

Sticky Bomb Detection

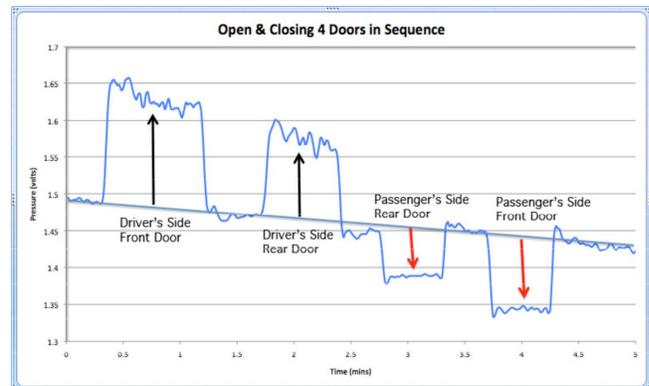
“Sticky bombs” are a type of improvised explosive device (IED), typically placed on a motor vehicle by a terrorist.

Tire Pressure

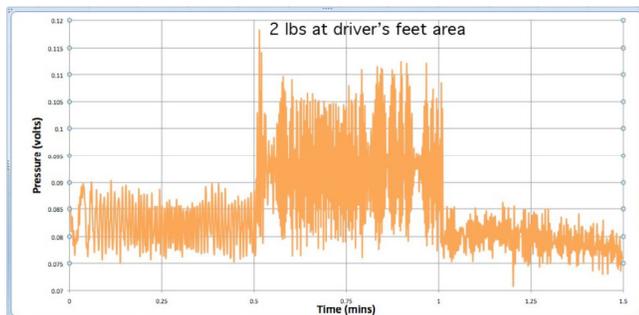
The Vulnerability Assessment Team (VAT) at Argonne National Laboratory has demonstrated that precisely monitoring the pressure in a tire makes it possible to detect a change of less than 5 ounces in the weight of a parked motor vehicle and its contents. This can be used to detect:

- placement of a sticky bomb
- placement of a surreptitious tracking device
- placement of a surreptitious eavesdropping device
- theft from the vehicle
- tampering with the vehicle
- intrusion into the vehicle
- which door was opened
- a person lurking or hiding in the vehicle

Even better sensitivity is possible with further work.



While monitoring the tire pressure on the front driver's side tire, each of the 4 car doors are opened, then closed in sequence. The magnitude and sign of the pressure change can be used to determine which door was opened. (Opening a passenger-side door causes a negative pressure change because the vehicle leans in the opposite direction compared to when a driver's-side door is opened.)



Relative tire pressure vs. time. A 2 lb weight is added to the parked vehicle at 0.5 minute, then removed at 1 minute.

Magnetic Detection

Sticky bombs or surreptitious electronic tracking devices are sometimes placed on vehicles using magnets. The VAT has demonstrated that inexpensive magnetic sensors can detect the magnets on parked vehicles.

Moving Vehicles

The magnetic technique should work well on moving vehicles. (AC magnetic fields and movement within the Earth's magnetic field do not cause problems.)

The tire pressure technique can potentially work on moving vehicles if an accelerometer and thermal measurements are used to correct for road vibration. The sensitivity, however, is likely to be less.

VAT Awards

The Argonne Vulnerability Assessment Team has won numerous awards. A partial list includes:

- * 10 U.S. patents
- * BECCA Honorary CCO Award for contributions to homeland security, 2009
- * LANL Fellows Prize for Outstanding Research, 2004
- * LANL Achievement Awards, 2007, 2004, 1999 & 1995
- * Distinguished Performance Award from the CIA, 2002
- * "Excellence in Performance Measure" Award, American Society for Industrial Security, 2002
- * LANL Distinguished Performance Awards, 2001 & 1996
- * Excellence in Technology Transfer Awards, 1997 & 1992
- * R&D 100 National Awards, 1992 & 1994
- * "Best of What's New Award", Popular Science, 1992



About Argonne National Laboratory

Argonne National Laboratory, the nation's first national laboratory, is one of the U.S. Department of Energy's largest national laboratories for science and engineering research. Argonne has approximately 3,000 employees, including 1,000 scientists and engineers, three-quarters of whom hold doctoral degrees. Argonne's annual operating budget exceeds \$630 million. Since 1990, Argonne has worked with more than 600 companies, federal agencies, and other organizations.

Currently, 16% of Argonne's budget is for intelligence, defense, and homeland security projects (up from 6% before September 11, 2001). The long-term goal is to significantly increase this percentage.

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