INTRODUCTION TO THE TRAINING SCHOOL FACILITIES

Purpose

The purpose of this initial introduction is to provide students with awareness, identify-cation, and location of the training facilities that will be used for subsequent hands-on training.

The overall purpose of this hands-on training is to give students the opportunity to examine and handle the actual component parts of an engine; to become more acquainted with the physical aspects of engines and their parts; and to grasp an understanding of what the components look like, how they fit together, and how they function individually and as a unit. This hands-on training will utilize the components of the 2-stroke cycle Fairbanks Morse Opposed Piston (OP) engine, the 4-stroke cycle ALCO engine, and the 4-stroke cycle FM Pielstick (PC) engine. The components used are more similar to those of other engines than they are different. Most of the procedures for setting up, timing the engine, making adjustments to the operating components are very similar to those used on all engines.

Classroom instruction will be comple-mented by hands-on instruction. This will provide the student not only with a basic understanding of the diesel engine and how it works but also with an appreciation for the complexity and yet simplicity of the machine. The classroom instruction is primarily geared to the theoretical aspects of the engine, and the general principles of physics and chemistry that make the engine possible. The hands-on instruction is to give the student a feel for the physical aspects of the engine and help explain how the theoretical and general principles apply to the engine and its components.

The hands-on instruction/work areas contain a number of engines and parts of the engines which will be used during the hands-on training. The primary engines and parts are listed below:

- There is a motorized, rotatable cut-away of the 2-stroke cycle Opposed Piston engine. It is used by the instructors to complement their classroom instructions. It is also used by the students to observe the motions and relative motions between the engine components as they slowly rotate and stop the engine as it performs its two-stroke cycle functions.

- There is a motorized, rotatable cut-away of the 4-stroke cycle ALCO engine. It is used by the instructors to complement their classroom instructions. It is also used by the students to observe the motions and relative motions between the engine components as they slowly rotate and stop the engine as it performs its four-stroke cycle functions.

- There is a non-motorized Opposed Piston engine complete with crankshafts, camshafts, cylinders and pistons with their connecting rods. It is used by the instructors to complement classroom instruction. It is also used by the students to measure and set cranklead; measure and set fuel injections pump timing; measure crankshaft alignment using the web deflection methodology; measure crankshaft thrust bearings' clearances; measure crankshaft end-to-end measurement (float); perform a bottom side inspection of cylinder liners, piston skirt, and crankshaft bearings; perform a borescope in inspection through the fuel injector nozzle hole to determine the condition of the piston crowns and cylinder liner; and perform a topside inspection of the crankshaft, pistons, cylinder liners, and bearing.

(The topside-bottomside inspection also may be performed on any of the other engines.)

- There is a complete 12-cylinder ALCO engine. It is used by the instructors to complement their classroom instruction and to show and identify all external parts of the engine including the governor with its linkage to all fuel pump racks, the engine control panel, intake and exhaust manifolds, turbocharger mounting, and high pressure fuel injection lines. Topside inspection can be made to learn about and take measurements of the valve operating rocker arm assembly. It is also used by the students to observe and learn more about the 4-stroke cycle engine and its vital components.

- There is a cutaway of two cylinders of a 4-stroke cycle Pielstick PC2.5 engine. It is used by the instructors to complement their classroom instructions. It is also used by the students to disassemble the cylinder heads with valves, the two-piece piston with its rings and wrist pin bearing, the valve rocker arm assembly, and the multi layers of the cylinder head to observe its water passages, fuel injector, and test cock mountings.

- There are a large number of engine components and parts in the training school. Many of the components are from several different manufacturers. These components include turbochargers, scavenging blowers, pumps (fuel transfer, fuel injection, lube oil, and jacket water), cylinder head assemblies, pistons, governors, injection nozzles, duplex filters, crankshafts, connecting rods, bearings, flexible drive gears, vibration dampers. Most are cutaway which enables students to examine their internal working parts without disassembly. These components are used by the instructors to complement their classroom instructions. Some of these components will be disassembled, reassembled, and tested by the students. The majority are used by the students for self-examination, evaluation, and learning.

- There is a gallery of many failed engine components. These components are used by the instructors to complement their classroom instructions particularly on Case Studies. The majority are used by the students for self-examination, evaluation, and learning.

- There is a complete EDG generator with its covers removed. It will be used by the instructors to complement their classroom instructions. Students will inspect and perform measurements as directed by the instructor.