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T. O. NO. 12-1-11

HANDBOOK OF INSTRUCTIONS

USE OF GASOLINE CONTAINERS FOR TRANSPORTATION OF DRINKING WATER

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LIST OF REVISED PAGES ISSUED

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This issue contains no revisions.

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SECTION I

INTRODUCTION

1. This Technical Order is issued as the specific instructions for the use of equipment involved.
2. The purpose of this Technical Order is to outline necessary procedure for freeing drinking water of lead, odors of gasoline, and objectionable color that might be picked up from the use, in emergency, of various types of containers that have previously been employed for the transportation of leaded gasoline. Water transported or stored in these containers is not exempt from the usual requirements as to chlorination.
3. In section V, the CAUTION, containing paragraphs 1., 2., and 3., is an excerpt from a report of The Kettering Laboratory of Applied Physiology, College of Medicine, University of Cincinnati, Cincinnati, Ohio. These findings are a result of a special project by National Defense Research Committee, Washington, D.C. Permission for the use thereof is by courtesy of The Kettering Laboratory of Applied Physiology, College of Medicine, University of Cincinnati, Cincinnati, Ohio.
4. Authority for publication of T. O. No. 12-1-11 is the Office of the Air Surgeon.

SECTION II

FIVE-GALLON TIN CANS

1. INSTRUCTIONS IN THE USE OF 5-GALLON TIN CANS FOR TRANSPORTATION OF DRINKING WATER.

- a. Choose new cans with bright interiors.
 - b. Allow the can to drain for 10 to 15 minutes in order to remove as much gasoline as possible.
 - c. Fill the can with water until half full, add 1 ounce of any powdered soap (or 3 ounces of powdered activated carbon), and shake for 5 minutes.
 - d. Discard water and again put in 2 to 3 gallons of water and shake.
 - e. Discard rinse water and fill to overflowing with water. Discard this water.
 - f. Fill with water to be used for drinking purposes.
2. Water thus stored should be used within a few days. Cans placed in water service rust rapidly and should be cleaned to remove as much rust as possible before each filling. It would be preferable, if possible, to discard used cans and to use only fresh cans for water service.

SECTION III
FIFTY-GALLON GASOLINE DRUMS

1. INSTRUCTIONS IN THE USE OF 50-GALLON
GASOLINE DRUMS FOR TRANSPORTATION
OF DRINKING WATER.

a. Choose drums that show no interior scale. The interiors should be bright and the galvanized coatings clearly discernible.

b. If steam is available, steam for 1/2 to 1 hour and proceed with step e. or h. below, depending on the quantity of water available.

c. If no steam is available, aerate for 15 minutes with compressed air.

d. Add 10 to 20 gallons of water, 1 pound powdered soap, and shake by rolling the drum back and forth for 15 minutes over a short distance. Discard contents.

e. Put in 10 to 20 gallons of water, 1/2 pound of activated powdered carbon, and repeat rolling operation. Discard contents.

f. Remove residual carbon by rinsing repeatedly with small portions of water.

g. If time permits and a sufficient supply of water is available, fill drum to overflowing and discard its contents.

h. Fill drum with drinking water.

2. Water may be stored in these drums for at least 8 days. White sediment (zinc compounds) may be filtered off through several folds of closely woven cloth of flannel. If there is a white scale on the interior of the drums, the lead content of the water may increase to above 0.10 ppm. In this case, and also if neither steam nor compressed air is available and step g. must be omitted, the water may have an appreciable gasoline odor. It may be made fit for use, however, by filtering it through a carbon filter case. For most efficient operation, renew the carbon filler for each drum of water filtered. An alternative procedure is to add 1 pound of powdered activated carbon to the water in the drum, shaking it for 10 to 15 minutes. The carbon may be filtered off through several folds of finely woven cloth or flannel.

SECTION IV
GASOLINE TANK TRUCKS

1. INSTRUCTIONS IN THE USE OF GASOLINE
TANK TRUCKS FOR TRANSPORTATION
OF DRINKING WATER.

a. Drain gasoline as completely as possibly from compartments.

b. Steam each compartment for not less than 90 minutes. (A steam jenny such as is used by building cleaners is satisfactory.)

c. Flush out loose scale with a pressure water hose.

d. Fill to overflowing with water in order to displace all gasoline.

e. Drain to the cargo level.

2. Water thus transported may be used without further treatment (other than chlorination) up to 18 hours after filling, if it shows no color or sediment. If the

water has become strongly colored and has picked up sediment, its appearance may be considerably improved by passing it through the standard Army mobile or portable purification unit. This procedure not only removes color and sediment but also decreases the gasoline odor and lead content of the water. All water stored longer than 18 hours in truck with iron tanks should most certainly be filtered through the sand filter to remove lead, for the lead content may have risen above the tolerance limit of 0.10 ppm. Increased assurance as to safety of the water may be provided by adding 0.5-1 gram of powdered activated carbon to each gallon of water, after its collection. After thorough mixing, the carbon should be allowed to settle for several hours and the water should be completely clarified by filtration through the mobile or portable water purifier. Trucks once cleaned and placed in water service improve with use insofar as odor and lead content are concerned, but should be flushed with a hose before each filling to remove scale and rust which will otherwise color the water after only a short period of storage.

SECTION V

GASOLINE TANK CARS

1. INSTRUCTIONS IN THE USE OF GASOLINE
TANK CARS FOR TRANSPORTATION
OF DRINKING WATER.

a. Steam for not less than 6 hours. (Locomotive steam or powerhouse boiler steam must be available.)

b. If possible (CAUTION*) have a man enter the tank car to flush away all loose scale on the surfaces of the tank, by means of a hose and a stream of water under pressure.

c. Fill to overflowing with water to displace any gasoline remaining in pockets, etc.

d. Drain water to level of dome.

2. In using water transported in gasoline tank cars, the same precautions should be followed as in the case of tank trucks.

3. In the case of tanks (either trucks or cars) which show heavy rust and scale deposits, flushing away of the deposit may open up pockets containing droplets of gasoline or uncover fresh surfaces that may be high in their lead content. The result may be to increase the gasoline odor or the lead contamination of the water. Possibly such pockets open up after water has been stored in the tanks for extended periods, and this may account for the gradual increase in the gasoline odor and lead content noticed especially in the rustier tanks. Many of these pockets can surely be eliminated in the case of tank trucks, if the walls are hosed prior to the steaming operation, in addition to the final hosing. In the case of tank cars, it may be good practice to interrupt the steaming after 4 hours in order to hose down the walls. The steaming should then be continued for 2 hours longer, followed by the final hosing procedure as outlined in the recommendations.

Caution

A gasoline tank car should not be entered in the absence of facilities for testing its freedom from harmful or explosive gasoline vapors, except with the following precautions:

1. The man who enters shall be equipped with a full facepiece (covering the eyes, nose, and mouth) or with a partial facepiece (covering nose and mouth) and goggles, to which is connected a canister with an adequate supply of fresh activated charcoal, or a hose line with a constantly supplied and adequate stream of fresh air. The Army service mask will be adequate, if the canister is fresh, but after use in entering a tank car, the canister should be replaced by a new one.

2. A safety line shall be firmly secured to the person entering the tank, by means of a suitable harness or belt, and lead to the outside of the tank into the hands of observers who shall be constantly prepared to remove the individual from the tank at the first sign that he is being affected by gasoline vapors. At least two persons shall be present on the outside to rescue the entrant, and to resuscitate him if need be, by prompt application of artificial respiration.

3. Care against fire or explosion must be taken by all persons in and on the tank car by employing spark proof tools and nozzle, and wearing shoes free of hobnails.

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