Recommended Practices for the Design and Maintenance of Fluid Distribution Systems at Vehicle Maintenance Facilities
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- PEI/RP1700, Recommended Practices for the Closure of Underground Storage Tank and Shop-Fabricated Aboveground Storage Tank Systems
FOREWORD

These Recommended Practices for the Design and Maintenance of Fluid Distribution Systems at Vehicle Maintenance Facilities have been prepared as an industry service by the Petroleum Equipment Institute. The text represents the consensus views of the PEI Vehicle Maintenance Fluids Equipment Committee, comprised of the following members:

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1. INTRODUCTION

1.1 Origin. The Petroleum Equipment Institute (PEI) has produced this document as an industry service. The recommended practices described herein represent a synthesis of industry procedures and manufacturer recommendations relating to centralized fluid distribution systems typically installed at vehicle maintenance facilities. These practices are the consensus recommendations of the PEI Vehicle Maintenance Fluids Equipment Committee. This Committee is made up of representatives from equipment manufacturers and contracting companies specializing in the design, service and installation of lubrication equipment. In addition, the Committee has had the benefit of reasoned comments submitted by parties interested in vehicle maintenance facilities.

1.2 Background. Well-designed and properly constructed centralized vehicle fluid distribution systems are commonly found at vehicle repair and fleet maintenance facilities. Although they are technically sophisticated, there is little published literature on the design of these systems. Because most of the fluids involved do not pose substantial fire or health hazards, there are few regulations regarding these systems. The absence of both industry guidance and regulatory standards has led to the installation of many such systems by people who are unfamiliar with the high air and fluid pressures present in these systems and the flow characteristics of lubrication fluids. Many factors make this uninformed approach to fluid distribution system design undesirable:

- Poorly designed systems may be inconvenient or inefficient to use and may require frequent servicing, repair or replacement.
- The high pressures used to convey viscous fluids can be dangerous.
- A lack of understanding of the relationships between fluid viscosity, pump pressure, and tubing length and diameter can result in the installation of distribution systems that have insufficient flow rates and inadequate performance.
- Improperly designed systems may create safety hazards posed by components operating at pressures well beyond their rated pressures.

The design of these fluid distribution systems is further complicated by the properties of the fluids themselves. Viscous fluid distribution systems must be properly designed in order to move these fluids efficiently through the distribution system. Proper design includes the use of specialized fittings, pumps and materials that can safely produce and contain the pressures required to move these fluids.

To perform effectively and efficiently, properly designed distribution and pumping systems must be able to safely and conveniently deliver ample flow rates at multiple distribution points. In addition, the rising cost of the products stored and distributed through these systems has placed increased emphasis on accurate inventory systems to track the usage of these fluids.

1.3 Purpose. The purpose of this document is to provide a concise summary of the design considerations and general guidelines for the proper installation of centralized fluid distribution systems for various types of vehicle-related fluids. This information has been assembled from published and unpublished sources provided by equipment manufacturers and experienced installers. The intent is to provide recommended practices to facility designers and installers that:

- promote construction of systems that operate safely and reliably;
- promote trouble-free performance of fluid distribution equipment; and
- provide the required flow rates over a broad range of end-user applications.

This document is NOT intended to:

- endorse or recommend particular materials, equipment, suppliers or manufacturers; or
- discourage the development and implementation of new procedures, equipment or devices.

1.4 Scope. These recommended practices apply to stationary, centralized fluid distribution systems for vehicle-related new and used fluids, such as:

- motor oil;
- gear oil;
- transmission fluid;
- hydraulic fluid;
- grease;
- antifreeze;
- windshield washer fluid.

The equipment covered includes supply containers (e.g., tanks, totes, drums, kegs, pails), piping and tubing, pumps, compressors, hoses, reels, control handles, and other equipment typically used to construct these systems.