



# The I-ENG-A Report

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## Propane Grill Fire: *Don't burn down the house with the turkey!*

In this investigation, a barbecue fire made a complete disaster out of what would have been a perfect picnic. Almost the entire house and two vehicles burned up in the flames. How could a little grill fire cause so much damage? Let's find out...

It was a Saturday at about 5:00 pm when the insured was grilling a turkey on a propane fired grill. He was in the kitchen and heard sounds coming from the grill location out on the patio. When he went to see what happened, he was shocked to see the entire side of his garage on fire including two cars. The house was severely damaged. In fact it was uninhabitable as a result.

The clean-up of the site was already in process when the engineer arrived and most of the original fire scene had been disturbed by fire investigations in the morning and heavy rains. Debris was already being loaded into a large dumpster.

The insured arrived and stated that he started cooking the turkey at about 4:15 pm, when he went to check and remove the gizzards. At that time it was working fine. He returned to the kitchen and started to prepare potato salad for the picnic. After hearing explosive noises outside, he went out to look and discovered the fire. It spread rapidly and was soon engulfing the garage and moving into the house.

The proximity of the grill to the garage at the time of the fire is not known exactly. The position measured approximately 42 inches from the wall. The grill was estimated to be no older than two years. It was a large grill with a surface burner off to the side to cook items in a pot or pan.

There were two propane cylinders involved. The first was the original tank (Tank 1) which came with the grill. The other was a newer cylinder

purchased as a spare on a later date (Tank 2). The original tank was in service at the time of the fire. Tank 2 was sitting in a standby storage on the grill framework alongside the tank that was in use.

Meanwhile, the turkey was lying on the ground in pretty good shape for all it had been through. It was on the side of the garage when the engineer arrived, but initially had been found after the fire on the northeast side of the garage. It was reportedly seen being carried around by the neighbor's dog. It did not appear to have gone through an explosion and was quite evenly browned with what appeared to be evenly done interior meat.

While the insured stated that he had the reserve propane tank in storage (unconnected) on the grill frame, the photo only showed one cylinder. Visual inspection of the shut-off/relief valves showed both tank valves to be in the open position. The melted valve handles molten aluminum locked the valves in place. To verify that the valves were open, radiographs (x-Rays) were taken and confirmed the fact.

There should have been a pressure regulator between the gas cylinder and the grill burner. No such regulator was found at the fire site.

There is a voluntary safety standard promoted by the Consumer Product Safety Commission (CPSC) which went into effect 1 Oct 95. It added three additional safety features:

1. A device to limit flow in case of line rupture.
2. A mechanism to shut off the grill if high temperatures are reached.
3. A feature to prevent the flow of gas if the connection between the grill is not leak proof.

There were obviously some unanswered questions at this point in the investigation:

1. The insured made it a point to state that he always closes the cylinder shut-off valves when not using the grill. The valve for Tank 2, the unused tank, was open prior to the fire and the tank wasn't connected to anything.
2. Why was the grill placed so close to the garage when the wind was from the east, blowing directly at the garage?
3. Why doesn't the spare tank show in the photo?
4. Why isn't there any sign of a pressure/flow regulator?
5. Why would a spare container be kept on hand under the grill? Why would a spare cylinder have a different connection configuration than the primary cylinder?

In conclusion, the engineer's opinion stated that there was not a malfunction of the propane tanks or their shut-off valve assemblies. There was not a likely explosion because an explosion requires containment. The only vessels offering any containment would have been the cast aluminum housing which contains the burner and the two propane cylinders.

Since the aluminum housing melted, briquettes were not strewn about the property, the burner was still intact, and the tubular steel frame was still intact, it is unlikely that the cooking containment exploded. The propane cylinders were still intact, so no explosions took place there either.

There could have been several instances where ignition of flammable fuels could have given off a sensation of explosions.

In the end, there were four violations of good practice which took place prior to the fire:

1. The spare tank was stored on the grill frame while the grill was in operation (against all recommendations).
2. The grill was in close proximity to the garage in the face of a wind which blew heat directly on the garage wall.
3. The grill was unattended for extensive periods of time. What might have been a minor incident became a catastrophe.
4. There was no evidence of a pressure/flow regulator having been installed.

The origin appears to have been the grilling process, but the cause was not defective tanks or valves. It could have been a defective hose, but with everything gone, it was unable to be proven. It was the engineer's opinion that the cause was one or more of the four good practice violations uncovered.

For more information about Safe Grilling Guidelines, contact the Barbecue Industry Association ([www.nbbqa.org](http://www.nbbqa.org)) or the National Propane Gas Association ([www.npga.org](http://www.npga.org)).

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**COMPANY NAME**

Address Line 1  
Address Line 2  
City, ST 11111



**COMPANY NAME  
STREET ADDRESS  
CITY, STATE 00000**