

THE RESCUE COMPANY

MORE ON TOOLS AND EQUIPMENT

WHEN WE THINK OF rescue tools and equipment we usually envision the large hydraulic spreading and cutting devices most commonly seen at a rescue operation. What tools are carried by the rescue companies throughout the country? Let's examine the various tools and equipment that are, by consensus, the most common tools and equipment carried by rescue companies.

A number of factors will determine the type, size, brand name, and amount of equipment carried. In previous articles we mentioned apparatus size, compartment availability, and, most importantly, the budget considerations for special units within a fire department. Understandably, older, more established companies may have a stockpile of various tools and equipment based on the years of experience in different types of rescue operations. Newer companies will usually begin with acquiring some of the most common and standard tools and equipment carried by other rescue companies. Their inventory increases with time and experience. Budget restraints can have a very serious impact in this area.

The size of the inventory or the amount of equipment are not necessarily the answers

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to solving every rescue situation. As a young firefighter in a rescue company, my first introduction to extrication involved the use of the main tool at that time, the portopower. Small in size, it was capable of spreading, extending, pulling, and lifting. Comparing it with electro, hydraulic, or pneumatic equipment on the market today, I wonder how we accomplished as much as we did with the equipment we had at that time. Yet surprisingly, that piece of equipment was used recently in a rescue operation because of its smaller size, its capabilities, and its power. The newer equipment available was simply too large. What works best is the tool to use.

Two recent incidents involving tools and equipment help remind me that we must utilize not only the equipment available, but also the ingenuity of our talented rescue firefighters. The first incident involved a worker trapped in a building collapse. After working for more than two hours to free him, one obstacle stood in the way of the rescue workers. A small lifting device had to be placed in a narrow opening so that it could provide the final force needed to free the victim's foot. As the device was being placed, it was stopped by what appeared to be a piece of wood lath that could not be seen by the rescuers. The smallest handsaw could not reach the area needed to be cleared. The alternative was to remove a large amount of very unstable debris.

One rescuer, feeling the wood and realizing its position and location, came up with the solution. Reaching into his pocket, he

opened a small multiblade knife. One of the blades was a saw no more than three inches in length. Repositioning himself, he was able to remove the wood lath by using this small blade in a very narrow opening. The firefighter still carries that small knife and still reminds me of the incident. At times, ingenuity is more powerful than the largest tool or piece of equipment.

A new pair of binoculars came in very handy during the latest heat wave in the city. The waterways in the area became the "backyard pool" for many of the inner city residents. The fire department was receiving as many as a half a dozen calls a day for "people in the water." This prompts a response of not only the local companies, but of a special SCUBA team and a marine unit (in addition to a number of other city agencies).

One evening, as dusk was setting in, a report was received of a "victim" in trouble in the water. The waterway is known for its unusually high current, moving at a rate that presents problems for boaters. Due to the fast movement of water and dusk lighting, a "victim" did appear to be in great danger. The officer that was first notified found only one thing unusual: Although the "victim" was only 200 yards away, no screams or calls for help could be heard. Deciding to take a good look prior to calling for assistance, the new binoculars were put into use. What first appeared as an unconscious, lifejacketed victim was really a pile of debris that someone had evidently thrown into the water. An unnecessary response and possible dive op-

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eration was averted due to the use of a new piece of equipment. I'm sure every rescue unit has had an incident in which the most unsuspecting piece of equipment or tool played a vital role in its outcome.

When choosing tools and equipment for the rescue operation, we must consider the means by which they are supplied power: electric—whether portable generators (2-cycle and 4-cycle) or standard power from utilities (AC or DC)—pneumatic, hydraulic, hand-foot pump, rechargeable battery, gas or other fuel. Most modern equipment is capable of being powered by more than one means. (Hydraulic tools, for instance, can be supplied by generator power, electric power, and hand-operated pumps.)

From the standpoint of safety, alternate power sources must be available at every rescue operation. For example, fuel and oil spills are characteristic of auto accidents, and power supply must be carefully chosen to prevent ignition of the spilled material. Many rechargeable battery-operated and gas-operated tools common in the construction industry are finding their way into the fire service. This, too, must be considered at the operation.

Application of equipment also demands the availability of alternate power sources. Extrinsication equipment can be supplied power directly from the apparatus, with hose reels capable of reaching areas within reasonable distances. But what if the tool or equipment is required at a distance or area not within the scope of the apparatus? The alternate power source (generator and hose reel) can be brought to a scene regardless of the distance because of its size and portable design. Know your tools and the alternate power supply to drive them—it should be a part of every game plan.

Smaller departments just starting out that may lack funding might want to consider component purchasing. If the department is unable to purchase the complete set of equipment or tools, starter sets are to be considered. For example, air bags can be bought in complete sets, that is, 10 bags of various sizes and lifting capabilities, or simply one at a time, complete with regulator and hoses. Additional bags can be purchased as funding becomes available.

Here's a compilation of equipment and tools commonly carried by rescue companies in the fire service.

Extrinsication equipment provides spreading, pulling, lifting, cutting, and extending capabilities. The manufacturers of this equipment provide a wide range of components to choose from. The various sizes and weights of these units provide options for the purchaser based on the needs of the rescue unit.

Cutters come with different size-opening and cutting capabilities. A combination cutter-spreader advertised as a one-man tool is available. This may be a good choice for a unit lacking funds for a complete set or for a unit with space limitations.

Rams used for pushing or extending come in various lengths and styles, and many allow for changing the heads to fit the operation. Telescoping design allows for combining two rams into one. Adaptor kits, including chains, hooks, tips of different sizes, and an assortment of parts, increase the versatility

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is limited only by space
imagination, experience, and,
of course, budget.

of these units.

The power sources may be directly from the apparatus, fuel or electric generators, or hand-foot pumps. The foot pumps have a pedestal and the hand pumps a grip handle for manual operation.

Manifolds or blocks allow more than one tool at a time to be operated from one power source. Some manufacturers provide blocks and others have additional hydraulic outlets on the main power supply. Hydraulic line reels can be mounted on the apparatus, on the pump itself, or on portable, hand-carried assemblies.

The type, size, manufacturer, component, and tool selection is clearly the department's choice based on its needs. Although often referred to as extrinsication tools, their capabilities are surely not limited.

When *air bags* were first introduced to the fire service, there was some confusion as to their intended purposes. They were a

cause for alarm for those unfamiliar with their capabilities. Used for many years in construction and other industries, their potential in fire rescue incidents has been proven.

Air bags are of both high-pressure and low-pressure design. High-pressure bags generally operate up to 120 psi. Their lifting capability in height and weight range from three inches to 20 inches in height and from one-and-a-half to 75 tons in weight. Air required for inflation can be as little as one cubic foot and as much as 47 cubic feet, depending upon the size of the bag. Newer, smaller bags have been an ideal addition to the systems because they allow for lifts in limited-access locations where hand tools or other equipment prove inadequate.

Regulators, controls, hoses, and adaptors increase versatility, providing the means by which these bags can be used for a variety of rescue operations. Bags are also designed for use by hazardous-materials teams. There are bags for sealing, patching, and stopping leaks in cylinders, tanks, tank cars, and trucks.

Bags are even designed for use inside of pipes, drains, and sewers, and provide a sealing condition from the inside. The types and sizes come in a wide range and can be readily adapted to fit almost any need. Leak-sealing bandages are also available for covering pipes. They come in various sizes for smaller pipes.

Low-pressure bags are ideal for lifting heavy loads, especially on uneven, soft terrain or on ice- and snow-covered grounds. They're generally used in pairs for safety. Using as little as 7 psi, 18 tons can be lifted up to a height of six feet. Low-pressure bags are often used for uprighting overturned tank trucks, and they're used quite extensively in outside industry.

Various *power saws* with wood-, metal- and masonry-cutting capabilities are part of the rescue company's ensemble. Chain saws (electrically, hydraulically, gasoline-, and air-operated), circular saws, Sawsalls, wizzer saw (with its three-inch carborundum disc blade), and handsaws, including hacksaws.

Torch and burning equipment comes in standard oxyacetylene setups, but some larger outfits can be carried on handtrucks and by portable means (both backpack and hand-carried). Other portable units supply oxygen and use electrical power with a special cutting rod to provide a unique rescue/cutting system. Protective equipment such

as blankets, gloves, and goggles must be part of the system.

Small, hand-held air bammers/chisels are equipped with various cutters (chisel bits, panel cutters, and bull points capable of cutting a variety of materials). In addition to these capabilities, the larger models can be used to breach concrete and masonry materials.

Pavement breakers/jack bammers are pneumatically or electrically operated and provide cutting and breaching of heavy concrete or asphalt.

Meters/detectors aboard the rescue truck might include explosive meters, O₂ indicators, CO meters, Gastek meters, electrical meters, heat detectors, thermal cameras, radiation detectors, and various chemical test kits for chlorine, hydrogen sulfide, and sulphur dioxide.

Lighting equipment includes portable lights, reels, fittings, converters, junction boxes, and adaptors. Some apparatus lighting devices are removable and equipped with portable telescoping light mounts that can be powered by a generator or electrical extension lines connected to the apparatus.

One of the newer items on the market is a small, portable generator with a high-powered light and extension which can easily be moved from location to location by virtue of its compact size. Much of the more recent equipment available is waterproof, crushproof, and engineered with firefighter safety as a priority. The amount and type of lighting equipment will depend on the unit's response duties as directed by its department. Some departments will outfit a special unit that's specially designed for lighting.

Rope and rigging on the rescue apparatus includes various types of rescue ropes, slings, hooks, shackles, snatch blocks, harnesses, ascenders, carabiners, figure-8's, rappelling rigs, special rescue slings and harness, rescue litter, and stretcher systems.

Collapse equipment might include trench jacks, air shore jacks, cribbing, chocks shims, shovels, pry bars, assorted timbers, planking, sledgehammers, wrecking bars, pinch bars, measuring tapes, hammers, and nails.

Self-contained breathing apparatus should be supported by additional cylinders, large-capacity air bottles, air supply lines and convections for use in confined-space rescues and other rescue applications.

The mechanic tool set will include pipe wrenches, pipe cutters, bolt cutters, utility

shut-off keys, plug kits, wedges, scalants, fittings, and couplings.

First aid equipment carried aboard the rescue rig will include first-aid bag, trauma kit, burn kits, stretchers, splints, immobilizing kits, resuscitators, long and short boards.

Various remote phone and handie-talkie systems should be part of the *special sound-powered phone equipment* used by the rescue company.

Units with special duties such as SCUBA responses, haz-mat responses, foam, salvage, or lighting in addition to their rescue duties will carry that equipment along with stan-

dard rescue equipment.

Hopefully, this list will give you some idea of what is being carried by rescue companies; however, many units will carry more and some less. The amount carried is generally only limited by apparatus and compartment space availability, imagination and experience, and, of course, budget restrictions.

Regardless of the amount, type, and size of equipment and tools assigned to a rescue unit, they must be maintained in good operating condition and capable of performing up to standards when being called upon in rescue operations. ■

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