Getting a Hook on a Diesel Nozzle

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An invitation to share technical information —Preventing nozzle fallout
An important part of PE&T's mission is to keep readers informed on the latest petroleum equipment and technology. In past issues, for example, we have presented several feature articles on petroleum dispenser technology and will have additional articles on that subject as developers of that technology provide the material. Recognizing the time is here for covering the latest in dispenser nozzle technology, PE&T invited all nozzle manufacturers listed in the Petroleum Equipment Institute's 1999 Directory to submit material on their recently developed unique nozzle technology. The two articles on pages 46-48, cover technologies that were developed in response to specific problems being experi- enced at refueling stations. The first article covers technology for preventing diesel fuel nozzle "fallout" and resulting spills. The second deals with technology for improving the ability of vacuum-assist Stage II vapor recovery nozzles to work in conjunction with vehicles equipped with Onboard Refueling Vapor Recovery systems, as well as with vehicles not so equipped. As with all of PE&T's editorial content, we welcome reader response to the material presented.
In the petroleum industry, there is a constant tension between the need to fuel vehicles quickly and the need to avoid accidental spillage and overruns. At many of the large volume fueling centers, the volume of fuel being dispensed each day demands larger and faster fueling pumps.

Some of these pumps—at busy diesel fuel truck stops—can flow up to 40 or 50 gallons per minute. Fueling at such high speed can create some problems. For instance, the fuel nozzle has been known to push itself out of the truck tank opening because of the pressure exerted against it. Also, the nozzle can simply fall out of the tank openings on many trucks that have large, four- to five-inch openings. The chances of a nozzle coming out of the tank opening during fueling are increased if there are any vibrations or bumping of the hose or nozzle. It can, and does, happen very easily.

The nozzle fallout problem is pronounced at truck fueling facilities with "satellite" pump systems that enable customers to fuel both of their dual truck tanks at one time. Usually, the driver first inserts the satellite pump nozzle in the tank opening on the side opposite the driver's side. The customer then moves to the driver's side of the truck to operate the main nozzle. The satellite nozzle starts flowing when the main nozzle is opened. This means that the satellite nozzle is frequently left unattended for at least some time. If the nozzle comes out of the tank, fuel can be spilled without someone immediately being aware of it.

By now, PE&T readers are familiar with the environmental, fire and explosion risks involved with fuel spills, and the costs involved in cleaning up the resulting hazardous material. Harco Industries Inc. has developed a nozzle safety hook that prevents spills caused by diesel nozzle fallout.

How the hook is installed

The safety hooking device is about six inches long. It is attached to the nozzle spout tube or to the spout housing, depending on the model of the nozzle. It is attached with two set screws, locking nuts and a two-piece clamp. The clamp will fit most nozzles that have diameters of from one and three-eighths inches to one and one-half inches.

When installed on the spout tube, the device can be positioned to accommodate different spout lengths and different tank opening depths. This is done by sliding the device forward or backward on the spout. If the spout tube has a metal coil spring, the spring can be slid forward so that the clamp can be attached to the tube (preferred method), or the clamp can be installed over the spring. Installation can be done right at the pump.

The hook on this diesel nozzle prevents the nozzle from coming out of the tank opening. Courtesy of Harco Industries Inc.

How the hook works

When putting the hook-equipped nozzle spout into the fuel tank opening, simply insert the spout into the tank opening and move the nozzle forward. The weight of the nozzle will cause it to tilt so that the hook locks on the inside of the lip of the fuel tank opening. This provides positive locking and does not interfere with the automatic shut-off of the nozzle. Once the tank is full, the operator pushes the nozzle into the tank about one inch, tilts the spout and hook so that the hook is released from the inside of the tank opening, and pulls the nozzle back and out of the tank opening.

Field testing

Before deciding on the final design of the safety hook, Harco tested and rejected many earlier versions because of various operational problems. The final design was tested extensively by Harco at high-use, truck-fueling centers in Pennsylvania.

At one of the locations where the safety hooks were used 100 percent of the time, accidental spills were reduced by more than 75 percent.

Other locations have reported no spills when safety hooks were properly installed. In addition, the ease of use is reported to be smooth as the safety hook engages and disengages with very little effort.

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