross-connections can be described by Google Ai

The walking is 2mph on level ground for each example

No Cross-Connections:

- a) robot (198lbs) + 1.5 gal diesel fuel + this new free-piston type engine (23lbs) = 39 hours
wattage of walking 203 watts

Cross-Connections:

- a) robot alone (198lbs) wattage of walking 147 watts 116 hours
- b) robot + 1.5 gal diesel fuel + engine wattage of walking 168 watts 100 hours