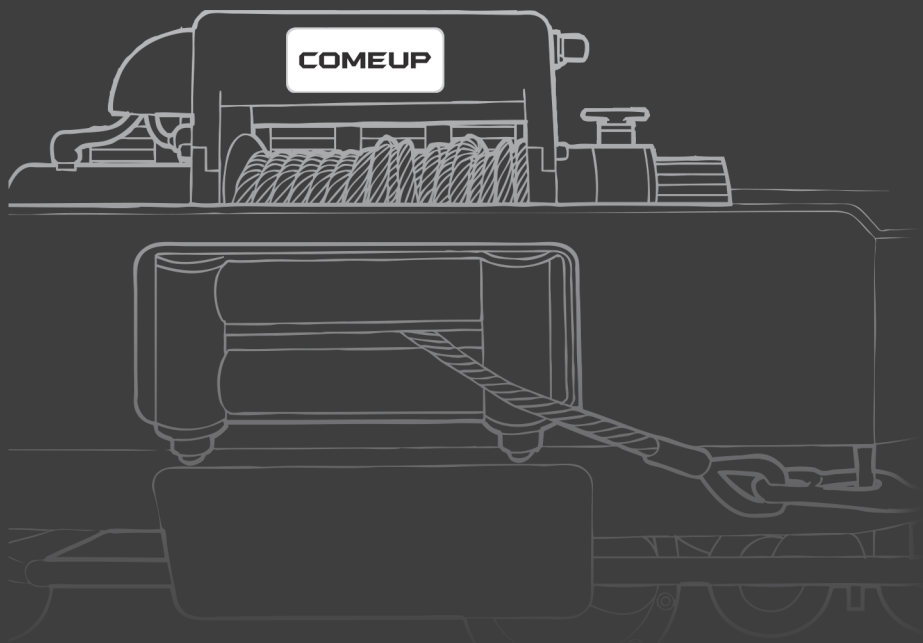


# COMEUP

## AUTOMOTIVE WINCH



## INSTRUCTION MANUAL





Thank you for purchasing a **COMEUP** Winch. This manual covers operation and maintenance of the winch. All information in this publication is based on the latest production information available at the time of printing. We reserve the right to make changes without notice because of continued product improvement.

The winch has been designed to give safe and dependable service if operated according to the instructions. Please read and understand this manual before installation and operation of the winch. Careless winch operation can result in serious injury or property damage.

When requesting information or ordering replacement parts, always give the following information:

1. Winch model and voltage
2. Serial Number
3. Item. No. and Part Number
4. Part Description



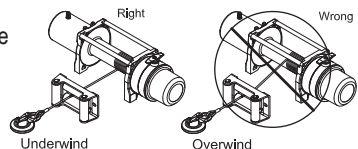
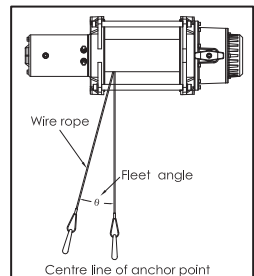
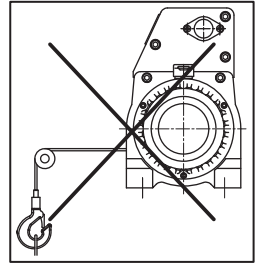
### **WARNING**

1. The winch is a very powerful machine. Treat with extreme care and observe all caution and warnings.
2. The winch is rated at the first layer of wire rope on the drum for intermittent-periodic duty.
3. The winch is not to be used to lift, support or otherwise transport personnel.
4. A minimum of five (5) wraps of rope around the drum is necessary to support the rated load.
5. Keep clear of winch, rope, hook, and fairlead while operating.
6. Wire rope can break without warning. Always keep a safe distance from the winch and rope while under a load.
7. Failure to adequately align, support, or attach the winch to a suitable mounting base could result in a loss of efficiency of performance or damage to the winch, wire rope and mounting channel.

## I. Safety Requirement

### ► General Rules

- ⚠ In some cases, the operator of a winch may be required to have qualifications according to applicable laws and ordinances.
- ⚠ Check safety and environmental conditions prior to and during use.
- ⚠ Only use correctly rated wire rope in construction, strength. Inspect for damage and/or defects before use.
- ⚠ Don't use an unsuitable hook and snatch block for rope.
- ⚠ The operator must remain with the winch during operation.
- ⚠ The winch duty rating is S3 (intermittent-periodic).
- ⚠ Do not use the winch as a lifting device or a hoist for vertical lifting and moving people.
- ⚠ Ensure that the winch is connected to the correct voltage. 12VDC or 24VDC only.
- ⚠ Do not exceed maximum line pull ratings. Shock load must not exceed these ratings.
- ⚠ Keep hands clear of wire rope and roller fairlead opening.
- ⚠ Pull from an angle below 15° in the horizontal plane to straighten up the vehicle or load.
- ⚠ Always use leather gloves when handling the wire rope.
- ⚠ When winching, always use a recovery damper. Place over the wire rope in the middle third of its length.
- ⚠ A wire rope should be replaced if it shows signs of excessive wear, broken strands, corrosion or any other defects.
- ⚠ If the winch fails to pull a load under normal conditions, stop the operation, otherwise motor damage may occur. The thermal indicator LED in the control box or remote switch will indicate RED as a warning.
- ⚠ Check that the clutch T-handle is in the "Engaged" position during and after use.
- ⚠ Remove the switch from the winch when not in use.
- ⚠ Do not wrap the wire rope around the load and back onto itself. Always use a tree truck strap.
- ⚠ Keep hands and clothes away from the winch, wire rope, and roller fairlead.
- ⚠ Never unplug the remote control when winching a load.
- ⚠ To avoid insufficient power when winching a load, the vehicle should be running and in neutral.
- ⚠ If noise or vibration occurs when running, stop the winch immediately and return it for repair.
- ⚠ The rope shall be wound in according to drum rotation sticker or refer to owners manual.



## II. Winching Principles

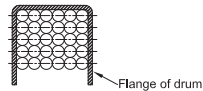
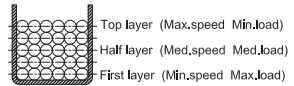
### ► Calculating Fleet Angle

To obtain the best wire rope service, the direction of pull will be on a horizontal within  $\pm 15$  degrees and perpendicular to be centerline of the winch drum within  $\pm 5$  degrees. If the fleet angle is bigger than the recommended angles, a good spooling cannot be obtained as the rope will spoon onto one side of the rope drum and possible damage to the rope or winch.

### ► Load Rating

Load and speed varies according to how much wire rope is on the drum. The first layer of rope on the drum delivers the slowest speed and the maximum load. A full drum delivers the maximum speed and the minimum load.

For this reason, all automotive winches are rated at their first layer capacities.



### ► Duty Cycle Ratings

Duty cycle ratings usually specify continuous, intermittent, or special duty (typically expressed in minutes).

- S1 - Continuous duty.

The motor works at a constant load for enough time to reach temperature equilibrium.

- S2 - Short-time duty.

The motor works at a constant load, but not long enough to reach temperature equilibrium, and the rest periods are long enough for the motor to reach ambient temperature.

- S3 - Intermittent periodic duty.

Sequential, identical run and rest cycles with constant load. Temperature equilibrium is never reached. Starting current has little effect on temperature rise.

For this reason, all automotive winches are rated at S3 intermittent periodic duty.

### ► Required Pulling Force

You need a winch powerful enough to overcome the weight of your vehicle with the added resistance caused by the obstacle, moving water, mud, snow, sand or on a steep hill.

As a general guide, you need a winch with a maximum line pull of at least 1.5 times greater than the gross vehicle weight.

There are three factors listed that influence the line pull effect required to recover the vehicle. The values and calculations in this section are approximate and are for reference only.

- a). Gross vehicle weight
- b). Type of the surface to be traversed
- c). Gradient to overcome

In recovery and loading the winch is used to pull something, the required pulling force (RPF) can be calculated according to the formula:

$$RPF = (Wt \times S) + (Wt \times G)$$

Where: Wt = The gross vehicle weight

S = The type of the surface to be traversed

G = The gradient to overcome

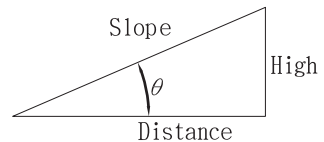
Surface Type	Surface Drag (S)
Metal	0.15
Sand	0.18
Gravel	0.20
Soft Sand	0.22
Mud	0.32
Marsh	0.52
Clay	0.52

Gradient	Angle (°)	Gradient (G)
5%	3°	0.06
10%	6°	0.11
20%	11°	0.2
30%	17°	0.3
50%	26°	0.44
70%	35°	0.58
100%	45°	0.71

For example, if a vehicle weighing 3,000 kg is winched up an incline by 100% on the marsh road, the above formula would be used as follows:

Where Wt: 3,000 kg, S: 0.52 G: 0.71

$$\begin{aligned}
 RPF &= (Wt \times S) + (Wt \times G) \\
 &= (3,000 \text{ kg} \times 0.52) + (3,000 \text{ kg} \times 0.71) \\
 &= 1,560 \text{ kg} + 2,130 \text{ kg} \\
 &= 3,690 \text{ kg of effect required to recover the vehicle}
 \end{aligned}$$



A gradient of 10% is a rise of one meter in ten meters (High / Distance)

### ► Securing Anchor Point

When choosing an anchor point, select a safe and firm point such as a tree, stump or rocks. If using a winch to retrieve another vehicle, the rescue vehicle is considered the anchor point and should be made secure.

The anchor point must be strong enough to hold the gross weight of the vehicle and be positioned to keep the fleet angle between the centre of the anchor point and the wire rope maintained less than 15°. Always use a tree trunk protector strap to prevent ring barking the tree and damaged to the wire rope.

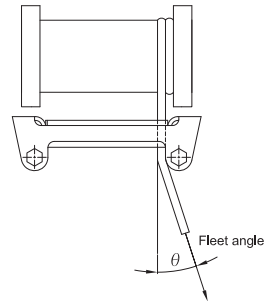
### ► Winching V.S. Hoisting. A pulling winch should not be used for lifting.

Please refer to our website to view our full range of lifting winches

### III . Accessories

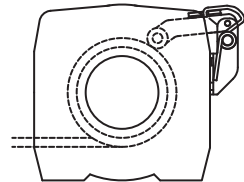
#### ► Roller Fairlead

The use of 4 ways roller fairlead can eliminate the contacting friction because the fairlead rollers contact with the wire rope. But the fairlead does not insure the wire rope will wind onto the drum in an orderly manner. The proper fleet angle within  $15^\circ$  must be maintained for the wire rope to wind onto the drum in an orderly manner. If the proper fleet angle is not maintained, it can result in damage to the winch and wire rope.



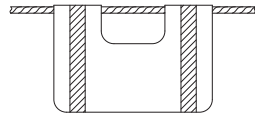
#### ► Cable Tensioner

The purpose of cable tensioner device is to keep the wire rope tight on the drum while the winch is in free spool mode or while there is no load on the wire rope. The cable tensioner shall be treated as optional to winches.



#### ► Recovery Damper

A recovery damper is a safety device designed to help eliminated the possibility of injury or property damage in the event of a wire rope failure. Place in the middle third of a live rope. The damper can help absorb the energy in the rope and reduce the likelihood of injury or damage.



#### ► Snatch Block

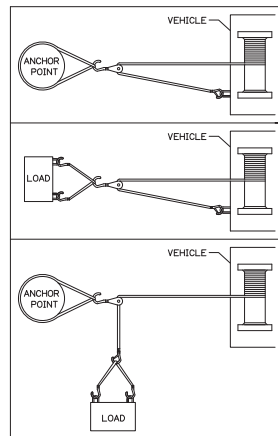
An important aid to successful winching is the use of snatch block, which can be used to increase the pulling power of a winch or change the direction of a pull.

A winch double lined with a snatch block creates a mechanical leverage cutting the effort required by nearly half.

The double line pull shows self recovery using a snatch block attached to an anchor point; the pull applied to the vehicle is almost twice as much as the line pull of the winch.

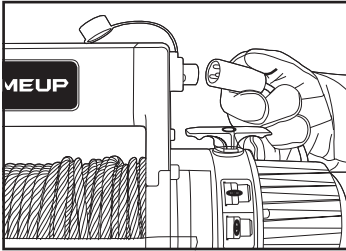
The use of one snatch block shows an indirect pull where the vehicle is limited due to unsuitable ground or obstruction. The pull on the load is the actual line pull of the winch.

If more than one snatch block is used, they must be located at least 100 cm (40") apart.



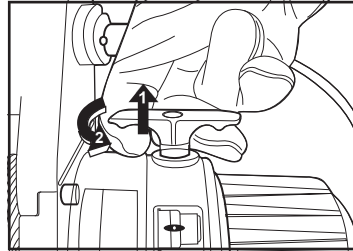
## IV. Winching Procedures

### ► Preparation before Winching



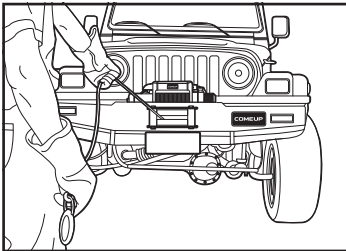
#### 1 、 Connect the remote control

Always disconnect the remote control when not in use. Always have the remote control kept free from winch, wire rope and roller fairlead.



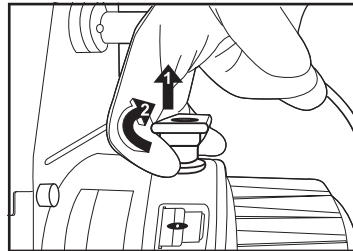
#### 2 、 Disengage clutch function

Lift the clutch T-handle up and turn it at 90° counter-clockwise rotation to the "Disengaged" position, wire rope can now clutch off the drum. Never disengage the clutch while wire rope is under load.



#### 3 、 Pull the wire rope to the anchor point

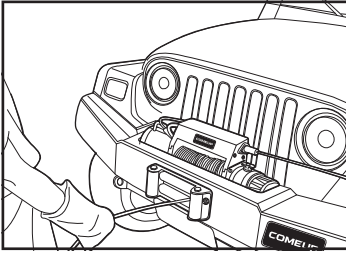
Wear leather gloves when handling wire rope. Pull out enough rope to reach the anchor point. Be careful to keep the rope under tension.



#### 4 、 Engage clutch function

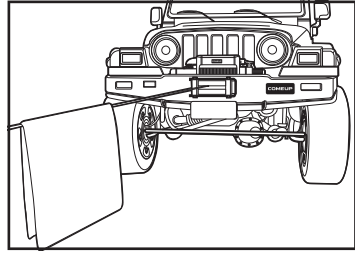
To engage, lift the clutch T-handle up and turn it at 90° clockwise rotation to the "Engaged" position. Never engage the clutch while the drum is rotating.

## ► Winching Operation



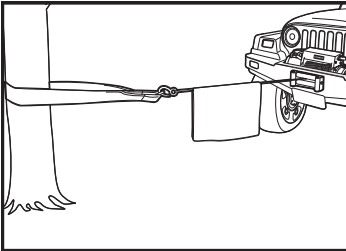
### 1 、 Check the wire rope

Before winching, make sure the rope is wound on the drum evenly. If there is a mixed winding, it is essential to rewind it evenly.



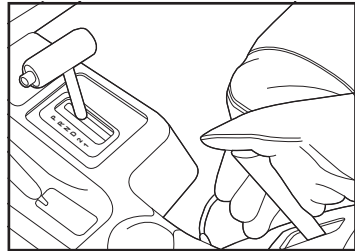
### 2 、 Lay a recovery damper over the rope near the hook end.

If a rope failure occurs, the damper can prevent the rope from whipping.



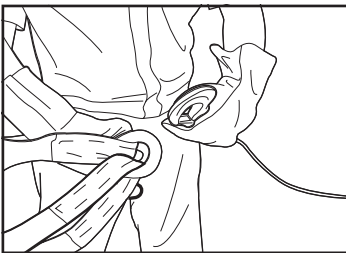
### 3 、 Secure anchor point

It is very important that an anchor point is strong enough to hold the load while winching. Do not wrap the rope around the load and back onto itself. Always use a strap to ensure that the wire rope does not fray or kink.



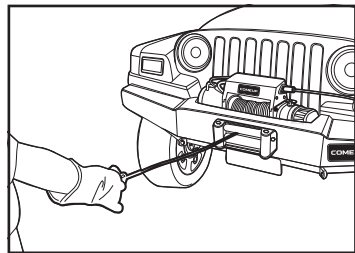
### 4 、 Setting the vehicle engine

The recovery vehicle engine should be running to provide maximum power to the winch. The transmission shall be set in neutral, hand brake applied and wheel chocked or vehicle anchored to prevent the vehicle from moving.



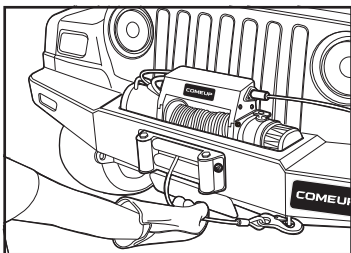
### 5 、 Attach shackle and hook

Use a shackle to lock both ends of tree trunk protector, and then attach to the wire rope hook.



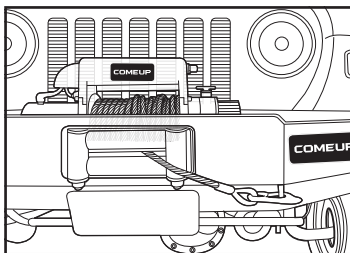
### 6 、 Begin winching

Keep force on the rope to ensure it winds onto the drum evenly. Release hand brake and continue pulling until the vehicle is recovered.



### 7 、 Secure vehicle

Once the vehicle is secured, wind the rope back onto the drum evenly and secure the hook firmly.



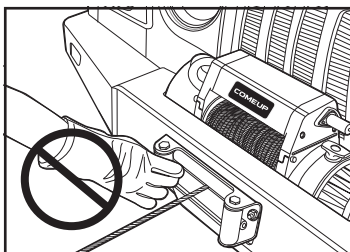
### 8 、 Disconnect remote control

Take remote control out of the socket and store it in a safe and dry place.

## ► Precaution while winching



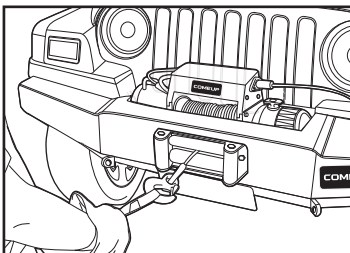
Make sure the wire rope is wound on the drum evenly. A tightly spiralled pig-tailed rope will damage its life and also cause injury.



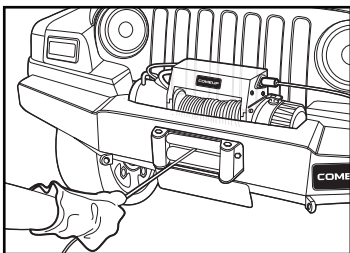
Keep clear of winch, rope, hook, and roller fairlead during winching.



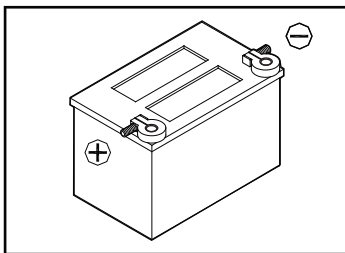
Keep winching area clear. Do not allow people to remain in the area while winching.



Never guide a wire rope onto the drum with your hand, use a hand saver strap.



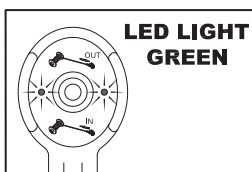
Avoid remote control cord from touching the wire rope.



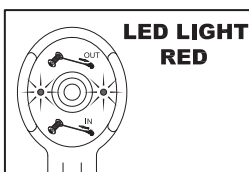
A winching operation requires extra consumption of battery power, so always keep your battery set in a good condition.

### ► Control with Thermal Sensor – Warning LEDs

The warning LEDs are shown on the remote control. You shall stop operation and allow winch to cool (Green LED) when the Red LED was illuminated.



(Normal winching)



(Abnormal winching)

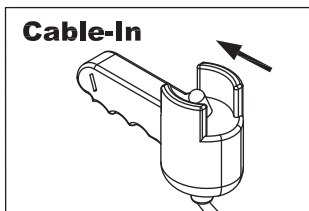
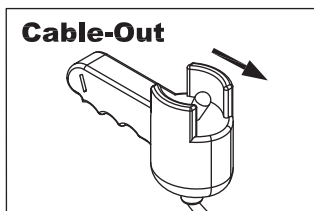
Functions	LEDs
Plug in the Winch	Green
Normal Winching Conditions	Green
Abnormal winching Conditions	Red
Stop the Winch	Green

### ► Battery Recommendations

A fully charged battery and good connections are essential for the proper operation of your winch. The minimum requirement for battery is 650 cold cranking amp.

### ► Cable-in / Cable-out Operation

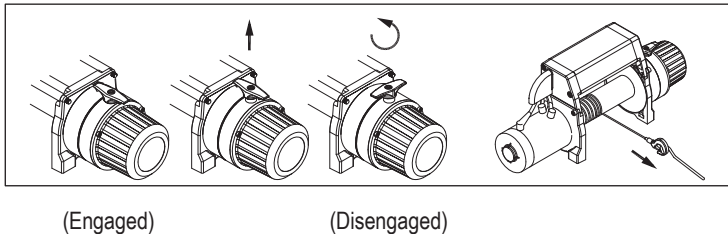
- 1).To determine "Cable - Out", trigger → out
- 2).To determine "Cable - In", trigger ← in
- 3).To stop winching, release the trigger



## ► Clutch Function

The clutch allows rapid pay-out of the wire rope for hooking onto a load or anchor points. The clutch T-handle must be in the “Engaged” position before winching.

- 1). To disengage, lift the clutch T-handle up and turn it 90° in a counter-clockwise direction to the “Disengaged” position. Wire rope can now free spool off the drum.
- 2). To engage, lift the clutch T-handle up and turn it 90° clockwise to the “Engaged” position.
- 3). If a clutch T-handle can't be properly locked in the “Engaged” position, rotate the drum to help the clutch device engage the gear train.
- 4). Wear leather gloves and use a hand saver strap when guiding the wire rope off the drum.

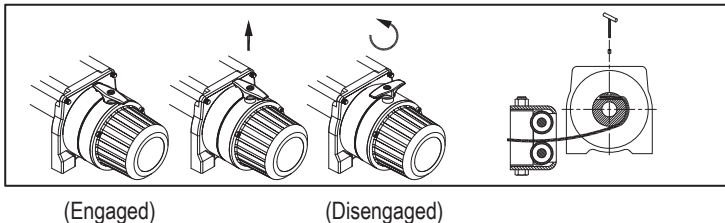


## V . Maintenance

### ► Wire Rope Replacement

Never use a rope of a different size or material. The wire rope end shall be inserted through a hole in the drum and a screw is used to clamp the wire rope in place

- 1). Disengage the clutch T-handle.
- 2). Spool the entire rope, and then remove it from the drum.
- 3). Place the replacement rope through the roller fairlead opening, pass below the drum, and insert it into the hole on the drum core. Tighten the screw downwards to secure the wire rope.
- 4). A red paint section of the rope warns the operator that there are 3 meters of rope left on the drum. Do not wind out past this point.

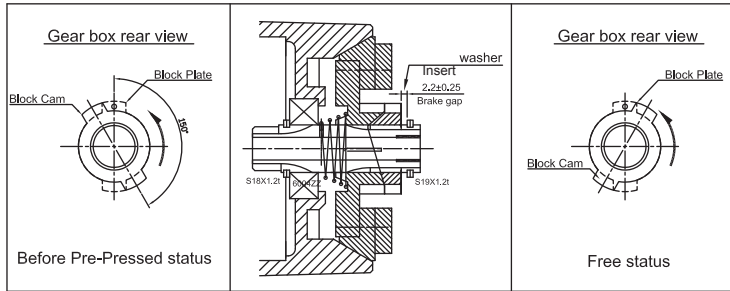


## ► Brake Adjustment

Under normal use, the brake mechanism will not require any adjustment. If the brake fails to hold a load, the brake disc may be worn and require replacement.

When the brake wears to the point that the load begins to slip, the brake can be adjusted as follows:

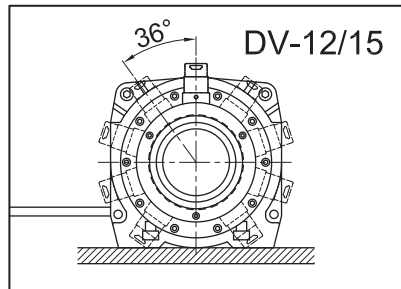
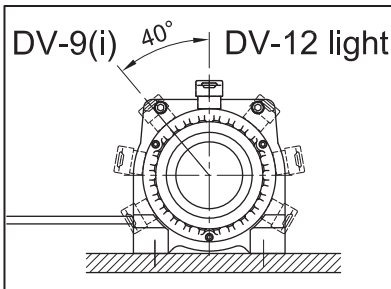
- 1). Loosen the bolt on the brake cover and take out the retaining rings.
- 2). Insert spacers/washers to maintain the brake spacer between to be  $2.2 \pm 0.25$  mm.
- 3). Make sure to keep the clutch base plate is rotated counter-clockwise by 150 – 180 degree .



## ► Repositioning Clutch

The gear box can be rotated for repositioning of the freespool clutch.

- 1). Loosen the bolts on the brake cover and separate brake clutch base and brake rear cover.
- 2). Pull and turn the T-handle counter-clockwise to the “Disengaged” position.
- 3). Turn the gearbox counter-clockwise or clockwise to the required position.
- 4). Assembly the brake clutch base and pull and turn T-handle to the “Engaged” position.



## ► Lubrication

All moving parts in the winch are permanently lubricated at the time of assembly. Under normal conditions factory lubrication will suffice. If re-lubrication of gear box is necessary after repair or disassembly use Shell EP2 or equivalent grease with enough quantity. Clutch T-handle lubricates regularly with light oil. It is not allowed to have brake assembly lubricated.

## ► Maintenance Schedule

- 1). Ensure that a responsible person carries out all inspections as per schedule.
- 2). Inspections are divided into Daily, Monthly and Quarterly.

Classification of check			Item		Checking method	Checking reference
Daily	Periodical					
	Monthly	Quarterly				
<input type="radio"/>			Installation	Mounting bolts & alignment	Bolt tension & wear	Existence of abnormalities
<input type="radio"/>			Remote control	Working	Manual	Reasonable actuation
		<input type="radio"/>		Wearing in contact points	Visual	Free of wear or damage
<input type="radio"/>			Wire rope	Broken strands	Visual, measuring	Less than 10%
<input type="radio"/>	<input type="radio"/>			Decrease in rope diameter	Visual, measuring	7% of nominal diameter max
<input type="radio"/>				Deforming or corrosion	Visual	Existence of abnormalities
<input type="radio"/>				Fastening condition of end	Visual	Existence of abnormalities
		<input type="radio"/>	Clutch assembly	Damaged clutch assembly	Visual evidence of wear	Free of wear or damage
		<input type="radio"/>	Motor	Staining, damage	Visual evidence of wear	Existence of abnormalities
		<input type="radio"/>	Brake	Wearing of brake disc	Visual evidence of wear	Free of wear or damage
<input type="radio"/>				Performance	Visual	Reasonable actuation
		<input type="radio"/>	Gear	Damage, wearing	Visual evidence of wear	Free of wear or damage

## VI .Trouble Shooting

When the winch fails to operate after several attempts, or if there is any fault while

Symptom	Possible Cause	Remedy
Winch will not operate	Cut circuit	Check battery lead
	Weak battery	Recharge or replace battery (at least 650CCA)
	Damaged over-load protector(option)	Replace over-load protector(option)
	Bad connection of wiring	Reconnect tightly
	Damaged contactor	Replace contactor
	Cut circuit on switch	Replace switch
	Damaged motor or worn carbon brush.	Replace motor or carbon brush
	Poor or lost connections to motor	Replace wiring or tighten it
Motor runs in one direction.	Broken wiring or bad connections	Reconnect or replace wiring
	Damaged or stuck contactor	Replace contactor
	Switch inoperative	Replace switch
Drum will not clutch.	Clutch does not disengage	Replace clutch
	Damaged 1 <sup>st</sup> shaft	Replace 1 <sup>st</sup> shaft
	Damaged brake cam and disc	Replace brake cam and disc
	Damaged output shaft	Replace output shaft
No brake	The gear train is mechanically binding up	Check to insure the winch is mounted on a flat, rigid surface
	Damaged brake cam and disc	Replace brake cam and disc
	Damaged gear box	Replace gear box
	Broken retaining ring	Replace retaining ring
	Oil leakage into brake cavity	Repair and clean oil leakage
	Damaged or inoperative spiral spring	Replace and position spiral spring
Brake distance is too long	Worn brake disc or loose brake spacer	Replace brake disc or adjust brake spacer according to brake adjustment procedures
	Oil leakage into brake cavity	Repair and clean oil leakage
Brake will be locked	Too much brake disc powder in the brake hub	Clean brake hub
	Over tensioned spiral spring	Adjust tension on spiral spring
	Stuck between brake disc and gear box	Replace with new brake assembly
Damaged gear box	Hit by certain exterior force	Replace the damaged components
	Damaged gear train	Replace the damaged components
	Over load operation	Stop the winch operation and reduce the load
Motor runs extremely hot	Long period of operation	Allow to cool
	Damaged motor	Replace or repair motor
	Damaged or inoperative brake	Replace or repair brake

# COMEUP

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PN 881406 Ver:02

Specifications subject to change without notice