



## **WINCH OPERATIONS (1.1)**

Developed by Firefighter Chris Fischer  
March 2012

### **TASK SKILL DESCRIPTION AND DETAIL**

Winch operations are used to aid in the recovery of a vehicle that cannot recover from an obstacle under its own power. The winch can also be used to stabilize a vehicle or remove an obstacle like a fallen tree. Winches are found on E236, E216, Heavy Rescue 2, and the Rhino.

This is an effective means of recovery however there are some safety considerations that must be followed at all times to prevent possible injuries.

- Leave a minimum of five wraps of cable spooled on the drum at all times while it is in operation.
- Keep yourself and others at a safe distance from the cable when it is under a load.
- Keep hands and loose clothing away from the cable drum to prevent them from getting caught the spool.
- Use clear, simple communications that can be understood by anyone involved in the operation.
- Never step over a cable that is under a load.
- Do not connect the winch remote control switch until you are ready to pull.
- Minimum PPE is leather gloves and a helmet.
- Never wrap the cable around an object or hook the cable back on to itself, it can damage the cable, the object, and could potentially cause failure of the cable.
- Always re-check components and connections after a load is applied to the system.

#### **Equipment Needed (See Figure 1)**

- Ramsey 12,000lb winch
- Snatch Block
- Lifting slings
- Tree sling
- 2 large clevises
- Binding chain



Figure 1



### Finding an anchor point

- Make sure that you locate a suitable secure anchor point. An anchor must be strong enough to hold during the winch operation.
- Ideally you will want to find an anchor point in line with the front of the vehicle; this will allow the cable to spool up tightly and evenly on the drum.
- Some examples of anchor points are:
  - Trees
  - Stumps
  - Rocks
  - Another vehicle

### Attaching to the anchor

- After choosing a suitable anchor point
  - Disengage the clutch on the winch to allow free-spooling of the winch drum. (Figure 2)
  - Unhook the cable and pull it to the anchor point. (Be sure to keep some tension on the cable so it doesn't twist or unwrap on the drum.)
  - Wrap the tree protector or a chain around the object and attach the clevis to the two ends of the strap. (Figure 3)
    - Try to avoid using a chain around a tree, use the tree protector or strap.
    - Attach the strap as low on the anchor as possible.
    - \*Note: Do not use a recovery strap for winching operations because it will stretch and act like a rubber band. If failure occurs it can violently shoot the cable back towards the vehicle.
  - Attach the cable hook to the clevis.



Figure 2



Figure 3



| <b>RE 12,000</b>                 |  |        |        |       |       |       |        |        |
|----------------------------------|--|--------|--------|-------|-------|-------|--------|--------|
| LAYER OF CABLE                   |  | 1      | 2      | 3     | 4     |       |        |        |
| Rated line pull per layer (lbs.) |  | 12,000 | 10,000 | 8,600 | 7,500 |       |        |        |
| (Kgs)                            |  | 5,430  | 4,530  | 3,890 | 3,390 |       |        |        |
| Cable capacity per layer (ft.)   |  | 20     | 40     | 70    | 100   |       |        |        |
| (3/8 dia.)                       |  | 6      | 12     | 21    | 30    |       |        |        |
| Line pull (lbs.)                 |  | 0      | 2,000  | 4,000 | 6,000 | 8,000 | 10,000 | 12,000 |
| (Kgs)                            |  | 0      | 900    | 1,810 | 2,710 | 3,620 | 4,530  | 5,430  |
| Line speed (FPM)                 |  | 16     | 8.6    | 6.5   | 5.3   | 4.4   | 3.8    | 3.3    |
| (MPM)                            |  | 4.9    | 2.6    | 2.0   | 1.6   | 1.3   | 1.2    | 1      |
| Amp draw                         |  | 12V    | 80     | 150   | 200   | 250   | 290    | 335    |
|                                  |  |        |        |       |       |       | 380    |        |

Table 1

\*Note: As shown in Table 1, the more layers of cable on the spool the more rapidly it decreases the line pull. (With that being said, the more cable that you can pull off of the spool will give you more pulling power. If needed adding a snatch block will change the mechanical advantage to 2:1 and also increase the pulling power.)

- Winch cable rigging
  - 1:1 vs. 2:1
    - 1:1 or single line pull will provide a faster recover time
    - 2:1 mechanical advantage or dual line pull will be a slower recovery time (half as fast as 1:1) but doubles the rated pulling power of the winch. (Figure 4)

### Starting to pull

1. Make sure communications are clear and everyone knows what is going on. Make it known what areas people should avoid (i.e. In front or behind the vehicle and around the winch cable)
2. Lock the clutch to engage the winch after attaching the cable to an anchor point.
3. Drape something like a blanket or bunker coat over the cable. (This can lessen the effects of recoil if the cable were to break) (Figure 6)
4. Plug in the remote winch controller and apply tension on the cable. (Figure 5)
5. Re-check all components in the system. Check the anchor to make sure everything is ok and ready to pull.



Figure 4



Figure 5



Figure 6





6. Once everything is ready and double checked get in the cab of the truck. The winch controller has a long enough cord to reach the cab and that is a much safer place to be. If circumstances deem that the cab is not an adequate place to be, use the length of the controller to stand out of the immediate danger area.
7. Put the vehicle in neutral if your vehicle is being pulled out. If you are recovering another vehicle then put the recovery vehicle in neutral, set the parking brake, and chock the wheels.
8. The winch uses a lot of power from the battery, set the vehicle at high idle when the winch is in use.
9. Press the IN button to start pulling.
10. Occasionally check the winch for overheating during long pulls. If it is too hot to leave your hand on it then stop and let it cool down. Damage to the winch can result from overheating.
11. After the vehicle is free of the obstacle stop and prepare to put the winch and components back in service.

#### **Placing the Winch In-Service**

1. Place the vehicle in park and chock the wheels.
2. Remove tension from the cable by pressing the OUT button on the winch controller. (Never attempt to remove tension on the cable by disengaging the clutch on the winch.)
3. Remove the cable from the anchor point.
4. Remove straps, snatch block, clevises, and any other components used and return them to the storage bag.
5. Rewind the cable evenly on the drum.  
(It is important to keep tension on the cable so it does not free spool on the drum. Putting a slight load on the cable will allow it to spool up tightly and evenly.)
6. Remove the winch control cable and place it back on the truck

#### **TASK SKILL INSTRUCTIONAL REQUIREMENTS AND IMPLEMENTATION**

- [http://www.ramseypdfs.com/owners\\_search\\_pdfs/912476-0802-D.pdf](http://www.ramseypdfs.com/owners_search_pdfs/912476-0802-D.pdf)
- Off-road driving Power-point presentation
  - [V:\Fire\Suppression\Wildland\Wildland Training\Training Topics\Driving & Apparatus\Off Road Driving Class.ppt](#)
- Additional materials for review – Ramsey Winch Safety Video



Ramsey\_Safety100k.wmv



**CITY OF LOVELAND**  
**FIRE AND RESCUE DEPARTMENT**  
410 E. Fifth Street • Loveland, Colorado 80537  
(970) 962-2471 • FAX (970) 962-2912 • TDD (970) 663-5144

---

## REFERENCE INFORMATION

- Ramsey Winch Company
- Warn Industries – Off-road products