TerrafirMa

A12000 ELECTRIC WINCH

Manual & Safety Instructions

www.terrafirma4x4.com

PLEASE READ CAREFULLY BEFORE OPERATING THE WINCH

Contents

1. Electric Winch Usage

Electric winches are extensively used on trucks and 4x4s for commercial, military, agricultural, competition and recreational off road. They can be used for self-recovery or for pulling other vehicles or objects and moving obstacles.

2. Safety Warnings & Precautions

2.1 Danger

1. Vehicle batteries contain gasses that are inflammable and can explode violently.

Dress properly

- Do not wear loose clothing or jewelry. They can be caught in moving parts.
- Non-skid footwear is recommended.
- Protective hair covering to contain long hair.

Battery

- Be sure that battery is in good condition. Avoid contact with battery acid or other contaminants.
- **Always** wear eye protection when working around a battery.
- **Always** follow wiring diagrams
- **Always** have the engine running when using the winch, to avoid flattening the battery.

2. Improper wiring can result in electrical shock or explosion.

•**Always** insulate and protect all exposed wiring and electrical terminals.

•**Always** place supplied terminal boots on wires and terminals as directed by installation instructions.

•**Never** connect DC Powered winches to AC current.

•**Never** operate a DC winch in an explosive environment.

•**Never** route electrical cables across sharp edges; near parts that get hot, nor through or around moving parts.

•**Always** verify the mounting area is clear of fuel lines, fuel tank, brake lines, electrical wires, etc., when drilling.

•**Always** consult the operator's manual for proper wiring details.

DANGER

3. Improper use or overloading of the winch can result in release of the load or rope failure.

Before winching a load, be sure the clutch is fully in the engaged position.

•**Always** properly seat load in the throat of the hook.

•**Always** use a shackle or strap when attaching the hook to an anchor point.

• **Always** use a hook with a latch and ensure hook latch is closed and not supporting load.

• **Always** keep hands clear of rope, hook loop, hook and fairlead opening during installation, operation and when spooling in or out.

• **Always** use supplied hook strap whenever spooling rope in or out during installation and operation.

• **Never** touch the rope or hook while in tension or under load.

• **Never** hook the rope back onto itself.

• **Never** use the winch to lift or move people.

• **Never** use the winch as a hoist or to suspend a load.

WARNING

2.2 Moving Parts Entanglement Hazard

• Keep the duration of your pulls as short as possible.

•Do not step over a cable, or near a cable under load.

•**Never** engage or disengage clutch if winch is under load, rope is in tension or drum is moving.

•**Always** keep hands clear of the rope, hook loop, hook and fairlead opening during installation, operation and when spooling in or out.

•**Always** keep the wired remote control lead clear of the drum, rope and rigging. Inspect for cracks, pinches, frayed wires or loose connections. Replace remote control if damaged.

Use only manufacturer's identical replacements with the exact specifications.

• **Always** pass the wired remote control through a window to avoid pinching the lead in a door when using remote inside a vehicle.

•**Never** leave a remote control where it can be activated during free spooling, rigging or when the winch is not being used.

•If the motor becomes uncomfortably hot to the touch, stop and let it cool for a few minutes. Do not pull for more than one minute at or near the rated load. Do not maintain power to the winch if the motor stalls.

•Check the motor often, never winch beyondmax pull as it may overheat and damage the motor.

2.3 General Safety

• **Always** know your winch. Take time to fully read the Installation Guide and the Basic Guide to Winching Techniques in order to understand your winch and its operation.

•Electric winches are for intermittent usage and should not be used in constant duty applications.

•Modification, alteration, or deviation to the winch should only be made by qualified Winch Company. (Altering or modifying the winch (i.e. machining or welding) in any way will void the warranty.)

• **Never** operate this winch if you are under 16 years of age.

• **Never** operate this winch when under the influence of drugs, alcohol or medication.

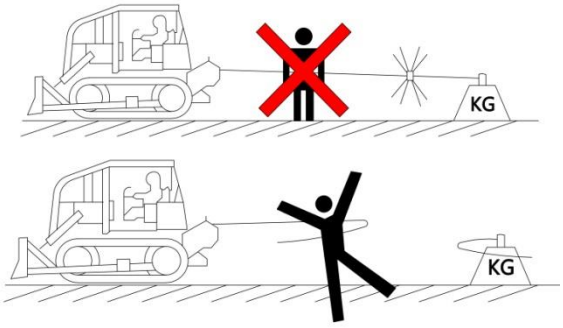
• **Never** exceed the winch or rope capacity listed on product data sheet. Double line winch using a snatch block to reduce winch load.

• Always be aware of the stability of the vehicle and load during winching, keep others away. Alert all bystanders of an unstable condition.

• Keep **a safe distance,** proper footing and balance all the time.

2.4 Installation Safety

• **Always** inspect rope, hook, and slings before operating winch. Frayed, kinked or damaged rope must be replaced immediately. Damaged components must be replaced before operation. If a cable pulls loose or breaks under load it can lash back and cause series personal injury or death.



• **Always** pre-stretch wire rope and re-spool under load before use. Tightly wound wire rope reduces chances of “binding”, which can damage the rope.

•**Always** spool the rope onto the drum in the direction specified by the winch warning label on the winch and/or documentation. This is required for the automatic brake (if so equipped) to function properly.

• **Always** choose a mounting location that is sufficiently strong to withstand the maximum pulling capacity of your winch.

• **Always** use factory approved mounting hardware, components, and accessories.

• **Always** use grade 5 (grade 8.8 metric) or better mounting hardware.
• **Never** weld mounting bolts.
• **Always** use care when using longer bolts than those supplied from factory. Bolts that are too long can damage the base and/or prevent the winch from being mounted securely.
• **Always** mount the winch and attach the hook to the rope's end loop before connecting the electrical wiring.
• **Always** position the fairlead with the WARNING label on top.
•**Never** obscure warning and instruction labels. Slowly take up the wire rope slack until taut.
• **Never** leave remote control plugged into winch when free spooling, rigging, or when the winch is not being used.
• **Never** hook rope back onto itself. In this case it causes rope to be damaged.
• **Always** use a choker chain, choker rope, or tree trunk protector on the anchor.
• **Always** be certain that the anchor you select will withstand the load and the strap or chain will not slip.
• **Always** select an anchor point as far away as possible. This will provide the winch with its greatest pulling power.
• **Never** operate a winch with less than 5 turns of wire rope around the drum and operate a winch with less than 8 turns of synthetic rope around the winch drum. The rope could come loose from the drum.
•**Never** expose the rope to heat sources or chemicals.
•**Never** pull the rope around non-rotating sheaves or rollers.
•**Never** allow rope to tangle or jam while winching. Rope could break before winch stalls.
•**Never** knot or tie the rope to secure a load or repair a broken rope.
•**Never** use a hook whose throat opening has increased, or whose tip is bent or twisted.
•**Never** use to raise, suspend, lower or secure horizontally hinged doors or ramps without additional counter balance springs centrifugal locking devices, or other secondary means of supporting the moving ramp or door.
•**Always** store the remote control in a protected, clean, dry area.
•**Always** double line or pick distant anchor point when rigging. This maximizes pulling power and avoids overloading the winch.
•Take recovery blanket on wire rope if possible before operating winch, it will make vehicle and operator safe once wire rope damaged.

2.5 Avoid Winch and Equipment Damage

• **Always** avoid side pulls which can pile up rope at one end of the drum. This can damage rope or winch.
•Do **not** operate the winch at extreme angles. Do not exceed the specified angles for a roller fairlead. For a hawse fairlead, the angle should be as close to straight as possible.
• **Never** use winch to tow other vehicles or objects. Shock loads can momentarily exceed capacity of rope and winch.
• **Always** avoid "powering out" for extended distances. This causes excess heat and wear on the winch motor and brake.

• **Always** use care to not damage the vehicle frame when anchoring to a vehicle during a winching operation.
• **Never** "yank" the rope under load. Shock loads can momentarily exceed the capacity of the rope and winch.
• **Never** use a winch to secure a load during transport.
• **Never** submerge winch in water.
• **Always** store the remote control in a protected, clean, dry area.

NOTICE

2.6 GENERAL TIPS FOR SAFE OPERATION

1. To prevent battery drain and maximize the power and speed of the winch, the vehicle engine should be kept running during operation. If the winch is used for a considerable time with the engine off, the battery may drain and be too weak to restart the engine.
2. Inspect the winch installation, check bolts to ensure that all bolts are tightened before each operation.
3. Any winch that appears to be damaged in any way, is found to be worn, or operates abnormally SHOULD BE REMOVED FROM SERVICE UNTIL REPAIRED. It is recommended that the necessary repairs be made by a manufacturer's authorized repair facility.
4. The wire rope may break before the motor stalls, for heavy loads at or near rated capacity, use a pulley/snatch block to reduce the load on the wire rope.
5. Do not move the vehicle to pull a load (Towing) on the winch cable, this could result cable breakage.

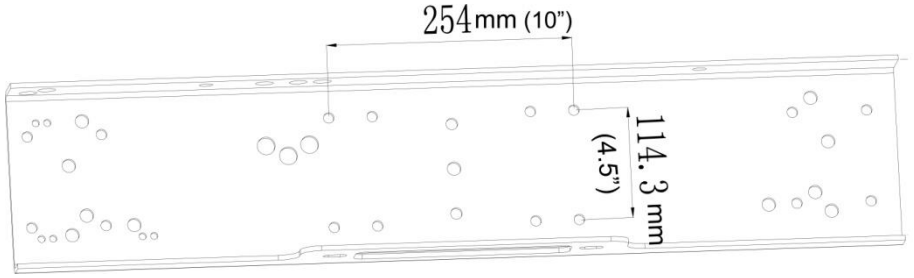
3. Electric Winch Installation

3.1 Unpack Your Winch

Unpack your new winch and ensure that all the parts are included by referring to the parts list and exploded drawings provided in this manual. If you find any parts missing or broken, please contact the store where you purchased the winch from as soon as possible.

3.2 Mount Your Winch

Choose a suitable location to mount the winch that is strong enough to withstand the loads (A mounting plate is recommended for winch installation). Check your mounting plate or bumper has the suitable screw holes, if not drill four mounting holes according to the bolt pattern mentioned in the winch specifications



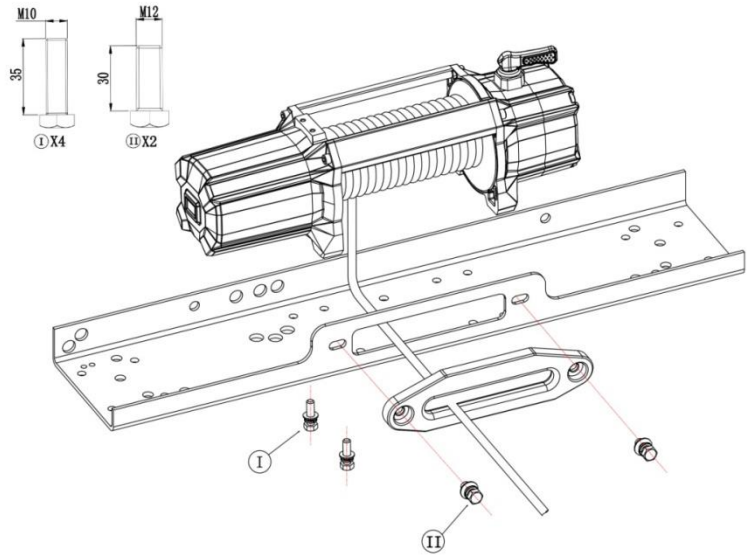
(Pictures for reference only)

3.3Fix Your Winch

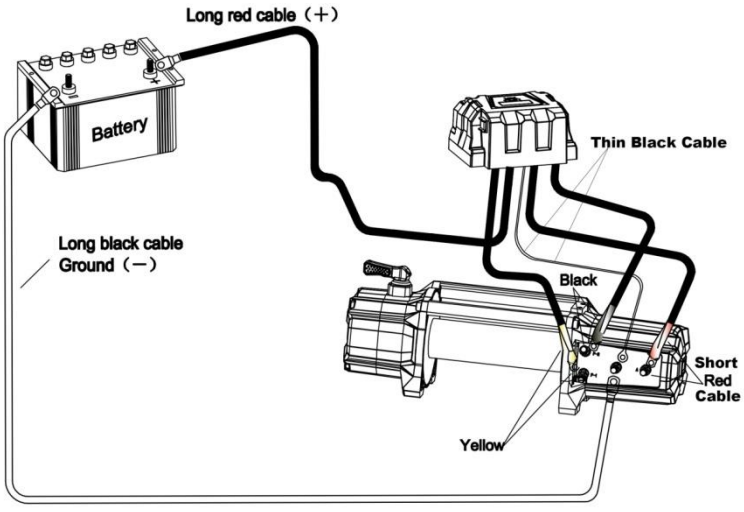
Install your winch on the mounting plate or bumper; make sure to tighten the mounting bolts fully. Be sure the motor, drum and gear box are on the one surface after installation.

3.4Install Your Winch Fairlead

Fix the fairlead on the mounting plate or bumper, all the winch fairleads come predrilled. If you use any other mounting platforms, drill two holes for the fairlead installation. Position the holes so that the fairlead opening hole is at least the width of the cable drum and deep enough to accommodate the max and min diameter of the drum with the cable installed. Note the winch direction after installation, the rope must run onto the bottom of the drum.



3.5 Install Control Box



- Short red cable connects to the red terminal (A) of the motor.
- Short black cable with yellow jacket connects to the yellow terminal (F-1) of the motor.
- Short black cable with black jacket connects to the black terminal (F-2) of the motor.
- Thin black cable connects to bottom terminal of the motor.
- Long black cable connects to bottom terminal of the motor.

3.6 Connect Electric Cables

- **Long Red** cable connects to the **Positive (+)** of battery.
- **Long Black** cable connects to the **Negative (-)** of battery.

3.7 Test Your Winch

After proper installation and connection, place the clutch in the “Disengaged” position, pull out the winch rope for about 2 meters, then turn the clutch to the “Engaged” position, and handle the remote control to see if the winch works. If the winch doesn’t work; check everything is in accordance with the instructions and all connections are correct and tight or the vehicle battery performance is sufficient. If the winch still does not work after thorough check, please contact the supplier.

3.8 Practice Using

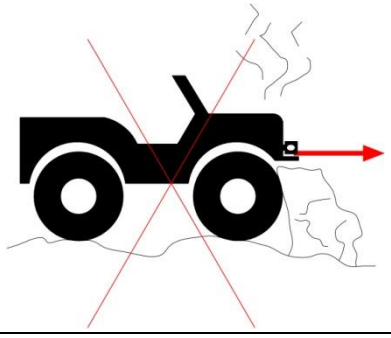
After the winch has been installed, take some time and practice using it so you will be familiar with all its operation. Periodically check winch installation to ensure that all bolts are tight.

4 Electric Winch Operation

NOTE: For optimal winch performance use a fully charged 12V battery with at least 650 CCA. Further it is advised to keep the engine running during the winch operation, so that the battery is being charged continuously.
All winches are equipped with a clutch lever that engages/disengages the clutch. Clutch engaged; the winch can pull the rope in; Clutch disengaged; manually pull the rope out.

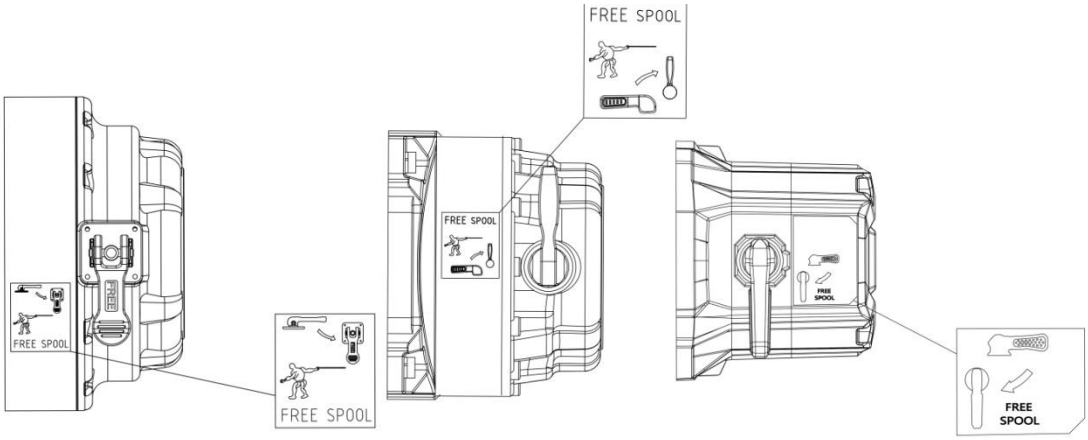
CAUTION: When using your winch, always make sure it has at least 5 turns of wire rope or 8 turns of synthetic rope on the drum before winching; Ensure the clutch is fully engaged or fully disengaged to avoid any injuries and damages.

CAUTION: **All Winches are for intermittent use only**. Wait until the motor cools down before resuming operation.
Potential causes of motor damage:
1. Long–duration pulls.
2. Low battery.
3. Overloading winch pulling capacity.
4. If you are winching against an immovable object it is possible the only thing you'll accomplish is bending something, or burning out your winch motor.



4.1 Step1: Disengage Clutch

Disengage your winch by sliding the clutch to **FREE-SPOOL** position.



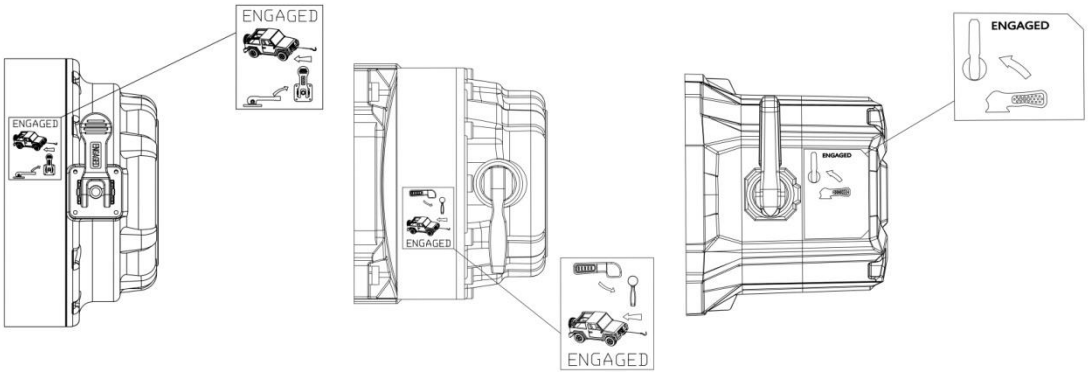
(Pictures for reference only)

4.2 Step2: Pull Rope to Anchor Point

Pull out enough rope to reach your anchor point. Be sure to keep ascertain amount of tension in the wire. It can become twisted and overwrap when slackened, leading to rope damage. To prevent losing the end, hold the winch hook in the hook strap while you work.

4.3 Step3: Engage Clutch

Engage your winch by sliding the clutch to **ENGAGED** position



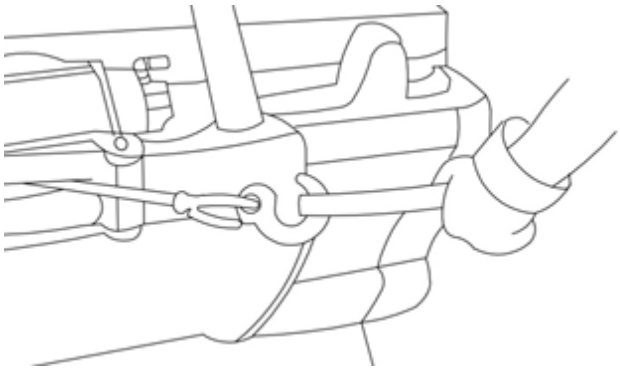
(Pictures for reference only)

NOTICE

If necessary, pull the rope out slightly until the clutch is seated correctly.

4.4 Step4: Winching

Connect the remote control to control box, keep a distance from the winch and rope for safety, press the button on the remote control to IN for winching.



NOTICE

Always disconnect the remote control when not in use.

4.5 Step5: For Vehicle Recovery

Continue pulling until the vehicle is on stable ground. If you are able to drive the vehicle, the winching operation is complete. Once recovery of the vehicle is complete, be sure to secure the vehicle's brakes and put the Transmission in "park". Release tension in the rope. Disconnect rope from the anchor, and then rewind rope. The person handling the rope should walk the rope in and not let it slide through the hand and control the winch at all times.

4.6 Step6: Disconnect Remote Control

Disconnect the remote control and store it in a clean and dry place. Winching operations are now complete. Put the cap on the socket.

⚠WARNING

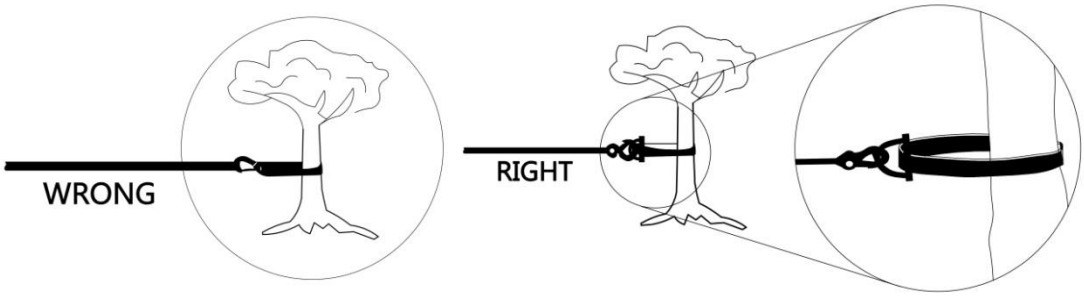
• **Always** be aware of the stability of the vehicle and load during winching, keep others away. Alert all bystanders of an unstable condition.

•**Always** keep **a safe distance,** proper footing and balance all the time.

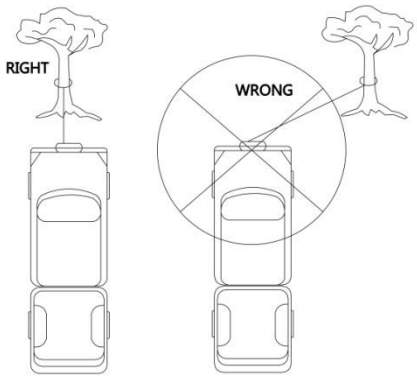
•**Always** disconnect the cable to the vehicle battery after winching.

NOTICE

1. **Never** hook the rope back onto itself. This could damage the rope. A tree saver is recommended.
2.



2. **Never** allow the rope to tangle or jam while winching, it could break before the winch stalls.
3. **Never** exceed the winch or rope capacity listed on the product data sheet. Double line winching using a snatch block will reduce the winch load.
4. Do not reverse the operation immediately. Relay can be easily damaged in this way.
5. Avoid continuous pulls from extreme angles. This can cause the wire rope to bunch at one end of the drum resulting in damage to the rope or winch. Do not exceed the specified angles for a roller fairlead. For a hawse fairlead, the angle should be as close to straight as possible.



4.7 Winch Accessories You May Need During Winching

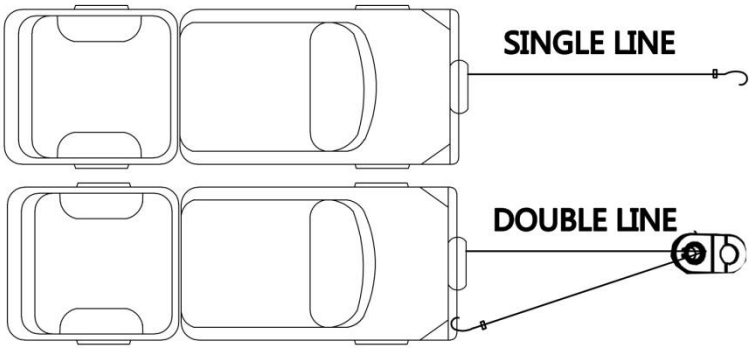
In order to be prepared for all recovery scenarios it is recommended to be equipped with a full recovery kit. These kits can include but are not limited to:
Heavy duty gloves, cable damper/blanket, tree protector strap, winch extension strap, choker chain, pulley/snatch block and shackles.

4.8 Some Tips for Better Winching

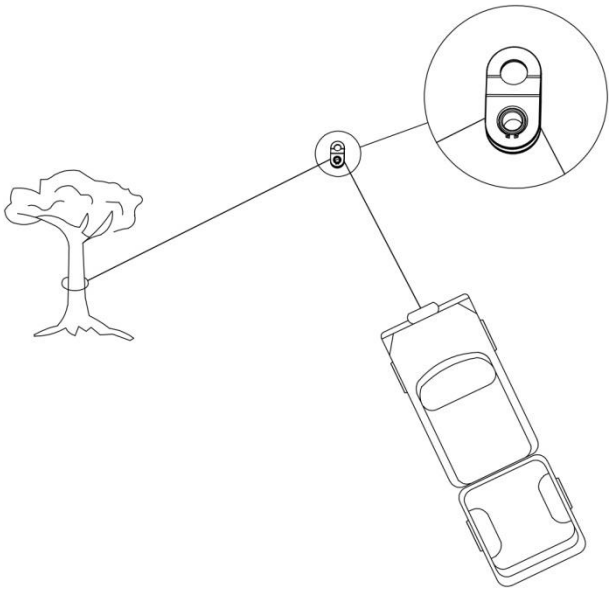
1. The use of a snatch block

(1) Double Line Pull

The use of a pulley/snatch block will aid recovery operations by doubling of the winch capacity and a halving the winching speed and load. A pulley can also be used to create a direct line pull to the center of the fairlead. When double lining during stationary winching, the winch hook should be attached to the chassis of the vehicle.



(2) Change the Pulling Direction

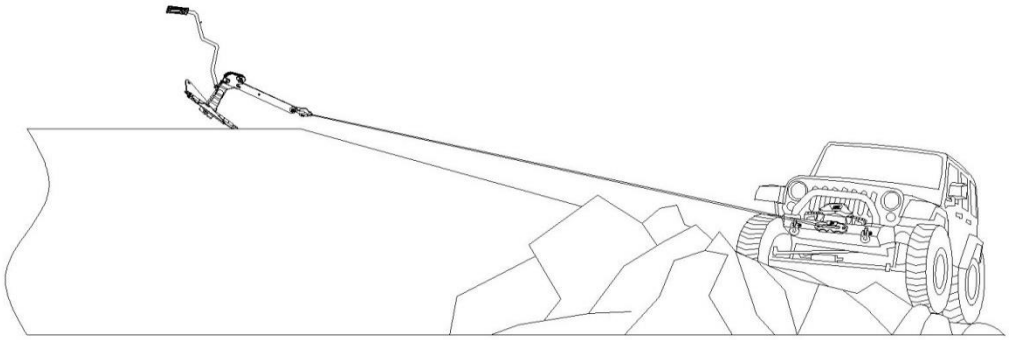


(3) Increasing pulling power &duration

For loads of more than½ the rated capacity, use a pulley block to double line the rope. This will reduce the load on the winch and up to 50% of the strain on the rope. Attach the pulley/snatch block to an anchor point and return the hook to the vehicle chassis.

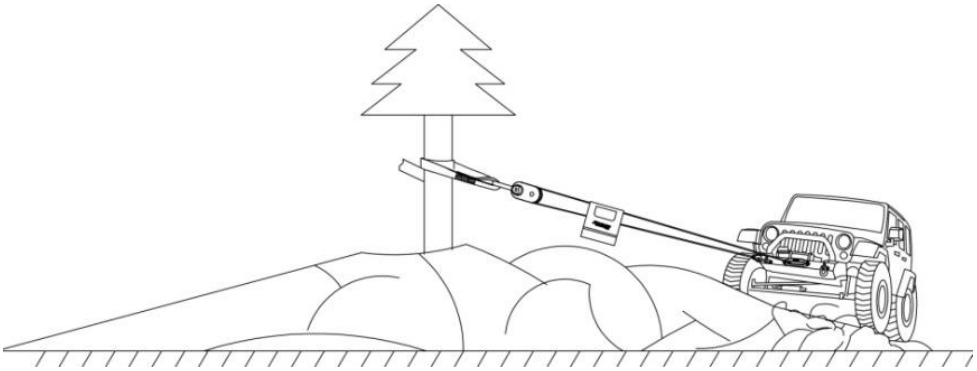
2. Ground Anchor

A ground anchor is a movable device designed to ‘anchor’ to the ground to securely attach a winch cable, often used for self-recovery. Great care should be taken as it is not easy to determine the security of the anchor.



3. Recovery blanket or other heavy duty material

   When pulling, put a cable damper/blanket or other heavy duty material over the rope near the hook end. If the rope fails for any reason the damper will absorb the energy stored in the rope to help reduce whiplash causing injury.



5. Electric Winch Maintenance& Storage

5.1 General Inspection

1) The gear box has been lubricated and is sealed at the factory. No further internal lubrication is required for the life of the winch. Ideally the winch should not be submerged in water for long periods of time). In the event this happens you should remove the earth screw and drain the motor as soon as possible and you should use the winch making the motor to work until it warms up and dries out the motor.
2) Do not attempt to disassemble the gear box. Repairs should be done by an authorized repair center.
3) Periodically check the tightness of the mounting bolts and electrical connections. Remove all dirt or corrosion and always keep the winch and rope clean.
   (Check battery cables and electrical connections at 90 day intervals to be certain they are clean and tight at all connection points.)

4) You should clean and lubricate after using; also should store the winch in the dry and cool place, disengage the clutch, and avoid children to contact and play.
5) If any assembly or mounting bolt is loose or corroded, please repair or replace it as soon as possible.
6) Check monthly the action of the clutch, making sure it is fully engaging and disengaging. If clutch is not fully engaging, inspect clutch shifter assembly parts, check for damage or excessive wear and replace as necessary.
7) Corrosion on electrical connections will reduce performance or may cause a short. Clean all connections especially in the remote control switch and receptacle. In salty environments use a silicone sealer to protect from corrosion.
8) To minimize corrosion of the internal motor components that may occur due to condensation, power the winch in or out periodically. Energizing the motor will generate heat, which will help dissipate any moisture buildup in the motor.

6. Troubleshooting Guide

SYMPTOM	POSSIBLE CAUSE	SUGGESTED REMEDY
Motor does not turn on	Faulty switch	Replace switch
	Winch not connected properly	Check all connections and tighten
	Battery cable damage	Replace battery cable
	Solenoid malfunctioning	Tap solenoid to free contact, applying 12 volts to coil terminal directly. Audible clicking when activating.
	Defective motor	Check for voltage at motor with the switch pressed. If voltage is present, replace motor.
Motor runs too hot	Long period of operation	Let winch cool down periodically or use a snatch block
	Insufficient battery	Check battery terminal voltage under load. If 10 volts or less, replace or install another battery in parallel.
Motor runs slowly or without normal power	Battery runs down	Recharge battery by running vehicle's engine
	Insufficient current or voltage	Clean, tighten or replace the connector
	Bad connection	Check battery cable for corrosion. Clean and grease.
Motor runs but cable drum does not turn	Clutch not engaged	Ensure lever is completely in "Engaged" position
Winch runs in one direction only	Defective or stuck solenoid	Tap solenoid to free contacts. Repair or replace solenoid.
	Defective switch	Replace switch
Motor water damage	Disconnect from battery	Remove ground bolt on bottom of motor and drain.
	Submerged in water or water from high pressure car wash	Allow to drain and dry thoroughly, then run motor without a load in short bursts to dry windings.
Will not hold load	Excessive load	Reduce load or double line
	Worn or damaged brake	Repair or replace brake

A12000 Specifications	
Rated line pull:	12000lbs (5443kgs)single line
Motor:	Series wound 6.0hp/4.4kw,12V DC
Gear train:	3stage planetary
Gear ratio:	265.：1
Clutch:	Sliding ring gear
Braking action:	Automatic in the drum
Fairlead:	4-way roller fairlead
Synthetic rope:	7/16"×79(11mm×24m)
Drum size:	2.5"×8.9"(63mm×226mm)
Dimensions:	21.5"×6.3"×7.6"(545mm×160mm×194mm)
Mounting bole pattern:	10"×4.5"(254mm×114.3mm)
Battery:	650 CCA minimum for winching 25 square mm,72"(1.83m)
N.W:	82lbs(37.5kgs)
Packing:	620mm×360mm×260mm(420pcs 20'container)

Line speed and motor current (first layer)							
line pull	Lbs	0	4000	6000	10000	12000	
	Kgs	0	1814	2722	4536	5443	
Line speed	FPM 12V	22	12.5	9.8	6.9	5.6	
	MPM 12V	6.8	3.8	3	2.1	1.7	
Motor current	Amps 12V	80	170	210	310	360	

Line pull and cable capacity							
Layer of cable		1	2	3	4		
Rated line pull per layer	lbs	12000	9900	8300	7000		
	kgs	5443	4490	3765	3175		
Cable capacity per layer	ft	19.6	42.6	72	79		
	m	6	13	22	24		