For the 2017 VRC game Starstruck, many designs have come to pass. One of the most popular ones are a fold- up tray, that would be folded up inside the 18-inch cube at the beginning of a match, and fall down and act as a dumper during the match. The main constraint to this design is a way to ensure that after the match starts, the tray doesn’t flop around and remains stabilized, both for the structural integrity of the robot and for consideration in awards. An obvious solution to this problem is motors to rotate the tray down, but that would take power away from other features of the robot. Likewise, there is no part legal for the Vex Competition that would automatically lock. However, this could be a thing of the past. With a simple plastic lock, with the concept inspired from a video, the theoretical tray could fall and stay locked down sturdily. It could easily fit on most robots requiring a one- way lock, and required a knowledgeable experience in Autodesk Inventor to design.

A Vex- produced lock to serve the need of the robots designed for the 2017 game Starstruck would fix a plethora of design problems and improve on what has already been created by the thousands of Vex teams. The designed lock is half an inch in diameter and four inches in length. It also features a hook that is 9/16 of an inch in length, a hole in the back for a screw, and well as a rounded top. This device would be mounted on a hinge or two pieces of metal connected by an axle using shaft bearings. The hinge would start compressed, and when fallen, the lock part would insert into each other and clasp. After clasping, the lock cannot undo, and this would result in the tray being locked down. Another use for this lock besides dumpers would be for hanging. At the end of every game, the robot had the ability to hang itself on a pole about two feet tall. While a root might have enough power to hang itself from motors or pneumatics alone, once hanging, the weight of the robot may cause the hanging system to slowly disengage, as it cannot sustain the weight without being constantly powered. With this hook, an elaborate system can be made so that the hang is one way. Once the hang goes up and the robot is in midair, the hook can engage and prevent the robot from falling.

In order to make the part, a proficient knowledge in Autodesk Inventor was pertinent. To start, a circle was made that was 1/2in in diameter. Using the extrude tool, which gives two- dimensional planes depths, a cylinder that was four inches long was made. To create the hook, it was first attempted to start a new sketch on the side of the cylinder, but the round surface prevented this. To amend this problem, a transparent rectangle was extruded around the cylinder. The sketch was created, and a rectangle was formed and cut to create the hook part of the part. A third sketch was cut in the back for a screw. Overall, the creation of the part was simple.

The key that was built offers functionality not currently available from Vex, and required some knowledge of Autodesk Inventor to create. This part can offer much for Vex, in both sales and team usability. Any piece of a robot that needs to extend outside of the 18 inch cubed barrier can exploit this part. Overall, it is a great part to add to Vex’s catalog.