

Vehicle and Equipment Recovery

Intro

In the coming weeks, we will be transitioning from winter to spring. Depending on where you live, the rapid change in temperature and rainfall can result in big changes for how we plan and conduct work in off-road environments. The solid, frozen surfaces used during the winter to access back yards and remote areas will soon be nothing but mud. Without fail, crews will find themselves bogged down on sloppy access roads, marshy rights-of-way, or stuck in a customer's yard. Good news, we have been around the block a few times and we know how to plan for and resolve these issues. We will grade and re-stone access roads, build up and stabilize work areas on rights-of-way, and use matting to protect sensitive lawns. However, I guarantee someone, somewhere will get a vehicle or piece of equipment stuck. Unfortunately, we know someone, somewhere will get hurt trying to get it out.

Stuck Vehicles and Equipment

Recovering stuck vehicles and equipment can result in property damage, injury, and fatality. Why is this task so hazardous and why do we continue to have problems when it seems like such a simple process? In my opinion, the answer can be found in the question itself. It seems so simple. Hook a strap or a chain to something heavy enough and with enough traction that the stuck vehicle has no choice but to come out. Simple right? The problem is rooted in the perception and the solution is rooted in the physics.

Recovery

We often hear, "leave it to the professionals" when faced with a challenge that exceeds our capacity to resolve it. Recovering vehicles is a lot like cutting trees. A worker may know how to use a chain saw and know how to notch and fell a tree, but what about rigging, stored energy, and the variability in how different species react when under strain? Recovering a vehicle can be safe when the conditions are right, but extremely hazardous when they are not. Workers must evaluate multiple factors when deciding whether they have the capability for the task.

- How much does the stuck vehicle/equipment weigh?
- What rigging and anchor points are available?
- How much are they rated for?
- What other forces are at play?
- Have I been trained?
- Does company policy even allow for it?

Summary

Whether or not a company allows workers to recover stuck vehicles or equipment is a question of risk tolerance. We can avoid every stuck vehicle incident if we simply don't allow it. However, with the right conditions, equipment, and training the task can be performed safely. Having this option, when appropriate, could save on delays and job costs. The best way to address this issue is with education. Train your folks on the various factors involved. Teach them how to determine the weight of the stuck vehicle, the varying degrees of resistance created by surfaces and conditions, the effect grade has on resistance, and how to identify properly rated connection points and rigging equipment. This is like cranes and derricks, where the operator must know weights, angles, and rigging requirements.

Ultimately, this choice must be based on the realities of operational experience. Even if we chose to prohibit workers from performing recovery tasks, educating them on the "why" will help them make better decisions in the field. The following example can illustrate how simple this decision making can be.

Practical Exercise Extracting a Stuck Digger/Derrick

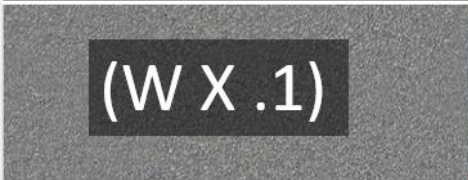




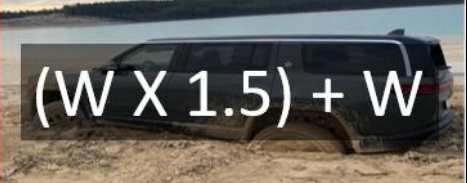


2018 ALTEC DM47B-TR – GVWR **33,000 lbs.**



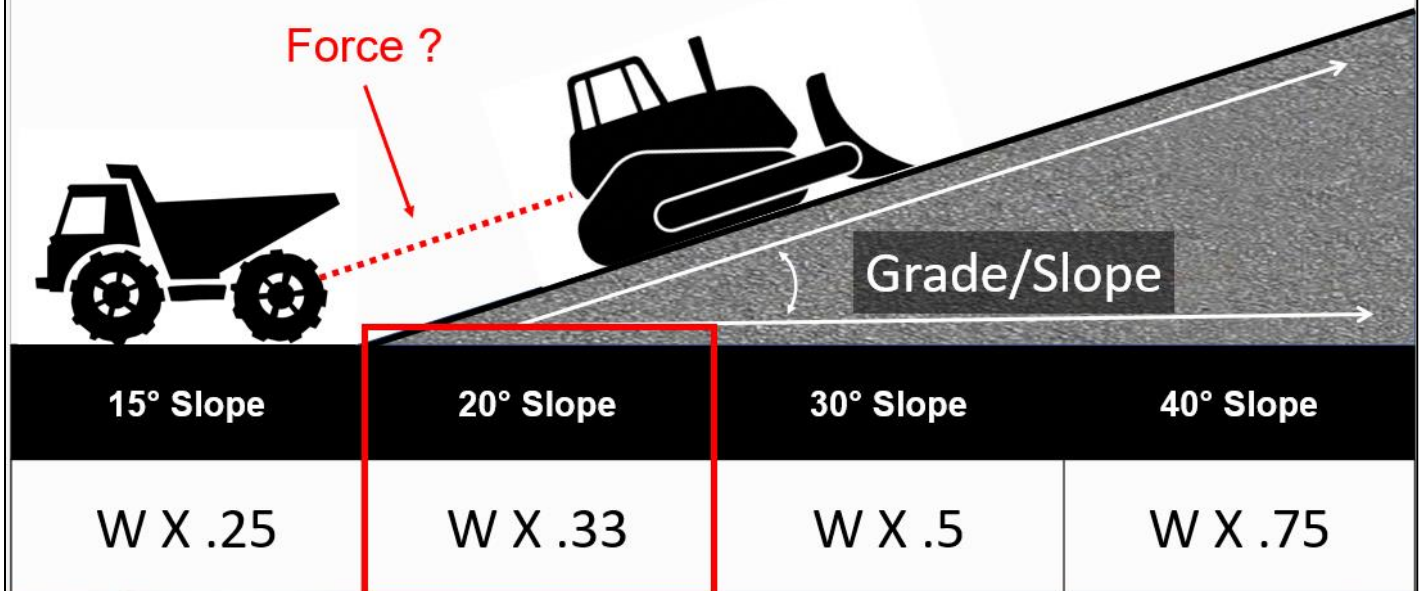
Transmission ROW, **20° Slope**

Calculating Additional Rolling Resistance

Blacktop/Concrete	Lawn/Grass/Packed Surface	Gravel/Stone
 (W X .1)	 (W X .25)	 (W X .5)
Snow/Shallow Mud	Wheel Deep Clay/Sand/Muck	Body Deep Clay/Sand/Muck
 (W X .5)	 (W X 2)	 (W X 1.5) + W

W = Weight

Calculating Gradient Resistance



Practical Exercise

Extracting a Stuck Digger/Derrick

- Digger Derrick Weight (GVWR) = 33,000 lbs.
 - Additional Rolling Resistance (ARR) = 8,250 lbs.
Wheel-Deep Mud (W X .25)
 - Additional Gradient Resistance (AGR) = 10,890 lbs.
20° Slope (W X .33)
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- Minimum Capacity Required = 52,140 lbs. (WLL)

Armed with this information, workers can make an informed decision based on the Working Load Limit (WLL) required for the operation. Anchor points and rigging can then be selected and applied based on the training they received. Rigging equipment designed for recovery should be used. Kinetic ropes and synthetic slings are safer options when compared to wire rope and chains.

Thank you,
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