

USE OF AMMONIA-FOSSIL FUEL EMULSIONS IN A DIESEL ENGINE

Ammonia as a Hydrogen Carrier

Vito Agosta, Ph.D., P.E.
Adjunct Professor, USMMA
Professor Emeritus, Polytechnic University
President, Propulsion Sciences Company

James A. Harbach, M.Eng., Engineer (Mech.), P.E.
Professor Emeritus, USMMA

The Depot Project (1960s)

- Manufacture fuel from air and water in field for military use.
- Storage and handling of fuel.
- Selection of ammonia as candidate fuel.
- Determination of ammonia combustion model.

Electrolytic Cell for Production of Hydrogen

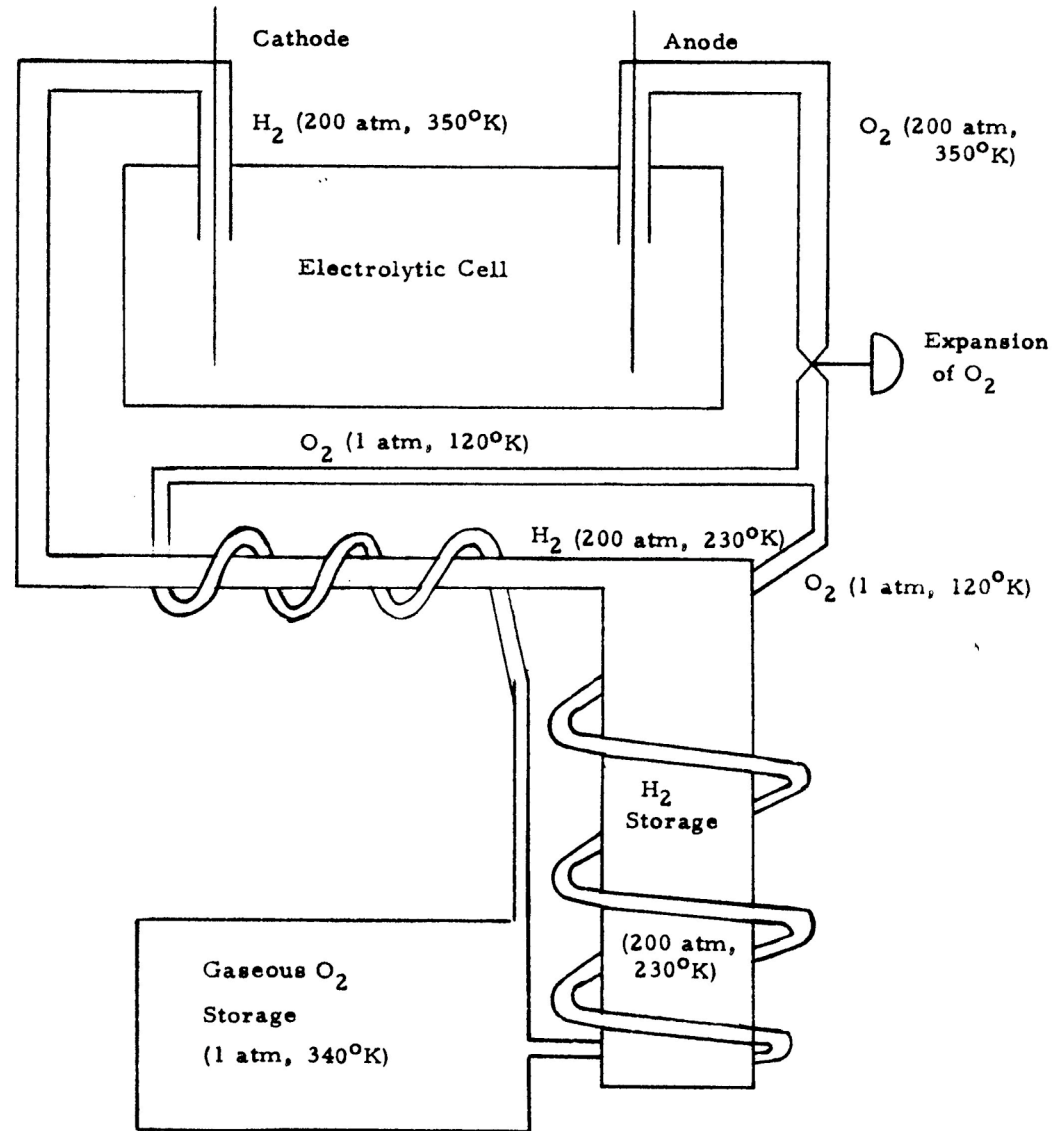
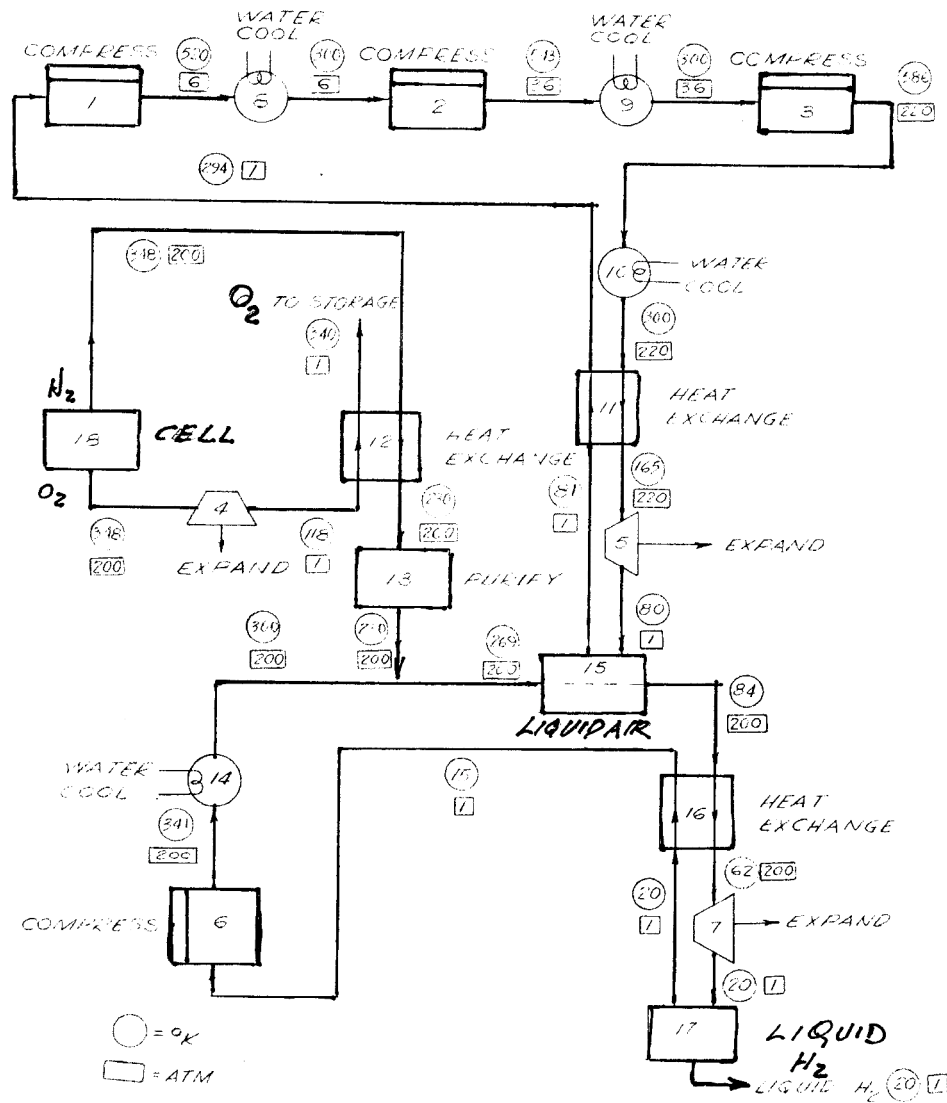
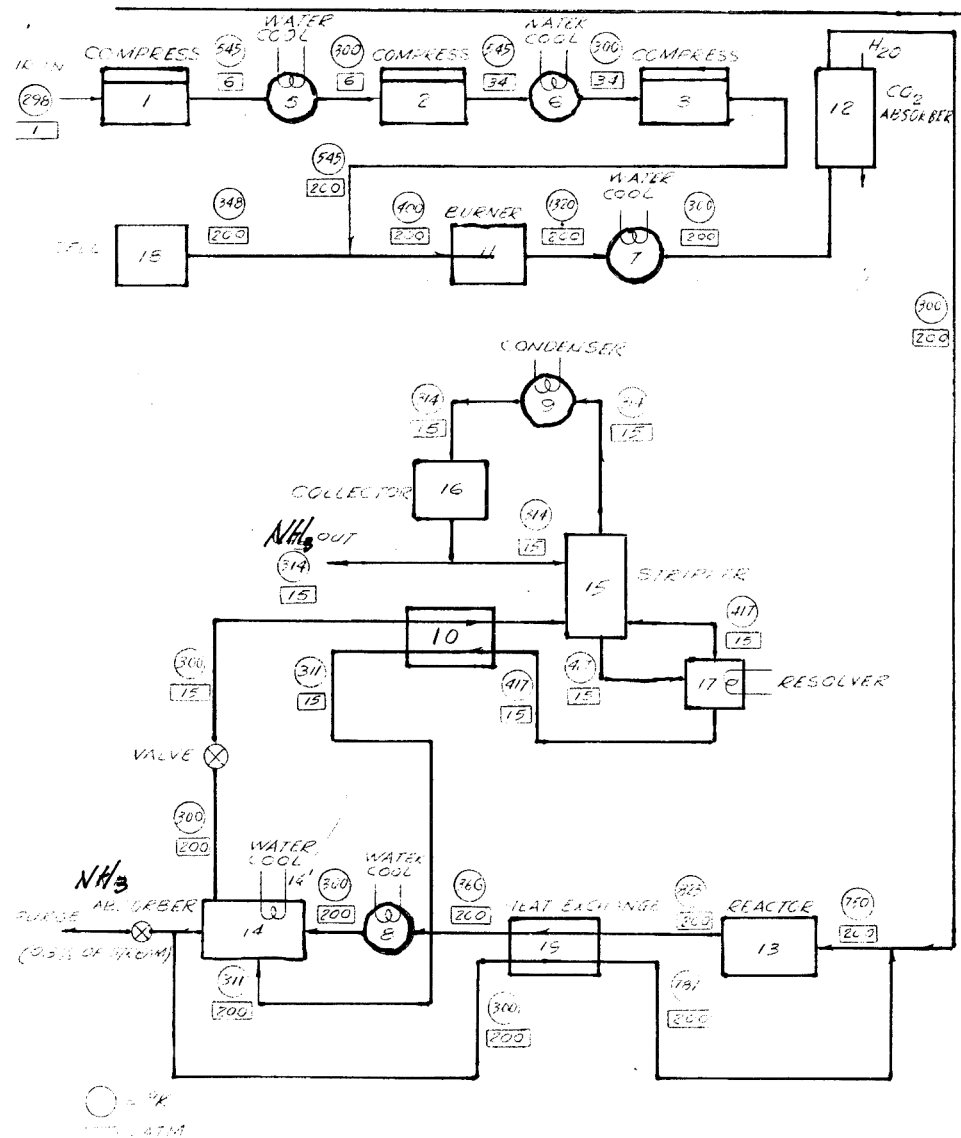


FIGURE III - 3

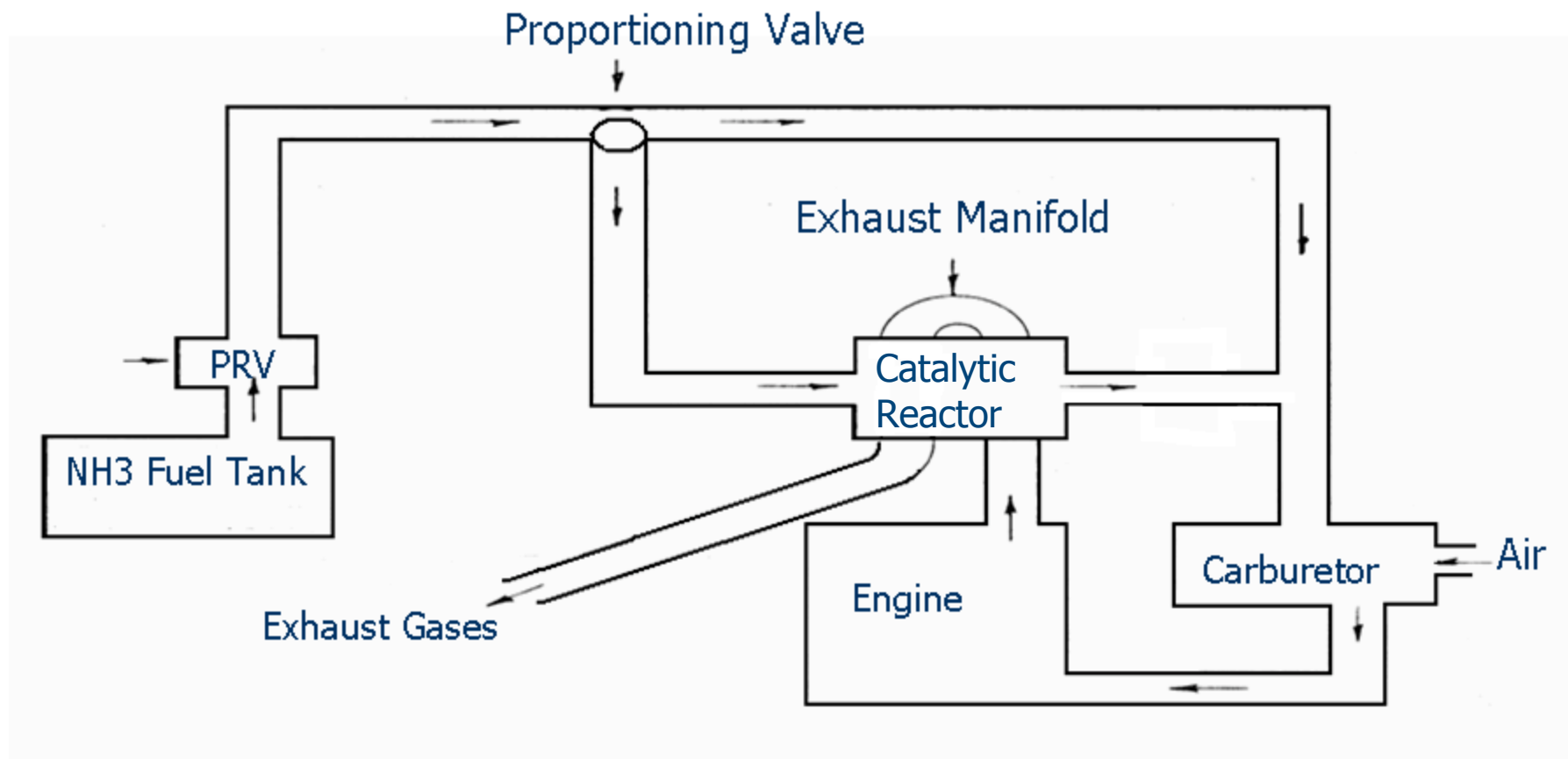
Combined Cooling and Storage of Electrolytic Hydrogen (from 200 atm, 350°K to 200 atm, 230°K) Using Expanded Electrolytic Oxygen.



Liquid H_2 Manufacture



Ammonia Manufacture



Engine Fuel Flow System

COMBUSTION MODEL

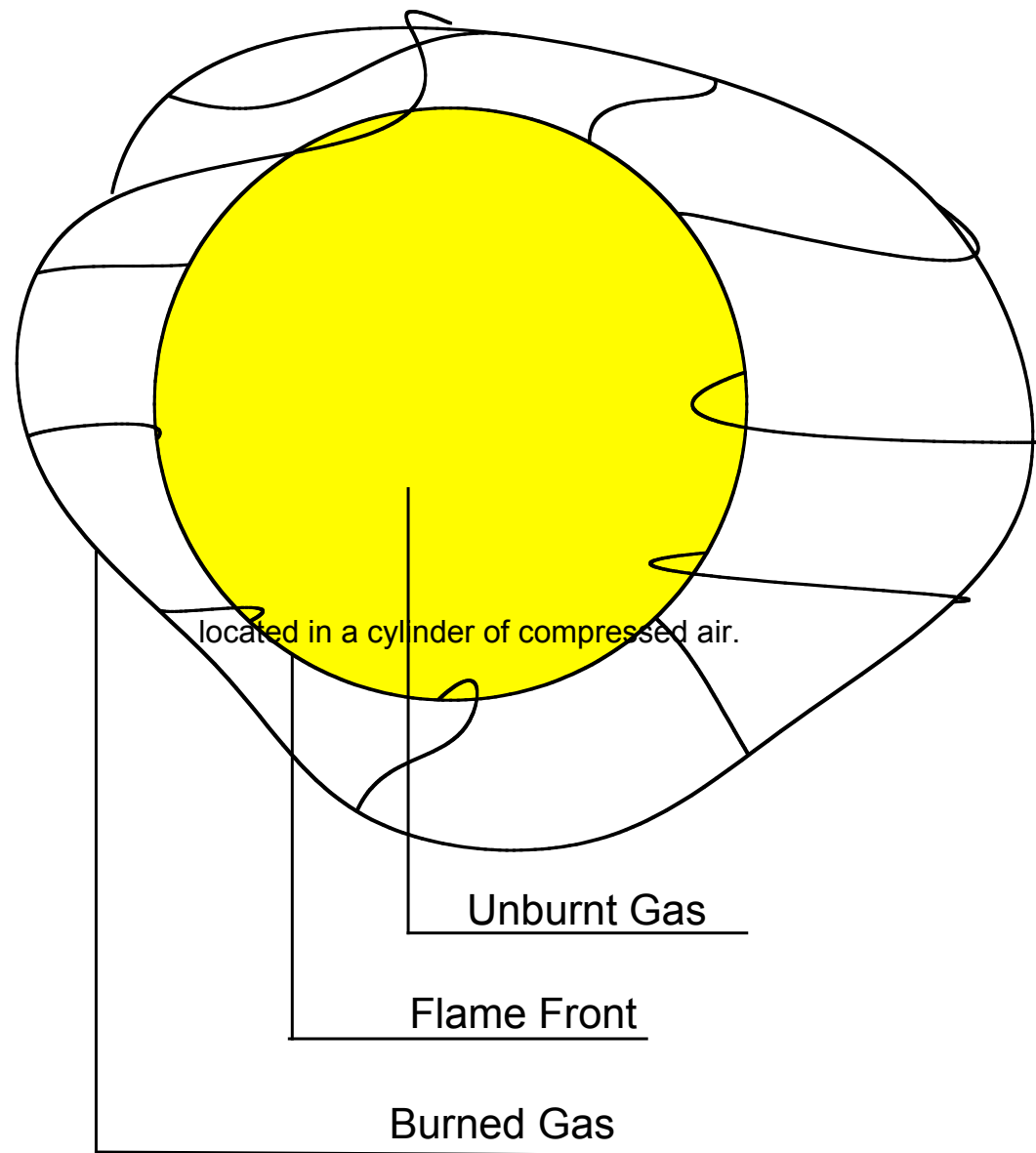


Figure 2a Flame front Propagation in a Vapor Cell

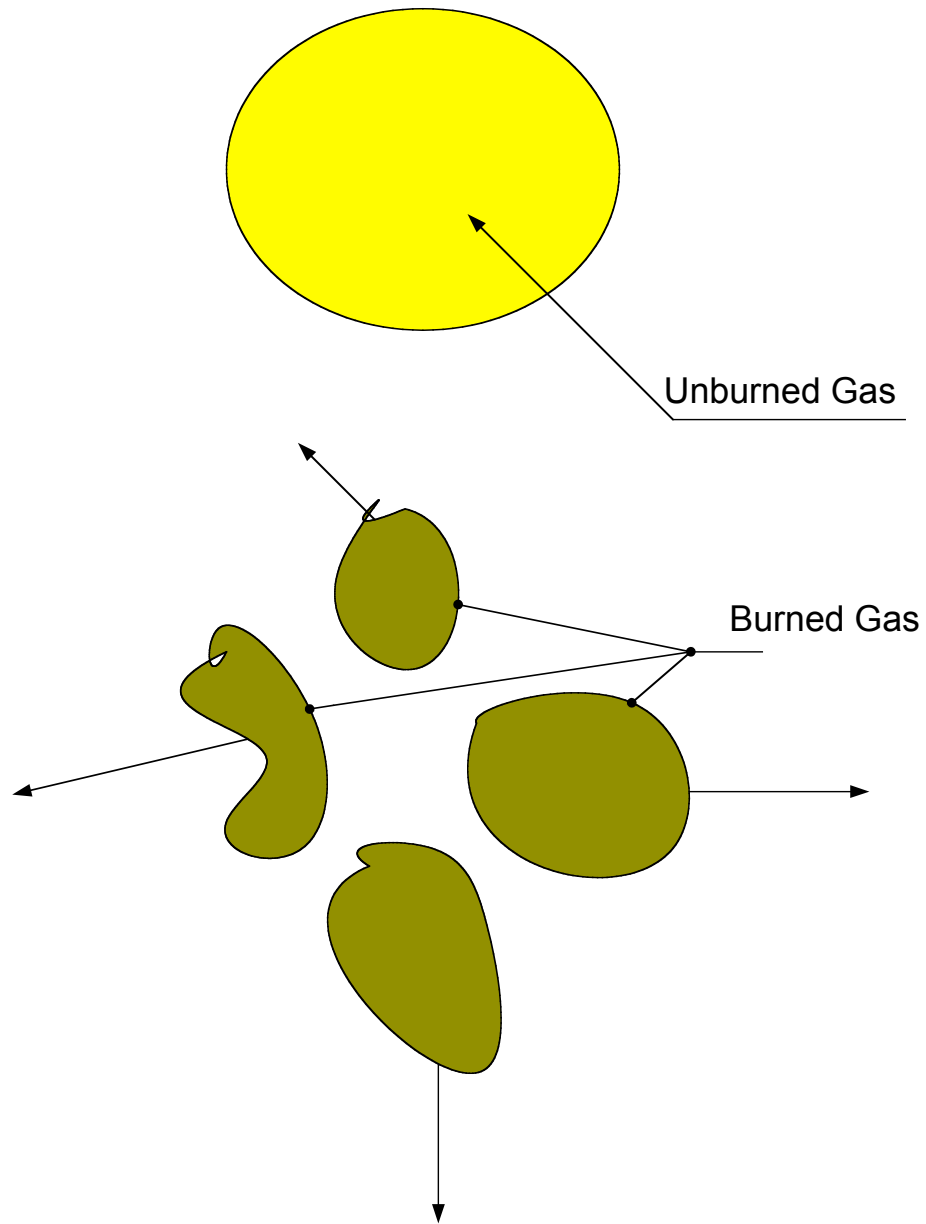


Figure 2b Volume Combustion

FUEL SYSTEM HARDWARE

Cavitating Venturi

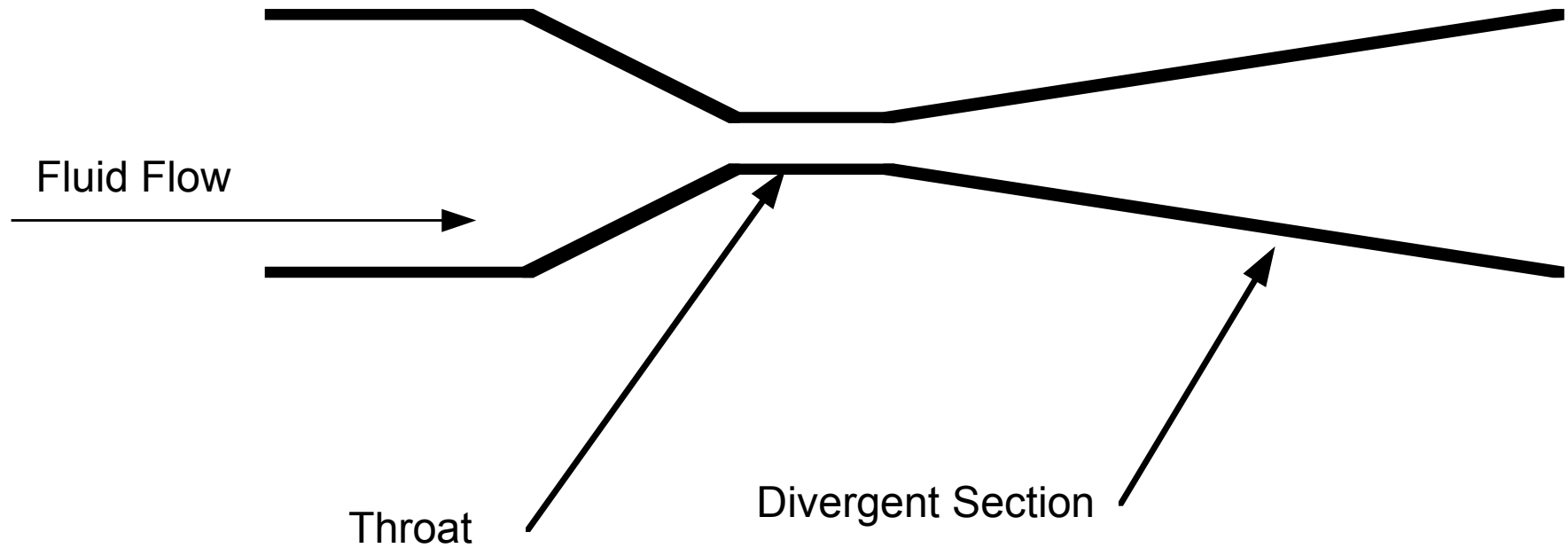


Figure 3. Cavitating Venturi

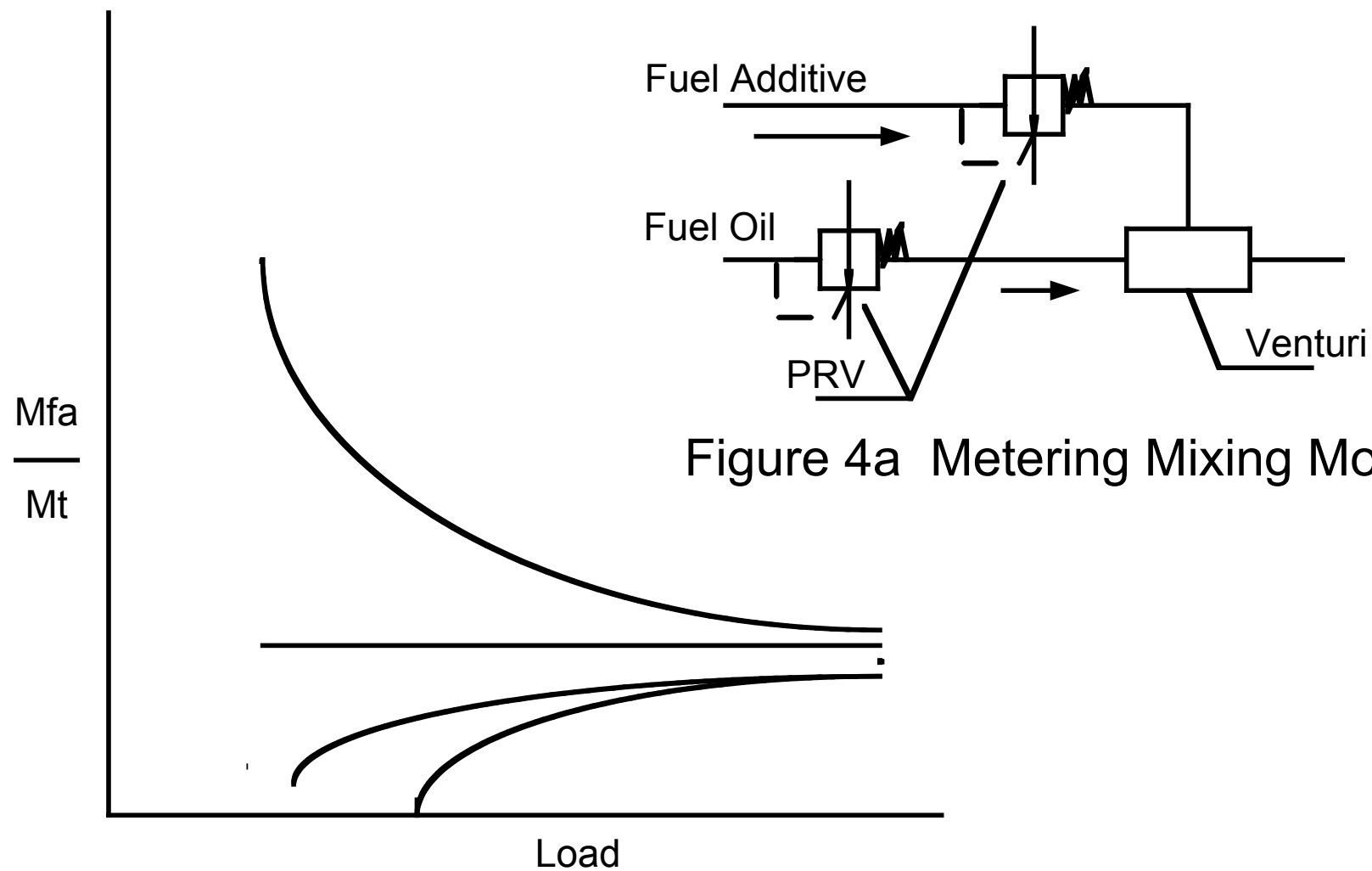


Figure 4a Metering Mixing Module

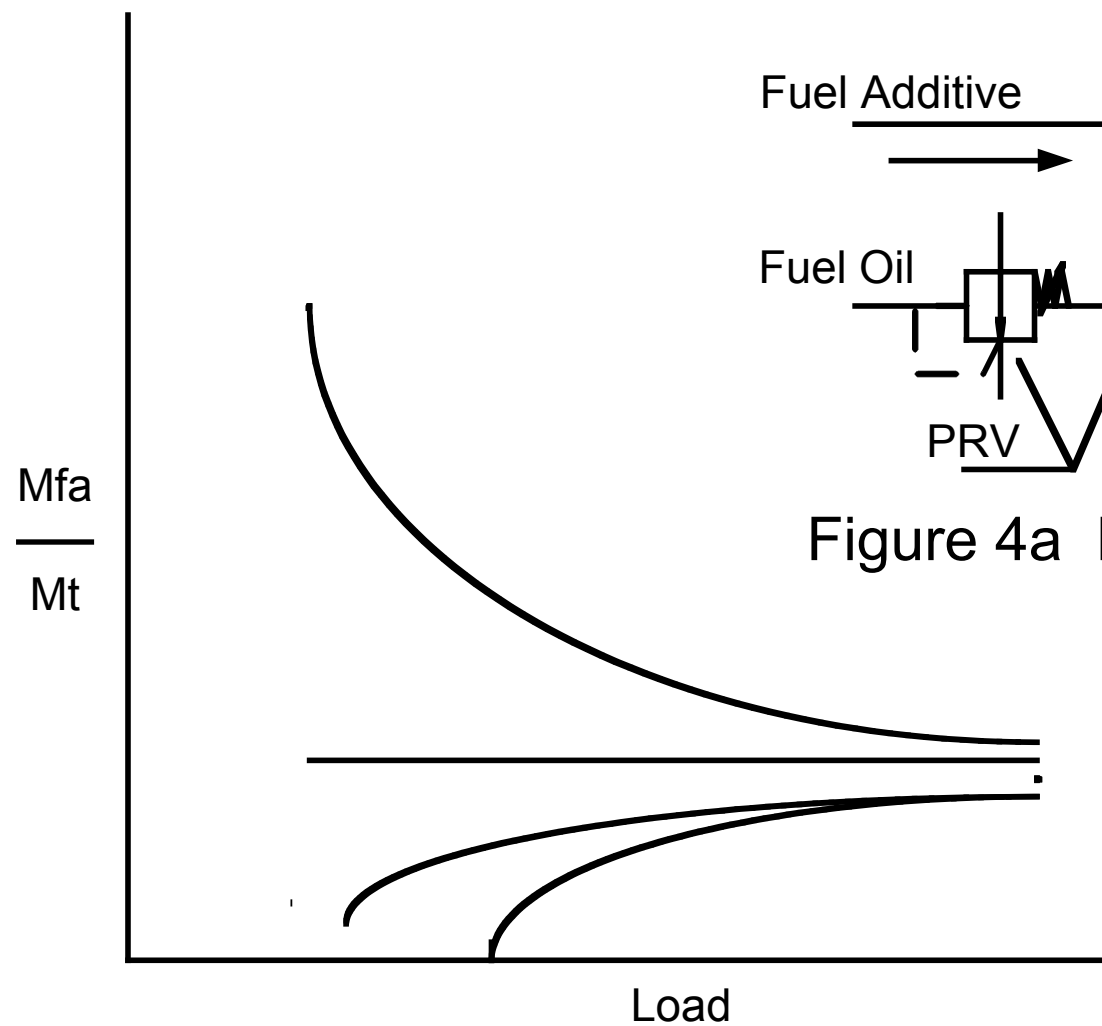


Figure 4b Fuel Flow Map for M

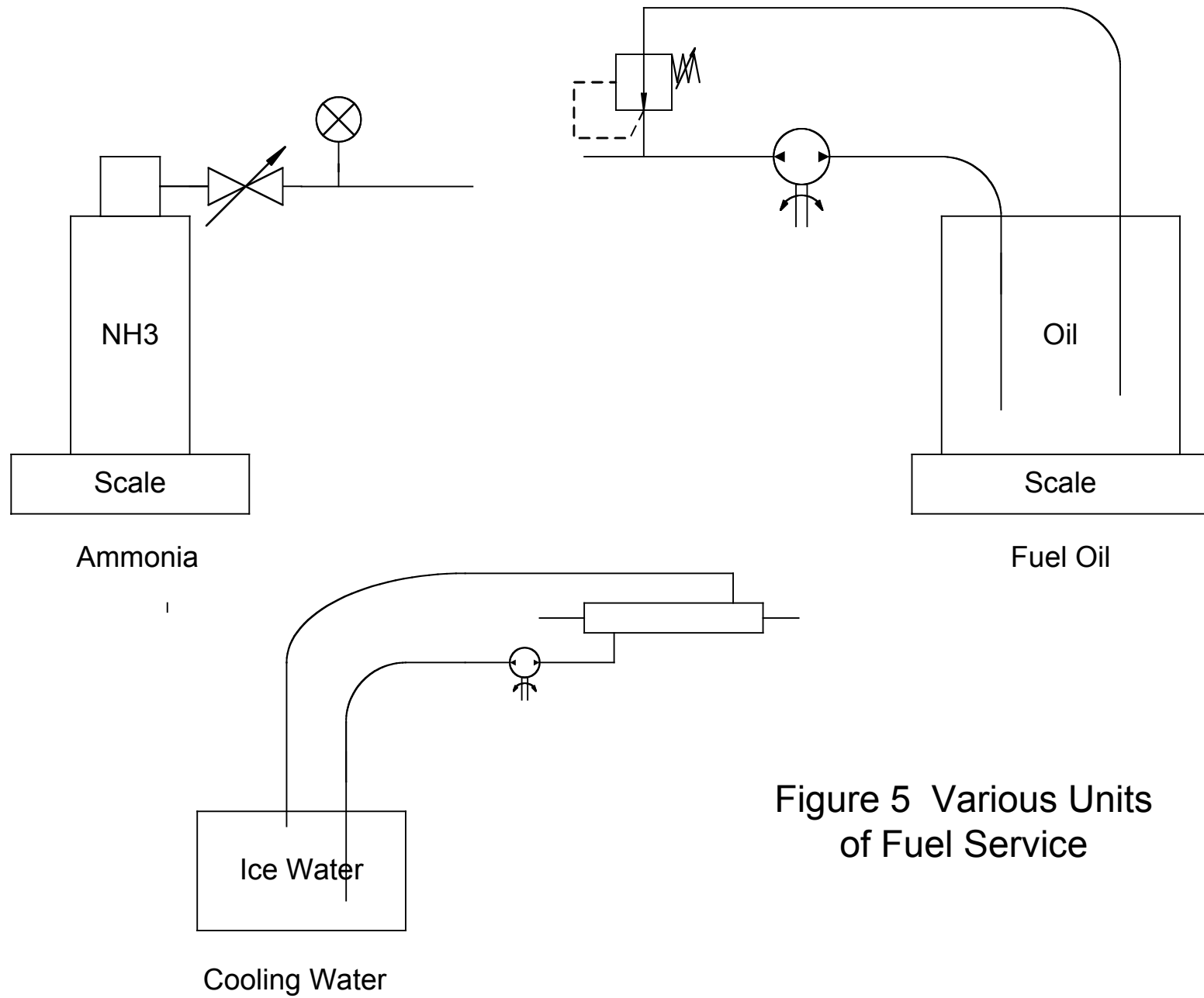


Figure 5 Various Units of Fuel Service

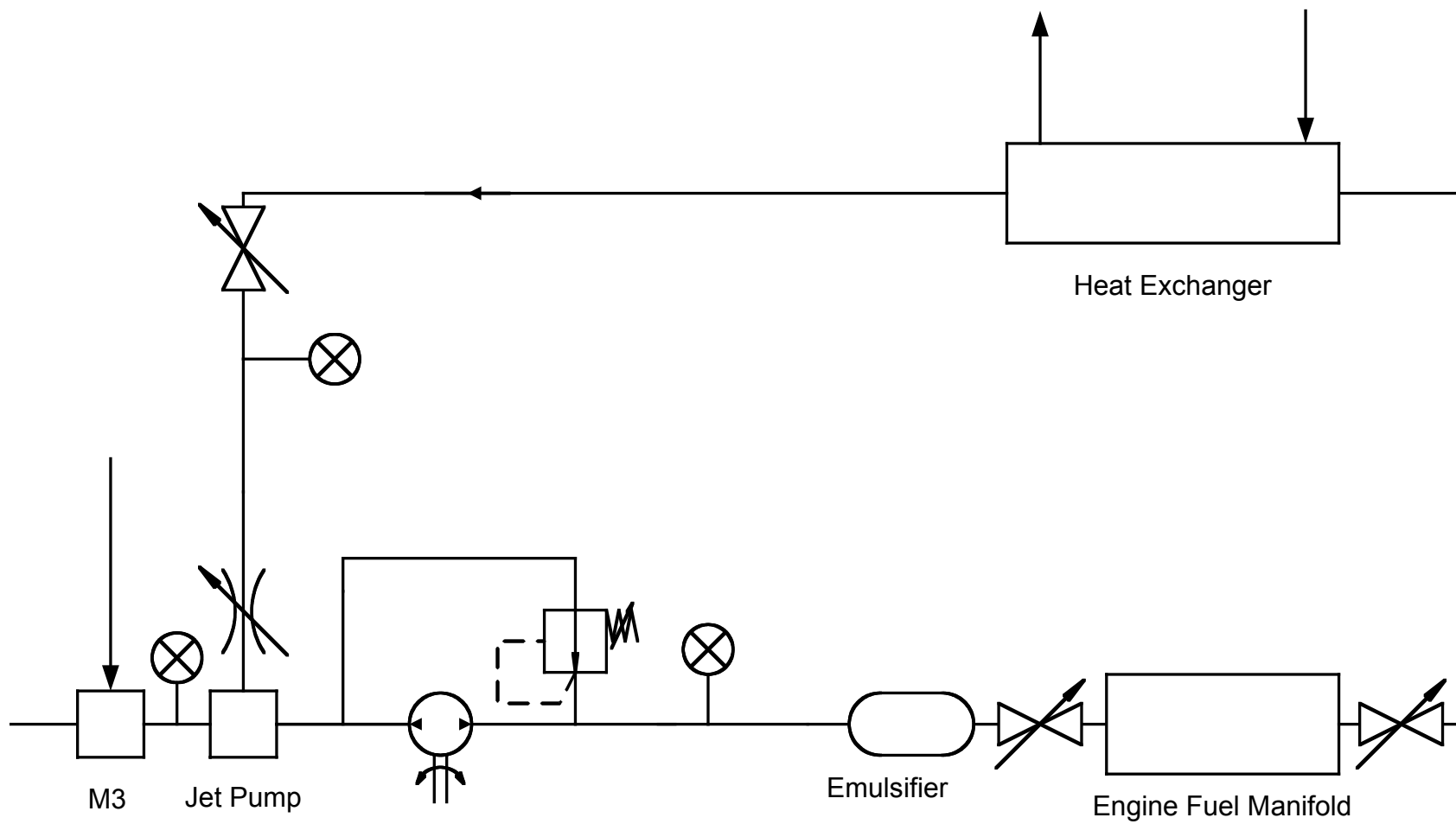


Figure 6. Emulsifier Fuel Service

