

# MISSOURI ABOVEGROUND STORAGE TANK INSPECTIONS AND REGULATIONS

MISSOURI DEPARTMENT OF  
AGRICULTURE



Weights, Measures &  
Consumer Protection  
Petroleum/Propane/Nh3

# 414-052

- ▣ These locations shall be kept in such condition as to be safe from fire and explosion and not likely to cause injury to adjoining property or to the public.
- ▣ The director shall have access during normal business hours to all places where motor fuels are marketed for the purposes of examination, inspection, taking of samples and investigation.

# 414-052

- ▣ Premises utilized for the sale of fuels to be safe from fire and explosion-access for inspection, search warrant –stop use order appeal of stop use order, and hearing.
- ▣ All premises including bulk storage installations, terminals, dispensing or distributing facilities, equipment, appliances or devices utilized for the sale of products regulated by sections 414-010 to 414-152



Ozark tank farm featuring the UL  
142/58 convertizional side draft.

Very rare

24 10:36 AM



UL 142 data plate with STI P3 coating

Single bulkhead

# NO UNDERGROUND TANKS ABOVEGROUND



CONVERTIZONALS





Yes, that really is where he was burning his old tires and trash!





# Weed Control





COFFEE  
BREAK

CENTRAL





TANK STABILITY

22 11:13 AM



12 4:25 PM



UNLEAD

ETHANOL





Areas subject to flooding



Directional vents must discharge away from ignition sources. This includes the transport delivery area



# Directional vents

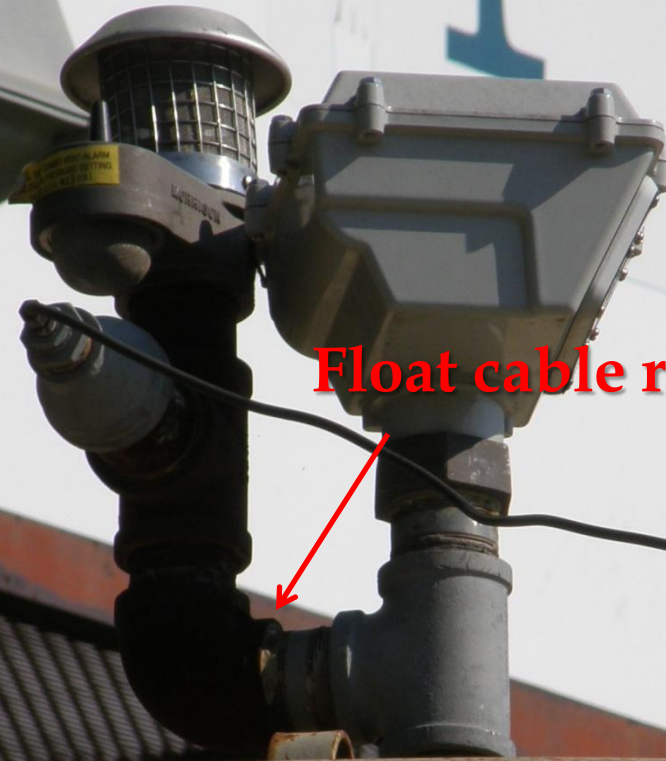






OBSTRUCTED VENTS

**Ignition source in the classified area**



**Float cable restriction**

**Copper vent tub**

**Many problems !**

Normal venting / overfill alarms / tank gauges



A photograph showing a close-up of a 'bull horn twin stack' on a dark, cylindrical industrial structure. The stack consists of two white PVC pipes that join at a central horizontal pipe and then curve upwards and outwards at approximately 90-degree angles, resembling the horns of a bull. Each pipe ends in a white cap. The background is a clear, light sky. The text 'Bull horn twin stack' is overlaid in yellow on the lower right portion of the image.

**Bull horn twin  
stack**







**Cables don't travel well around corners.**



# Incompatibility issues



Vent is restricted down from  
it's nominal size.



Some of the new CARB  
approved vents are restricted  
down.



Vent manifolds





**Premium**

**#2 Diesel**

**Unleaded**

**Never manifold Class I and  
Class II vent Pipes.**

One way to prevent tank overfills from leaving the containment.







# FROZEN VENTS

7 9:26 PM

# January 6, 2005

- Weather Conditions on January 6, 2005
  - Freezing rain, Sleet & Snow, 30° F
- Weather Conditions on January 7, 2005
  - Cloudy/overcast skies, 30° F, & SE winds 0 – 5
- Fire burned for over 30 hours
- Approx. 4 million gallons of water used
- >450 gallons of AFFF foam
- >750 gallons of fuel for the fire fighting apparatus
- Four responding departments - > 100 personnel





8 9:43 AM



8 9:42 AM



8 9:42 AM











8 9:41 AM





# Emergency Venting

Deception



DECEPTION

21 12:39 PM





21 12:38 PM



# Deception







Zip tie method



Vents painted  
shut





ENARDO  
LEVER TYPE  
STACK VALVE





**Shim can affect the operation of the vent and allow fugitive emissions.**





Something's missing



A photograph of a white cylindrical tank, possibly a water tower or storage tank, with a dark, jagged opening at the top. The tank is set against a background of bare trees and a clear sky. The text "Weak Roof-to-Shell" is overlaid on the tank in blue, bold font.

**Weak Roof-to-Shell**



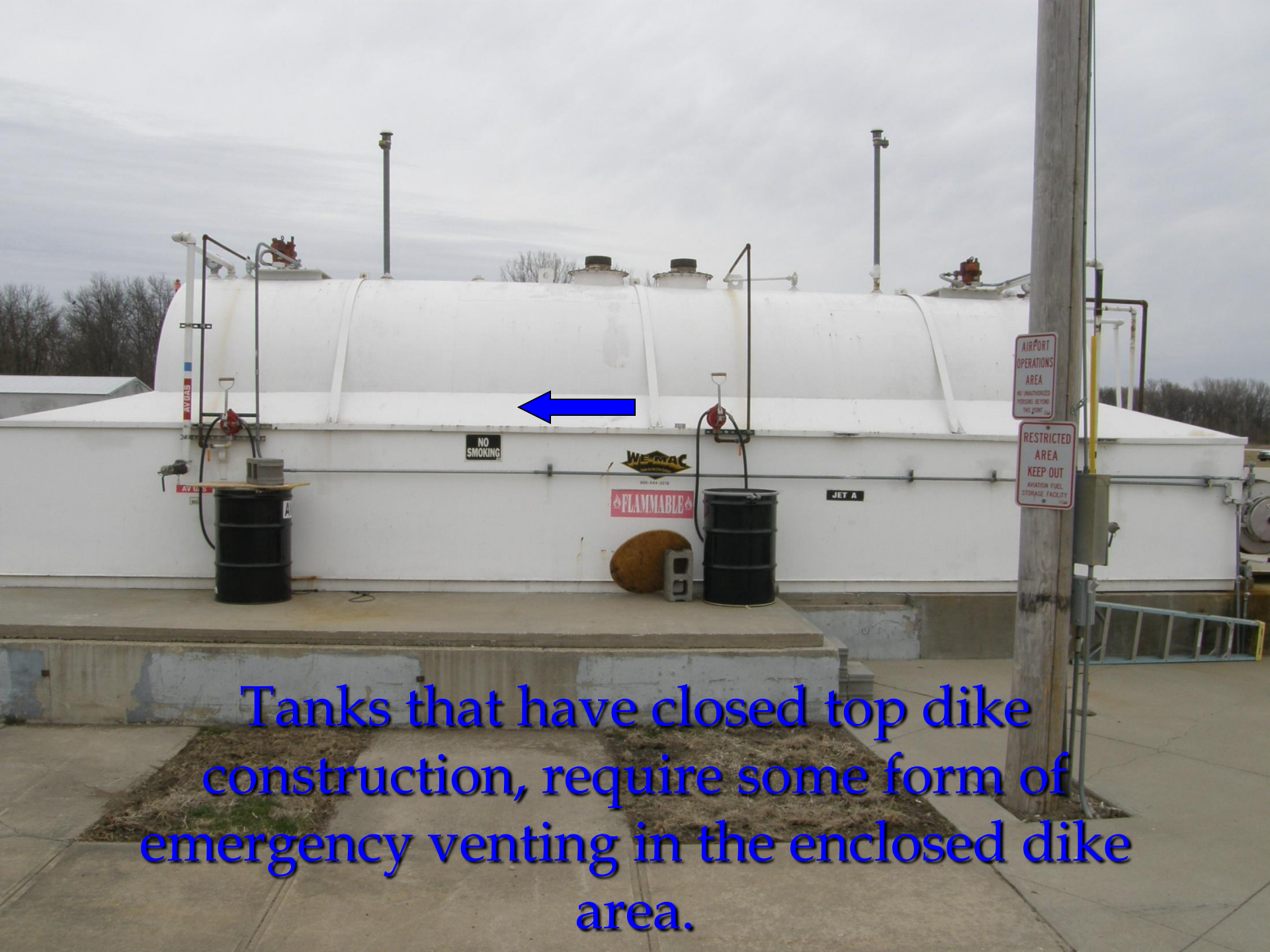
A close-up photograph of a manhole cover. The cover is dark, possibly black or dark grey, and appears to be made of metal or heavy-duty plastic. It is mounted on a concrete base. A long, horizontal metal pipe or rod is positioned across the top of the cover, passing through several holes. This pipe is obstructing the cover from being lifted. The background is a light-colored, textured wall, possibly concrete or masonry. The lighting is bright, creating strong shadows and highlights on the metal surfaces.

Obstructed Long Bolt Manhole  
Cover.

LIST OF  
SCOPE  
WORK

IS PROVIDED WITH  
MERGES

W. A. HILSON



Tanks that have closed top dike construction, require some form of emergency venting in the enclosed dike area.



**Over  
Pressurization**



**NO SMOKING**

NO. 2 DIESEL FUEL



Damage







Riveted tanks

A close-up photograph of a metal surface, likely a ship's hull, showing a horizontal seam and a vertical seam. The metal is heavily rusted and shows signs of wear. The text "Concealed rivets" is overlaid on the image.

Concealed rivets

2

MORRISON.

7-28.

Welded and riveted.





# Manifolds



Every transport drivers nightmare



**1**

**DIESEL**  
**FLAMMABLE**

**STOP**

**IS THE  
DRAIN VALVE  
CLOSED?**

**If filling diesel  
tanks 1-4, tanks  
do not fill evenly.**

**Tank 1 fills much  
faster, watch  
gauges and close  
valve as needed.**



# REPAIRS





# Acme quick plug kit.









21 2:58 PM









SOLVENT

A high-magnification microscopic image of a metal surface. The surface is covered in a dense, granular texture of corrosion products. Numerous small, dark, irregular pits of varying sizes are scattered across the surface, representing localized corrosion. The lighting is directional, creating highlights and shadows that emphasize the three-dimensional nature of the corrosion and the depth of the pits. The overall color palette is grayscale, with some darker tones in the pits and lighter tones on the raised corrosion products.

**Corrosion and  
pitting**

UNLEAD



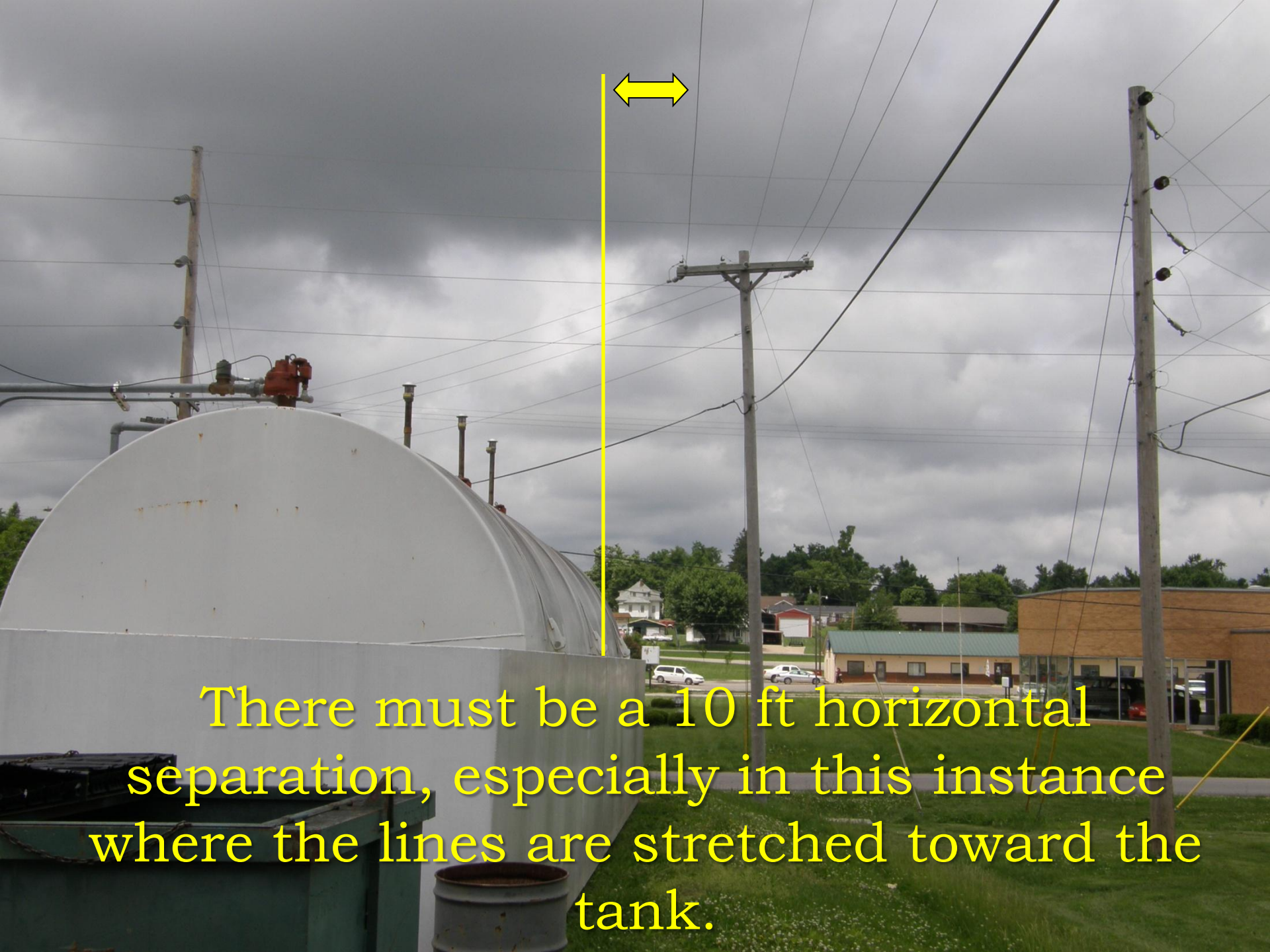


# The Ozarks

NO  
SMOKEING



PERM



There must be a 10 ft horizontal separation, especially in this instance where the lines are stretched toward the tank.





Tape/float gauges must enter tank vertically.



# Separation of LPG storage tanks



# In Missouri, Tanks storing different classes of products must have double bulkheads

#2D Clear

Premium

Unleaded

FLAMMABLE

ULTRA-LOW SULFUR HIGHWAY DIESEL FUEL  
NO. 2 DIESEL - CLEAR



GASOLINE

FLAMMABLE

UNLEADED GASOLINE







Serial No. FS 010548  
FLAMESHIELD™

SwRI I.D. 00077-01/100-01

Listed by:  
**Southwest Research Institute**  
**San Antonio, Texas**

SwRI is recognized as a testing  
laboratory and quality  
assurance/inspection agency by the  
National Evaluation Service, Inc.  
and ICBO ES.

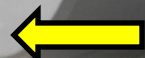
- Follow Installation Instructions.
- Tank is intended for stationary installation.
- This tank is built in accordance with UL 142 (1994) and complies with the requirements of Section 2-4.5(a) of NFPA 30A, 1996 edition as a Fire Resistant Tank.



**FLAMESHIELD**  
Tested to NFPA 30A-2000  
Fire-Resistant Tank  
Requirements



**FLAMESHIELD**  
Tested to NFPA 30A-2000  
Fire-Resistant Tank  
Requirements





DOUBLE WALL  
FIRE RESISTANT

DIESEL



Vapor Recovery

Fill Connection

NO SMOKING  
STOP YOUR ENGINE

COMBUSTIBLE

NO SMOKING

Spill  
Response  
Kit



Missing interstitial plug!

Interstice not sealed



**DO NOT PUT WRENCHES ON HOSE:**

Wrenches must only be used on the *hex* of the fitting.

**DO NOT OVERBEND THE CONNECTOR:**

The installed radius of the connector must be larger than the minimum bend radius defined in *the table below*.

**DO NOT ABUSE CONNECTOR:**

...tracing the connector... contact with other  
...service...

CONNECTORS

Flex piping



Flex connectors

**GORMAN-RUPP**  
**PUMPS**  
MANSFIELD, OHIO U.S.A.







Other related piping issues







FLAMMABLE  
NO SMOKING

FLAMMABLE

JET A

NO SMOKING

FLAMMABLE

NO SMOKING

JET A



2/60 S-75  
VICTAULIC

SPAN

SPAN

Secondary containment











In the Missouri Ozarks old tanks never die





**2,000 GALLON WATER TANK CONVERTED TO  
SMOKER**

# MDA Weights & Measures Petroleum Inspection Program

Ron Hayes, Director

JOHN ALBERT, PROGRAM  
ADMINISTRATOR

CLINT WHITAKER,  
INVESTIGATOR/TRAINER

- ▣ Jefferson City Missouri
- ▣ (573) 751-4278

- ▣ Salem Missouri
- ▣ (573) 751-5636

THANK YOU