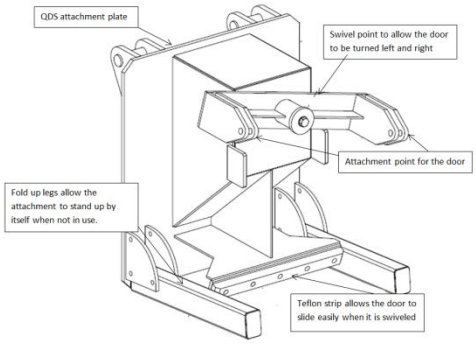
Machine Door Lifter Quick Detach System (QDS) Attachment

Rio Tinto Coal Australia- Kestrel Coal Mine

The Problem

To allow the ventilation system in an underground mine to operate, various ventilation control devices (VCD's) are required to be installed. These items allow roadways to be blocked off as required to direct the air travelling through the mine to be directed to the locations where it is needed. It is sometimes necessary to install machine doors into different parts of the vent circuit to allow access to areas of the mine by mobile plant-loaders etc. The machine doors are built using an outer frame which is bolted to the roof and ribs of the roadway, and have 2 doors hung from the frame. Each door has an approximate weight of 400 kg.

In the past, these doors were hung using a sling or chain from the horns of the loader, which was attached to a shackle on the top of the door. There was no positive connection between the loader and the door, the sling could slide off of the horns, and during the installation of the door the operator who had to install the hinge pin was exposed to a suspended load and pinch points between the loader, the door, the frame and the ribline. The activity had to occur in a confined working area with up to 3 people maneuvering the door.



The Solution

This was achieved by designing and constructing a QDS attachment which allows the door to be pinned to the loader and lifted into place. The attachment has the ability to allow the door to be moved forward and backward using the crowd function of the loader, raised and lowered on the boom of the loader, and rotated left and right on a pivot set up on the attachment. All of this allows for the door to be moved into the correct position regardless of the loader position as the floor is never flat.

This removes personnel from the pinch point of the door during installation and eliminates the risk of the door falling from the loader and crushing the operator. This attachment can be made to fit any underground loader.