



## **MODULE 3**

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- How to handle emergencies
- What to do in case of an emergency

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## **Autogas vehicle's safety features**

Autogas vehicles are safer in many ways than gasoline vehicles since the tanks are much stronger and have numerous safety features built in.

- The fuel tank is built of steel and is far tougher than a gasoline tank, allowing it to sustain larger impacts than regular gasoline tanks.
- The tank contains a pressure relief valve that opens at 27 Bar in the case of a fire that is heating the tank, releasing excess gas and preventing a BLEVE.
- On both the tank and the filler, a non-return valve prevents gas from escaping through the filler intake.
- In the event of a breakage in the pipeline to the engine, an excess flow valve is installed at the tank end. Even if the engine is still running, this valve automatically reduces the supply to a minimum.
- To prevent Autogas from entering the car, the tank's valves must be enclosed by an airtight cage with an atmospheric vent.
- A stop fill valve with an 80 per cent shutoff is also included in the tank. This permits the liquid Autogas to expand in the tank.
- After 2001, all tanks must have an automatic shut-off solenoid installed. When the vehicle is turned off, stalls, or is switched to petrol supply, this device immediately turns off the fuel

supply from the tank. Many conversions before this period have this safety precaution as well, and conversions without an automatic solenoid may have a manual shut off valve in situ.

### **What to do in case of an emergency**

If a vehicle is on fire, there are several dangers to consider.

The greatest dangers associated with a tank of this type under fire are caused by the tank itself. These tanks, like other cylinders, are vulnerable to a BLEVE (boiling liquid expanding vapour explosion). The high heat of a fire can cause a weak area in the cylinder to shatter, which will result in BLEVE.

Vehicle Autogas tanks are required to have a pressure relief valve installed to help prevent an explosion. However, it can still be a problem because the pressure relief valve will emit a large amount of gas, resulting in a jet of flame.

When the vehicle is on its roof, the same behaviour is seen, however liquid instead of gas is ejected from the relief valve, which expands 250 times when it reverts to a gas, resulting in a larger jet of flame.

- To begin, attempt to determine if it has an Autogas conversion, and if it does, proceed with utmost caution.
- Firefighting must be done with the proper PPE (full fire kit and breathing apparatus).
- If Autogas is discovered, the first concern should be to cool the tank to prevent it from fracturing, which can be accomplished with a jet rather than a hose reel. Consider employing the services of a ground monitor.

- When approaching the car while still alight, exercise extreme caution because the pressure release valve may actuate, resulting in a jet of flame.
- Set up a perimeter around the car, with a radius of 150 meters suggested by the Hereford & Worcester Fire Brigade. Ensure that all members of the public are out of the exclusion zone, and residents of the impacted region should remain indoors and watchful.
- Once the fire is completely out, make sure the tank is cool and inspect for any cracks or leaks, especially if there's a danger the fire can re-ignite.

### **When there's a leak, there's a lot of danger.**

Other than the smell, Autogas may be detectable. The chilling effect of Autogas on the surrounding region may manifest itself as frost near the site of escape, making it easier to detect. Because Autogas has a different refractive index than air, escaping vapour can appear to shimmer.

Autogas vapour is an anaesthetic and can be an asphyxiant by diluting or decreasing available oxygen, especially if it is in an enclosed structure like a garage, even if it is not hazardous at extremely high quantities in the air.

If personnel are unsure how to deal with or isolate a leak or incident, they should seek help from an expert.

If the leak cannot be stopped, the volume leaving and the direction it will flow – given the wind direction and the fact that it will flow to the lowest point – must be considered to calculate the perimeter and precautions for the region.

PPV can be used to ventilate and distribute vapours. Especially if there are drains or ditches nearby where vapour pockets could form.

- If not already done, make sure the engine is turned off and the battery is unplugged.
- If a large amount of gas has leaked and there is a risk of igniting, seal off the area with a perimeter of at least 150 meters.
- Prepare any essential equipment, such as a PPV camera.
- Make sure there are no open fires or smoke in the area, and that there are no ignition sources. Be aware that, similar to petrol vapour, even opening the vehicle door or boot can activate a light switch, which can cause ignition.
- Consider the importance of BA, particularly in enclosed spaces.
- If it is safe to do so, push the car into an open area if it is in an enclosed place.
- While trying to figure out if there's a leak and where it's coming from, make sure you're wearing the proper PPE, which includes gloves and making sure your goggles and visor are both down to avoid cold burns.
- Determine when the LPG has been dispersed (note that even when no harmful quantities of gas are present, there will be a residual odour) and the area can be reopened.

### **Hazards in the event of an accident with an Autogas leak but no fire**

Apart from the safety elements stated above, an Autogas tank is much less likely than a fuel tank to shatter or leak due to impact.

Crews would have to undertake a rescue with the risk of igniting any leaking gas if people were trapped in an Autogas car with a leak. Metal on metal can cause sparks, even if the cutting equipment isn't meant to do so.

Also, because the power pack is not intrinsically safe, it must be placed as far away from the incident as feasible, with both hose lines drained.

To disperse vapours while working on the car, use PPV:

Use additional caution when operating spreading and cutting equipment, particularly the hydraulic ram. There is still fuel in both the supply line to the engine and the line between the tank and the filler, even though there is no leak and the tank is isolated. Despite being in locations that would ordinarily necessitate cutting or spreading, supply lines may occasionally run near the vehicle's sill rather than underneath it. As a result, there is a risk of localized tearing and deformation of the dashboard sill when conducting a dashboard roll. If the pipes burst, there will be a leak and the associated dangers of fire. So, before cutting or spreading the area, try to locate the pipes.

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