

Image Captions and Descriptions for the ***5DT Wheeled Loader Training Simulator***

Short form descriptions of the above simulator are supplied below. Image captions and image descriptions are also supplied.

Wheeled Loader Training Simulator

Introduction

The 5DT Wheeled Loader Training Simulator teaches the trainee loader operator how to operate a wheeled loader. It is expected of the trainee operator to load several trucks. For this purpose autonomous (computer controlled) trucks have been implemented. These trucks arrive continuously and position themselves for loading. The autonomous trucks position themselves at random positions to ensure that the trainee operator is subjected to many different loading challenges.

Simulator Setup

The system consists of a mock-up cabin that is mounted on a motion base, in the midst of three large projection screens. The three screens (left, middle, right) provide the trainee with a wide field of view (approximately 180 degrees). This is the same out the window (OTW) view that a real operator would experience in a real wheeled loader. The mock-up cabin is equipped with controls and instruments that mimic real controls and instruments in a loader. The motion base provides realistic motion cues to make the trainee feel as if he/she is operating a real loader.

Interchangeability

The mock-up cabin may easily be interchanged with mock-up cabins of other mining vehicles. The simulator hardware (computers, large projection screens and motion base) may therefore be used for several different 5DT Training Simulators.

Virtual Environment

The virtual loader is operated in a photo-realistic virtual environment that emulates reality very closely. The virtual surface mine emulates a real mine. Realistic computer graphics (visual) models of entities like haul trucks, water cars and light delivery vehicles were also developed. These models do not only look like the real thing, but they also sound like the real thing - real sound recordings were used for this effect.

Material Interaction

A sophisticated material interaction model has been developed for the loader simulator. If material (e.g. ore) is removed from the mine, other material slides down to partly fill the empty space. This ensures realistic filling of the bucket by the trainee.

Performance Measurement

The instructor monitors the performance of the trainee. This is achieved by means of real-time graphs, reports and a record/playback module. The trainee is presented with a detailed, categorized report after each session. The record/playback module records the entire training session. The session can be played back for detail analysis and evaluation.

Team Training

The 5DT Surface Mining Simulators may be networked together. A Shovel Training Simulator may be networked with a Haul Truck Training Simulator so that two human operators, in two separate simulators, can work together to complete a task. The 5DT Simulators are '*Network-Ready*', which means that it has been designed to function together and that it can be networked without any problems.

Conclusion

The 5DT Wheeled Loader Training Simulator is the closest thing to reality you can get! The main advantages offered by the simulator is that one does not have to use a production-capable loader

for training, that the trainee cannot damage or destroy the virtual loader and that the trainee can be exposed to life-threatening conditions and situations without putting either the trainee or the loader at risk.

MINE_Surface Loader_001

Wheeled Loader: Outside View: Manufacturer's Colors

Photorealistic computer graphics models provide for a very real learning experience. The simulator also includes other vehicles like computer controlled haul trucks, a shovel, water cars and light delivery vehicles.

MINE_Surface Loader_002

Wheeled Loader: Outside View: Mine's Colors

Photorealistic computer graphics models provide for a very real learning experience. The color scheme of the wheeled loader may be customized.

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