



ELECTRIC WINCH Manual & Safety Instruction

**MODEL:
X3500 and X3500S**

***PLEASE READ CAREFULLY BEFORE OPERATING THE WINCH**

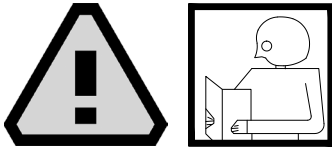
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WHAT'S INCLUDED

DESCRIPTION	QUANTITY
1. Winch Assembly with Wire or Synthetic Rope _____	1
2. Bolt Installation Kit _____	1
3. Clevis Hook w/Pin and Pull Strap _____	1
4. Wired Remote _____	1
5. Winch Mounting Plate _____	1
6. Solenoid Box w/Wire Leads _____	1
7. Fairlead _____	1
8. Instruction Manual _____	1

Warnings and Cautions



1. **As you read these instructions**, you will see **WARNINGS**, **CAUTIONS**, **NOTICES** and **NOTES**.

Each message has a specific purpose. **WARNINGS** are safety messages that indicate a potentially hazardous situation, which, if not avoided, could result in serious injury or death. **CAUTIONS** are safety messages that indicate a potentially hazardous situation which, if not avoided, could result in minor or moderate injury. A **CAUTION** may also be used to alert against unsafe practice. **CAUTIONS** and **WARNINGS** identify the hazard, indicate how to avoid the hazard, and advise of the probable consequence of not avoiding the hazard. **NOTICES** are messages to avoid property damage. **NOTES** are additional information to help you complete a procedure. **PLEASE WORK SAFELY!**



1.2 MOVING PARTS ENTANGLEMENT HAZARD

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.

Failure to observe these instructions could lead to severe injury or death.

To avoid injury to hands or fingers:

- **Always** keep hands clear of rope, hook loop, hook and fairlead opening during installation, operation and when spooling in or out.
 - **Always** use extreme caution when handling hook and rope during spooling operations.
 - **Always** use supplied hook strap whenever spooling rope in or out, during installation, and during operation.
 - **Always** keep vehicle in sight during winching operation.
 - **Always** wear heavy leather gloves when handling rope.

WARNING



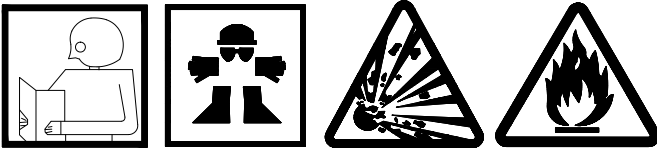
1.3 CHEMICAL AND FIRE HAZARD

Failure to observe these instructions could lead to severe injury or death.

- **Always** remove jewelry and wear eye protection.
- **Never** lean over battery while making connections.
- **Always** verify area is clear of fuel lines, fuel tank, brake lines, electrical wires, etc. when drilling.
- **Never** route electrical cables:
 - Across any sharp edges.
 - Through or near moving parts.
 - Near parts that become hot.
- **Always** insulate and protect all exposed wiring and electrical terminals.
- **Always** install terminal boots as directed in installation instructions.

1.4 Vehicle batteries contain gases that are inflammable and can explode violently.

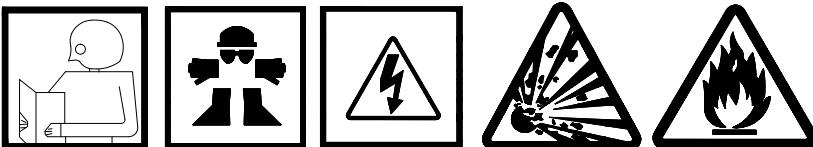
WARNING



1.5 Battery

- Be sure the 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
- Have the engine running when using the winch, to avoid flattening the battery.

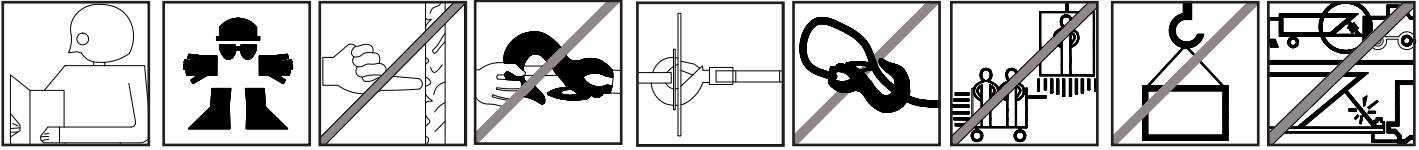
WARNING



1.6 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 area is clear of fuel lines, fuel tanks, brake lines, electrical wires, etc., when drilling.
- **Always** consult operator's manual for proper wiring details.

DANGER



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

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

- **Always** properly seat load in throat of hook.
- **Always** use a shackle or strap when attaching the hook to an anchor point.
- **Always** use a hook with a latch and insure 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 rope or hook while in tension or under load.
- **Never** hook the rope back onto itself.
- **Never** use winch to lift or move persons.
- **Never** use winch as a hoist or to suspend a load.

WARNING

1.8 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 rope, hook loop, hook and fairlead opening during installation, operation and when spooling in or out.
- **Always** keep 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 wired remote control through a window to avoid pinching lead in door, when using remote inside a vehicle.
- **Never** leave 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 more than one minute at or near the rated load. Do not maintain power to the winch if the motor stalls.
- Check motor often, never winching out of max pull and specific time, it will make the motor hot and damage it.

1.9 General Safety

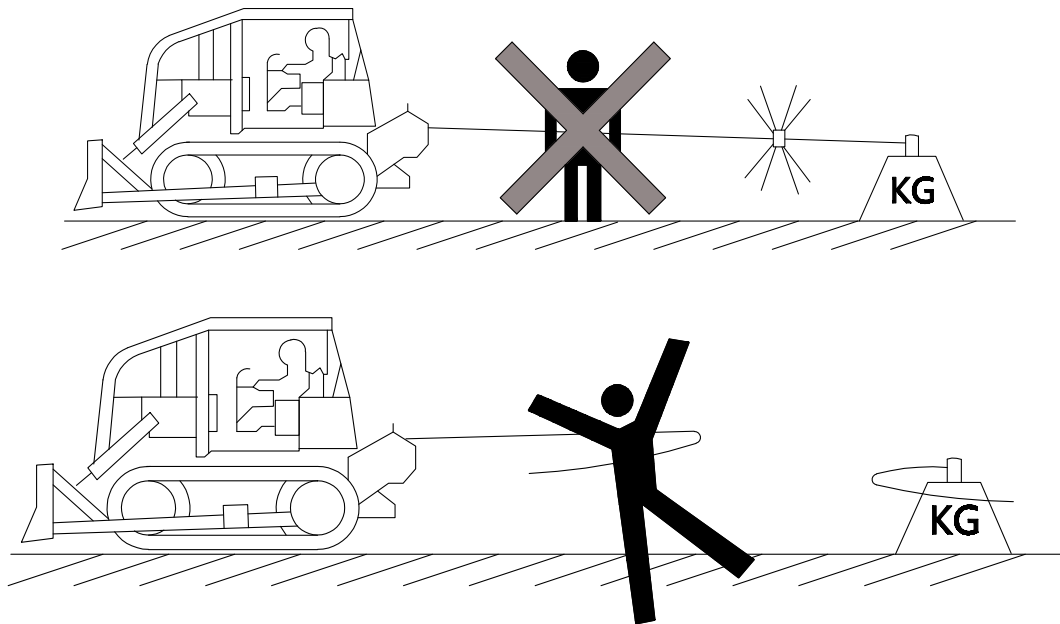


- **Always** know your winch. Take time to fully read the Installation Guide and the Basic Guide to Winching Techniques in order to understand your winch and its operation.
- Electric winches are for intermittent usage and should not be used in constant duty applications.
- Modification, alteration, 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 winch/rope capacity listed on product data sheet. Double line using a snatch block to reduce winch load. **3**

- **Always** be aware of stability of 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.

1.10 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 serious personal injury or death.



(Figure 2-4)

- **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** be careful 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 ropes end loop before connecting the electrical wiring.
- **Always** position fairlead with WARNING label on top.
- **Never** obscure warning and instruction labels.
- **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, it causes damage to the rope.
- **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 or 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
- **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.
- Place a recovery blanket on wire rope if possible before operating winch, it will make vehicle and operator safe if wire rope is damaged.

CAUTION

1.11 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** “jog” rope under load. Shock loads can momentarily exceed capacity of rope and winch.
- **Never** use winch to secure a load during transport.
- **Never** submerge winch in water.
- **Always** store the remote control in a protected, clean, dry area.

NOTICE

1.12 General Tips for Safe Operation

1. To prevent battery drain and maximize 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 **SHALL 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 block/snake 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 in cable breakage.

NOTICE

2. Step 1 - Mount the Winch

To secure the winch, always use:

- A flat, secure mounting location at least 4.8 mm (3/16 in.) thick.
- Lock washers.
- Hex head cap screws when using a one-piece winch mount plate.

Note: When using separate winch mount and fairlead plates use hex head capscrews on the motor side of the base as shown in Figure 4.

- Torque the mounting bolts to 16 N-m (12 lb-ft).

- Remove bottom tie bolt. This bolt should be retained for winch service.
- Put clutch in freespool position.
- Manually feed cable loop through fairlead.
- Attach hook to cable loop and re-engage clutch.

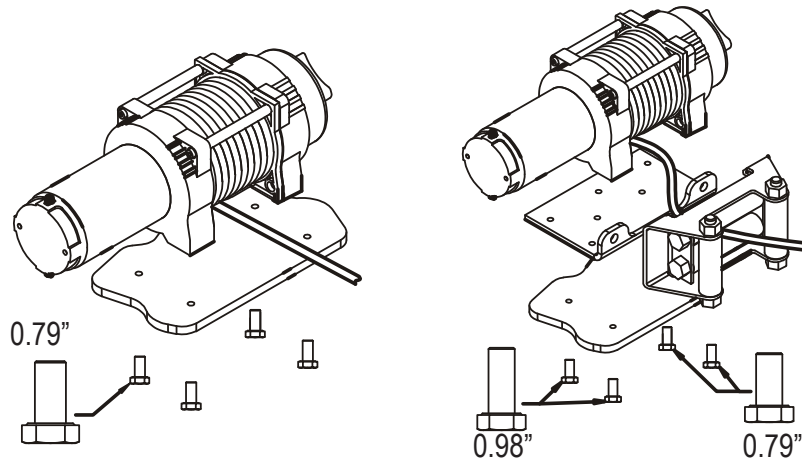
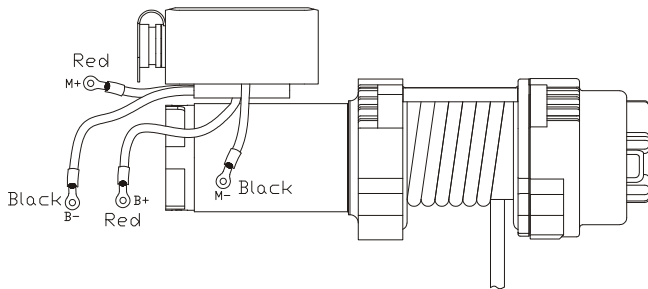


Figure 4: Orientation of winch to mounting plate and bolt lengths.

2.1 Step 2 - Install Control Box and Install Wiring

- Mount the control box on winch.
- Connect the short red cable to the “+” terminal of the motor and cover with terminal boot.
- Connect the short black cable to the “-” terminal of the motor and cover with terminal boot.
- Connect the long red cable to the “+” terminal of the battery.
- Connect the long black cable to the “-” terminal of the battery.



- **Always** remove jewelry and wear eye protection.
- **Never** lean over battery while making connections.
- **Always** verify area is clear of fuel lines, fuel tanks, brake lines, electrical wires, etc. when drilling.
- **Never** route electrical cables:
 - Across any sharp edges.
 - Through or near moving parts.
 - Near parts that become hot.
- **Always** insulate and protect all exposed wiring and electrical terminals.
- **Always** install terminal boots as directed in installation instructions.

2.2 Step 3 - Check the System

Before using the winch, verify the following:

- Wiring to all components is correct. All loose wires are tie wrapped tight.
- There are no exposed wiring or terminals. Cover any existing terminal exposures with terminal boots, heat shrink tubing or electricians tape.

2.3 Step 4 - 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 operate the remote control to see if the winch works. If the winch doesn’t work, please check if all the things are in proper condition, such as, if the cable connection is correct and tight or the vehicle battery is sufficient. If the winch still does not work after a thorough check, please contact the supplier.

2.4 Winch Maintenance

1. No further internal lubrication is required for the life of the winch. Winch should not be soaked in water for a long period of time.
2. Lubricate the cable periodically, replace either new cable as soon as possible if a kink, fray, fracture or crease is found.

TROUBLESHOOTING

SYMPTOM	POSSIBLE CAUSE	SUGGESTED REMEDY
Motor does not turn on	<ul style="list-style-type: none"> • Solenoid malfunctioning • Switch assembly not connected properly <ul style="list-style-type: none"> • Loose battery cable • Battery weak 	<ul style="list-style-type: none"> • Insert switch assembly all the way into the connector • Tighten nuts on all cable connections. • Replace switch assembly • Check for voltage at armature • Check battery for proper voltage level
Motor runs but cable drum does not turn	<ul style="list-style-type: none"> • Cam Ring (clutch) not engaged 	<ul style="list-style-type: none"> • Move Cam Ring to the “in” position. If problem persists, a qualified technician needs to check and repair.
Motor runs slowly or without normal power	<ul style="list-style-type: none"> • Insufficient current or voltage 	<ul style="list-style-type: none"> • Battery weak, recharge. • Run winch with vehicle motor running <ul style="list-style-type: none"> • Loose or corroded battery cable connections • Clean, tighten or replace battery cables
Motor runs too hot	<ul style="list-style-type: none"> • Long period of operation 	<ul style="list-style-type: none"> • Let winch cool down periodically
Winch runs in one direction only	<ul style="list-style-type: none"> • Defective or stuck solenoid • Defective switch assembly 	<ul style="list-style-type: none"> • Repair or replace solenoid. • Replace switch assembly

SPECIFICATIONS

X3500 and X3500S

Rated Line Pull	3500LBs
Motor	Permanent magnetic DC 12V with 1.5HP/1.0kw output
Gear Train	3 Stage Planetary
Gear Ratio	198:1
Wire Rope	7/32" x 33'
Synthetic Rope	7/32" x 33'
Drum Size	2.48" x 8.9"
Bolt Pattern	10" x 4.5"
N.W.	17.6LBs



IP68 rated to keep out dirt, water and to ensure reliability.

LINE SPEED & MOTOR CURRENT (FIRST LAYER)

Line Pull:	Lbs	0	1000	2000	3000	3500
	Kgs	0	454	907	1360	1589
Line Speed:	FPM	16	10.5	9.2	7.2	5.9
	MPM	4.9	3.2	2.8	2.2	1.8
Motor Current:	Amps	15	70	10.5	135	150

LINE PULL & CABLE CAPACITY

Layer of Cable		1	2	3	4
Rated Line Pull Per Layer	Lbs	3500	2870	2430	2100
	Kgs	1598	1300	1100	950
Cable Capacity Per Layer:	Ft	6.9	15.1	24.9	36.4
	M	2.1	4.6	7.6	10

