

# POWER CRAWLER 5000

Introducing the POWER CRAWLER 5000! This light-weight robot has a 'triple-wheel' drivetrain, mining drill, as well as a high power gearbox to lift the robot over nearly any obstacle that comes in its' path. This robot is great for entertainment of all ages, and can still be used in the work field of geology and earth exploration.

To start off, this robot weighs approximately 12.6 lbs. The drive train is considered a 'triple-wheel'. It is powered by 4-393 motors on a 3:1 (torque) gear ratio. The 'triple-wheel' consists of 3-4 inch regular wheels attached together to form one wheel. In the middle of the entire wheel structure, there is a triangular piece of Lexan with a 1/8" hole in the center for the axle. I chose this wheel design for its versatility. It can be used in an urban or rough terrain setting. In both of those settings, it is used to simply drive or, it can climb over obstacles.

Next is the lift. It is high power gearbox attached to an arm that can rotate 360°. The gearbox is powered by 4 - 269 motors on a 35:1 (torque) gear ratio. The arm is a 35-hole piece of c-channel. On the end of the arm is a triangular piece of Lexan that rotates along gravity. This triangular piece allows the robot to clip onto the obstacles that it will lift over for more stability.

Another feature on the POWER CRAWLER 5000 is the mining drill. It is a 2.5 inch diameter piece of solid black Lexan attached to a 269 motor. That is then attached to a linear slide with rack and pinion. The linear slide is actuated by a 269 motor. Behind all that is a Lexan collector. After you've drilled up all your data from the earth, you can simply drive forward and all of your data will be stored in the collector. You can animate the mining drill by driving the constraint called "Animated".

I started this online challenge back in October and have kept it in mind until November. From there, I began writing down all the ideas I had collected within the past month. I then narrowed it down to the best design that would offer the most for size. The idea came down to the POWER CRAWLER 5000. The idea of my robot evolved over time and I think it is now the best possible design for the size and motor placement.

Autodesk Inventor has great uses. My favorite of these is the angle constraint. I like this feature a lot because it proved useful while designing this robot, and many others. I used it in this robot while assembling the triple-wheel, for getting the pieces of metal aligned properly. Another feature of Autodesk Inventor that I think is very useful is the use of assemblies and sub-assemblies. This feature drastically decreases the workload if you robot is symmetrical on each side.

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