ProWINCH®

Reg. U.S. TM. Off.

PWYH Series

Instructions and Owner's Manual.

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PROWINCH LLC COMPANY WITH QUALITY MANAGEMENT SYSTEM

LSQA CERTIFICADO CERTIFICATE
ISO 9001:2008 REG: 1875/01

DISCLAIMER PROWINCH®

Prowinch LLC. states that has given the customer all possible safety warnings related to the acquired equipment, so, in behalf of that, does not assume any responsibility for any problems or injuries that the customer or third parties may suffer if caused by not complying direct or indirectly the operation and safety instructions indicated in this User's Manual with the warnings associated with the acquired unit.

Prowinch LLC will not respond for any accidents or harm done to persons or the property that may result as a consequence of the wrong use of this equipment.

Prowinch LLC will not assume any responsibility regarding the use of third party recommendations and does not offer any warranty for them. Any other recommendation does not have any priority over the safety norms in force at customers site.

In case of use of the equipment warranty, Prowinch LLC will only execute it and respond if the customer has valid proof of complying with all warnings and safety instructions indicated in this user's manual

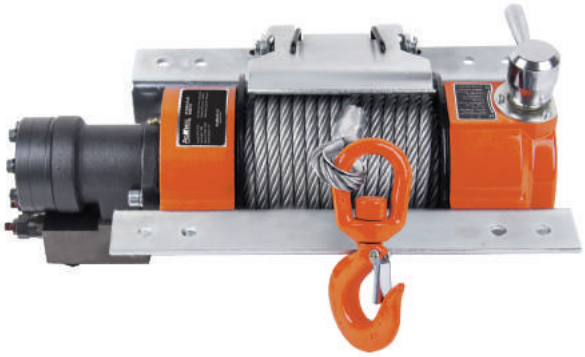
The information contained in this manual may have technical errors over which Prowinch LLC does not assume any responsibility.

This user`s manual is subject to changes without customers permission or prior advise.

Always check **www.prowinch.com** for the latest information regarding this equipment.

Index

PWYH11000



PWYH18000

PWYH25000

PWYH45000

Thank you for purchasing a Prowinch® winch. This manual describes the operation and maintenance of the winch. All information in this publication is based on the newest production information is available at print time.

2. GENERAL SAFETY PRECAUTIONS

Prowinch®'s winches are designed for delivering a safe and trustable service if they are operated according to this manual.

This manual contains important information to help you properly install, operate and maintain your winch for maximum performance, economy and safety.

Please study its contents thoroughly before putting your winch into operation. By practicing correct operating procedures and by carrying out the recommended preventive maintenance suggestions, you will experience long, dependable and safe service. After you have completely familiarized yourself with the contents of this manual, we recommend that you carefully file it for future reference.

Applications for PWTR Prowinch® winches

Choose the Prowinch® winch that is right for you: PWTR series offers you top of the line models from 9500 lb up to 17000 lbs, featuring standard and optional accesories for recovery applications. We offer you lightweight, durable and affordable winches. Specially design for recovery applications, our winches are equiped of a durable wound motor for long life and extra pulling power, featuring a tough 3 stage planetary gear box delivering power and reliability. The body and frame of your winch are corrosion resistant stainless steel to provide a long life.

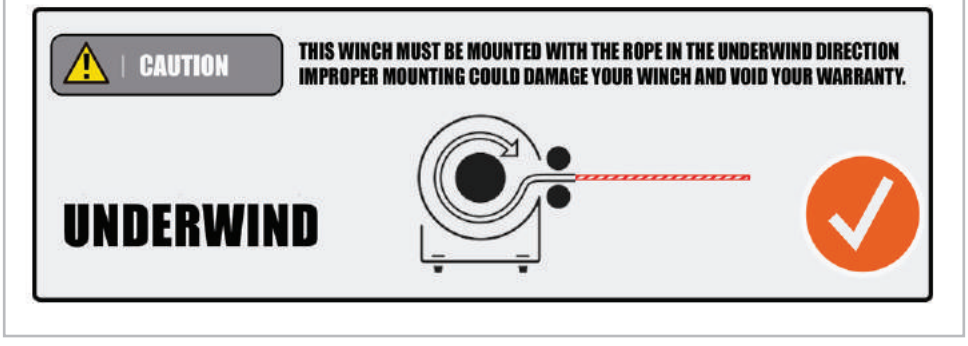
Mandatory use of:

WARNING: This symbol indicates a dangerous situation which if not avoid, may cause minor or moderate wounds. It is also used for indicating unsafe practices.

DANGER: This symbol indicates a dangerous situations which if not avoided, may cause severe injuries or death.

DANGER

All operators and other users who are near the wire rope, must wear the safety protection for this equipment. This includes gloves and eyes protection.



2.1. GENERAL SAFETY:

1. Take time to fully read the instructions from this User's Manual, in order to understand your winch and its operations.

2. Do not exceed winch or winch wire rope rated capacity. Double line using a snatch block to reduce winch load.

3. Do not use winch or winch wire rope for towing. Shock loads can damage, overload and break wire rope.

4. Do not use a winch to secure a load.

5. Do not operate this winch when under the influence of drugs, alcohol or medication.

6. Always wear heavy leather gloves when handling winch wire rope.

7. Always remove jewelry and wear eye protection.

8. Always be aware of possible hot surfaces at winch motor, drum or wire rope during or after winch use.

9. Inspect equipment regularly, replace damaged or worn parts, and keep appropriate records of maintenance.

10. Use only PROWINCH®'s recommended parts for replacement. Any modifications or repairs without the approval from PROWINCH® will void the warranty.

DANGER

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

2.2 INSTALLATION SAFETY:

1. Choose a mounting location that is sufficiently strong to withstand the maximum pulling capacity of your winch.

2. Use class 8.8 metric (grade 5) or better hardware.

3. Do not weld mounting bolts.

4. Use factory approved mounting hardware, components, and accessories.

5. Do not use bolts that are too long.

6. Confirm required bolt length to ensure proper thread engagement.

7. Complete the winch installation and hook attachment before installing the wiring.

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

9. Always position fairlead with warning readily visible on top.

10. Prestrech wire rope and respool under load before use. Tightly wound wire rope reduces chances of binding, which can damage the wire rope.

11. Insulate and protect all exposed wiring and electrical terminals.

12. Do not route electrical cables across sharp edges, near parts that get hot and/or through or near moving parts.

13. Always place the supplied terminal boots on wires and terminals as directed by the installation instructions.

14. Do not lean over battery while making connections.

15. Do not route electrical cables over battery terminals.

16. Do not short battery terminals with metal objects.

17. Battery Recommendations A fully charged conventional automotive battery with a minimum rating of 650 cold cranking amps is recommended to obtain peak performance from your winch. Make sure all electrical connections are clean and tight.

18. Consult this User's Manual for proper wiring details.

2.3. SAFETY OPERATION:

1. Inspect winch wire rope, hook, and slings before operating winch. Frayed, kinked or damaged winch wire rope must be replaced immediately. Damaged components must be replaced before operation. Protect parts from damage.

2. Remove any element or obstacle that may interfere with safe operation of the winch.

3. Always be certain the anchor you select will withstand the load and the strap will not slip.

4. Always use supplied hook strap whenever spooling winch wire rope in or out, during installation and during operation.

5. Always require operators and bystanders to be aware of vehicle and or load.

6. Be aware of stability of vehicle and load during winching, keep others away. Alert all bystanders of an unstable condition.

7. Always unspool as much winch wire rope as possible when rigging. Double line or pick distant anchor point.

8. Take time to use appropriate rigging techniques for a winch pull.

9. Do not touch winch wire rope or hook while someone else is at the control switch or during winching operation.

10. Do not engage or disengage clutch if winch is under load, winch wire rope is in tension or drum is moving.

11. Do not touch winch wire rope or hook while under tension or under load.

12. Stand clear of winch wire rope and load and keep others away while winching.

13. Do not use vehicle to pull load on winch wire rope. Combined load or shock load can damage, overload and break wire rope.

14. Do not wrap winch wire rope back onto itself. Use a choker chain or tree trunk protector on the anchor.

15. Do not operate winch with less than 5 wraps of winch wire rope or 10 wraps of synthetic rope around the drum. Wire rope could come loose from the drum, as the wire rope attachment to the drum is not designed to hold a load.

16. Do not use winch as a hoist or to suspend a load.

17. Always be certain anchor will withstand load, use appropriate rigging and take time to rig correctly.

18. Do not use winch to lift or move persons.

19. Do not use excessive effort to freespool winch wire rope.

20. Always use proper lifting technique or get lifting assistance while handling and installing.

21. Always wind the winch wire rope on bottom (mountside) of drum.

22. Do not wind wire rope over top of drum. Always spool the winch wire rope onto the drum in the direction specified by the drum rotation labels on the winch and/or in this manual.

23. Do not leave remote control where it can be activated during free spooling, rigging, or when the winch is not being used.

24. Do not leave the winch remote control plugged in when installing, freespooling, rigging, servicing or when the winch is not being used.

25. Do not operate any equipment on which the safety placards or decals are missing or illegible.

26. Report any malfunction or irregular operation of the equipment.

27. Do not operate an equipment that has been modified without previous PROWINCH® approval.

28. Winch damper helps to prevent wire rope recoil in the event of a wire rope failure. Do not approach or move the damper once tension is applied. Do not allow it to get pulled into the fairlead.

WARNING

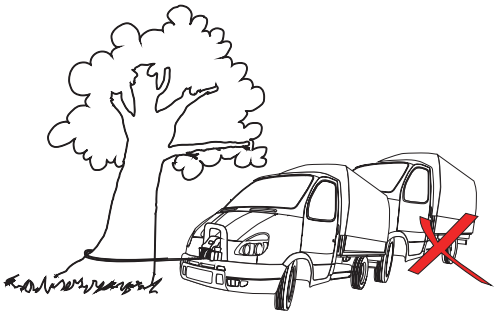
An improper operation of the equipment can create a potentially hazardous situation which, if not avoided, could result in minor or moderate injuries. To avoid a potentially hazardous situation, always take time to fully understand your winch and winching operation by reviewing this manual.

DANGER

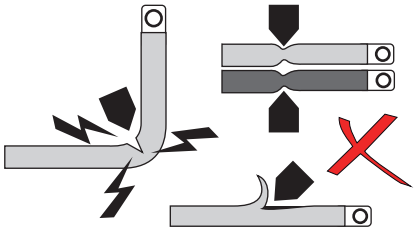
Never let winch wire rope slip through your hands

DANGER

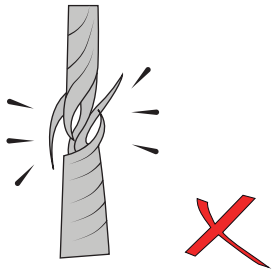
Never use winch as a hoist or to suspend a load.



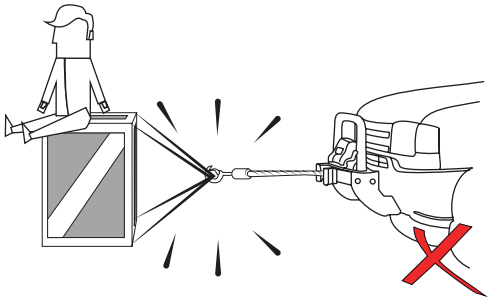
1. Do not exceed winch or winch rope rated capacity.



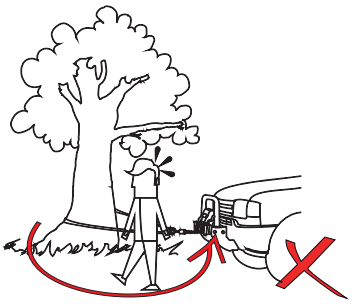
2. Do not route electrical cables across sharp edges, near parts that get hot and/ or through or near moving parts.



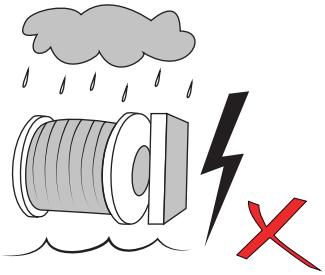
3. Always inspect winch rope, hook, and slings before operating winch. Frayed, kinked or damaged winch rope must be replaced immediately.



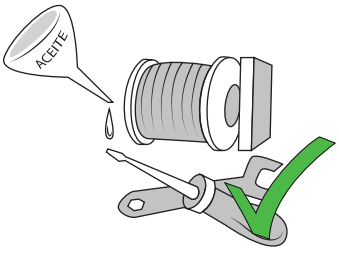
4. Do not use the equipment to lift or move people.



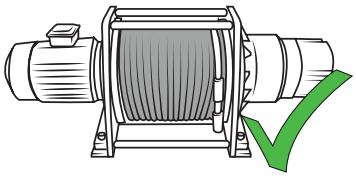
5. During winching operation always be aware of stability of vehicle and load during winching, keep others away. Alert all bystanders of an unstable condition.



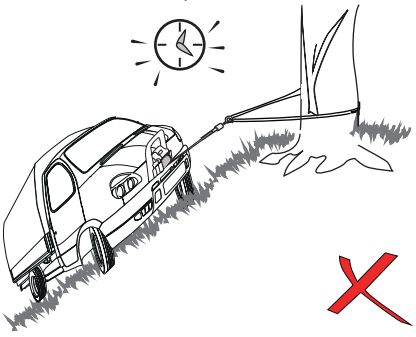
6. Do not submerge winch in water. Always store the remote control in a protected, clean, dry area.



7. Perform preventive checks as part of a regular maintenance schedule to keep your winch operating properly.



8. Always verify installation before operating.



9. Do not leave loads unattended, wire rope could come loose from the drum, as the wire rope attachment to the drum is not designed to hold a load.

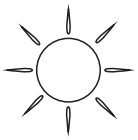
2.4. GENERAL ENVIRONMENTAL PRECAUTIONS

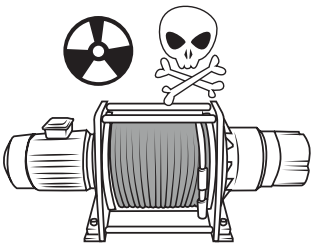
DANGER

The following environmental conditions can cause malfunction of the winch.

The following environmental conditions may cause mal functions in the equipment.

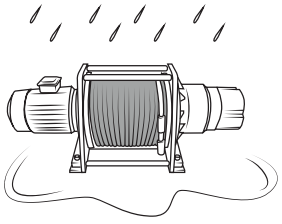
When operated outdoor, a shelter should be used for extreme weather conditions: below -10º C or above 40º C



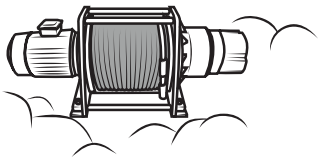


If used near chemicals, corrosive gas or explosives may cause an explosion.

Exposure to salt or acids may cause malfunctioning.



Avoid exposure to rain or extreme humidity. It may cause rusting of the equipment.



Exposure to sand may cause malfunctioning.

warnings:

PWYH11000

Unpacking
When unpacking, check to make sure all parts is included. Refer to Winch Assembly Drawing and Parts List (both with respective item numbers) at the end of this manual.

Installation
Mount winch to the vehicle by using high strength cap screw. It should be aligned and secured to a solid part of the vehicle (front or rear) where the full rated load will be evenly distributed.

Mounting the directional solenoid valve assembly(Optional):
The valve should be mounted away from any areas where heat may be considered too extreme. Such as an exhaust manifold or turbo. Be sure all plumbing and wiring reaches from the area is selected without being stressed. It may be mounted by using the bracket and Allen screws supplied. Using the bracket as a guide, mark the location of where the mounting holes are going to be drilled, remove the plate and drill four 1/4” holes. Mount valve assembly using nuts, bolts.
Note: No need to mount directional solenoid valve if there is one manual directional valve on the vehicle already.

Mounting the balance valve(Optional):
The balance valve you obtained (it's optional) is simply connected to motor. If your winch system installs a balance valve as complete working mode, be sure the balance valve's installing direction meets hydraulic principle chart. Otherwise, the winch will not reach the rated line pull, and it is also dangerous for winch to power off the cable with heavy load. If this symptom happens, simply disconnect the balance valve, exchange the oil hole between hydraulic motor and balance valve, and reconnect it. If your ordered, the balance valve should be supplied. It will have been connected with the motor at the factory.

Electrical connections(Optional):

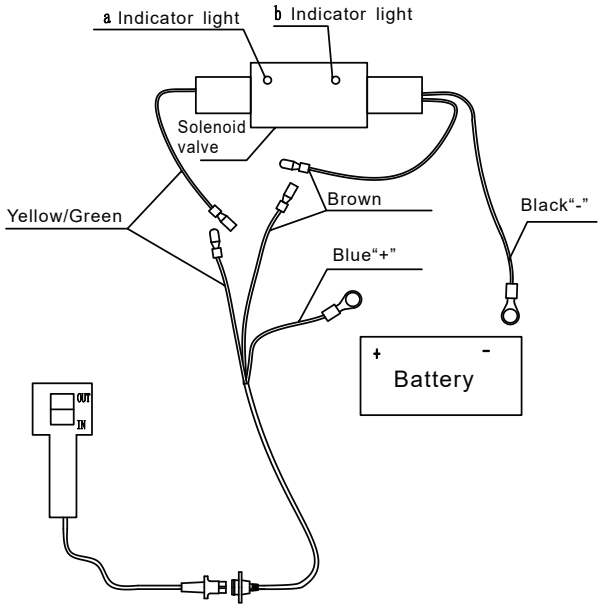
If winch's power supply is from the vehicle's exiting power steering pump, the solenoid valve system is designed default to the power steering box so power steering is always available even when the winch is in use. The power source to the solenoid is not energized until the three-pole quick connector plug is plugged in.

Each solenoid has two wires--either of which can be used as a ground or for electric power. The grounds are connected to each other at the factory.

The other will connect to the blue and yellow wire in the harness (see illustration). Determine a location on the front grill to mount the female 3 pole plug connector. Drill a hole and mount the female 3 pole plug connector using nuts, bolts and washers supplied.

Connect all wiring as shown in illustration. Test hand control unit, solenoids will make a slight “click” sound if connected properly.

Note: No need to do the wiring if there is one manual directional valve on the vehicle already.



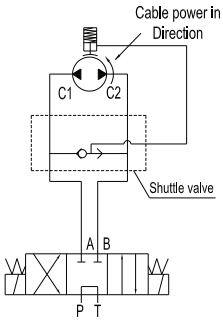
Plumbing connections

Keep all hoses away from any areas where heat may be considered too extreme such as an exhaust manifold or turbo. Lines should not be allowed to rub on any abrasive or vibrating surfaces. In some applications, right angle fittings on the directional valve and motor or balance valve are

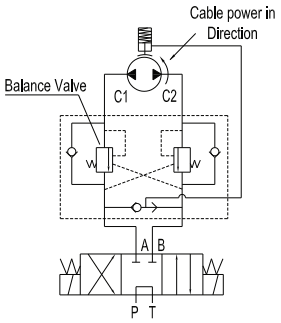
necessary to make hose mounting more flexible. After plumping has been laid out on vehicle, install o-ring fittings supplied to valve. Torque tight. DO NOT OVERTIGHTEN ANY FITTINGS. Install o-ring fittings on winch motor. Torque tight. Connect any hose port A on motor or port C1 on balance valve to port A on directional valve, pot B on motor or port C2 on balance valve to port B on directional valve, port P on directional valve to pump's high pressure port, port T on valve to reservoir. Attach any o-ring or seal from vehicles original tube fitting to tube fitting.

Working hydraulic principle chart:

Simple working mode

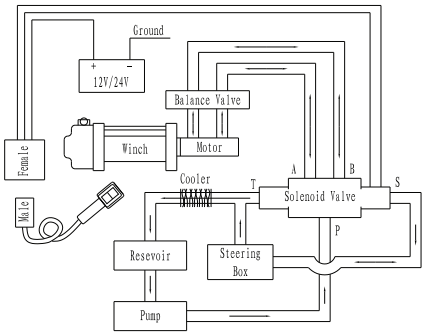


Compete working mode

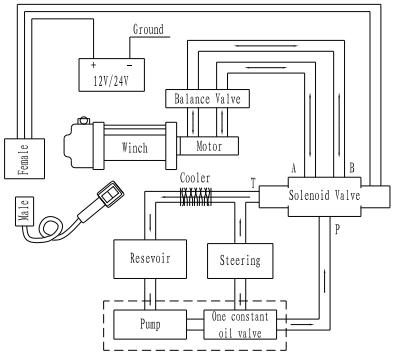


Installation illustration (Complete working mode):

1.Hydraulic power from a suitable individual pump



2.Hydraulic power from a combined pump



Caution:

Battery cables should not be drawn taut，leave slack for some cable movement.

If your application is supplied with an added cooler, please refer to illustration. Check fluid level. Replace lost fluid to system. System will need to be purged. Start engine. Power winch cable in 5 feet. Shut engine off. Check fluid level. (Add fluid until full. start engine. power winch cable. Out 5 feet. Shut engine off. Check fluid level.) Add fluid until full if necessary. Start engine. Power winch cable into desired position. Turn vehicle wheels from lock to lock position 5 times. This will aid in bleeding out any air that may have got into the system.

If the hand control unit is working backwards, simply exchange the brown and white wire connectors.

Winch cable must be wound onto the drum under a load of at least 10% rated line pull or outer wraps will draw into inner wraps and damage winch cable.

Test winch for proper operation. Refer to the operation section below.

WARNINGS!

1. Make sure the clutch is totally engaged before starting any winch operation;
2. Stay clear and away from raised loads;
3. Stay clear of cable while pulling do not try to guide cable;
4. A min. of wraps of cable around the drum.

General information

The winch's standard equipments contain gear reducer, drum, hydraulic motor, The winch obtains its pressure from the vehicle's existing power steering pump or other hydraulic power.

There are several ways to supply the pressure for winch. The first way: use an individual pump for engineering use; the second way: the winch's pressure is from the vehicle's exiting power steering pump as installation illustration: ① Use a suitable individual pump which has not oil valve. It supplies pressure for both steering box and winch. ② Use a combined pump which integrate an oil valve together. The oil valve supplies two kinds of flow for difference demand, one with constant flow is for steering use, the other with higher power is for engineering use. Refer to installation. You can choice the best suitable way.

If your winch installed as a simple working mode (standard supplied), NEVER POWERWINCH CABLE OUT WITH HEAVY LOAD, that will be serious dangerous.

Trouble shooting

SYMPTOM	POSSIBLE CAUSESUGGE	STED ACTION
Winch drum runs slowly or without	-Hydraulic system failure.	-Check if oil circuit error. -Check system pressure.
	-Hydraulic motor failure	-Change hydraulic motor or directional control valve.
Oil leakage	-Winch overload.	-Change hydraulic motor seals or change hydraulic motor. DO NOT overload during operation.
Winch stuck during Freespooling or hard to Freespool	-Knob on the wire rope -winch mounting bolts loose.	-Smooth wire rope. -Tighten the mounting bolts.
	-Freespool knob rust.	-Disassemble Freespool knob in no load, lubricate it with lubrication oil.
Brake failure	-Brake pad worn.	-Change brake assembly.
	-Wrong wire rope winding direction.	-See from motor side, counterclockwise winding should be cable in.

Maintenance

It is highly recommended and that the winch be used regularly (once a month). Simply power the cable out 15m, free spool 5m and then power back in. This will keep all components in good working condition so that the winch can be relied on when needed. Contact your authorized outlet for technical assistance and repairs.

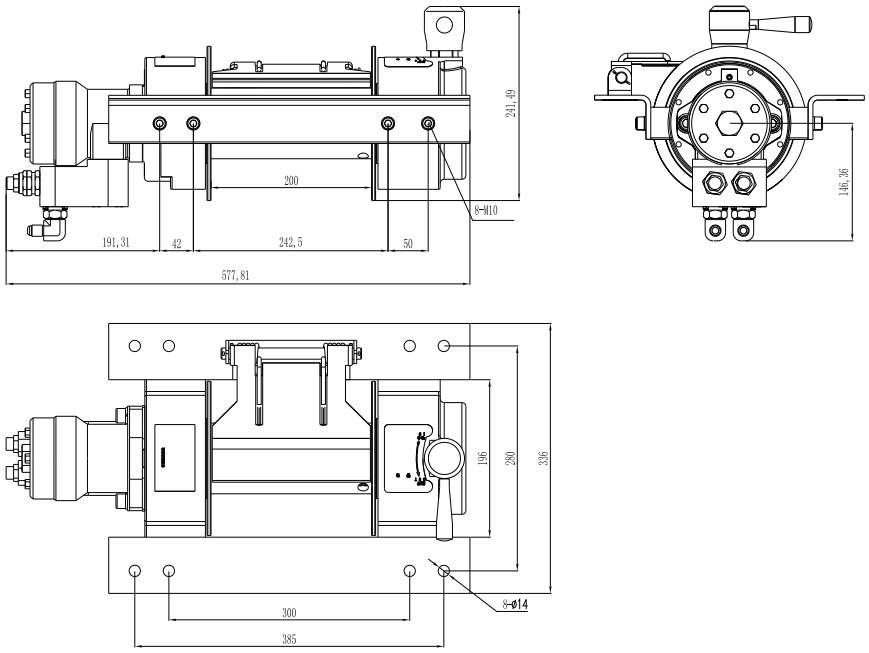
Lubrication

1.All moving parts within the winch having been lubricated using #2 lithium grease at the factory. No internal lubrication is required.
2.Lubricate cable assembly periodically using light penetrating oil.

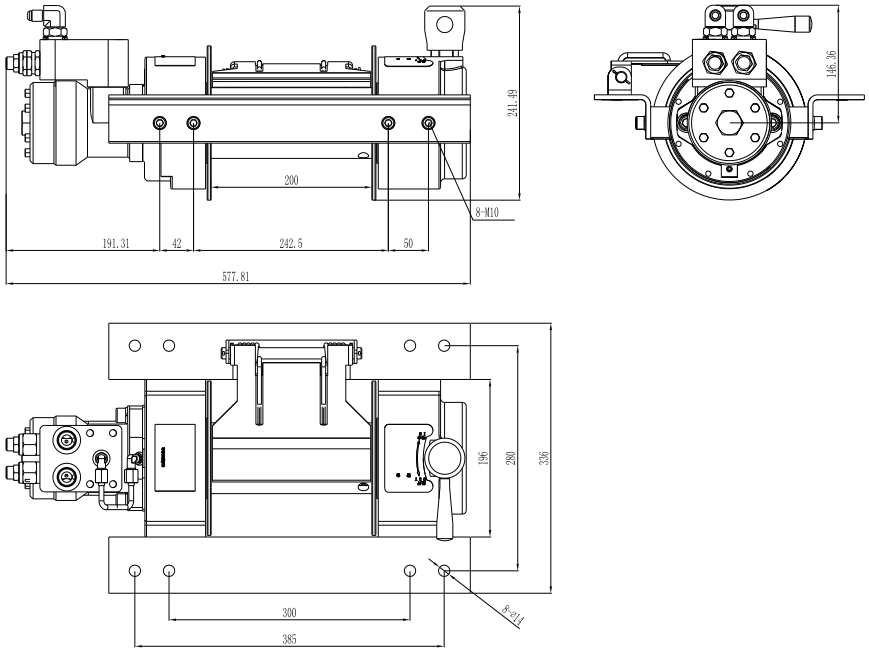
Cable Assembly Replacement

1.Turning clutch to the “Clutch Out” position.
2.Extend cable assembly to its full length. Pay attention to how the existing cable is connected to the drum.
3.Remove old cable assembly and attach new one.
4.Retract cable assembly onto drum, first five wraps being careful not to allow kinking then winch cable must be wound onto the drum under a load of at least 10% rate line pull.
5. The roller fairlead is to be mounted so as to guide the rope onto the drum evenly.

PWYH11000 With Balance Valve Downwards



PWYH11000 With Balance Valve Upwards

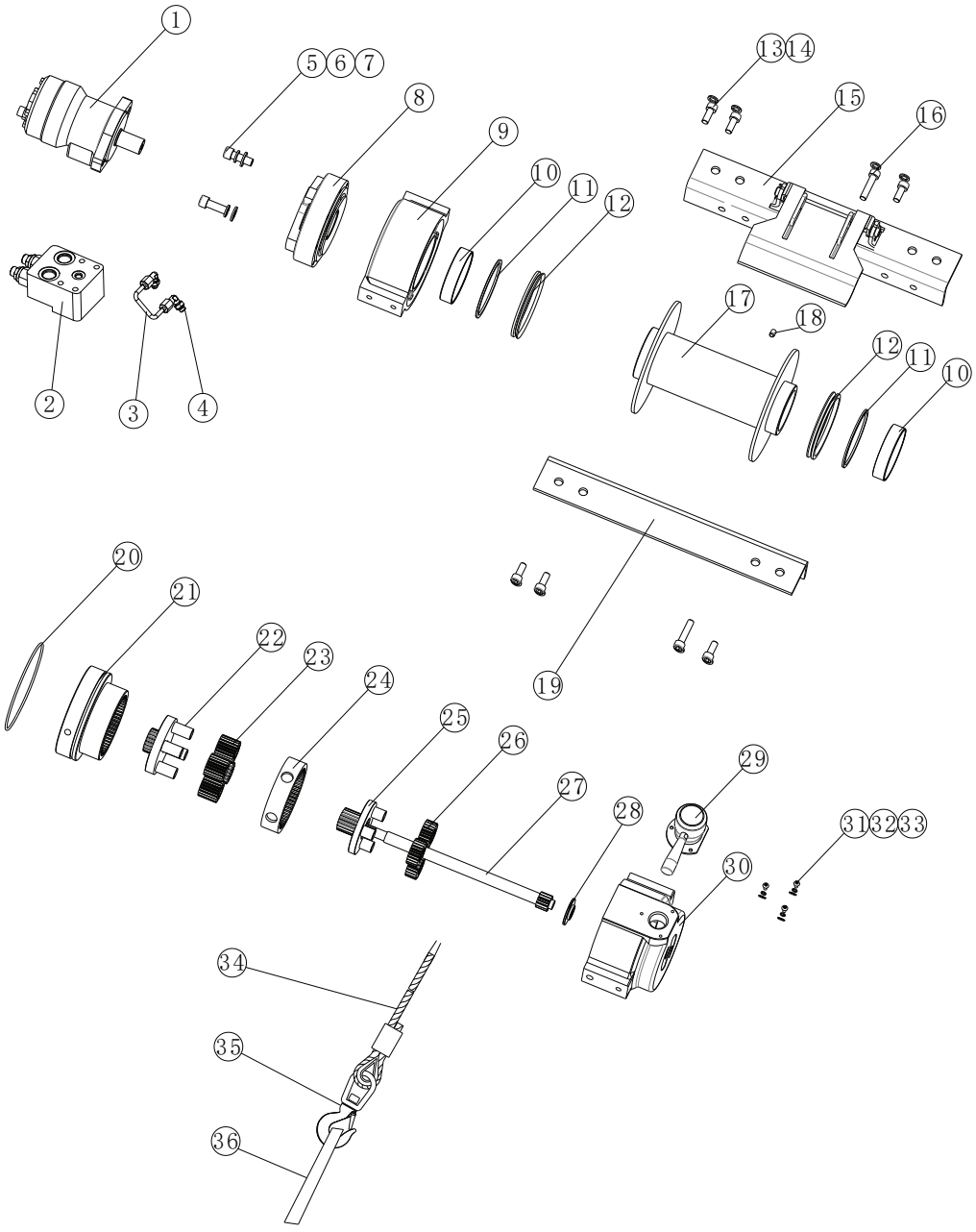


PWYH11000 With Balance Valve Winch Performance Specification		
Rated line pull:	11000lbs(4990kg) single line	
Motor displacement:	80 ml/rev	
Max flow:	30-60 l/min	
Max pressure:	14Mpa	
Gear train:	2 stang planetary gear	
Gear ratio:	23:1	
Clutch:	Rotate cam clutch	
Braking action:	Automatic hydraulic brake	
Fairlead:	4-way roller fairlead(Optional accessory)	
Wire rope:	15/32"x82'(12mmx25m)	
Drum size:	3.46"x7.56"(88mmx192mm)	
Dimensions:	22.75"x13.23"x11.5" (578mmx336mmx292mm)	22.75"x13.23"x9.5" (578mmx336mmx242mm)
Bolt pattern:	11.81"x11.02"(300mmx280mm) 15.16"x11.02"(385mmx280mm)	
Net weight:	128lbs(58kg)	

11000LB winch Line pull and pressure difference	
Single line pull(lbs/kg)	Pressure difference between motor entry and exit: Mpa
0/0	2
2750/1248	5
5500/2495	7
8250/3742	10
11000/4990	13

11000LB winch Line pull and cable capacity			
Layer of cable	Rated line pull per layer:lbs/kg	Line speed: m/min	Cable capacity per layer:ft/m
1	11000/4990	9	17.06/5.2
2	8250/3742	11.2	37.07/11.3
3	5500/2492	13	59.71/18.2
4	2750/1248	15	82/25

PWYH11000 With Balance Valve
Winch Assembly Drawing



PWYH11000 With Balance Valve

Item.	Description	Qty.	Remark
1	Hydraulic motor	1	
2	Valve block	2	
3	Brake u-shape oil pipe	2	
4	Flaring type adjustable right-angle connector	2	
5	Spring washer φ12	1	
6	Hexagon socket cap screw M12×35	2	
7	Flat washer φ12	2	
8	Brake assembly	2	
9	Motor support	1	
10	Drum shaft sleeve	1	
11	Drum retaining ring	1	
12	A shape seal ring	1	
13	Hexagon socket cap screw M10×25	6	
14	Spring washer φ10	8	
15	Wire rope tensioner assembly	1	
16	Hexagon socket cap screw M10×45	2	
17	Drum	1	
18	Hexagonal socket screw M8×12	1	
19	Right angle iron	1	
20	O-ring	1	
21	Output ring gear assembly	4	
22	2rd stage planetary gear carrier assembly	1	
23	2rd stage planetary gear	1	
24	1st stage ring gear	3	
25	1st stage planetary gear carrier assembly	1	
26	1st stage planetary gear	1	
27	Sun gear axle	1	
28	Gearbox nylon retaining ring	1	
29	Freespool knob assembly	3	
30	Gearbox housing	1	
31	Allen at round head screw M5×12	1	
32	Flat washer φ5	1	
33	Spring washer φ5	3	
34	Wire rope assembly φ12	3	
35	Rotatable 3/8" hook	1	
36	Hand saver	1	

PWYH18000

Unpacking
When unpacking, check to make sure all parts is included. Refer to Winch Assembly Drawing and Parts List (both with respective item numbers) at the end of this manual.

Installation
Mount winch to the vehicle by using high strength cap screw. It should be aligned and secured to a solid part of the vehicle (front or rear) where the full rated load will be evenly distributed.

Mounting the directional solenoid valve assembly(Optional):
The valve should be mounted away from any areas where heat may be considered too extreme. Such as an exhaust manifold or turbo. Be sure all plumbing and wiring reaches from the area is selected without being stressed. It may be mounted by using the bracket and Allen screws supplied. Using the bracket as a guide, mark the location of where the mounting holes are going to be drilled, remove the plate and drill four 1/4” holes. Mount valve assembly using nuts, bolts.
Note: No need to mount directional solenoid valve if there is one manual directional valve on the vehicle already.

Mounting the balance valve(Optional):
The balance valve you obtained (it's optional) is simply connected to motor. If your winch system installs a balance valve as complete working mode, be sure the balance valve's installing direction meets hydraulic principle chart. Otherwise, the winch will not reach the rated line pull, and it is also dangerous for winch to power off the cable with heavy load. If this symptom happens, simply disconnect the balance valve, exchange the oil hole between hydraulic motor and balance valve, and reconnect it. If your ordered, the balance valve should be supplied. It will have been connected with the motor at the factory.

MOUNTING

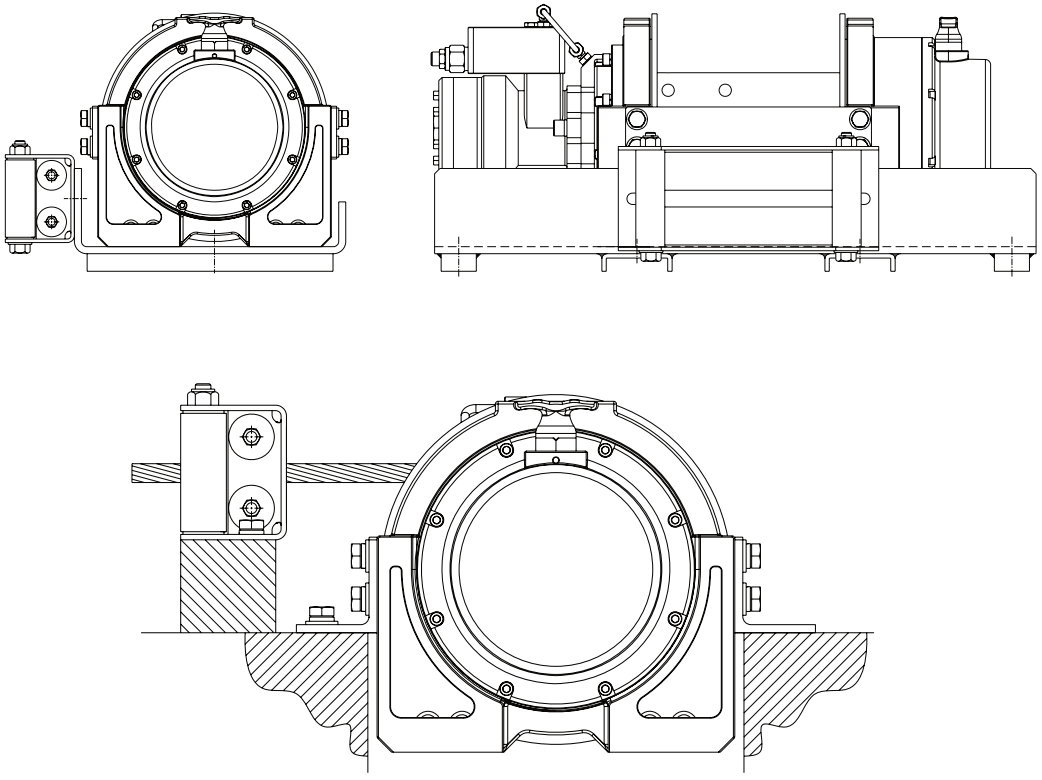
The diagrams show the mounting dimensions for the 8000 - 18000LB.

The side and feet mounting hole positions are designed to allow the winch to be interchangeable with the most popular 8000 - 18000LB units currently available. The diagram below shows the 8000-18000LB mounted on a flatbe mounting kit , shown with Roller Fairlead. If a mounting plate is not used, the surface must be fla within 0.5 mm and sufficientl stiff to prevent flxing. A minimum of 6.0 mm thick steel plate should be used. The thicker the plate, the better the alignment between motor mounting, drum and gearbox housing.

It is important that the winch is mounted securely so that the motor mounting, drum and gearbox housing are accurately aligned. Be sure the winch will not move under load, otherwise you may cause misalignment in the winch, causing the drum to bind up.

The tie bars supplied with the winch must remain attached when the winch is foot mounted.

Angle mounting is possible and recommended for maximum flxibility in mounting. These mounts allow the winch to be low-mounted. See the diagram below.



Electrical connections(Optional):

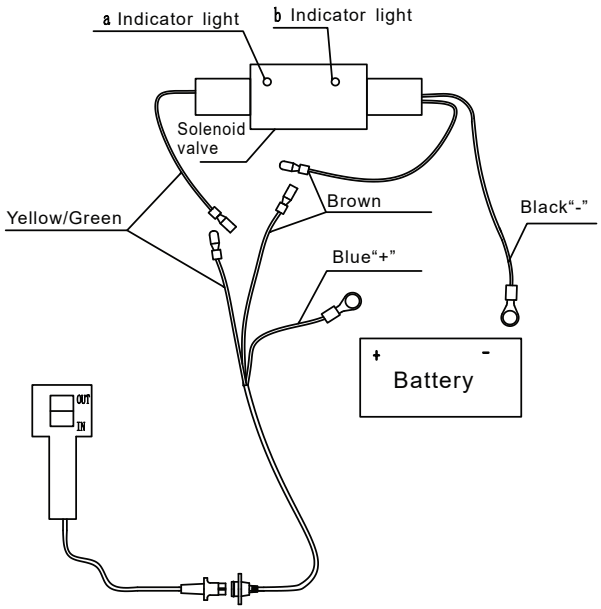
If winch's power supply is from the vehicle's exiting power steering pump, the solenoid valve system is designed default to the power steering box so power steering is always available even when the winch is in use. The power source to the solenoid is not energized until the three-pole quick connector plug is plugged in.

Each solenoid has two wires--either of which can be used as a ground or for electric power. The grounds are connected to each other at the factory.

The other will connect to the blue and yellow wire in the harness (see illustration). Determine a location on the front grill to mount the female 3 pole plug connector. Drill a hole and mount the female 3 pole plug connector using nuts, bolts and washers supplied.

Connect all wiring as shown in illustration. Test hand control unit, solenoids will make a slight “click” sound if connected properly.

Note: No need to do the wiring if there is one manual directional valve on the vehicle already.



Plumbing connections

Keep all hoses away from any areas where heat may be considered too extreme such as an exhaust manifold or turbo. Lines should not be allowed to rub on any abrasive or vibrating surfaces. In some applications, right angle fittings on the directional valve and motor or balance valve are

necessary to make hose mounting more flexible. After plumping has been laid out on vehicle, install o-ring fittings supplied to valve. Torque tight. DO NOT OVERTIGHTEN ANY FITTINGS. Install o-ring fittings on winch motor. Torque tight. Connect any hose port A on motor or port C1 on balance valve to port A on directional valve, pot B on motor or port C2 on balance valve to port B on directional valve, port P on directional valve to pump's high pressure port, port T on valve to reservoir. Attach any o-ring or seal from vehicles original tube fitting to tube fitting.

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SYSTEM REQUIREMENTS:

2500 PSI RELIEF VALVE SETTING

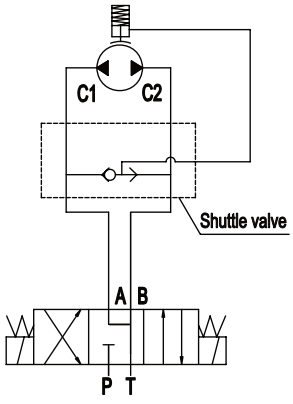
20 G.P.M. FLOW RATE *

10 MICRON NORMAL FILTRATION

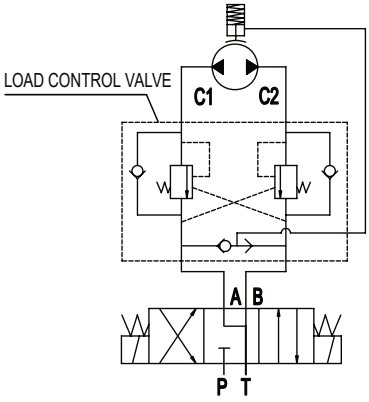
*Caution: Do not exceed 20 G.P.M. If exceeded, motor and winch may be damaged.

Working hydraulic principle chart:

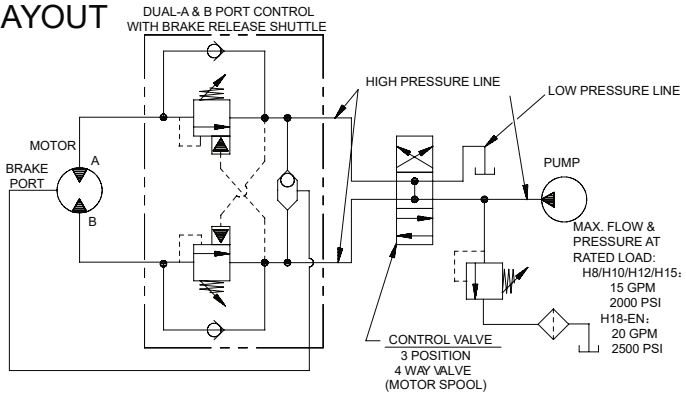
WITHOUT LOAD CONTROL



WITH LOAD CONTROL



TYPICAL LAYOUT



Caution:

Battery cables should not be drawn taut，leave slack for some cable movement.

If your application is supplied with an added cooler, please refer to illustration. Check fluid level. Replace lost fluid to system. System will need to be purged. Start engine. Power winch cable in 5 feet. Shut engine off. Check fluid level. (Add fluid until full. start engine. power winch cable. Out 5 feet. Shut engine off. Check fluid level.) Add fluid until full if necessary. Start engine. Power winch cable into desired position. Turn vehicle wheels from lock to lock position 5 times. This will aid in bleeding out any air that may have got into the system.

If the hand control unit is working backwards, simply exchange the brown and white wire connectors.

Winch cable must be wound onto the drum under a load of at least 10% rated line pull or outer wraps will draw into inner wraps and damage winch cable.

Test winch for proper operation. Refer to the operation section below.

WARNINGS!

1. Make sure the clutch is totally engaged before starting any winch operation;
2. Stay clear and away from raised loads;
3. Stay clear of cable while pulling do not try to guide cable;
4. A min. of wraps of cable around the drum.

General information

The winch's standard equipments contain gear reducer, dump, hydraulic motor, solenoid valve, switch assembly, female connector and plumbing fittings The winch obtains its pressure from the vehicle's existing power steering pump or other hydraulic power. The winch is totally sealed, can be used underwater. There are several ways to supply the pressure for winch. The fist way: use an individual pump for engineering use; the second way: the winch's pressure is from the vehicle's exiting power steering pump as installation illustration: ① Use a suitable individual pump which has not oil valve. It supplies pressure for both steering box and winch.② Use a combined pump which integrate an oil valve together. The oil valve supplies two kinds of flw for difference demand, one with constant flw is for steering use, the other with higher power is for engineering use. Refer to installation. You can choice the best suitable way.

If your winch installed as a simple working mode (standard supplied), NEVER POWERWINCH CABLE OUT WITH HEAVY LOAD, that will be serious dangerous. If your winch installed a balance valve as a complete working mode, you can power winch cable in and out under heavy load even lifting.

1. Disengage the clutch by turning the clutch to theo ut position.
2. Grab the Cable and hook assembly and pull the cable to the desired length, then attach to item being pulled.

Caution: always leave at least fie turns of cable on the drum. Review winch Safety Warnings and Precaution before continuing.

3. Reengage the clutch by turn the clutch to thei n position. If necessary to turn the drum make a slight click sound while engaged properly, then finge the clutch tight.
4. Lift the female connector cover exposing the electric switch connector.
5. Insert the switch assembly connector on to the female connector .
6. While standing aside of the towing path, press (and hold) the push button on the switch assembly . Press (and hold) the opposite push button to reverse directions. Wait until the motor stops before reversing directions.
7. When the towing is complete remove the switch assembly. From the female connector and replace the female connector's cover.

Maintenance

It is highly recommended and that the winch be used regularly (once a month). Simply power the cable out 15m, free spool 5m and then power back in. This will keep all components in good working condition so that the winch can be relied on when needed. Contact your authorized outlet for technical assistance and repairs.

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Lubrication

1.All moving parts within the winch having been lubricated using #2 lithium grease at the factory. No internal lubrication is required.
2.Lubricate cable assembly periodically using light penetrating oil.

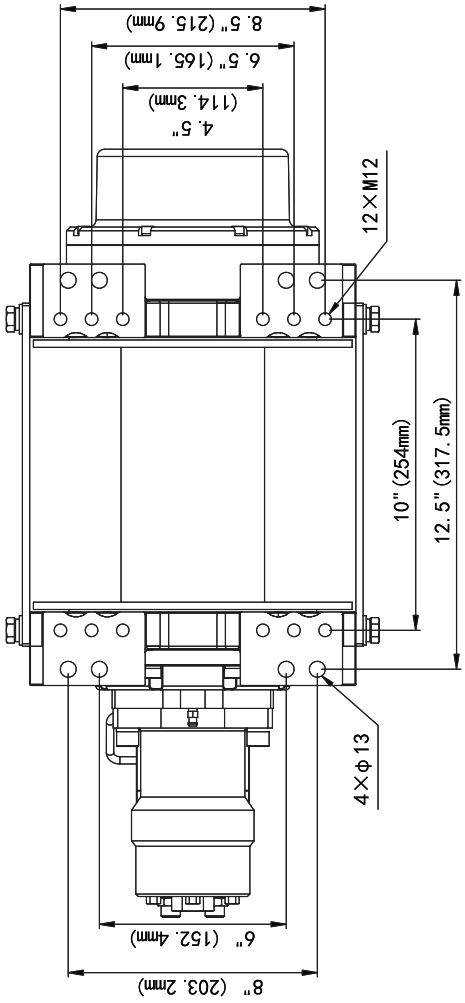
Cable Assembly Replacement

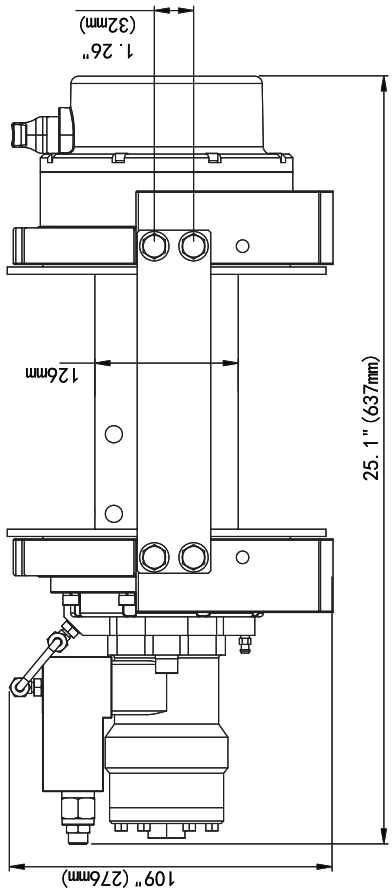
1.Turning clutch to the “Clutch Out” position.
2.Extend cable assembly to its full length. Pay attention to how the existing cable is connected to the drum.
3.Remove old cable assembly and attach new one.
4.Retract cable assembly onto drum, first five wraps being careful not to allow kinking then winch cable must be wound onto the drum under a load of at least 10% rate line pull.
5. The roller fairlead is to be mounted so as to guide the rope onto the drum evenly.

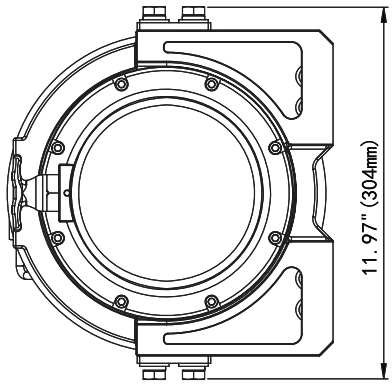
Trouble shooting

SYMPTOM	POSSIBLE CAUSESUGGE	STED ACTION
Winch drum runs slowly or without	-Hydraulic system failure.	-Check if oil circuit error. -Check system pressure.
	-Hydraulic motor failure	-Change hydraulic motor or directional control valve.
Oil leakage	-Winch overload.	-Change hydraulic motor seals or change hydraulic motor. DO NOT overload during operation.
Winch stuck during Freespooling or hard to Freespool	-Knob on the wire rope -winch mounting bolts loose.	-Smooth wire rope. -Tighten the mounting bolts.
	-Freespool knob rust.	-Disassemble Freespool knob in no load, lubricate it with lubrication oil.
Brake failure	-Brake pad worn.	-Change brake assembly.
	-Wrong wire rope winding direction.	-See from motor side, counterclockwise winding should be cable in.

PWYH18000


8.5" (215.9mm)
6.5" (165.1mm)
4.5"
(114.3mm)
12×M12
10" (254mm)
12.5" (317.5mm)
4×φ13
6" (152.4mm)
8" (203.2mm)


1.26"
(32mm)
126mm
25.1" (637mm)
109" (276mm)


11.97" (304mm)

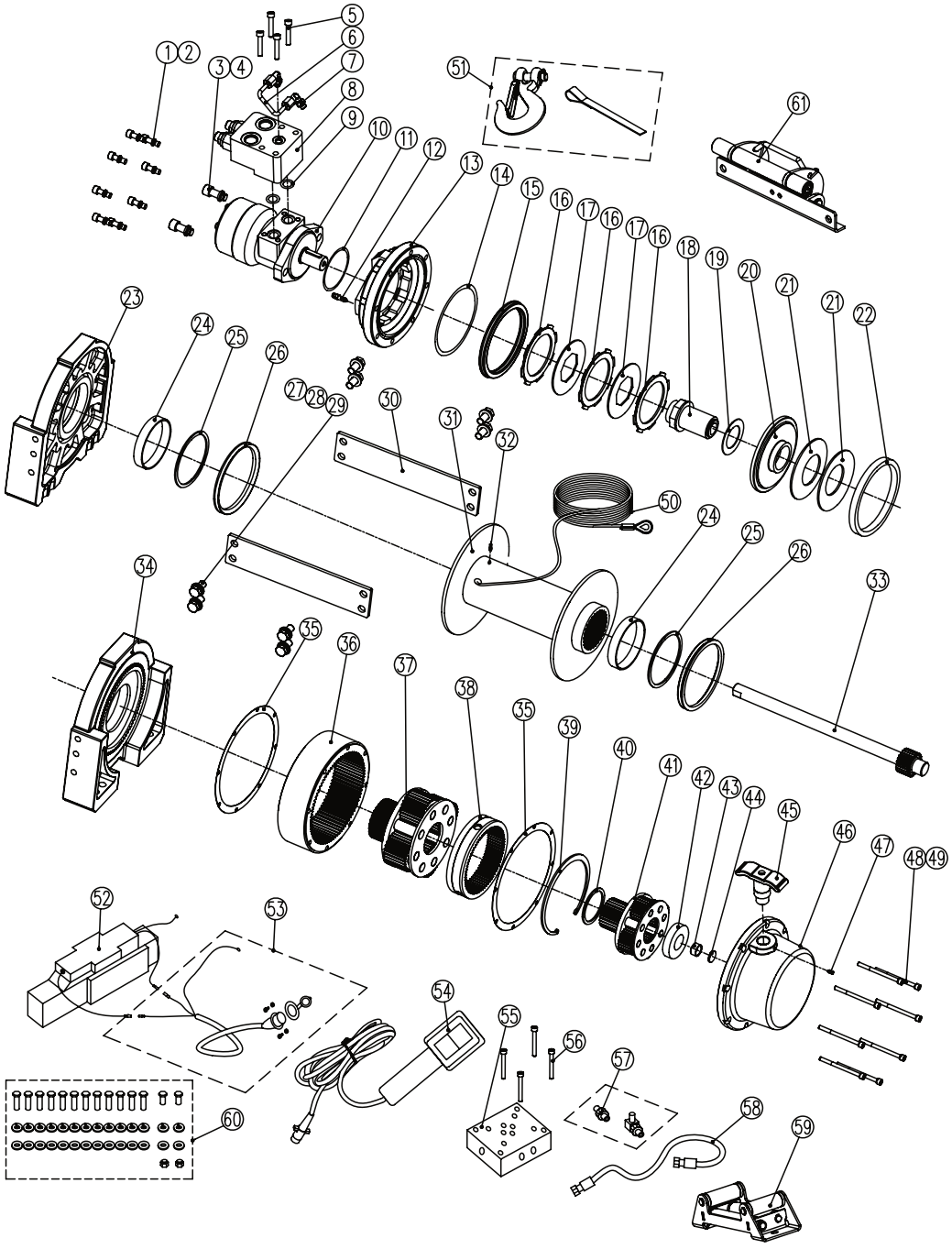
PWYH18000 winch performance specifications	
Rated line pull	18000lbs (8165kg)
Gear ratio	17.3:1
Max Flow	75L/min
Max pressure	17.5MPa
Motor displacement	200ml/r
Wire rope	35/64"×98.4 ' (Φ14mm×30m)
Drum size	5"×8.2" (126×208mm)
Overall Dimensions	25.1"×12"×10.87" (630×304×276mm)
Bolt pattern	10"×4.5"(254×114.3mm) 10"×6.5"(254×165.1mm) 10"×8.5"(254×215.9mm)
Net Weight	167.4 lb(76kg)

18000LB winch Line pull and pressure difference						
Single line pull	lbs	0	8000	12000	15000	18000
	kg	0	3632	5448	6810	8172
Pressure difference between motor entry and exit	MPa	8	9	11	14	17

18000LB winch line pull and cable capacity					
Layer of cable		1	2	3	4
Rated line pull per layer	lbs	18000	15000	12857	11250
	kg	8172	6810	5837	5108
Cable capacity per layer	Ft.	21.3	45.3	71.5	98.4
	m	6.5	13.8	21.8	30
Line Speed	Ft/min	23.0	27.6	32.8	36.7
	m/min	7	8.4	10	11.2

PWYH18000

Winch Assembly Drawing



PWYH18000

Item	Description	Qty	Remark
1	Hexagon socket screw	8	
2	Spring washer 8	8	
3	Hexagon socket screw M12X35	2	
4	Spring washer 12	2	
5	Hexagon socket screw	4	
6	U Tube	1	
7	Adaptor	2	
8	Block load control	1	
9	O-ringΦ17 XΦ2.65	2	
10	Hydraulic motor	1	
11	O-ringΦ82 XΦ2.65	2	
12	M7 bleed nipple	1	
13	Motor mounting plate	1	
14	O-ringΦ155 XΦ3.1	1	
15	U-seal	1	
16	Stationary disc	3	
17	Rotating disc	2	
18	rotor	1	
19	Thrust washer	1	
20	Pressure plate	1	
21	Disc spring	2	
22	Supporting ring	1	
23	Motor frame	1	
24	gasket	2	
25	Nylon washer	2	
26	Seal ring	2	
27	screw M12X25	8	
28	Spring washer 12	8	
29	Plain washer 12	8	
30	Tie Bar	2	
31	Drum	1	
32	Hexagon socket set screws with fat point, M8X8	1	
33	1 st stage gear shaft	1	
34	Gearbox housing	1	
35	Seal	2	
36	2 nd stage gear ring	1	
37	2nd planetary gear assembly	1	
38	1st stage gear ring	1	

Item	Description	Qty	Remark
39	Retaining ring for bore,145	1	
40	Nylon thrust washer Ⅰ	1	
41	1st planetary gear assembly	1	
42	Nylon thrust washer Ⅱ	1	
43	Slide bearing	1	
44	thrust washer	1	
45	Clutch assembly	1	
46	Gear box frame	1	
47	Hexagon socket set screws with fat point, M4X8	1	
48	Hexagon socket screw	8	
49	Spring washer 6	8	
50	Cable	1	optional
51	Hook Assembly and Hand Saver	1	optional
52	Electromagnetic directional valve,	1	optional
53	Connector	1	optional
54	Switch	1	optional
55	Valve plate(with block up, seal assemble)	1	optional
56	Hexagon socket screw	4	optional
57	fttings	1ST	optional
58	Plumbing fxtures (1m long)	4	optional
59	Fairlead	1	optional
60	fastener	1ST	
61	Wire rope tensioner	1	optional

PWYH25000

Unpacking
When unpacking, check to make sure all parts is included. Refer to Winch Assembly Drawing and Parts List (both with respective item numbers) at the end of this manual.

Installation
Mount winch to the vehicle by using high strength cap screw. It should be aligned and secured to a solid part of the vehicle (front or rear) where the full rated load will be evenly distributed.

Mounting the directional solenoid valve assembly(Optional):
The valve should be mounted away from any areas where heat may be considered too extreme. Such as an exhaust manifold or turbo. Be sure all plumbing and wiring reaches from the area is selected without being stressed. It may be mounted by using the bracket and Allen screws supplied. Using the bracket as a guide, mark the location of where the mounting holes are going to be drilled, remove the plate and drill four 1/4” holes. Mount valve assembly using nuts, bolts.
Note: No need to mount directional solenoid valve if there is one manual directional valve on the vehicle already.

Mounting the balance valve(Optional):
The balance valve you obtained (it's optional) is simply connected to motor. If your winch system installs a balance valve as complete working mode, be sure the balance valve's installing direction meets hydraulic principle chart. Otherwise, the winch will not reach the rated line pull, and it is also dangerous for winch to power off the cable with heavy load. If this symptom happens, simply disconnect the balance valve, exchange the oil hole between hydraulic motor and balance valve, and reconnect it. If your ordered, the balance valve should be supplied. It will have been connected with the motor at the factory.

Electrical connections(Optional):

If winch's power supply is from the vehicle's exiting power steering pump, the solenoid valve system is designed default to the power steering box so power steering is always available even when the winch is in use. The power source to the solenoid is not energized until the three-pole quick connector plug is plugged in.

Each solenoid has two wires--either of which can be used as a ground or for electric power. The grounds are connected to each other at the factory.

The other will connect to the blue and yellow wire in the harness (see illustration). Determine a location on the front grill to mount the female 3 pole plug connector. Drill a hole and mount the female 3 pole plug connector using nuts, bolts and washers supplied.

Connect all wiring as shown in illustration. Test hand control unit, solenoids will make a slight “click” sound if connected properly.

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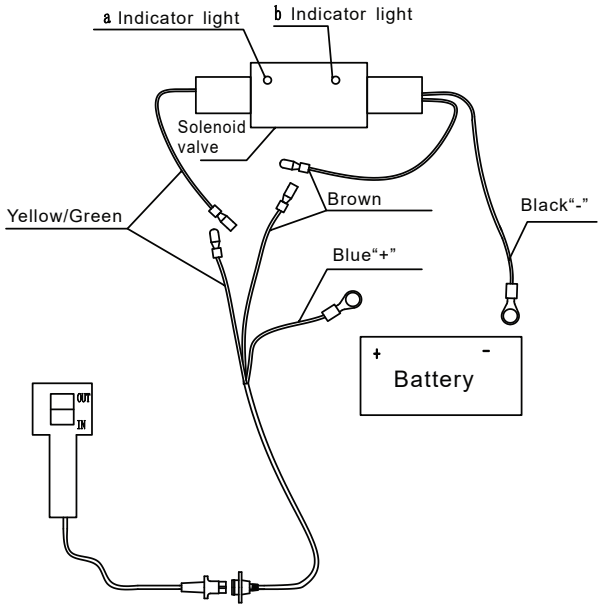

Plumbing connections

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HYDRAULIC SYSTEM REQUIREMENTS

Refer to the performance charts below to properly match your hydraulic system to the winch performance. A motor spool directional control valve is recommended.

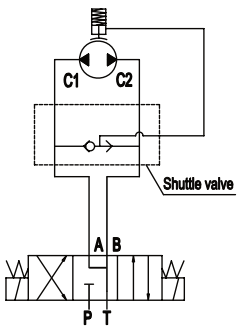
PWYH25000:

SYSTEM REQUIREMENTS:
2000 PSI RELIEF VALVE SETTING
15 G.P.M. FLOW RATE *
10 MICRON NORMAL FILTRATION

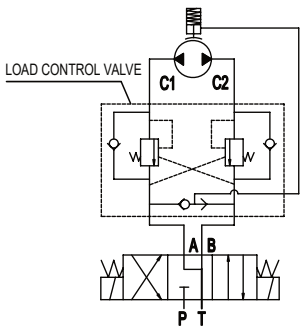
*Caution: Do not exceed 15 G.P.M. If exceeded, motor and winch may be damaged.

Working hydraulic principle chart:

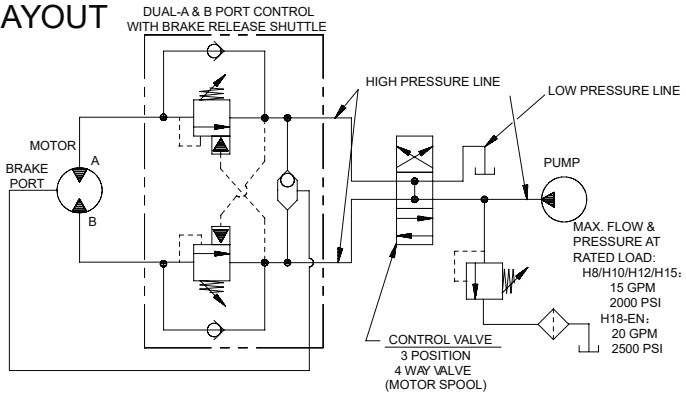
WITHOUT LOAD CONTROL



WITH LOAD CONTROL



TYPICAL LAYOUT



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Caution: always leave at least fie turns of cable on the drum. Review winch Safety Warnings and Precaution before continuing.

3. Reengage the clutch by turn the clutch to thei n position. If necessary to turn the drum make a slight click sound while engaged properly, then finge the clutch tight.
4. Lift the female connector cover exposing the electric switch connector.
5. Insert the switch assembly connector on to the female connector .
6. While standing aside of the towing path, press (and hold) the push button on the switch assembly . Press (and hold) the opposite push button to reverse directions. Wait until the motor stops before reversing directions.
7. When the towing is complete remove the switch assembly. From the female connector and replace the female connector's cover.

Maintenance

It is highly recommended and that the winch be used regularly (once a month). Simply power the cable out 15m, free spool 5m and then power back in. This will keep all components in good working condition so that the winch can be relied on when needed. Contact your authorized outlet for technical assistance and repairs.

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1.All moving parts within the winch having been lubricated using #2 lithium grease at the factory. No internal lubrication is required.
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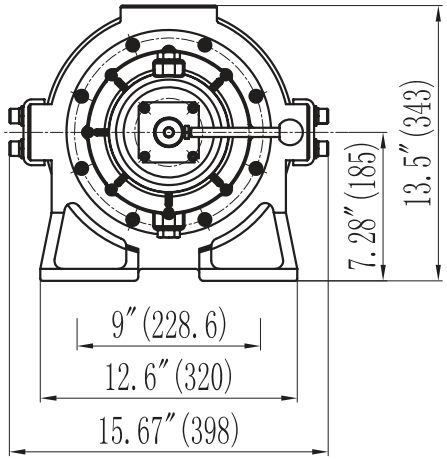
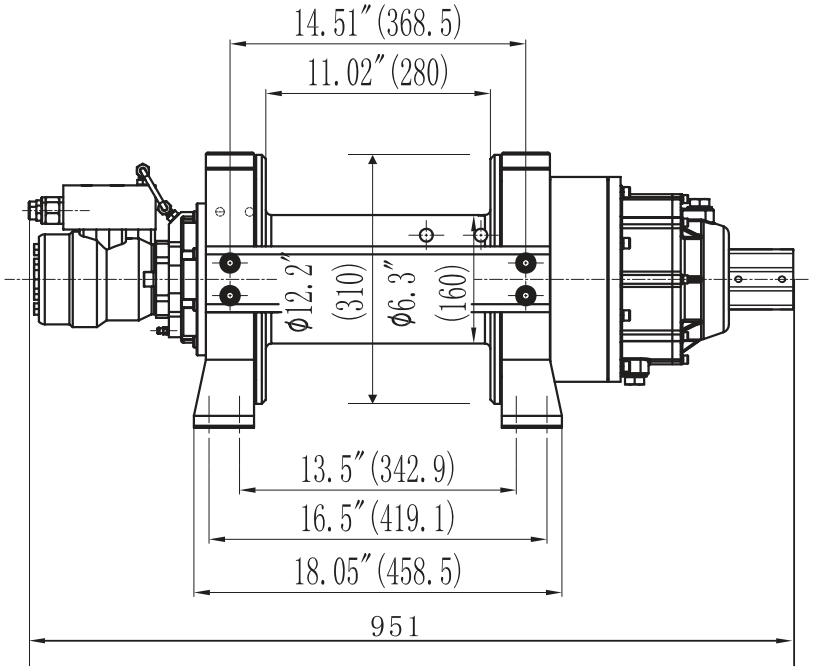
Trouble shooting

SYMPTOM	POSSIBLE CAUSESUGGE	STED ACTION
Winch drum runs slowly or without	-Hydraulic system failure.	-Check if oil circuit error. -Check system pressure.
	-Hydraulic motor failure	-Change hydraulic motor or directional control valve.
Oil leakage	-Winch overload.	-Change hydraulic motor seals or change hydraulic motor. DO NOT overload during operation.
Winch stuck during Freespooling or hard to Freespool	-Knob on the wire rope -winch mounting bolts loose.	-Smooth wire rope. -Tighten the mounting bolts.
	-Freespool knob rust.	-Disassemble Freespool knob in no load, lubricate it with lubrication oil.
Brake failure	-Brake pad worn.	-Change brake assembly.
	-Wrong wire rope winding direction.	-See from motor side, counterclockwise winding should be cable in.

PWYH25000


7.28″(185)
13.5″(343)
9″(228.6)
12.6″(320)
15.67″(398)


14.51″(368.5)
11.02″(280)
ϕ12.2″
(310)
ϕ6.3″
(160)
13.5″(342.9)
16.5″(419.1)
18.05″(458.5)
951

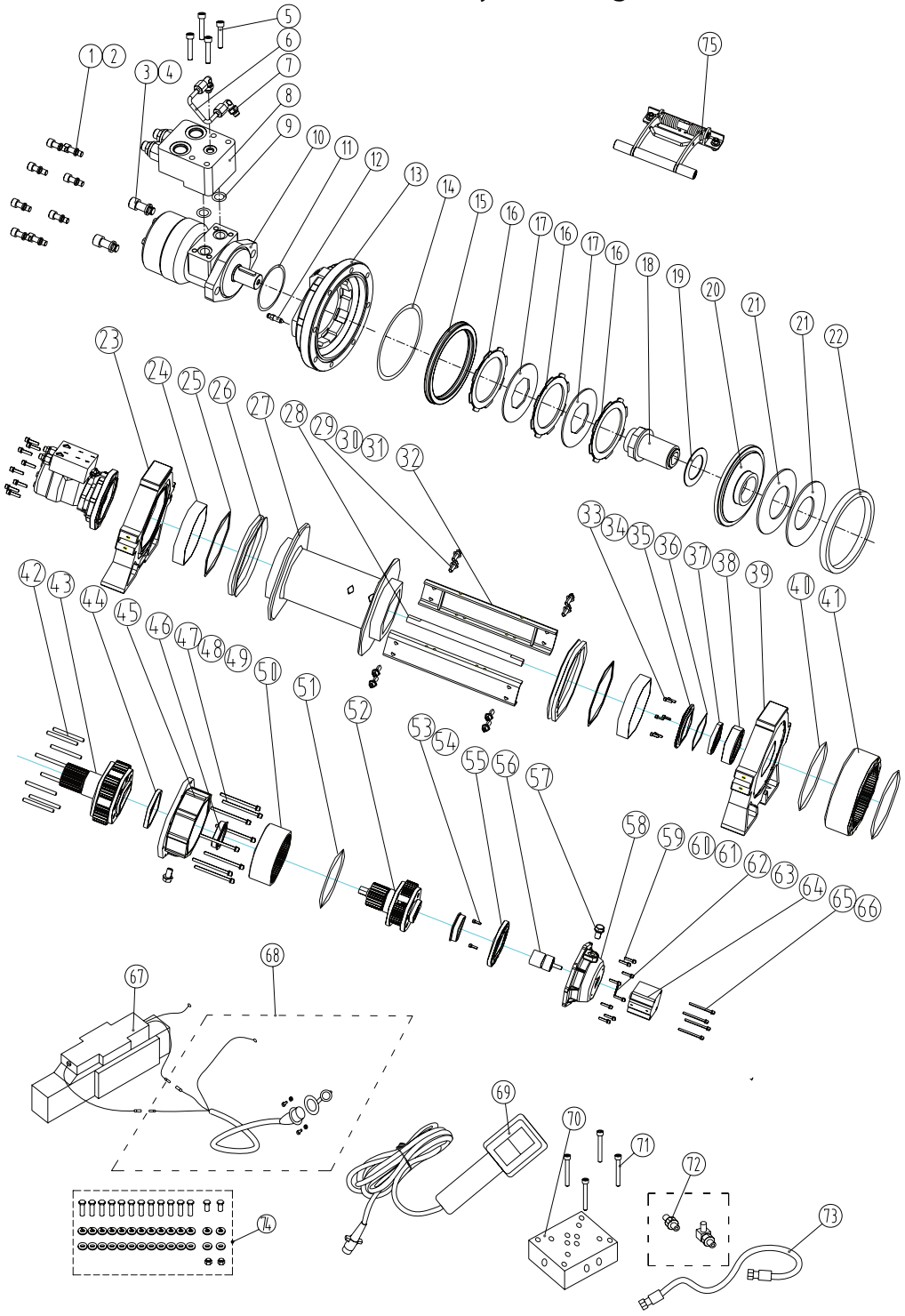
20000/25000LB winch performance specifications		
	PWYH20000	PWYH25000
Rated line pull	20000lbs(9072kg)	25000lbs(11340kg)
Gear ratio	20:1	20:1
Max Flow	75L/min	75L/min
Max pressure	16MPa	17.5MPa
Motor displacement	315mL/r	400mL/r
Wire rope	35/64"x223'(Φ14x68m)	5/8"x157'(Φ16x48m)
Drum size	6.3"×12.2 "(Φ160×280mm)	6.3"×12.2 "(Φ160×280mm)
Overall Dimensions	37.1"×15.67"×13.5" (944×398×343mm)	37.4"×15.67"×13.5" (951×398×343mm)
Bolt pattern	13.5"×9"(342.9×228.6mm) 16.5"×9"(419.1×228.6mm)	13.5"×9"(342.9×228.6mm) 16.5"×9"(419.1×228.6mm)
Net Weight	370lb(168kg)	372lb(169kg)

25000LB winch Line pull and pressure difference							
Single line pull	lbs	0	9341	12884	17531	21856	25000
	kg	0	4237	5844	7952	9914	11340
Pressure difference between motor entry and exit	MPa	3. 5	7	9	12	14.5	17.5

20000/25000 winch line pull and cable capacity							
Layer of cable			1	2	3	4	5
Rated line pull per layer	PWYH20000	lbs	20000	17227	15130	13488	12167
		Kg	9072	7814	6862	6118	5518
	PWYH25000	lbs	25000	21153	18333	16174	/
		Kg	11340	9594	8315	7336	/
Cable capacity per layer	PWYH20000	Ft.	35. 8	77.4	124.6	177.8	223
		m	10.9	23.6	38	54.2	68
	PWYH25000	Ft.	30. 8	67.2	109.2	157	/
		m	9.4	20.5	33.3	48	/
Line Speed	PWYH20000	Ft/min	20. 6	23.9	27.2	30.5	33.7
		m/min	6. 3	7. 3	8. 3	9. 3	10. 3
	PWYH25000	Ft/min	18	21.3	24.6	27.8	/
		m/min	5.5	6.5	7.5	8.5	/

PWYH25000

Winch Assembly Drawing



PWYH25000

Item	Description	Qty	Remark
1	Hexagon socket screw	8	
2	Spring washer8	8	
3	Hexagon socket screw M12X35	2	
4	Spring washer 12	2	
5	Hexagon socket screw	4	
6	Utube	1	
7	Adaptor	2	
8	Block load control	1	
9	O-ring Φ17XΦ2.65	2	
10	Hydraulic motor	1	
11	O-ring Φ82XΦ2.65	2	
12	M7 bleed nipple	1	
13	Motor mounting plate	1	
14	O-ring Φ155XΦ3.1	1	
15	U-seal	1	
16	Stationary disc	3	
17	Rotating disc	2	
18	Rotor	1	
19	Thrust washer	1	
20	Pressure plate	1	
21	Disc spring	2	
22	Supporting ring	1	
23	Hydraulic motor support	1	
24	Drum Slide bearing	2	
25	V-seal VA-220-N60	2	
26	Nylon washer	2	
27	Drum assembly	1	
28	Drive shaft Ⅱ	1	
29	Hexagon socket cap screw M12×30	8	
30	Sring washer Φ12	8	
31	Flat washer Φ12	8	
32	Tie bar	2	
33	Hexagon socket cap screw M6×22	6	
34	Sring washer 6	6	
35	Seals cover plate	1	
36	O-ringφ115×Φ2.65	1	
37	Lip seal B64	1	
38	Double row cylindrical roller bearing NN 3015	1	
39	Gearbox support	1	
40	O-ring Φ212×Φ5.3	2	

41	2nd stage ring gear	1	
42	Cylindrical pin Φ10×100	8	
43	2nd planetary gear assembly	1	
44	2nd slide bearing	1	
45	1st gear box housing	1	
46	1st slide bearing	2	
47	Hexagon headed bolt M8x120	8	
48	spring washer Φ8	8	
49	flat washer Φ8	8	
50	1st gear ring	1	
51	O-ring Φ180×Φ3.55	1	
52	1st planetary gear assembly	1	
53	Hexagon socket cap screw M6×20	2	
54	Spring washer Φ6	2	
55	1st back carrier	1	
56	1st sun wheel assembly	1	
57	Cooper gasket 16	2	
58	Hexagon headed bolt M16×1.5×20	2	
59	back cover	1	
60	Hexagon socket cap screw M6×30	8	
61	Spring washer Φ6	8	
62	Flat washer Φ6	8	
63	O-ring Φ30×Φ2.65	1	
64	Cylinder Φ63×40	1	
65	Hexagon socket cap screw M6×75	4	
66	Spring washer Φ6	4	
67	Electromagnetic directional valve,	1	optional
68	Connector	1	optional
69	Switch	1	optional
70	Valve plate(with block up,seal assemble)	1	optional
71	Hexagon socket screw	4	optional
72	Fttings	1ST	optional
73	Plumbing fxtures (1mlong)	4	optional
74	Fastener	1ST	
75	Wire rope tensioner	1	optional

PWYH45000

MOUNTING

The diagrams show the mounting dimensions for the 30000-45000 LB.

The side and feet mounting hole positions are designed to allow the winch to be interchangeable with the most popular 30000-45000LB units currently available. The diagram below shows the 30000-45000 LB mounted on a flatbe mounting kit , shown with Roller Fairlead. If a mounting plate is not used, the surface must be fla within 0.5 mm and sufficientl stiff to prevent flxing. A minimum of 6.0 mm thick steel plate should be used. The thicker the plate, the better the alignment the better the alignment between motor mounting, drum and gearbox housing.

It is important that the winch is mounted securely so that the motor mounting, drum and gearbox housing are accurately aligned. Be sure the winch will not move under load, otherwise you may cause misalignment in the winch, causing the drum to bind up.

The tie bars supplied with the winch must remain attached when the winch is foot mounted.

Angle mounting is possible and recommended for maximum flxibility in mounting. These mounts allow the winch to be low-mounted. See the diagram below.

Electrical connections(Optional):

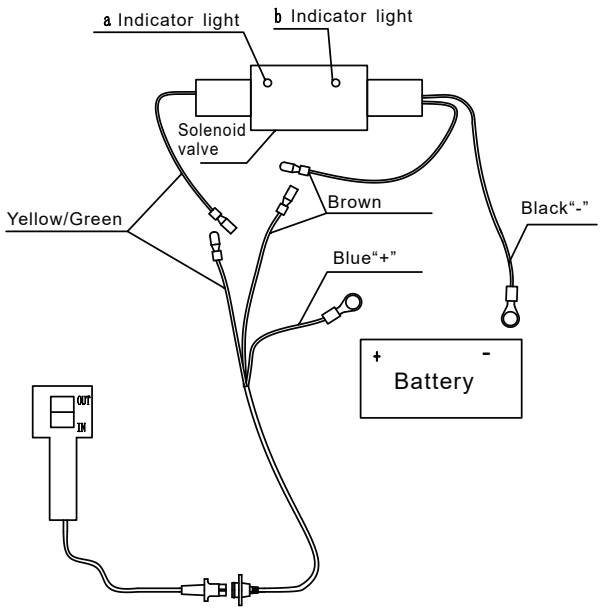
If winch's power supply is from the vehicle's exiting power steering pump, the solenoid valve system is designed default to the power steering box so power steering is always available even when the winch is in use. The power source to the solenoid is not energized until the three-pole quick connector plug is plugged in.

Each solenoid has two wires--either of which can be used as a ground or for electric power. The grounds are connected to each other at the factory.

The other will connect to the blue and yellow wire in the harness (see illustration). Determine a location on the front grill to mount the female 3 pole plug connector. Drill a hole and mount the female 3 pole plug connector using nuts, bolts and washers supplied.

Connect all wiring as shown in illustration. Test hand control unit, solenoids will make a slight “click” sound if connected properly.

Note: No need to do the wiring if there is one manual directional valve on the vehicle already.



Plumbing connections

Keep all hoses away from any areas where heat may be considered too extreme such as an exhaust manifold or turbo. Lines should not be allowed to rub on any abrasive or vibrating surfaces. In some applications, right angle fittings on the directional valve and motor or balance valve are

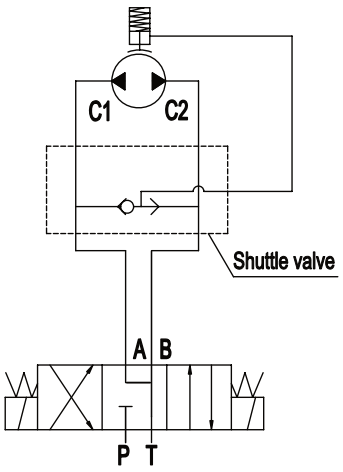
necessary to make hose mounting more flexible. After plumping has been laid out on vehicle, install o-ring fittings supplied to valve. Torque tight. DO NOT OVERTIGHTEN ANY FITTINGS. Install o-ring fittings on winch motor. Torque tight. Connect any hose port A on motor or port C1 on balance valve to port A on directional valve, pot B on motor or port C2 on balance valve to port B on directional valve, port P on directional valve to pump's high pressure port, port T on valve to reservoir. Attach any o-ring or seal from vehicles original tube fitting to tube fitting.

HYDRAULIC SYSTEM REQUIREMENTS

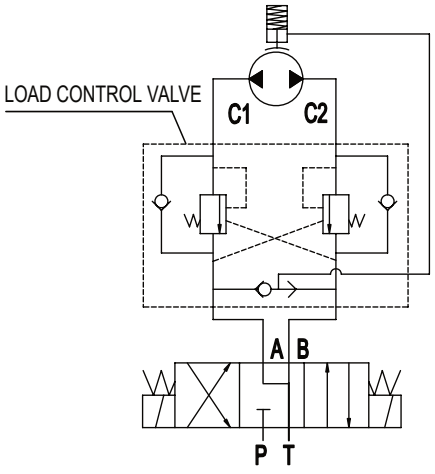
Refer to the performance charts below to properly match your hydraulic system to the winch performance. A motor spool directional control valve is recommended.

Working hydraulic principle chart:

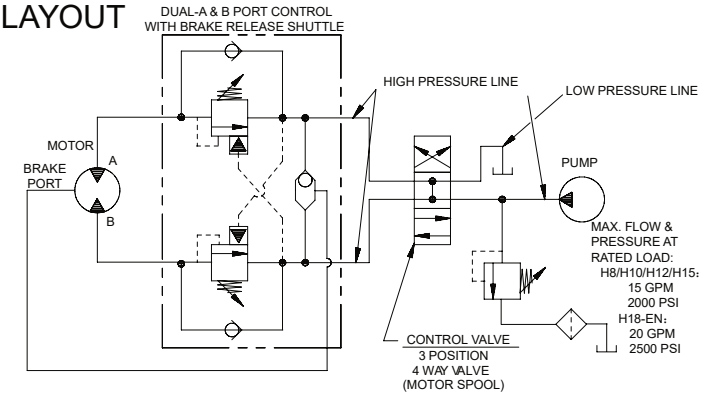
WITHOUT LOAD CONTROL



WITH LOAD CONTROL



TYPICAL LAYOUT



Caution:

Battery cables should not be drawn taut，leave slack for some cable movement.

If your application is supplied with an added cooler, please refer to illustration. Check fluid level. Replace lost fluid to system. System will need to be purged. Start engine. Power winch cable in 5 feet. Shut engine off. Check fluid level. (Add fluid until full. start engine. power winch cable. Out 5 feet. Shut engine off. Check fluid level.) Add fluid until full if necessary. Start engine. Power winch cable into desired position. Turn vehicle wheels from lock to lock position 5 times. This will aid in bleeding out any air that may have got into the system.

If the hand control unit is working backwards, simply exchange the brown and white wire connectors.

Winch cable must be wound onto the drum under a load of at least 10% rated line pull or outer wraps will draw into inner wraps and damage winch cable.

Test winch for proper operation. Refer to the operation section below.

WARNINGS!

1. Make sure the clutch is totally engaged before starting any winch operation;
2. Stay clear and away from raised loads;
3. Stay clear of cable while pulling do not try to guide cable;
4. A min. of wraps of cable around the drum.

General information

The winch's standard equipments contain gear reducer, dump, hydraulic motor, solenoid valve, switch assembly, female connector and plumbing fittings The winch obtains its pressure from the vehicle's existing power steering pump or other hydraulic power. The winch is totally sealed, can be used underwater. There are several ways to supply the pressure for winch. The fist way: use an individual pump for engineering use; the second way: the winch's pressure is from the vehicle's exiting power steering pump as installation illustration: ① Use a suitable individual pump which has not oil valve. It supplies pressure for both steering box and winch.② Use a combined pump which integrate an oil valve together. The oil valve supplies two kinds of flw for difference demand, one with constant flw is for steering use, the other with higher power is for engineering use. Refer to installation. You can choice the best suitable way.

If your winch installed as a simple working mode (standard supplied), NEVER POWERWINCH CABLE OUT WITH HEAVY LOAD, that will be serious dangerous. If your winch installed a balance valve as a complete working mode, you can power winch cable in and out under heavy load even lifting.

1. Disengage the clutch by turning the clutch to theo ut position.
2. Grab the Cable and hook assembly and pull the cable to the desired length, then attach to item being pulled.

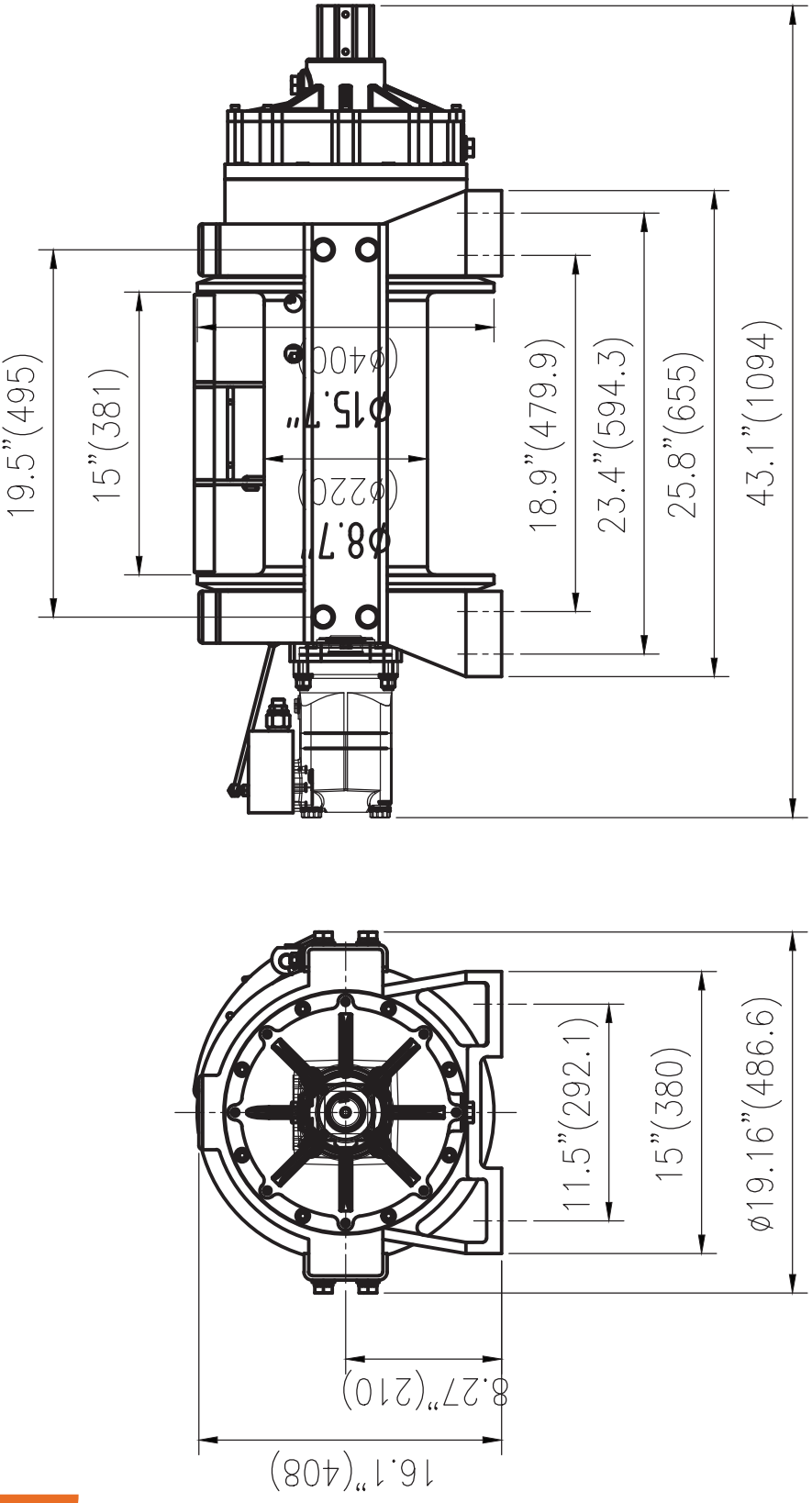
Caution: always leave at least fie turns of cable on the drum. Review winch Safety Warnings and Precaution before continuing.

3. Reengage the clutch by turn the clutch to thei n position. If necessary to turn the drum make a slight click sound while engaged properly, then finge the clutch tight.
4. Lift the female connector cover exposing the electric switch connector.
5. Insert the switch assembly connector on to the female connector .
6. While standing aside of the towing path, press (and hold) the push button on the switch assembly . Press (and hold) the opposite push button to reverse directions. Wait until the motor stops before reversing directions.
7. When the towing is complete remove the switch assembly. From the female connector and replace the female connector's cover.

Maintenance

It is highly recommended and that the winch be used regularly (once a month). Simply power the cable out 15m, free spool 5m and then power back in. This will keep all components in good working condition so that the winch can be relied on when needed. Contact your authorized outlet for technical assistance and repairs.

PWYH45000


19.5”(495)
15”(381)
Ø15.7”
(Ø400)
Ø8.7”
(Ø220)
18.9”(479.9)
23.4”(594.3)
25.8”(655)
43.1”(1094)
11.5”(292.1)
15”(380)
ø19.16”(486.6)
8.27”(210)
16.1”(408)

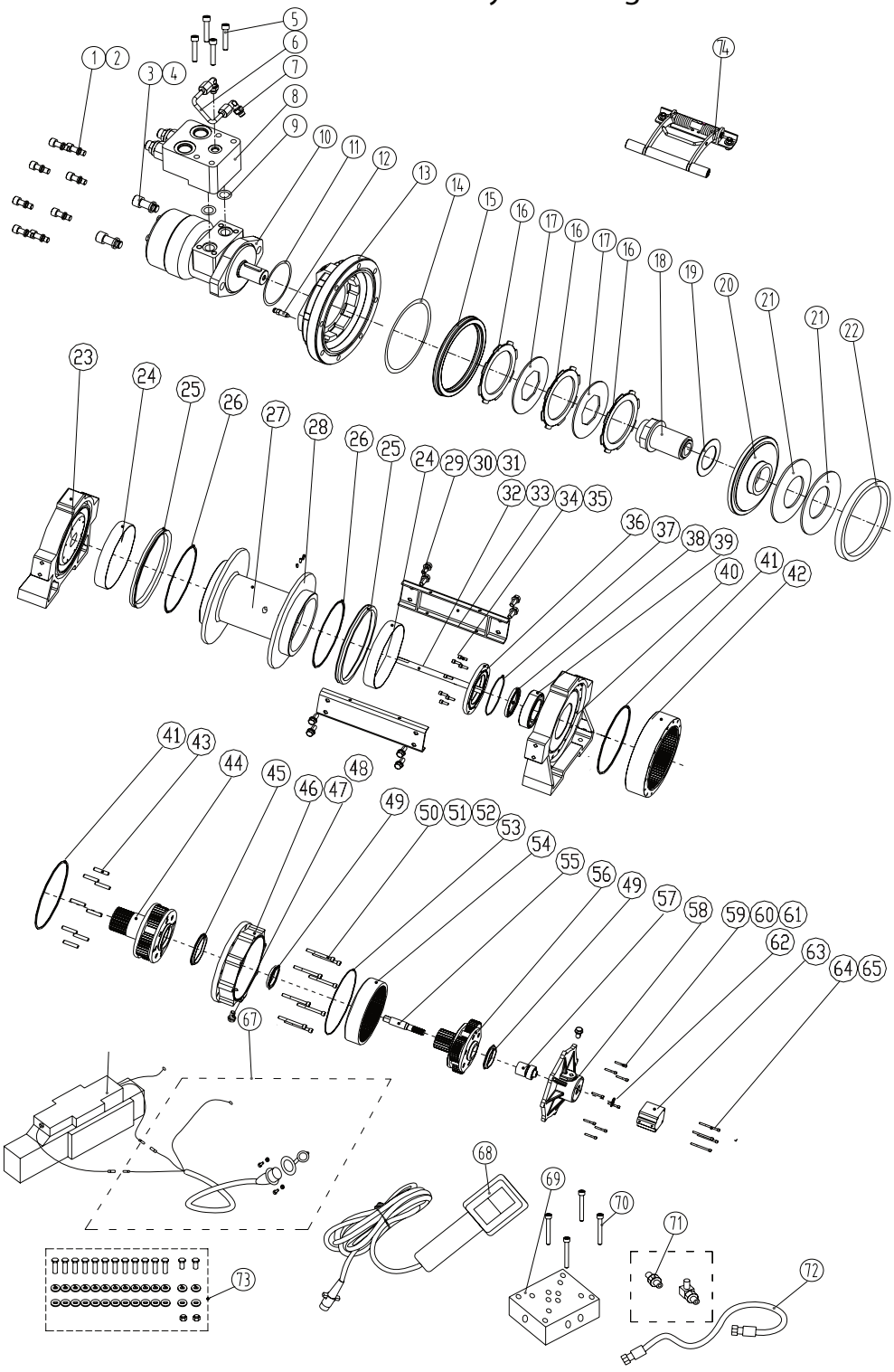
45000LB winch performance specifications	
	PWYH45000
Rated line pull	45000lbs(20412kg)
Gear ratio	30.39:1
Max Flow	75L/min
Max pressure	14MPa
Motor displacement	500mL/r
Wire rope	4/5"x213'(Φ20x65m)
Drum size	8.66"×15 "(Φ220×381mm)
Overall Dimensions	46.94"×19.16"×15.75" (1192.2×486×400mm)
Bolt pattern	18.9"×11.5"(479.9×292mm) 23.4"×11.5"(594.2×293mm)
Net Weight	660lb(300kg)

45000LB winch Line pull and pressure difference						
Single line pull	lbs	0	18046	30603	40000	45000
	kg	0	8185	13881	18144	20412
Pressure difference	Mpa	3	8	10	12	14

45000LB winch line pull and cable capacity					
Layer of cable		1	2	3	4
Rated line pull per layer	lbs	45000	38571	33750	30000
	kg	20412	17496	15309	13608
Cable capacity per layer	Ft	46.9	101.7	164.3	213
	m	14.3	31	50.1	65
Line speed	Ft/min	12.4	14.4	16.4	18.7
	m/min	3.8	4.4	5	5.7

PWYH45000

Winch Assembly Drawing



PWYH45000

Item	Description	Qty	Remark
1	Hexagon socket screw	8	
2	Spring washer8	8	
3	Hexagon socket screw M12X35	2	
4	Spring washer 12	2	
5	Hexagon socket screw	4	
6	Utube	1	
7	Adaptor	2	
8	Block load control	1	
9	O-ring Φ17XΦ2.65	2	
10	Hydraulic motor	1	
11	O-ring Φ82XΦ2.65	2	
12	M7 bleed nipple	1	
13	Motor mounting plate	1	
14	O-ring Φ155XΦ3.1	1	
15	U-seal	1	
16	Stationary disc	3	
17	Rotating disc	2	
18	Rotor	1	
19	Thrust washer	1	
20	Pressure plate	1	
21	Disc spring	2	
22	Supporting ring	1	
23	Hydraulic motor support	1	
24	Drum Slide bearing	2	
25	V-seal VA-300-N60	2	
26	Nylon washer	2	
27	Drum assembly	1	
28	Hexagon socket set screw with flat point, M8×20	3	
29	Hexagon socket cap screws M12×30	8	
30	Sring washer φ12	8	
31	flat washer φ12	8	
32	Drive shaft Ⅱ	1	
33	Tie bar	2	
34	Hexagon socket cap screws M8×25	8	
35	Sring washer φ8	8	
36	Seals cover plate	1	
37	O-ringφ155×φ2.55	1	
38	Lip seal B71	1	
39	Double row cylindrical roller bearing NN 3019	1	
40	Gearbox support	1	

41	O-ring φ272×φ5.3	2	
42	2nd stage ring gear	1	
43	cylindrical pin φ12×90	8	
44	2nd planetary gear assembly	1	
45	2nd stage slide bearing	1	
46	1st gear box housing	1	
47	Cooper gasket 16	2	
48	Hexagon headed bolt M16×1.5×20	2	
49	1st Slide bearing	2	
50	Hexagon socket cap screws M8×100	8	
51	Spring washer φ8	8	
52	Flat washer φ8	8	
53	O-ring φ265×φ2.65	1	
54	1st stage ring gear	1	
55	Drive Shaft Ⅰ	1	
56	1st planetary gear assembly	1	
57	1st sun wheel assembly	1	
58	Back cover	1	
59	Hexagon socket cap screw M6×35	8	
60	Spring washer φ6	8	
61	Flat washer φ6	8	
62	O-ring φ30×φ2.65	1	
63	Cylinder φ63×40	1	
64	Hexagon socket cap screws M6×75	4	
65	Spring washer 6	4	
66	Electromagnetic directional valve,	1	optional
67	Connector	1	optional
68	Switch	1	optional
69	Valve plate(with block up,seal assemble)	1	optional
70	Hexagon socket screw	4	optional
71	Fttings	1ST	optional
72	Plumbing fxtures (1mlong)	4	optional
73	Fastener	1ST	
74	Wire rope tensioner	1	optional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