The American Excavator

Straight Talk About Straight Bars: Bolstering Hazard Assessments at Dig Sites

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Straight bars, also known as sissy bars are commonly used on excavator buckets to reduce the potential for puncturing many underground utilities. The scope of work and a thorough hazard assessment should be conducted when implementing straight bars on buckets in an attempt to reduce punctures when the utility is contacted. Straight bar buckets will receive resistance in frozen and rocky ground and should receive approval from an excavation specialist before being removed. Using straight bars on all excavator buckets should be considered for accepted best practice by all utility owners when constructing, repairing, or maintaining utilities in house or by a third-party contractor.

Let's begin with the scope of the work: many excavations require digging around utilities. While calling your local one-call (811) is effective and required, they are only responsible for notifying locators about publically owned utilities. This leaves thousands of privately owned or operated utilities, and decommissioned, abandoned, or ceramic utilities that are often not located. Thus begins the need for understanding the scope of work. One-call systems promote safe digging and offer great tools for exercising safe digging practices, but it is a combination of pro-active thinking, experience, and engineering practices that complete the 811 objective. This makes safe digging a joint effort and must be considered in the entire scope of work for all excavators. It is a must because there are unknowns that can be encountered and must be planned for and expected. Once the scope of work is discussed, a plan for an excavation should be discussed between the operator and a DESIGNATED spotter. This plan goes into the specific of a hazard assessment.

The hazard assessment involves many common cautions described in 811 best practices. However, excavators need to know more in order to anticipate a worst case scenario. Understanding your work location and region are key to this hazard assessment. Common questions that should be asked include: Is there a potential cathodic anode ground bed that was not located? Are their hidden structures that could be abandoned facilities? Do you see a company sign not listed on the one-call ticket? Is there melted snow or low crop height in a uniformed pattern? Is the dig site in an old shale play that may have abandoned salt water, flow, or gathering lines (H2S)? What are the specific cross bore hazards and do the locate markings match my drill profile and hydro-vacuumed utilities? Is the site in a congested area that could benefit from a "Joint Meet" to clarify scope of work and better communication with affiliated utilities? These are just a few of the questions to ask before breaking ground.

Breaking ground then involves a good understanding of equipment, experience, and communication. Equipment has grown more powerful with the advancements of hydraulic technology. This has made equipment easier to operate and requires less experience to be efficient with it, causing a loss in feel and comfort level with the machines that is priceless in the world of excavations. With experience dwindling, many contractors now implement straight bars on their buckets as an extra cautionary method when digging. The straight bar is designed to distribute hydraulic force across a utility if one is contacted instead of puncturing it. A line contact is the worst thing that could happen to any excavator, and the straight bar is intended to mitigate damage to a utility should a hit take place, as the bar may only dent or scratch a utility. Although this is very bad for any excavator, it is better than a rupture which can cause life loss and millions in environmental damage. A rupture could involve a complete shutdown of a pipeline, versus repairs made under reduced pressure and flow which still allows for revenue, contract satisfaction, and no media attention.

Straight bars should be installed to fully cover the front of the excavator bucket and should have the ends rounded off and in a good transition to the end teeth of the bucket. Paddle teeth are designed with the same idea as a straight bucket. Clients and owner operators often require the spacing between the paddle teeth to be filled in to offer a straight consistent connection, ultimately forming a straight bar in the end. When digging with a straight bar, it is still crucial to dig with a DESIGNATED spotter. This spotter helps the operator by understanding different soils, identifying predisturbed soil, difference in rock, clay, and metal if contacted, and shadows while excavating. The straight bar is simply a failsafe in the event there is a breakdown in communication between the operator and designated spotter. While straight bars are a good practice for excavating, they should never take the place for safety as a failsafe to human error. They are simply meant to reduce contact damage in the event a utility is contacted, though it does NOT guarantee that an improperly installed straight bar or even a properly installed straight bar cannot still puncture a utility.

Without a straight bar attachment, the paddle teeth on this bucket can easily rupture or puncture a utility line.

Having the straight bar attached distributes the force of a hit across the utility line, causing dents or scratches instead of punctures, mitigating huge potential damages and losses.

Straight bars on excavator buckets can become worn and jagged from typical use or digging in hard materials. These buckets should be maintained through daily inspection and repaired as needed. A defective straight bar defeats the purpose of using one and should be repaired or removed immediately from use. Straight bars should also be discussed for familiarity during damage prevention or ground disturbance trainings, as newer employees to excavation related industries can then identify their integrity and intended use. An experienced excavator may think they do not need a straight bar or dislike using one due to lost productivity in rocky areas or frozen soil/clay, but this cannot interfere with the decision to implement them because utility locates are not a guarantee to identifying everything that is underground. People retire, maps are lost, companies switch owners, resources get misplaced during transitions, markets change, and dangerous residuals stay un-located. An excavator cannot predict these circumstances which can alter the safety of the job and the lives of his or her crew. While straight bars cannot prevent line contacts or ruptures, they are an added tool and practice to help execute safer excavations when considering foreign working environments, communication barriers, and learning curves for employees new to excavation industries.

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