Abstract
Build a simple virtual reality (VR) training system for a technician to perform maintenance in an immersive 3D virtual environment. An accompanying tutorial utilizes audio and visual cues to aid the technician in identifying a failed component, replacing the component, and bringing the system back to a working state. The subject of maintenance tasks is a commercial diesel generator. The primary focus is on a positive user experience with high interaction fidelity.

Architecture
Environment, Animations and Assets
• Unity Game Engine

3D Interaction
• C#
• SteamVR

Hardware
• HTC Vive VR System

Impact
• Demonstrates the advantage of using VR for technical training, particularly when the training is difficult or even dangerous in a real-world environment.
• Provides a high degree of interaction fidelity with both tools used and with other manipulable objects.
• Offers a potential of high throughput of specialized and concurrent training, without burdening real-world equipment and resources.

Results

Performance Metrics
• Ten (10) weeks to complete project.
• Week 4 – Virtual environment completed.
• Week 7 – Disassembly and replacement interactions completed.
• Week 10 – Tutorial interface completed.

Summary
• Supports a flexible objective system with a nested objective structure.
• Audio hints to guide the user through the steps.
• Visual indicators to aid audio instruction.
• Tool motion mechanics.
• Interactive clipboard for progress tracking.