

THE RESCUE COMPANY

AIR, AIR, AND MORE AIR

THE NEW ZEALAND Fire Service, when faced with what management felt were cost-prohibitive expansion plans, came up with its own solution for the problem. In "Working on Air" in the December issue of *Fire Engineering*, Kevin O'Sullivan describes the benefits derived from working with air-powered tools: "Air is clean, requires only a single feedline to the tool, is intrinsically safe and is totally reliable in starting. Air-driven tools are simple, lightweight, and powerful. They are also relatively quiet." "Quiet" was the word that put my computer (yes, you know the one) into action.

A few years back, my unit was called to assist in the removal of a four-year-old boy's thumb from a doorknob locking device of a bathroom door. Apparently, while trying to lock the door, the child pressed in the center button, which then collapsed into the door handle and assembly; his thumb became jammed in the tiny knob hole.

Efforts to remove the thumb by family members only aggravated the situation. After using butter, lard, and ice to

■ RAY DOWNEY has been a member of the Fire Department of New York City for 26 years and has commanded the operations of Rescue Co. 2 for the past 8. Captain Downey holds an associate's degree in fire science. He's a New York State Certified instructor and has conducted seminars and lectures throughout the United States on rescue-related tactics.

try and free the thumb, tugging by a family member caused additional swelling of the thumb, which then became securely wedged into this tiny hole. During the efforts to free the thumb, a retaining pin that normally releases the inner and outer doorknobs became dislodged, complicating the situation further. Each attempt to separate the knobs caused the boy more pain.

Truck company members at the scene cut the entire lock assembly out of the door, hoping to make freeing the thumb easier. Promises of a ride on a big, red, shiny fire truck helped calm the hysterical youth, who thought the saw was being used to free his thumb rather than to cut away a section of the door.

Our unit was called for the use of our Wizzer saw, a special air-operated cutting tool. But the incident commander, taking into consideration the youth's emotional state and the need to use another cutting saw, decided that it would be better for professional medical personnel to assess the situation, and hospital staff were notified.

At the hospital, the youth's hand was anesthetized, and a trauma specialist made several attempts to free the thumb. The doctor, when notified of our Wizzer saw, agreed to let rescue members make cuts along the knob assembly in hopes of freeing the thumb. The tool was set up, sufficient air was available, and members awaited the doctor's instructions. Prior to starting

the saw, all flammable items were removed, a safe environment was established, and hand extinguishers were ready for use. (Surprisingly, sparks were not a problem.)

The boy became more apprehensive upon seeing the tool, regulator, hoses, and air cylinders. Psychological reassurance must always be one of the resources that rescue members have in their arsenal: This was the time for the heavy artillery. How do you gain the confidence of a hysterical four-year-old?

I thought back to when my son needed his first haircut. I spent most of my time that memorable day acting like a middle linebacker, stopping my young boy from trying to escape from the barber shop. The barber's solution was to let him play with the comb and brush, listen to the scissors open and close, and make airplane-like noises, all while cutting a lock of hair at a time. Why not let this youngster feel the tool, listen to it, and watch one of the firemen with the tool, not unlike my barber with his scissors.

Much to the surprise of the boy and the medical personnel, the tool's sound was much less than had been anticipated; its sound was much like that of a state-of-the-art dentist drill.

After a few minutes of "show and tell," it was time for the real thing. The youth's hand was held firmly as precision-like cuts were made. After the cover of the knob was removed, the

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thumb was exposed. It had been bent down into a narrow opening as the youth had applied pressure to the lock assembly. With a little manipulation, the doctor was able to free the thumb.

This incident helped us develop an SOP for our Wizzer saw operations. Familiarity with the tool's capabilities and limitations, working pressures, and air consumption was developed through company drills. Discussion of our special operations, in addition to drills, played an important part in future operations involving the Wizzer saw. Two practically identical incidents would be successfully resolved because of lessons learned and training drills involving air-operated tools.

At first mention of a meat grinder, my "computer" spit out a "graphic print-out" of my grandmother's hand-operated meat grinder from the early 1900s. While responding to a report of a per-

son with his hand stuck in a meat grinder, my first thoughts were: Had anybody tried to disassemble the machine? Couldn't the hand be worked out by using butter or lard? But these next two incidents involved machine-operated commercial meat grinders that resembled my grandmother's in name only.

The first incident involved a 14-year-old who had been working with his father in the meat section of a supermarket. When rescuers arrived, they found the youth's hand and part of his arm enmeshed in the meat grinder. Medical personnel on the scene monitored the youth during the entire rescue effort. A two-man team—one a tool operator, the other acting as the "eyes and ears"—set up the Wizzer saw, prepared it for use, discussed the operational plan, and provided that necessary psychological reassurance.

First, horizontal cuts were made along the barrel section. Vertical cuts down the grinder intersected these horizontal cuts. An additional cut provided a window-type opening, in which the

tips of a porto-power spreading device were inserted. The spreader was activated slowly and the cut sections separated. Removal of the worm gear was required to free the hand completely. Due to the seriousness of the injury, medical personnel had made preparations for a helicopter transport to a major trauma facility.

The second incident involved an identical meat grinder, but the victim this time was a middle-aged restaurant worker. The man said that while he was cleaning the grinder, a cleaning rag was sucked into it, dragging his hand and part of his arm with it. From the strong odor of alcohol on his breath, it was clear that the man had been drinking; a language barrier caused additional problems for rescuers. A bilingual firefighter was on hand to communicate with the victim in his native tongue, but the other problem couldn't be resolved that easily.

As instructions were relayed to the victim, firefighters made him as comfortable as possible while positioning the tool operators. Two Wizzer saws

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were at the scene, and a two-tool operation plan was formulated. Cutting on both sides of the grinder horizontally and vertically, the need for the additional cuts and porto-power were eliminated. The intersecting cuts on two sides were all that was needed to separate the grinder and free the victim's hand and arm. As in the first incident, the worm gear had to be removed to completely free the victim. Keeping the highly emotional victim calm was almost as difficult as performing the surgeon-like cuts on the grinder. The talents of these specially trained rescue firefighters were never more evident than at this operation.

The printout (yes, the mental one) was instrumental in ensuring that sufficient air would be at the scene of this incident. We had learned that at the first meat grinder incident, air was used for approximately 45 minutes. We anticipated an extended cutting operation, so

additional 300-cubic-foot air cylinders were requested. Using two Wizzer saws would require additional air. Our apparatus was equipped with two 300-cubic-foot cylinders able to be used either from the apparatus or brought by hand to the scene of the operation. As was the case of the young boy in the hospital, the location of this second meat grinder incident precluded using air directly from the apparatus.

"Contingency plans" are a vital part of a rescuer's game plan, as well as the "what ifs": what if the hoses don't reach; what if we need more air? As the officer-in-command, I had to review what type of game plan would be implemented, and have that contingency plan on standby. The request for additional air cylinders was fulfilled by our associated engine company, which was familiar with our tools and equipment stored in quarters. Also, the incident commander had anticipated the need of manpower to assist in getting the cylinders, hoses, regulators, and equipment as close to the scene as possible. All of these factors were the key ingredients that made this

another successful rescue operation.

An interesting sidelight to the operation involved the chips of cast steel from the grinder that were being thrown off during the sawing operation. While in quarters critiquing the incident, a member noted that the tool operator's work shirt had an unusual-colored pattern outlined on it. On closer investigation, it was determined that the pattern was formed from the metal chips that had been thrown off while cutting the meat grinder. A medical examination showed that these chips had penetrated the member's skin. Due to the limited working area and the high temperature there, most members removed their turnout coats. All members who had worked in the immediate area of the incident were required to undergo chest X-rays, which revealed that these chips had penetrated the chests of five rescuers. They were assured that most of the chips would be gone after a good shower, and that they were in no immediate danger.

• Add to the lessons learned not only the importance of proper protective

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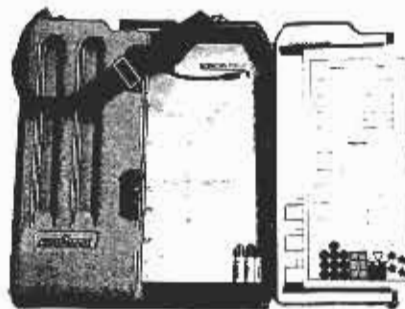
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clothing but the absolute imperative-ness of eye shields or goggles.

• Proact, rather than react: Have sufficient air at the scene. Never worry about having too much air—it's cheap. Manpower must always be considered; the trauma room or restaurant work area may be on the upper or lower levels and unable to receive air directly from the apparatus. Regularly scheduled

maintenance of your tools and equipment will help ensure their reliability during an emergency. Your contingency plan must include these possibilities and take into account the need for improvisation.

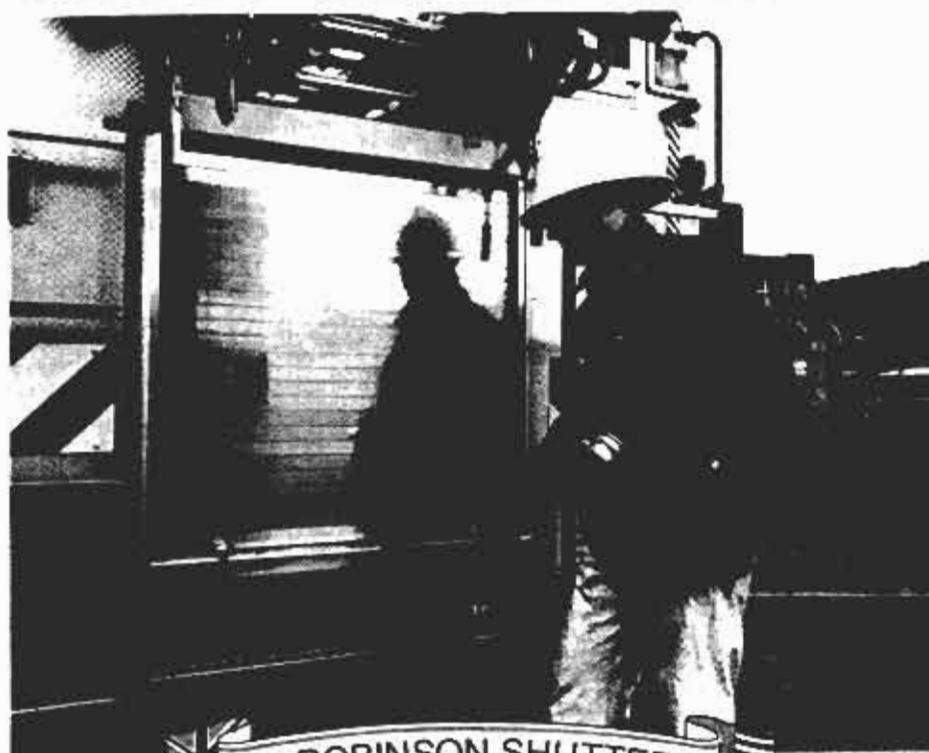
The Wizzer saw referred to in this article is a tool that's been used in the automotive field for years. The fire service uniquely adapted it for its needs, as it has with other tools. Weighing only two pounds, the Wizzer is easily han-

dled by one firefighter. The tool can be used for two to three minutes operating at 90 psi from a SCBA cylinder with a regulator. A 3-inch carborundum cutting blade turns at 20,000 rpm; a Lexan guard covers the blade area, providing some protection for the tool operator. The tool can be used on case-hardened locks, sheet metal and other materials, depending on their thickness. Testing, training, and drilling with the tool will provide the necessary information regarding the tool's capabilities and limitations. There are various brands and makes, all with different capabilities.

Let's look back at a meat grinder incident from 20 years ago: A teenager's hand and arm are enmeshed in a commercial meat grinder. Hospital personnel had requested the assistance of the rescue company, mainly for the power saw that was recently introduced to the fire service. A power saw with a metal cutting blade was placed into operation as hospital personnel stood by. The saw was held by two men and directed by a third, the guide man. Two other firefighters held an extinguisher, not only to cool the tool and grinder, but to put out spark-related fires. The fumes produced by the saw required a fan for ventilation. The high noise level of the saw created additional communications problems between rescuers and added to the victim's fears. Rescuers overcame these obstacles and successfully freed the victim's hand.

By comparison, we see how the Wizzer's weight makes it much easier to operate. Only one operator is needed to hold and direct it. The air-operated Wizzer doesn't have the fume problem associated with power saws. Lastly, and a very important factor, think about the psychological fear that the much higher noise level of a power saw can cause as compared to that generated by the Wizzer saw.

We can see that whether it's the 60s or 80s, the people or problems don't change. The tools and equipment most certainly do. The utilization of our specially trained and talented rescue personnel and their ability to improvise and adapt will always be one of the greatest strengths and assets of the fire service. ■



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