

G&W 3500 & 4500 WINCH



TECHNICAL MANUAL

WWW.WINCH.COM.AU

MODEL -

SERIAL NO.

EARTH CONTINUITY TEST

OPERATIONAL TEST

NOT FOR MOVEMENT OF HUMANS



THINK SAFETY FIRST AND LAST WARNING!!

FAILURE TO READ THE FOLLOWING WARNINGS MAY RESULT IN SERIOUS INJURY OR DEATH. AND ALL MODIFICATIONS MUST BE APPROVED BY GEARS AND WINCHES IN WRITING AND SHALL BE CARRIED OUT BY A QUALIFIED PERSON!

- ❖ This winch is supplied with a low voltage removable pendant control. You may upgrade to a wireless remote at any stage.
- ❖ It is imperative that the winch rope is kept taut at all times. If for some reason it has unravelled on the winch drum you must ensure that it is wound back on correctly before you start winching. It is possible under rare circumstances for the rope to be caught between itself and can damage the rope irreparably. If damage occurs under these circumstances it is not covered under warranty.
- ❖ Our G&W Series Winches may be supplied full of lubrication, but this is not guarantee. It is your responsibility to make sure your winch is lubricated appropriately. One way to do this is to observe heat build-up.
- ❖ Avoid shock loads. This type of load imposes a strain on a winch many times the actual load rating of the winch and can cause severe damage to the winch and or the cable.
- ❖ If your winch is supplied/fitted with a dog clutch it is possible to use it for lifting subject to the following the winch is rated for lifting and a dog clutch locking device is fitted.
- ❖ To help keep you winch running correctly you may have to spray the unit and surrounding area with a surface spray as geckos, spiders etc. love to make their home in our expensive machines.
- ❖ Also, to help preserve this unit and to help the rope lay better a light oiling is recommended
- ❖ Cable anchors on G&W Winches are not designed to hold the rated load of the winch. You must keep at least 5 wraps of cable on the drum to ensure that the cable doesn't come loose
- ❖ Stay clear of suspended loads and of cable under tension. A broken cable or dropped load can cause serious injury or death.
- ❖ A full copy of our risk management assessment can be found on our website:
www.winch.com.au

GENERAL INFORMATION

Welcome to our huge family of happy winch owners, we would like to thank you for purchasing from our G&W Series Winch range. We trust you will be very happy with the performance and reliability of this product. However, we do ask that you take a few minutes to read and thoroughly understand this booklet. Also, if you have new operators assigned to the winch, make sure that they read and understand it also.

These winches are specially designed for a fast and economical load recovery. They are built strong, lightweight and compact to ensure for an extended use life. The motors fitted to these winches are specifically designed and built for electric winching operation and should not be restricted from reasonable ventilation. The G&W Series winches also fitted with a fail-safe electro-magnetic brake. This ensures strong and safe operation. In the event of power outages, the brake is automatically engaged.

We are so confident in our product all our winches have a full "2-year warranty".

INDICATIVE AMPS DRAW @ FULL LOAD

For all 240 volt models 10 AMP maximum.

If you have any queries on fitting, operating or information in general, please don't hesitate to contact us as we are happy to answer any and all of your queries.

WARNING: These winches are not for the movement of humans.

PLEASE NOTE: ANY AND ALL MODIFICATIONS MUST BE APPROVED BY GEARS AND WINCHES IN WRITING AND SHALL BE CARRIED OUT BY A QUALIFIED PERSON

INSTALLATION INSTRUCTIONS

The initial installation or mounting of this Winch is critically important for proper operation and performance. If the winch is mounted unevenly the centre line of the unit can be distorted to a point where the winch will not operate in either direction. It is therefore very important that the following instructions are observed when this Winch is installed. Please spend a bit of quality time on this – it will pay off in the long run.

1. Make certain that the mounting platform is sufficiently strong (at least twice the rated load of the winch) in order to avoid deflection when the load is hauled or lifted.
2. These units are very versatile they may be mounted on the wall, on a removable post mounted in the floor or any flat surface as long as the structure is strong enough. It is imperative that whatever these winches are bolted to is robust, safe and strong.
3. Set the winch in/on mounting platform and make sure good surface contact is made on all mounting pads of the winch. We suggest that a bitumen or tarbased coating be placed on the base of the winch to minimise rusting and deterioration of the frame. We also suggest the winch be mounted on galvanised or stainless-steel washers this will minimise twisting of the frame on uneven surfaces.
4. Install mounting bolts and tighten firmly.
5. We advise the entire winch should be sprayed with a film of de-watering fluid i.e. WD40, Inox etc, and the winch rope should be sprayed with de-watering fluid regularly to avoid oxidization.

BREAK-IN

To familiarize yourself with the winch, run it for a few minutes to understand the controls and “feel” of the winch. Pay particular attention to the controls and how they operate.

Winches, like any other kind of machinery, require a “break in” to perform well and to maximize their life. The following guidelines should be used in the break-in of G&W winches.

Use extreme care when first spooling cable onto the winch. Do NOT run the winch under heavy loads when performing this operation. Make sure that the cable is unrolled in a line (to prevent kinks) a light load is best for bedding in the rope while in hauling the cable. Do not exceed one half-rated load for the first thirty minutes of operation.

This will ensure that the drive system will have an opportunity to wear properly and if there is any kind of problem it may be found and rectified before serious damage can occur. Periodically, check the gears for wear and lubrication –this must be done manually. Planetary gear winches are designed and intended for longer duty applications, they should generate very little heat. You must however keep the lubrication up to them because lack of lubrication means rapid deterioration.

Do not let the oil in the winch “BURN” it is totally useless as a lubricant once it has reached this heat.

**REMEMBER THINK SAFETY AT ALL TIMES
PLEASE NOTE – ANY UNAUTHORISED MODIFICATION OF OUR
PRODUCTS MAY VOID WARRANTY.**

WINCH OPERATING INSTRUCTIONS

Our winches are designed and manufactured for ease of use; hence the operational use of this winch is very easy and straight forward.

- Make sure of current output i.e. 10 amps.
- Ensure Earth Leakage Circuit Breaker (ELCB) has been fitted to the Power circuit.
- Plug control pendant into control enclosure.
- Plug into power outlet and switch on.
- Make sure the area around the winch is safe i.e. no authorised people and material.

SPECIAL NOTE:

Please identify whether or not your winch is fitted with an “Emergency Stop” Button. Your winch will not work if it is depressed. Check and Re-check this, if your winch does not work. This is the most common cause of in-operation.

LOW VOLTAGE PENDANT CONTROL MODELS

- Press the “Down” button to unwind rope, (make sure the rope is under Tension). The load will travel backwards/lower.
- Press the “Up” button on the pendant control for retrieval/Raising of the Load.
- E Stop button is for emergency stop function if applicable.
- **When using the pendant control – buttons must be fully depressed.**

REMOTE CONTROL MODELS

- Press the button marked “B” on the remote controller to unwind the rope making sure the rope has tension all the time. This will allow the load to travel backwards.
- Press the button marked “A” on the remote controller for retrieval of the load.
- In case of a remote controller fault - forward and reverse switch is fitted to the main control box along with an emergency shut off switch.
- At the end of each winching operation or If there is a problem and all else fails, immediately turn off the power at the mains.
- Last but not least, ensure the load is secure.

PLEASE NOTE – SOME OUR WINCHES ARE FITTED WITH THE FOLLOWING

- This winch maybe fitted with a spring-loaded flex plate, this plate is designed to help layer the rope tidily and to hold the rope on the drum when the end of the rope goes loose – i.e. when your boat is inside your shed, parking station etc. or any flat ground or if for some reason your rope is not connected to the tailer and the rope becomes loose, it will not ball up on the drum. The plate also prevents loose rope being caught in the gear mechanisms on the winch.
- “Caution” this flex plate is designed to hold the rope on the drum in both directions. It is necessary that you make sure there is weight on the rope when launching over the same flat area, or the plate may hold the top layer and the under layers may begin to ball up.
- Simply stated don’t launch slower than the winch

SAFETY RULES

Before operating the winch, read and follow the instructions.

- This winch is designed for hauling only. Under no circumstances, should it be used for the movement of humans.
- The winch should be mounted on a flat, solid surface as level as possible. This will ensure that the steel rope will arrange neatly on the drum. This will avoid any irregular damage to the steel rope and will eliminate distortion of frame.
- Do not exceed the rating lifting capacity of the winch. Allowable weight is indicated on the attached plate.
- The winch should be operated by a skilled operator.
- Before operating the winch check again to ensure all screws are tightened securely without loosening.
- Before operating the winch check to see if the steel rope drum runs to the correction direction and the brake works normally.
- Prior to initiating winching operations be sure any element which can interfere with the safe winching operations is removed.
- Stand clear of wire and load during operation. Never touch wire rope or hook while in tension.
- Keep hands clear of wire rope, hook and fairlead opening during operation and when spooling.
- Never touch wire rope or hook while in tension.

For a full Risk Management, please go to our website:

www.winch.com.au

INSPECTION AND MAINTENANCE

Check wire rope periodically:

- Replace when signs of excessive wear, serious deformation and corrosion exist.
- Lubricate wire rope regularly.

Check daily: -

- External visual inspection of winch including brake, gear reduction, wire rope and electrical connections.
- Test winch hoisting/lowering functions for smooth operation via push button control.
- Test E Stop
- Ensure wire rope is wound in the correct manner

Check monthly:

- Inspect entire wire rope assembly.
- View control/motor wiring for damage.
- Check mounting bolts.
- Keep motor and controls from water
- Should the motor be shielded, care should be taken not to choke motor heat dissipation vents.

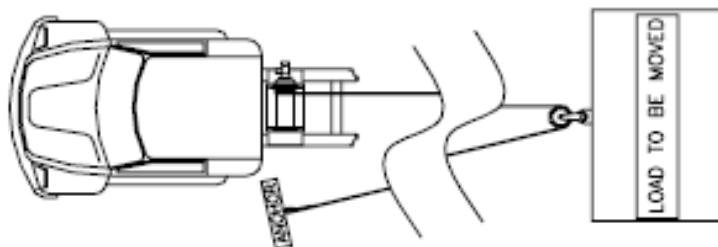
Lubrication:

Please Note: The Blue Series winch are of open gear cut design therefore requires more human intervention when it comes to lubrication. The gears must be lubricated with “open gears spray” available at a quality hardware store such as Blackwood’s etc. The winch must be run once every 3 months, the gears and chains should be lubricated at that time. If the winch is used more frequently they should be lubricated every 2-3 hours of use.

The plumber block bearings and or every other grease nipples should be greased at the same interval.

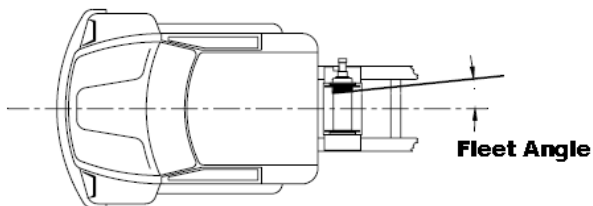
USING A SNATCH BLOCK

By using a snatch block you have effectively cut the load on the winch in half. A snatch block should be used any time you have a concern about the ability of the winch or cable to move a load. The following illustration shows one way to rig such a block.



THE IMPORTANCE OF A PROPER FLEET ANGLE

Maintaining the proper fleet angle is important to the success of your winching operation, the life of your winch and the life of the cable you are using. The fleet angle can best be described by the following illustration.



The fleet angle should be kept as small as possible to insure proper spooling and to maximise cable and winch life. To promote even cable spooling, keep the flit angle below three degrees. Never pull directly against the flange of the winch cable drum as this may cause the cable or the winch to break.

BRAKE FAILED?

PROBLEM CAUSE	CORRECTION
Incorrect wiring	Check wiring
Brake coil or burnt out	Replace- see manufacturer
Rectifier damaged	Replace- see manufacturer

POOR BREAK PERFORMANCE? BREAKING TIME TOO LONG?

PROBLEM CAUSE	CORRECTION
Oil or dust	Clean break lining
Too much gap between brake linings	Adjust gap properly
Brake lining worn out	Replace- see manufacturer

ABNORMAL NOISE?

PROBLEM CASUE	CORRECTION
Continuous loud noise- bearing damaged/gear worn out.	Repair- see manufacture
Occasional loud noise- bearing Damaged or dirty.	Repair- see manufacturer

POOR START?

PROBLEM CAUSE	CORRECTION
Starting capacitor damaged	Replace- see manufacturer

CAPICITOR DAMAGED

PROBLEM CAUSE	CORRECTION
Eccentric switch connection point damaged	See manufacturer

WINCH WILL NOT RUN?

PROBLEM CAUSE	CORRECTION
NO power at the winch - If your winch is fitted with an E stop button is it pressed in- this is the most common problem with electrical supply.	<ol style="list-style-type: none"> 1 Check power supply 2. Check ELCB 3. Check overload switch on winch 4. Check power point by plugging in another appliance.
Brake system failed	Brake coil or rectifier damaged. May need to replace it- see manufacturer
Poor contact on switch	May need to repair or replace- see manufacturer.
Voltage too low	Check if power wires are too long or their diameter is too small
Overloaded	Reduce load
Capacitor damaged	Replace capacitor- see manufacturer
Damage to gears, bearings, motor shaft or coil	Return to manufacturer for repair

MOTOR RUNS BUT STEEL ROPE DRUM DOES NOT?

PROBLEM CAUSE	CORRECTION
Coupling between motor and the first shaft may not be mounted properly	You may need a replacement or it may not be fitted properly.
Motor shaft broke	Replace- see manufacturer
Gear damaged	Return to manufacturer for repair

TECHNICAL INFORMATION

Motor		
	Single ph. Voltage	Three ph. Voltage
Power source	240v	440v
Frequency	50hz	50hz
Cooling method	Fan cooling	Fan cooling
Start method	Run start capacitor start	Contactors
Frame material	Steel	Steel
Speed Reducer		
Gear	Satellite gear drive. Long service life manufactured from special alloy steel, precision machined and carbonisation heat treated	
Gear box material	Aluminium alloy die cast	
Lubrication	The unit has been filled with high quality lubricating grease. No further lubrication is required in this area.	
Brake		
Actuation method	Electromagnetic brake (failsafe brake)	
Volt	DC 110v or 220v (with rectifier)	
Ambient Conditions		
Temperature	0°C - 45°C	
Humidity	Under 90% (no condensation)	
Location	Indoor: dry environment well ventilated	

Along with our in-house design and winch manufacturing our comprehensive workshop also offers a full range of specialized machining capabilities including gear cutting, gear tooth and thread grinding, internal and external splining, CNC wire cutting, CNC slotting, CNC lathe and milling work, multi head intergrex and more.



This is just one example of our complement of modern gear cutting and grinding equipment

The G&W 3500 AND 4500 are of a small footprint. They are however quite tall and at 80 plus kilos quite heavy. Being so tall and heavy makes shipment a little difficult- so we have separated the bottom section, drum and gear box from the motor and controller. This also makes installation easier as well.

Once the bottom section has been bolted into position, simply line up the keyway in the gearbox and slide home. Fit the 4 bolts around the motor and away you go.



GEARBOX AND MOTOR SELECTION FOR WINCH		1000kg 3rd layer 9 x 30 rope=4500 up 12.5 deg spd 5.2 mpm av																																																
N.B. The efficiencies are theoretic.		<table border="1"> <thead> <tr> <th>Layer nr.</th> <th>Layer diameter (mm)</th> <th>Wire length (m)</th> <th>Output torque (Nm)</th> <th>Wire speed (m/min)</th> </tr> </thead> <tbody> <tr><td>1</td><td>110</td><td>8.21</td><td>593</td><td>4.41</td></tr> <tr><td>2</td><td>130</td><td>17.89</td><td>699</td><td>5.21</td></tr> <tr><td>3</td><td>149</td><td>29.05</td><td>806</td><td>6.00</td></tr> <tr><td>4</td><td>169</td><td>41.69</td><td>913</td><td>6.79</td></tr> <tr><td>5</td><td>189</td><td>55.80</td><td>1,019</td><td>7.59</td></tr> <tr><td>6</td><td>209</td><td>71.39</td><td>1,126</td><td>8.38</td></tr> <tr><td>7</td><td>228</td><td>88.46</td><td>1,233</td><td>9.17</td></tr> <tr><td>8</td><td>248</td><td>107.00</td><td>1,339</td><td>9.97</td></tr> </tbody> </table>				Layer nr.	Layer diameter (mm)	Wire length (m)	Output torque (Nm)	Wire speed (m/min)	1	110	8.21	593	4.41	2	130	17.89	699	5.21	3	149	29.05	806	6.00	4	169	41.69	913	6.79	5	189	55.80	1,019	7.59	6	209	71.39	1,126	8.38	7	228	88.46	1,233	9.17	8	248	107.00	1,339	9.97
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Line pull last layer = F	(kg)	G&W 4500																																																
Wire diameter = d	(mm)	HAUL 30 x 9																																																
Wire diameter + 4%	(mm)	9.88																																																
Drum diameter	(mm)	100																																																
Drum length	(mm)	240																																																
Number of layers		3																																																
Speed of last layer	(m/min)	6																																																
Output torque last layer = T2	(Nm)	806	Turns 1st. layer																																															
Output speed = n2	(rpm)	12.79	3																																															
Type of gearbox / winch		NMRV-P90 20;1 plus 5.5	Turns length																																															
Gearbox ratio		110	1.04																																															
Gearbox efficiency (0,97 each stage)		0.675																																																
Input torque last layer = T1	(Nm)	11																																																
Input speed = n1	(rpm)	1,407																																																
Input power	(kW)	1.60																																																
Type of electric motor		CMG																																																
Nominal power	(kW)	1.7																																																
Nominal speed	(rpm)	1410																																																
Nominal braking torque of the motor	(Nm)	16																																																

Rope position 1 / 0

0

vers. d/d 29-07-98

GEARBOX AND MOTOR SELECTION FOR WINCH		800 kg 3rd lyr 8x30 rope up 12.5 D=3.5T spd 7.2 mpm avrg																																																
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Type of gearbox / winch		NMRV-P90 25;1 plus 3.11	Turns length																																															
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Rope position 1 / 0

0

vers. d/d 29-07-98

GENERAL WARRANTY

Winch Industries Pty. Ltd. warrants parts and labour, directly to the first purchaser of each winch against defects in material and workmanship appearing under normal use and service only for a period of two (2) years from the date of purchase. If you discover a covered defect, Winch Industries will, at its option, repair, replace or refund the purchase price of this winch or winch parts at no charge to you, provided you return it during the applicable warranty period, transportation charges prepaid, to Winch Industries Service Department or Factory Authorized Servicing Distributor. (You can obtain additional information from Winch Industries directly at the address below). Please attach your name, address, telephone number, and a description of the problem and a copy of a bill of sale bearing the appropriate proof of original retail purchase, to each product returned for warranty service. To obtain any warranty coverage, it is absolutely necessary that your present proof of purchase acceptable to Winch Industries, such as a copy of the purchase receipt.

This warranty applies only to winches sold and/or manufactured by Winch Industries, which can be identified by the "Winch Industries" trademark, trade name or logo affixed to them. This warranty does not apply if the product has been damaged by accident, abuse, misuse, collision, overloading, exhaust, or misapplication, or has been improperly installed, has been improperly used, has been improperly serviced, or has been modified without the written permission of Winch Industries. This warranty does not apply if any Winch Industries serial number has been removed or defaced. The finish and wire rope on the product are excluded from this warranty.

Except as expressly stated herein, there are no warranties, express or implied, including implied warranties of merchantability and fitness for a particular purpose. Any implied warranty of merchantability or fitness for a particular purpose which by law may not be excluded is limited in duration to two (2) years from the date of original retail purchase of this product.

The warranty and the remedies set forth above are exclusive and in lieu of all others, oral or written, express or implied. No winch industries dealer, agent or employee is authorised to make any modification, extension or addition to this warranty.

In no event is winch industries responsible for special, incidental or consequential damages resulting from any breach of warranty, or under any other legal theory, including, but not limited to lost profits, down time, goodwill, damage to or replacement of equipment and property, loss of use of the product or of any associated equipment, or cost of substituted products.

Warranty enquiries should be directed to:
GEARS AND WINCHES
2 COIN STREET, MOOROOKA, QLD, 4105
PHONE 07 3875 1568 FAX 07 3277 4316
EMAIL - admin@winch.com.au