FLEX 'EM . . .

Stuck . . . stranded . . . sittin' there helpless . . . ?

Well, friend, you can tie-on to some recovery know-how.

Here's a load of old, reliable recovery tricks for you. But first, how's your recovery lingo?

MECHANICAL ADVANTAGE—That's what you have when you know your rigging . . . cables, blocks, anchors . . . when you know how to set-up tackle to increase your pulling power.

CABLES—Deliver your winch's power to the trapped load.

BLOCKS—They change the direction of pull, and multiply your pulling force. There's the common block (you reeve—thread—the cable through it) and the snatch block (its shell opens up to take the cable).

They come in various shapes and sizes, and are called single, double, or triple, which tells how many sheaves (grooved pulleys) a block has . . . how many lines it can take, that is.

The more lines you rig the bigger your mechanical advantage will be, natch. 'Cause with tackle (like with most pull) with two or more forces pulling in parallel, the total pulling power adds up to the sum of the forces (less what's lost through friction in the blocks).

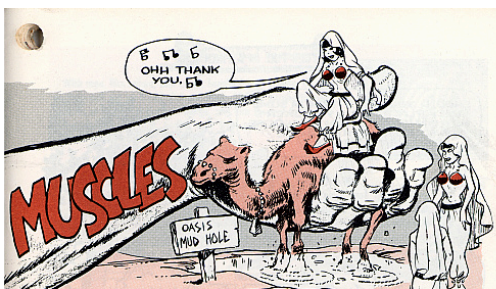
TACKLE—Cable (or rope) and blocks rigged-up for pulling or lifting is your tackle. The individual tackle lines are usually identified this way:

Any part of the cable between the recovery-power and the block is a **fall line.** Cable between blocks is a **return line.** Cable between blocks and the anchor, and between the blocks and the load are **dead lines.** (A dead line is usually called the weakest part of a rigging—since it takes the greatest amount of strain.)

The tackle advantage on a load depends on the number of lines supporting the load. That is—two lines give you a 2-to-1 advantage, three lines a 3-to-1 advantage, four lines a 4-to-1 advantage. A single line is a direct pull.

SNUBBING LINE—A check line. It's used to steady a suspended or moving load.

ANCHORS—Hold your recovery-power in place when you're pulling. You may have the ready-made kind (like the Holmes ground anchor set), or use trees, stumps, a deadman, earth embankment, or lasso the nearest and sturdiest thing which'll give you a strong hold.



YOUR PULLING FORCE

The force your tackle puts on a load, is often expressed in foot-pounds, and it's figured by multiplying a specified force (pull you're applying) times a specified distance (over which the pull is applied).

THIS WILL GIVE YOU A 2-TO-1 MECHANICAL ADVANTAGE.

You reel in the winch cable	2 ft
The snatch block on the load moves forward	1 ft
Your winch line pull is	2000-lbs.
The snatch block increases your winch's pull to (2000-pound winch line pull x 2 feet of line reeled in equals 4000 foot-pounds.)	4000-lbs.
And, 4000-pounds x 1 foot equals 4000 foot-pounds.	

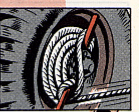
Just one more thing . . . the big fat by-word in any recovery job is CHECK-AND-DOUBLE-CHECK. Use only stout lines and anchors, and re-check your tackle before you apply any power.

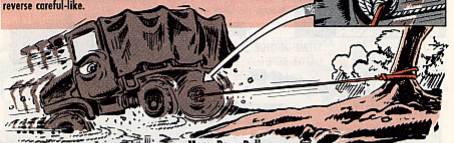
FOR A FULL RUN DOWN ON RECOVERY, GET A COPY OF FM 20-22 (OCT 62), "VEHICLE RECOVERY OPERATIONS".

MORE

Single Wheel Winching

With rope, like before, and a jack handle (piece of pipe, or rod) you can pull out an M135, 2½-ton truck. Slip the handle through the hole in the end of the axle flange, and lash the tool to the hub with a figure-eight knot. Anchor your lines and run the truck in reverse careful-like.

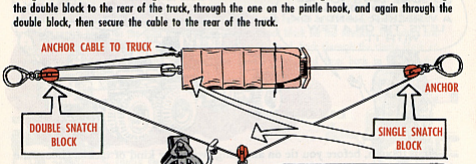




More Rear Pull

If it has a front winch, and you can collect enough rigging in the vicinity, a truck that's gone off the road can pull itself out by winching itself backward. It takes one double and three single snatch blocks and the usual strong anchors. Anchor the first single block a short ways in front of the truck, the second one off to the side (away from the road), and the third single block to pintle hook on the rear of the truck. Anchor the double block a short distance to the rear of the truck.

Rig the winch cable first through the block in front of the truck, through the one on the side, through the double block to the rear of the truck, through the one on the pintle hook, and again through the double block, then secure the cable to the rear of the truck.

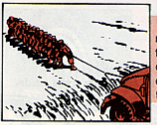


Pry 'Em Out

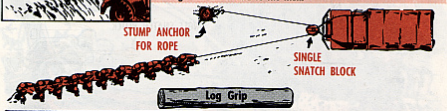
One or more strong poles, or timbers, for levers, and some manpower can pry out a truck that's gone head-first into a narrow ditch. Pivot the lever on something sturdy (log, stump, etc.). Rig the lever under the bumper for the first lift, if need be. Block up vehicle after first lift, re-rig the lever (try for under the axle) and pry up again. The size of the ditch, length of the lever, and pushing power are some of the things that decide the times you'll have to re-rig the lever.

MORE

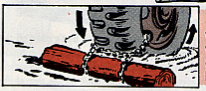
Man-Power



When you're without trustworthy mechanical power, 15 to 20 men on a rope provide a hefty pull. Put all the men on one side of the rope, and keep the line from under-foot. To give the men a 2-to-1 advantage anchor one end of the rope in line with the load. Attach a single snatch block to the load. Run the rope from the anchor through the block and to the men.

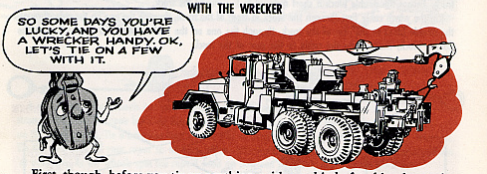


Log Grip



To lift a wheel out of a deep hole, chain a log to the wheel. Run the truck slowly; as the log grips, the wheel will raise up. You set the brakes, have the wheels blocked, and the hole filled with rocks or blocked with a log, before you remove the log from the wheel.

WITH THE WRECKER



First, though, before you tie on anything, with any kind of tackle, choose the best stand (on hard ground, if possible) for your wrecker, and, also, if possible, set the wrecker for a straight pull on the load.

Dig two holes for the wrecker's ground spades, lower the spades into the ground, and then inch the wrecker back till the spades are well dug in.

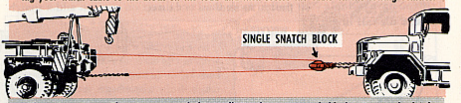
With any recovery vehicle—when digging spades in near the crest of a hill or on an embankment or on soft ground, bury a heavy log ahead of the spades, and then stake the log with pickets. Best make a strong mental note of this. You can see where the recovery vehicle and crew might end up if the spades don't grab a good hold.

Lock the wrecker's wheels (set the electric brake lock), and also block 'em with logs, rocks, chocks, or what-have-you.

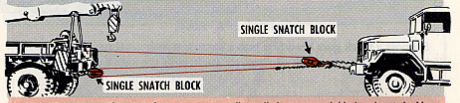
BASIC HOOK-UPS

These hook-ups are OK for a wrecker, tow truck, or recovery vehicles, and, properly put together, they'll help you recover just about any wheeled or tracked vehicle that's worth taking home.

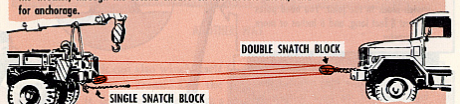
The Two-Part Line—This is your simplest hook-up. Just attach a snatch block to the load. Rig your winch cable to the block on the load and then secure the cable on the towing vehicles.



Three-Part Line—This gives you a heftier pull. It takes two snatch blocks. One at the load and one at the wrecker. Your winch cable goes first through the snatch block on the load, then back through the snatch block on the wrecker, and again to the load where you secure it.



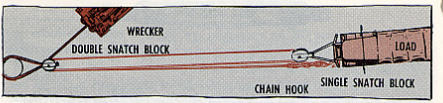
Four-Part Line—This one's for even greater pull. It calls for two snatch blocks, also. A double-sheave snatch block for the load and a single-sheave snatch block for the wrecker. The winch line goes first through one sheave of the double block on the load, back through the single block on the wrecker, through the second sheave on the double block, and then back to the wrecker for anchorage.



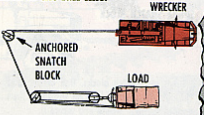
When you can't set-up your recovery power for a straight pull on the load, you have to line-up an especially good anchor in the direction the load must move, and find the best possible stand for your wrecker, and anchor it there—dig in the rear spades, and anchor it by its front winch, if need be.

Attach a snatch block to the anchor in line with the load, and another one on the load. Reeve the rear winch cable first through the block on the anchor, then through the block on the load, take the cable through the block on the anchor again, and then return it to the load and secure it.

MORE



If you have to angle your pull in more than one direction you can add a snatch block to the fall line.



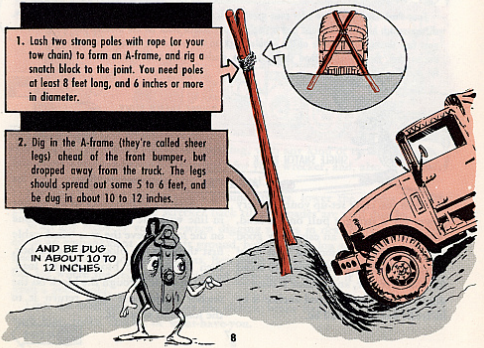
Move everything and everyone out of the angled area when the cables are under stress. **Cables have been known to snap.** And when that happens the cable's deadly whiplash can easily slice through humans, trees, equipment, and anything else within its reach. So pick a spot at least as far away as the length of the paid-out cable for any on-lookers or any baggage you may've had to unload.

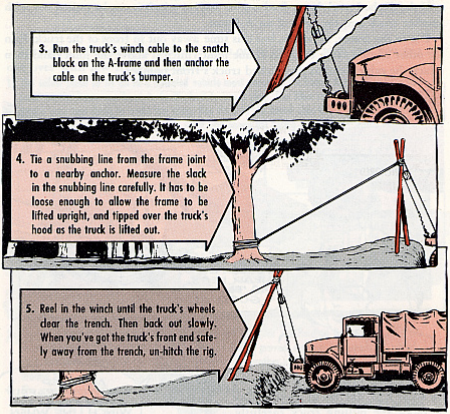
TRY THE "A" FRAME

Suppose a truck goes head-first into a narrow trench . . . if its engine runs, and if it has a winch, the truck can recover itself with the aid of an A-frame.

1. Lash two strong poles with rope (or your tow chain) to form an A-frame, and rig a snatch block to the joint. You need poles at least 8 feet long, and 6 inches or more in diameter.

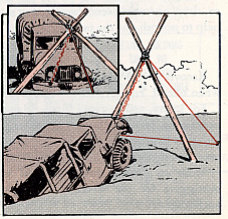
2. Dig in the A-frame (they're called sheer legs) ahead of the front bumper, but dropped away from the truck. The legs should spread out some 5 to 6 feet, and be dug in about 10 to 12 inches.





ANOTHER WAY

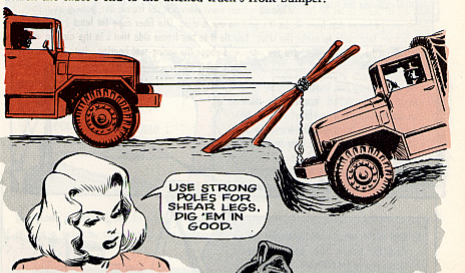
A ditched truck can also winch itself forward using the A-frame. Dig the frame in so it leans over the truck's hood. Attach a tow chain from the frame's joint to the truck's bumper. Run the winch line through a snatch block anchored nearby, in front of the load, and bring the cable back and tie it to the joint of the A-frame. As you pay in cable the frame will lift up taking the truck's front end with it. Un-rig the frame and pull the truck on out.



MORE

If the ditched truck has a dead engine and no winch it can be pulled out with another truck and the help of an A-frame.

Dig in the frame, as before, but this time away out in front of the truck. Run the other truck's cable to the A-frame joint (hitch it above the joint) and then attach the cable's end to the ditched truck's front bumper.



And, here as in any recovery job, "safety comes first." Use strong poles for shear legs, dig 'em in good, anchor or block the pulling truck carefully, and prepare the areas as well as you can (dig or fill around the nosed truck, or slant or ramp trench walls if it'll help to smooth-out the pull).

WHEELS UP

Recovery work always takes sweat . . . but sometimes more than others. Like when one of 'em goes all the way over, or lands on its side.

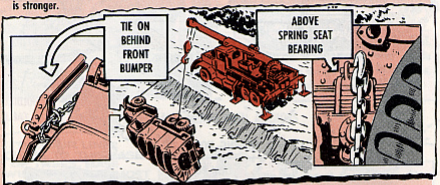
For safety, and to avoid further damage, this misfortune calls for two separate operations. First, it's best to get the vehicle right-side up again, and then you set-up to haul it out. Also, it takes two sources of power. One to roll the vehicle over, another for holding it to check a crash landing as you pull it over.

With an up-side down wheeled vehicle the recovery job usually means outriggers for the wrecker . . . to keep it from toppling over . . . and plenty anchorage.

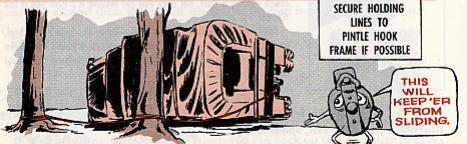
Also, with any over-turned vehicles, watch for spilled fuel. Mark off a "no-smoking" area before you get down to the serious wrestling.

It takes a lot of force to pull one back on its feet, but with care you can roll one over with few recovery bruises.

1. The safest place to tie on to a wheeled vehicle most always is the frame. But, pulling from one point on the frame can bend it. So it's best to use a sling. Use fiber rope (at least 1-in rope) or use your tow chain to make the sling. You tie it to the frame side that's in the air. Tie one end behind the front bumper, and the other end above the spring-seat bearing where the frame is stronger.



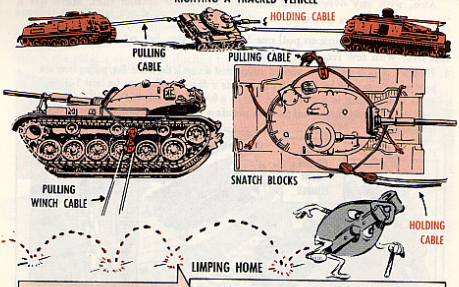
2. Tie on a second sling at the same points as the first, for the holding lines that'll ease the truck's drop as it rolls over. (Good holding lines will help prevent damage to suspension, wheels, etc.). Power for these lines can be the front winch of another vehicle, or strong ropes snubbed around trees.
3. The ground's condition, as always, has a lot to do with your other preparations for the job. For example, you may have to fill-in, dig-out, or otherwise repair the spot where it's to land up-right.
4. Soft ground, on the other hand, will help you hold the truck as you start to pull it over. If you're on hard ground, though, the truck may just slide with the pull. Holding lines from the pintle hook, frame or towing eyes, to trees, stakes, or another vehicle, should do the trick for you here.



5. After you've righted the truck you'll likely have to reposition the wrecker before you hook-up your tackle to pull the truck out.

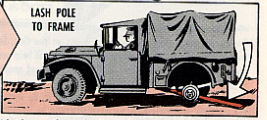
MORE

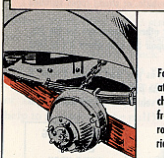
RIGHTING A TRACKED VEHICLE



LIMPING HOME

After you struggle to pull 'em out you may find a busted rear wheel, damaged axle, or a flat. Well, you can still get away.





Skid Along—If your load is light, and the road's fair, try this: For a ¼ or ¾-ton truck find a strong pole, 6 to 8 feet long, and at least 4 inches in diameter. Lash the pole to the frame with a tow chain or heavy wire, and remove the wheel. Then you shift into front wheel drive and you can move out s-l-o-w-l-y. It might be rough getting a start, but once you get moving it'll give you a fair ride for a good piece.

On a 6x6 (single or duals) truck—Raise the bum rear wheel, and lash the axle to the frame with a tow chain or heavy wire (take care your rigging doesn't hurt the brake lines). Remove the wheel and you're on your way.

QUICK HOOK-UP

Here's one you save for desperate situations. It's set-up fast, and it's helpful in an emergency, but it's not as safe as you'd want it under normal conditions (like, with a tow bar).

Use two log chains. Put one chain around the bumper of the dead truck, and then through the wrecker's pintle hook. Wrap the other chain around the truck's bumper and then up to the wrecker's hook.

As you lift and crowd the boom you lift the truck's front end, and you can hold it so it won't ram the wrecker as you drive along.

Anytime you have to tow, or be towed, it's best to stop and check the vehicle TM's, for any special towing instructions, before you make your tie-up.

WAYS AND MEANS WITH ANCHORS

Trees, if you're near the right kind, make dandy anchors. If there aren't any healthy, good-sized trees, nearby, you can tie on to two or more smaller ones. But, whichever kind you use always tie your lines close to the base of a tree where it can take the most strain. If you have to use several smaller trees loop your line around them and adjust the line so the pull is even on all the trees.

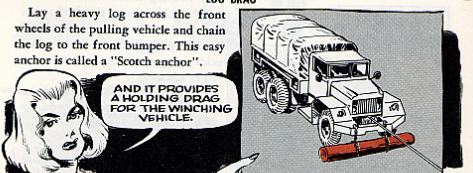
FRONT OR REAR ANCHOR

If you're pulling with the front winch you can back up to a good tree and tie the truck's pintle hook to the tree. Or, brace the front, or the rear, of your recovery vehicle against one or two trees for a front, or rear, winching job.

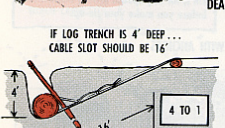
MORE

LOG DRAG

Lay a heavy log across the front wheels of the pulling vehicle and chain the log to the front bumper. This easy anchor is called a "Scotch anchor".



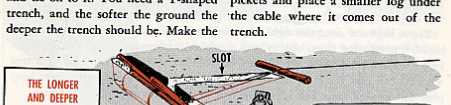
DEADMAN



Sink a strong log in a deep trench, and tie on to it. You need a T-shaped trench, and the softer the ground the deeper the trench should be. Make the wall which will take the pull slant away from the load. The leg of the T is an upward slanting slot to take the cable. And the longer and deeper the slot the straighter and stronger the pull will be on the log.

A good rule-of-thumb for digging the cable slot is four-to-one. If the log trench is four feet deep, the cable slot should run out at least 16 feet.

Then stake the deadman with strong pickets and place a smaller log under the cable where it comes out of the trench.

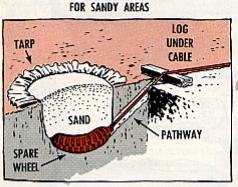


SANDY ANCHOR

When you're in soft sand (it won't hold a deadman) your best bet is a sand parachute. Line a really big hole with the handiest tarp you can find, then fill the tarp with sand. Pull the tarp corners together, and secure your anchor line to that point.

For a stronger hold, tie the anchor cable to a spare wheel or any other heavy object that's handy and bury it under the parachute. With the cable under-

ground, though, you'll need a pathway for the cable, like with the log deadman, and also a log under the cable where it comes out of the trench. With this set-up you needn't bother tying the tarp corners.

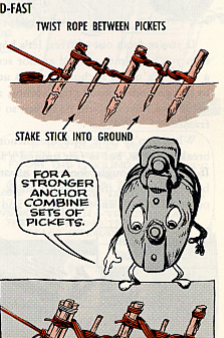


PICKET HOLD-FAST

Strong wooden pickets (about 5 feet long and 3 inches in diameter . . . of ash, if possible) make good anchors. Drive a row of pickets into the ground, about 2 or 3 feet apart, and loop them together with rope . . . from the top of the first to the bottom of the next, and so on down the row. With a strong stick, twist the rope between the pickets, then stake the stick into the ground so the rope'll stay tight.

For a stronger anchor, stake two or three pickets close together in a tight group, bind them with rope, then loop the rope from that set of pickets to the next. You can combine sets of pickets and single pickets in a row, if need be.

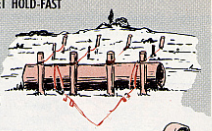
The holding-power of a picket holdfast depends a lot on the strength of the front (or anchor) picket. So two or three pickets (a group) staked close together and bound tightly before they're roped to the other pickets in your holdfast, are better when you're anchoring for a heavy pull.



MORE

LOG AND PICKET HOLD-FAST

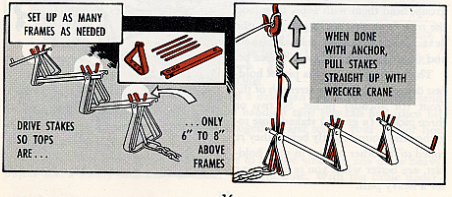
Tie the anchor cable to a heavy log, and stake four to six strong pickets right in front of the log. Lash the tops of the pickets to another row of pickets (or some other anchor) behind the log.

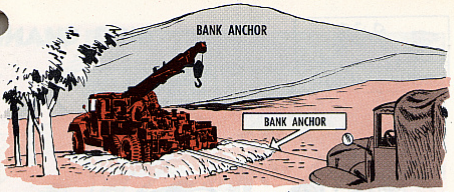


HOLMES GROUND ANCHOR SET

If you're fresh out of trees, let's hope somebody within yelling distance can loan you a Holmes ground anchor set. This ready-made, portable, hold-fast is a set of six metal anchors (frames and stakes). You simply stake the frames to the ground to make your anchor, and you can set up as many frames as you need. The stakes should be driven so their tops are only 6 to 8 inches above the frames.

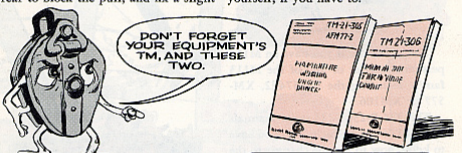
When you're done with the anchor, the stakes may be a bit stubborn about breaking loose, but in fair ground a solid blow at the base should do the trick. If it doesn't, though, don't haul off and hit them sideways at the top . . . that'll bend 'em. When they're really stuck fast use the wrecker's crane to pull them out safely. Pull 'em straight up, and one at a time.



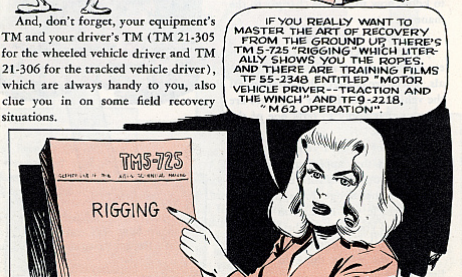


When your wrecker is sitting on hard ground (but, off the road) you can dig in its rear wheels for holding power. Make a straight embankment across the rear to block the pull, and fix a slight ramp in front to let you back in and pull out easy like.

That's about it. Some of these ideas should help you get loose—even by yourself, if you have to.



And, don't forget, your equipment's TM and your driver's TM (TM 21-305 for the wheeled vehicle driver and TM 21-306 for the tracked vehicle driver), which are always handy to you, also clue you in on some field recovery situations.



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