ADR LPG TRANSPORT TANK USE GUIDE

Company : MIM-MAK

Service : LPG

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Entrance

BASIC INFORMATION ABOUT LPG

LPG is an abbreviation for liquefied petroleum gases, just like gasoline, diesel and fuel oil.

obtained from the refining of petroleum. LPG consists mainly of butane and propane, with a small amount of

consists of similar hydrocarbons.

Butane and propane, which are gaseous under normal atmospheric pressure, can only be stored in tanks.

When stored, it is in liquid form under certain pressure.

When released from pressure, LPG evaporates rapidly and expands 300-350 times its liquid volume.

Some properties of liquefied petroleum gases are:

Feature		**Butane**	**Propane**
Density @ 15°C	kg/it	0.580	0.505
Specific gravity of the gas	air = 1	2.07	1.54
phase Specific volume @ 15° C	3m _ /kg	0.407	0.535
Evaporation temperature at atmospheric pressure	oc	-0.5	-44
Gross caloric value, liquid	kcal/kg	11,800	11,900
Gross calorific value, gas, @ 15 °C and 1 bar	kcal/m3	28,800	22,300
heat of evaporation	kcal/kg	91.5	101.7
Combustion limits when mixed with air	Top % Lower%	1.8 8.4	2,4 9.3
Ignition temperature	revenge	525	535
Air required to burn 1 **m3** of gas	3m	29.5	23
flame temperature	revenge	1,925	1,920

The properties of a mixture can be found by calculation. for example,

70% Butane and

30% Propane blend density

= 0.70 X 0.580 + 0.30 X 0.505 = 0.558 kg/it.

The following precautions should be taken when using LP-Gas:

During freezing of storage tanks that will allow the liquid LPG to evaporate.

space must be left on the tank. For this reason, the volumes of storage tanks

It is filled up to 85% and the remaining 15 % *teak volume meets evaporation. Overfill, YE!ngin*

and may cause an explosion.

Storage tanks are equipped with safety valves. Storage tanks are subject to excessive heat

pressure rises when exposed to (eg in case of fire). The tank pressure is

When it reaches the value, the pressure safety valves open and the excess pressure is released to the tank.

they protect.

LPG devices consume LPG in gas form. Considering the LPG tank, it is on the upper side of the tank.

gas phase is burned. Some liquid then evaporates and thus *tank pressure constant*

remains. The heat required for evaporation is taken from the product itself and from the tank body. Therefore

The LPG tank body cools down during use. But for evaporation in industrial uses

More heat is needed than the heat taken from the tank body. For this reason, industrial

In applications, LPG vaporizer/ar is included in the system.

Liquid LPG evaporates quickly when released into the atmosphere. The heat required for evaporation

taken from any object. For this reason, cold burns can occur when liquid LPG comes into contact with the skin.

it causes. The effects of cold burn on the skin are the same as hot burns. _

When liquid LPG is released into the atmosphere, it quickly evaporates by taking the necessary heat from the environment. in this surrounding

causes some of the moisture in the air to condense. shaped white fog

this image allows us to distinguish a liquid LPG leak from a gas leak.

LPG itself is odorless. However, there is an irritating odor that will enable the detection of gas leaks.

has been added.

LPG gas is heavier than air. For this reason, instead of spreading, it accumulates on the ground. Leaking gas from slopes

flows and accumulates in holes, pits and channels. When it reaches the lower glare rate (2%)

explosion may occur.

LPG is not toxic, but can cause suffocation by displacing air. 1 % *O LPG mixed*

breathing air causes fatigue, while higher concentrations and longer duration

inhalation can cause death.

GAS LEAK CONTROL

LPG is harmless as long as it is in closed containers or pipes. But some users

errors can cause serious hazards.

When the three elements come together, a fire triangle will cause a fire or explosion.

it is completed. These

1) Evaporated fuel

2) Weather

3) spark

If any of these are missing, there is no risk of fire or explosion.

gets up. In case of LPG leakage, there is vaporized fuel in the environment. always in the atmosphere

Since air is present, the 2 elements of the fire triangle are ready. In this case, explosion and fire

The most effective way to prevent spark is to prevent spark.

The factors mentioned above are not only for LPG, but also for all liquid, gas and solid fuels.

also applies to

A- Detection of Leaks

NEVER SEARCH FOR LEAKS WITH A BARE FLAME

Since LPG is heavier than air, the leak does not spread easily. Gas spilled on the floor in pits, channels, etc. accumulates. In this case, an open flame or a spark will cause an explosion.

After a new installation or in case of any suspected leakage, clean with soap and water. leak test should be done. Soap bubbles at every connection point on the plumbing or leaking It should be applied wherever possible. Growing bubbles indicate leakage. This is a safe and effective method that detects even small leaks.

B - What To Do When There Is A Gas Leak Panic is more dangerous than a gas leak. It's important to stay calm. First leak detection then the nearest valves that can cut the leakage should be closed.

What to do in detail:

1. In case of gas leakage, all operations in the environment that will cause fire and sparks must be stopped.
2. Never pocket in the leak area. Do not use a cordless or cordless telephone. Ex-proof Any type of electrical device other than those - even a battery powered flashlight - with explosion may result in ignition. Never in areas with gas leaks electrical devices should not be used
3. Never turn off working electrical devices. electrical devices when shutting down there is a spark in the keys. Turning off a switch is from a running engine or on more dangerous than a lamp.
4. The area with gas leakage should be ventilated immediately.
5. When there is a large leak in the open environment, the area until the LPG dissipates. should be ventilated. Spraying water with a hose and sweeping the area with water spray, It will help disperse the gas.

C - When Leaking Gas Causes Fire

The general rules for fighting LPG fires are as follows:

1. Put out the flames and stop the leak if you can stop the leak.
2. If you can't stop the leak, let the gas burn but keep it from spreading. be. When the gas runs out, the flame will go out by itself.
3. The most dangerous situation in LPG fires_ when you cannot stop the leak and the flame comes into contact with the tank. the situations it does.

The flames heat the LPG and more LPG evaporates. In this case, the pressure in the tank begins to increase. With increasing temperature, the strength of the tank body begins to decrease and BLEEVE occurs. Therefore, it is very important to cool the tank.

WORKING INSTRUCTIONS

LPG transport tankers are designed to operate regularly in all road conditions. There are a few rules that must be followed in order to use transport tankers in a healthy way.

- Transportation should be done within the relevant filling rates.
- Transportation should be done within the appropriate filling range .
- The ground must be flat during filling and unloading.
- The movement of the transport tanker must be supported by brakes during loading and unloading.
- Hoses used for filling and draining must be connected to ACME couplings. These must be tightened with their own private keys.
- Pressure remaining in the hose after filling and draining It must be reset by means of a tool and then disassembled. keys
- Tank level magnetic level indicator and tank maximum filling fixed level must be controlled by the valve.
- Filling, when the tank reaches 85%; discharging, tank reaches 2% level time is stopped.
- Pressure and temperature changes should be monitored via manometer and thermometer.
- Manometers and thermometers should be calibrated annually.
- During LPG loading, the empty tank must be grounded first.
- Fire extinguishers on the vehicle should always be full and easily accessible. should be on the ground.
- Fire extinguishers of all sizes should be inspected periodically.

FIRST FILLING OF THE TANK

Before the tank is put into operation, the remaining air must be evacuated. Evacuation process water It can be made with nitrogen or LPG gas phase.

- **Discharge with Water**

While the tank is filled with water with the help of a suitable pump, air is discharged from a nozzle on the top of the tank. Then, while the gas phase is supplied to the tank from above, the water is discharged. tank water completely before commissioning. Make sure it is evacuated.

- **Discharge with Nitrogen**

If nitrogen is available, this is the safest and most convenient method. The tank is filled with gas nitrogen at a pressure of 0.5 bar , then the pressurized gas in the tank is discharged. This process is done inside the tank. It is repeated 3-4 times until the O2 concentration in the atmosphere drops below 5%. Then LPG gas phase is taken into the tank. The denser LPG compresses the nitrogen into the upper part of the tank. tank Before commissioning, the nitrogen trapped here must also be evacuated.

• Discharge with LPG Gas Phase

Care must be taken when evacuating with the gas phase, because the air in the LPG gas phase ·11e tank can form a flammable mixture. However, with LPG gas phase

Evacuation is a method that can be applied to stones smaller than 200 **m3 .** LPG gas phase is supplied to the tank from the lower part of the tank and the pressure is expected to rise to 1-2 bar. The gas phase will compress the air into the upper part of the tank. That a rich non-flammable mixture occurs in the tank. we accept. Then, the air trapped in the upper part of the tank is discharged from a suitable nozzle. is done.

ATTENTION!

- The tanker should not be filled more than 85%. The level should be monitored with a magnetic level indicator and a fixed level indicator.
- While the gas-air mixture in the tanker is evacuated, it is removed from the filling facilities and the settlement. Care should be taken to prefer areas that are far from the units.

USE OF GROUND REEL

The ground wire **(Picture 1)** is wrapped in air.

If the grounding cable is to be opened, the grounding reel switch located on the right side of the cabinet should be turned to the open position. The cable is opened manually.

Picture 1

ATTENTION!

1. There is an emergency stop button on the tanker. The front of the tanker chassis positioned on the left side of the cabinet. If an emergency arises, the internal valves are It can be stopped using one of the stop buttons.
4. The pressure in the air tank should always be at the level of 7-8 bar. Pressure can be measured with the manometer on the air tank. If the pressure value is different, the regulator It is adjusted to 7-8 bar level with the valve on it.

Picture 2-3

SAFETY VALVES

- The internal pressure of the tanker may increase up to the tanker design pressure for various reasons.

  Tankers are subjected to test pressure at the factory according to the design standard conditions.

- Tankers are equipped with two safety relief valves (See: **Picture 4).** These safety valves

  It is designed to open at 17.2 bar pressure. when the internal tanker pressure reaches 17.2 bar,

  safety valves open to relieve excess pressure.

- Calculation of the required discharge capacity for a tanker, the surface area of the tanker

  it depends. The model, size and number of safety relief valves

  determined by its capacity.

- Safety relief valves should be tested every five years; After the pressure is reduced, True

  It should be seen whether it is opened under pressure and whether it is tightly closed.

- Safety relief valves should be replaced after 5 years or when they are not working properly.
- Safety relief valves must not be repaired or readjusted.
- The plastic cover **(Picture 5)** on the safety relief valve must be kept. Plastic

  cover from rain, snow, ice, sand, dirt, gravel, insects, other debris and contamination.

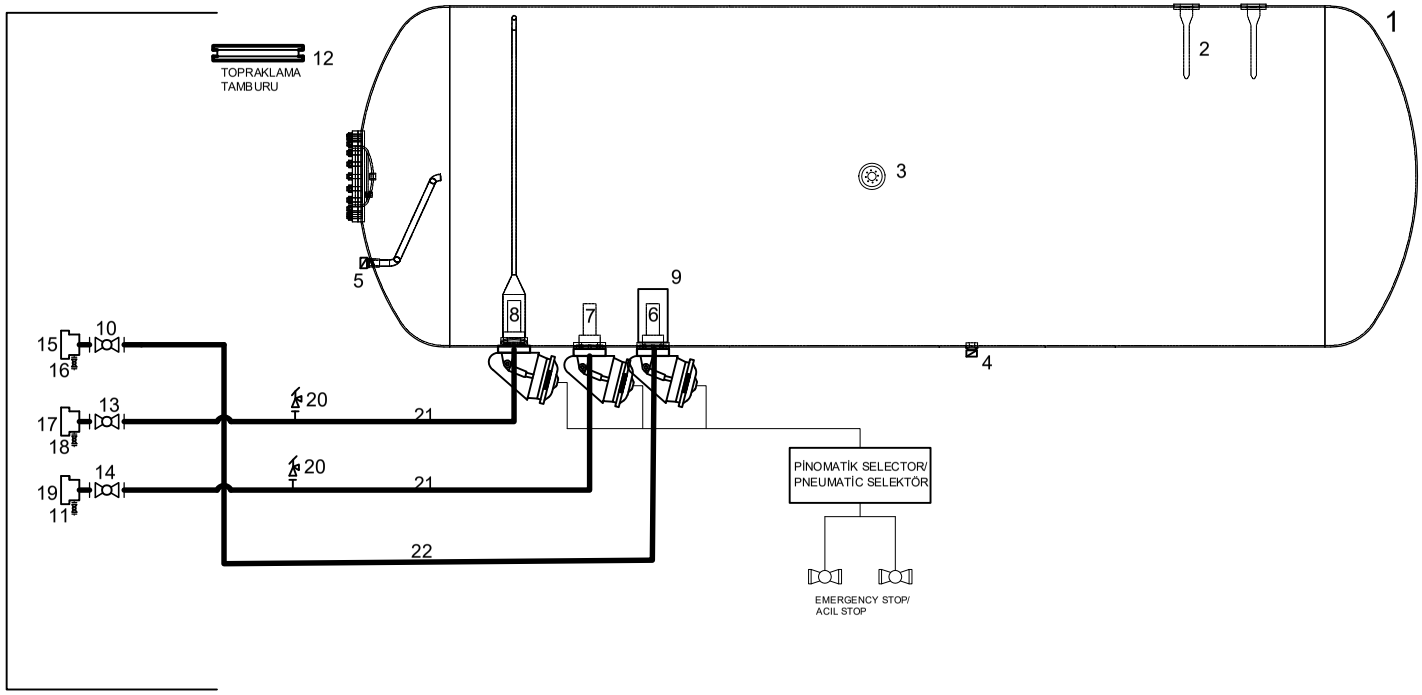
  It helps to protect the safety relief valve against malfunctions.

- **NOTE: Replace damaged or missing plastic caps and always check the safety valve.**

  Keep it covered with a lid.

PICTURE 4

PICTURE 5



Ekipman Listesi			
S.N	Ekipman Adı	SIZE	STANDART
1	Tank Gövdesi		
2	Emniyet Ventili	3"	
3	Rochester	4"	EN 13799
4	Drain Valve	11/4"	
5	Acil Tahliye Valfi		
6	Likit Boşaltma Valfi	3"	EN 13175
7	Likit Dolum Valfi	2"	EN 13175
8	Gaz Dengeleme Valfi	2"	EN 13175
9	Filtre	4"	
10	Likit Boşaltım Ağzı Vanası		
11	Hat Boşaltma Vanası		
12	Topraklama Tamburu		
13	Gaz Dengeleme Ağzı Vanası		
14	Likit Dolum Ağzı Vanası	1"	
15	Likit Boşaltım Ağzı		
16	Hat Boşaltma Vanası		
17	Gaz Dengeleme Ağzı	2"	
18	Hat Boşaltma Vanası		
19	Likit Dolum Ağzı		
20	Hat Emniyet Ventili	1/2"	
21	HAT TESİSAT BORUSU	2"	EN 10216-1/
22	HAT TESİSAT BORUSU	3"	EN 10217-1

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