

HYDRAULIC WINCH

HWT011

HWT015

Assembly & Operating Instructions

Overview

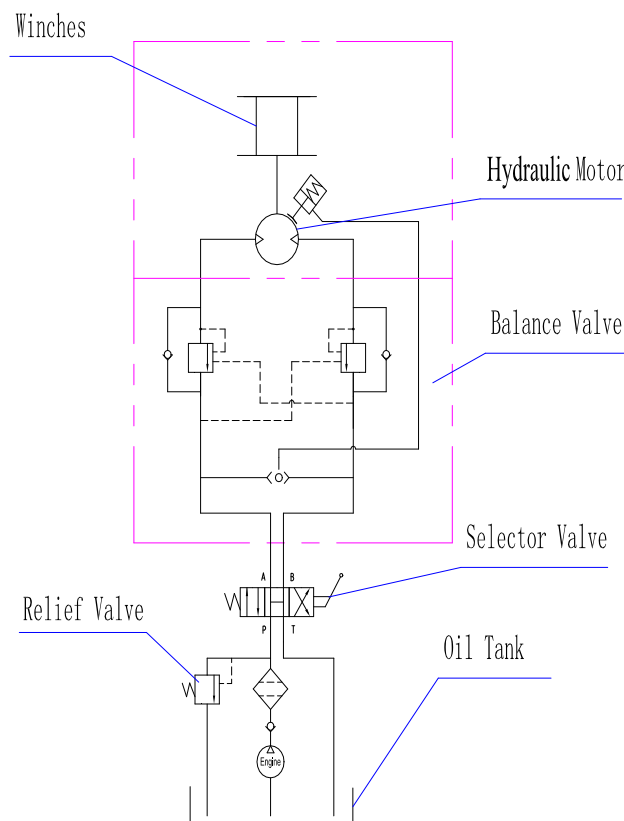
HWT011/015 hydraulic winch widely used in boat, drilling machine, pile engine, trailer, crane, etc. This winch can work outside for a long time. The advantage is compact structure, small size, light weight, large pull, easy installation, easy maintenance.

Working principle & composition

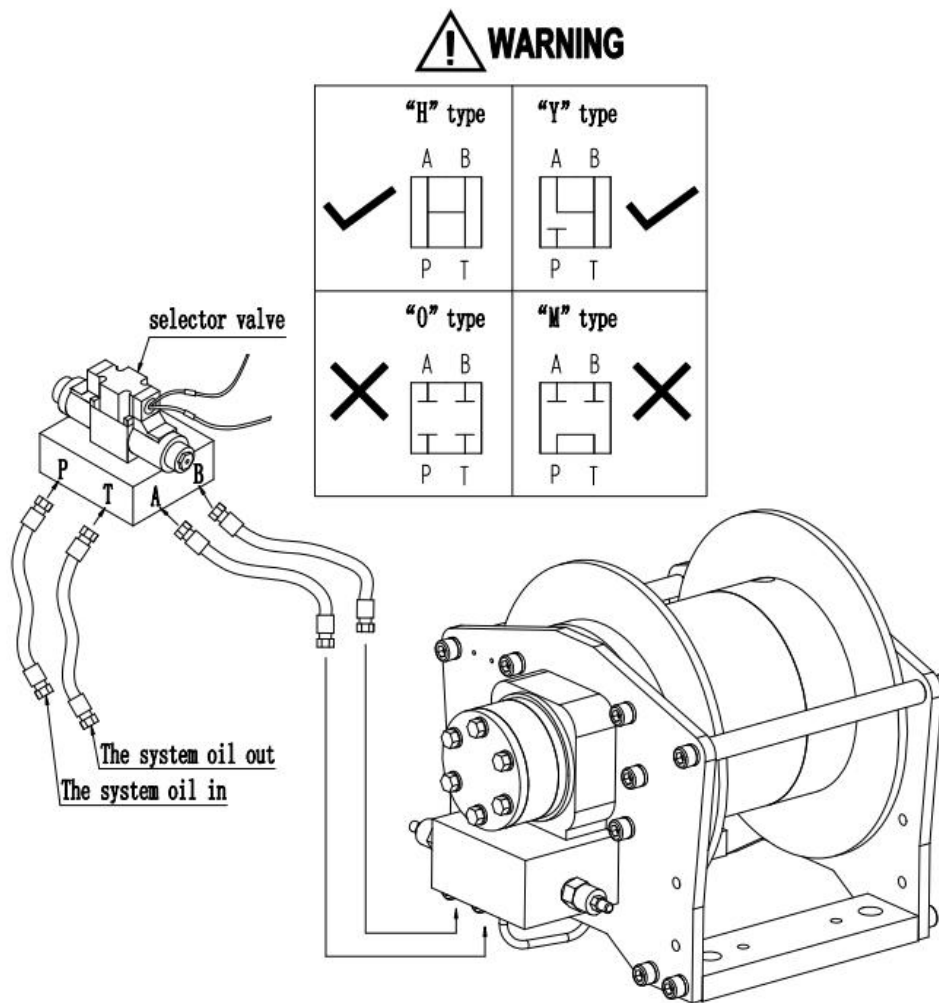
HWT011/015 hydraulic winch adopt of advanced planetary gear differential transmission, bearing capacity is much higher than the turbine worm drive more than 50%, transmission efficiency increased by 50%, smooth transmission, easy to operate. It consists of planetary reducer, low-speed high-torque hydraulic motor, mechanical clutch, reel and other components.

The hydraulic winch is converted into mechanical energy by the hydraulic motor through the hydraulic system. The motor can be decelerated by the planetary reducer, which produces a great torque on the reel. The purpose of towing the weight is achieved by winding the wire on the reel.

Working hydraulic principle chart :



Hydraulic working principle



Hydraulic control valves are an essential component for optimising system performance. They're used to regulate the flow rate and pressure of the hydraulic oil as it passes through a hoses or pipes, always maintaining the speed and pressure at all times.

Hydraulic flow control valves are adept at controlling the flow of these liquids from the pumps to cylinders and motors. Their primary function is to regulate the flow and direction rate within a specific area of a hydraulic circuit. At the same time, they also control the transfer rate of energy across all pressure levels.

A selector valve is used to control the direction of movement of a hydraulic actuating cylinder or similar device. It provides for the simultaneous flow of hydraulic fluid both into and out of the unit. Hydraulic system pressure can be routed with the selector valve to operate the unit in either direction and a corresponding return path for the fluid to the reservoir is provided. There are two main types of selector valves: open-center and closed-center. An open center valve allows a continuous flow of system hydraulic fluid through the valve even when the selector is not in a position to actuate a unit. A closed-center selector valve blocks the flow of fluid through the valve when it is in the NEUTRAL or OFF position.

Selector valve choice as follows:

(H type and Y type is available, O type and M type is not available)

There are three positions for the selector valve. This means the Solenoid directional/selector valve spool has three working positions, both ends of the valve are solenoid coil control action.

1. 'A' coil is energized and 'B' coil is powered off, the spool moves to the direction of the 'A' coil;
2. 'B' coil is energized and 'A' coil is powered off, the spool moves in the direction of the 'B' coil.
3. 'A' and 'B' coils are powered off at the same time, the solenoid valve spools back to the middle position, forming a closed loop, that is, the two chambers of the cylinder is completely closed, resulting in no movement.

The valve has four channels: P, T, A and B.

'P' is for oil In, 'T' is for oil Out, 'A' and 'B' is for output.

When the electromagnet is not energized, the reversing valve is in the middle position. The PTAB is connected to each other in the middle of 'H' type. In the middle position of 'Y', TAB is connected to each other, and P is disconnected from other routes. Type O directional valve in the PTAB access is blocked. In the middle position of 'M' type, PT communicates with each other, 'A' does not communicate with other, and 'B' does not communicate with other.

"H" type: all oil ports are connected, the system is unloaded, and the cylinder is floating. Hydraulic cylinder is connect to oil tank in two chambers, from static stop to start impact. When braking, the oil port is interconnecting, and the braking is more stable than the "O" type, but the reversing position changes greatly.

"Y" type: the oil pump does not unload, the hydraulic cylinder is connected to the oil tank in two chambers, there is impact from rest to start, and the braking performance is between "O" type and "H" type.

"O" type: all oil ports are closed and the system does not unload. Hydraulic cylinder filled with oil, smooth from rest to start. When braking motion inertia caused by hydraulic impact. High accuracy of reversing position.

"M" type: oil pump unloading, from rest to start smoothly. The braking performance is the same as the "O" type.

Installation & use precautions

1. When installing the winch, the bolt should meet the 10.9 grade (GB5782-86), Or directly welding on boat.
2. How to wrap the rope on the drum? Put the rope end into the rope hole on the drum and tighten the screw. After 4 to 5 turns of manual winding, load 5 to 10 kN to tighten the wire rope.
3. The hydraulic system pressure and flow should meet the winch requirements .
4. Hydraulic system filter should not less than 25um to ensure the cleanliness of the system.
5. The hydraulic winch is not designed for lifting person.
6. Prohibit use unsafe wire rope, wire rope should be used to refer to GB5972-86.
7. For safety reasons, keep the drum at least 5 turns of wire rope.

Maintenance

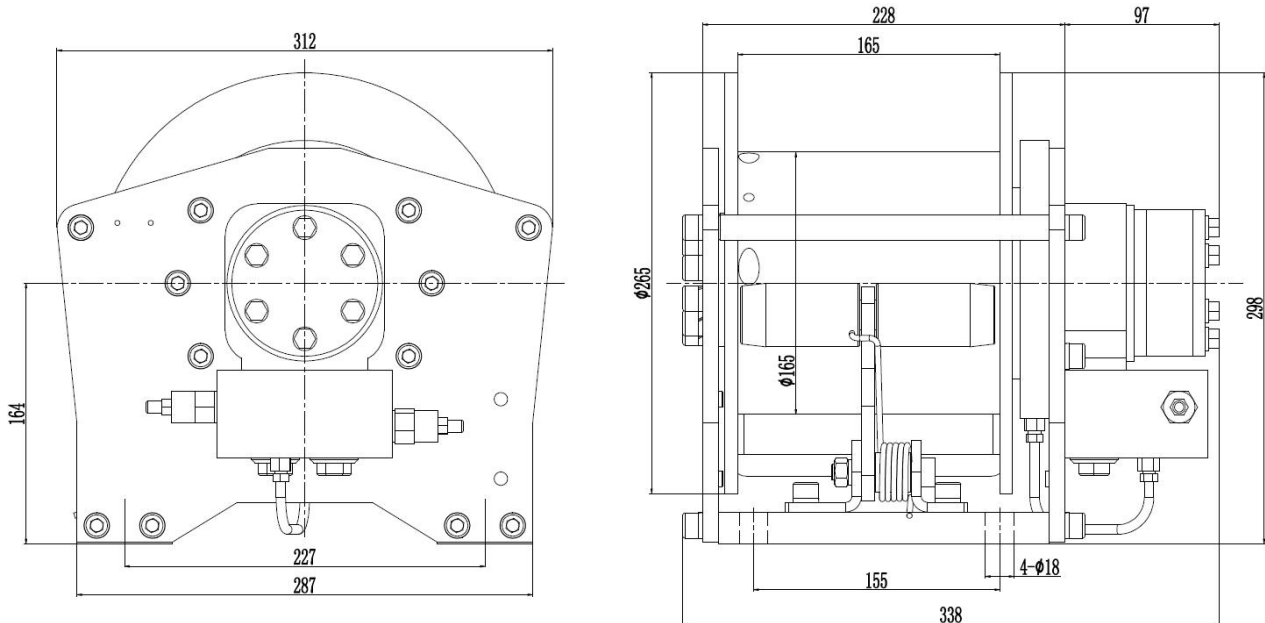
1. Each year or 300 times the working cycle should be filled with the gear box of lithium-based grease to ensure good lubrication of the piston.
2. Check the winch all the part, and if the winch have oil spill ,tighten the plug or renew the oil seal.
3. Winch mounting bolts should not be loosened, often checked and tighten.

Common faults &exclusions

Fault performance	Cause Analysis	Solution
The hydraulic motor does not turn	<ul style="list-style-type: none"> ——Hydraulic system pressure is insufficient ——Hydraulic circuit installation is wrong ——No oil into the motor 	<ul style="list-style-type: none"> ——Check the safety valve to adjust the pressure ——According to hydraulic principle to overhaul ——Check the direction control valve
The winch rotary slowly, crawling or shaking	<ul style="list-style-type: none"> ——System pressure is insufficient ——System flow is small, the motor is insufficient 	<ul style="list-style-type: none"> ——Replace the power source or hydraulic pump ——Check the fuel tank, timely replenishment of hydraulic oil
Winch brake failure	<ul style="list-style-type: none"> ——Brake device friction plate wear failure ——Have dirty things in the hydraulic brake 	<ul style="list-style-type: none"> ——Replace the friction plate ——Clean the brake
The motor turns normal but the winch does not turn,or the winch turns hard and produces a loud noise	<ul style="list-style-type: none"> ——System pressure small ——brake is not fully open ——The brake is oily ——The clutch is not closed 	<ul style="list-style-type: none"> ——Increase system pressure ——Replace the brake seal ——Closed clutch device
The empty load is running normally with the load slowing down or stopping	<ul style="list-style-type: none"> ——Pipeline leaks ——The motor is vented ——Safety valve adjustment pressure is too low 	<ul style="list-style-type: none"> ——Overhaul piping ——Replace the motor ——Increase the safety valve pressure
When the winch is running, the motor shakes or winch side plate shakes	<ul style="list-style-type: none"> ——Planetary gear reducer failure ——The connection between the sleeve and the motor output shaft is faulty 	<ul style="list-style-type: none"> ——Clean up maintenance ——Overhaul

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Installation dimensions



The main technical parameters

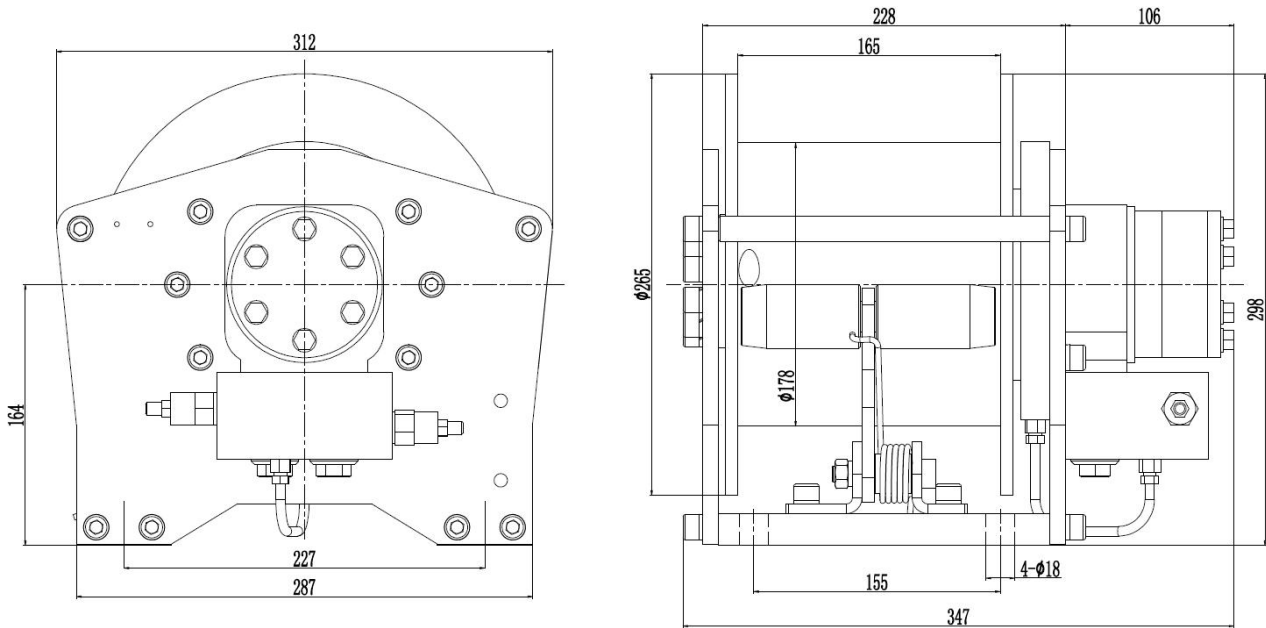
Rated line pull	2420 lbs(1100Kg)
Motor displacement	160ml/r
Pressure	14Mpa
Gear reduction ratio	5.7 : 1
Cable (Dia. × L)	Ø11/31"×114.8' (Ø9mmx35m)
Drum size(Dia. × L)	Ø6.5 "×6.5"(Ø165mmx165mm)
Mounting bolt pattern	6.1"×8.94"(155mmx227mm) 4-M16
Overall dimensions (L×W×H)	13.3"×12.3"×11.7" 338mmx312mmx298mm

Pull , Speed, Pressure, Flow

Pressure	14Mpa			
Oil flow	50L/min			
Layer of wire rope	1	2	3	4
Rated line pull lbs(kg)	3313(1506)	3033(1379)	2796(1271)	2593(1179)
Line speed ft/min(m/min)	87.2(26.6)	95.4(29.1)	103.6(31.6)	111.8(34.1)
Total rope on drum ft (m)	27.9(8.5)	59(18)	91.8(28)	114.8(35)

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Installation dimensions



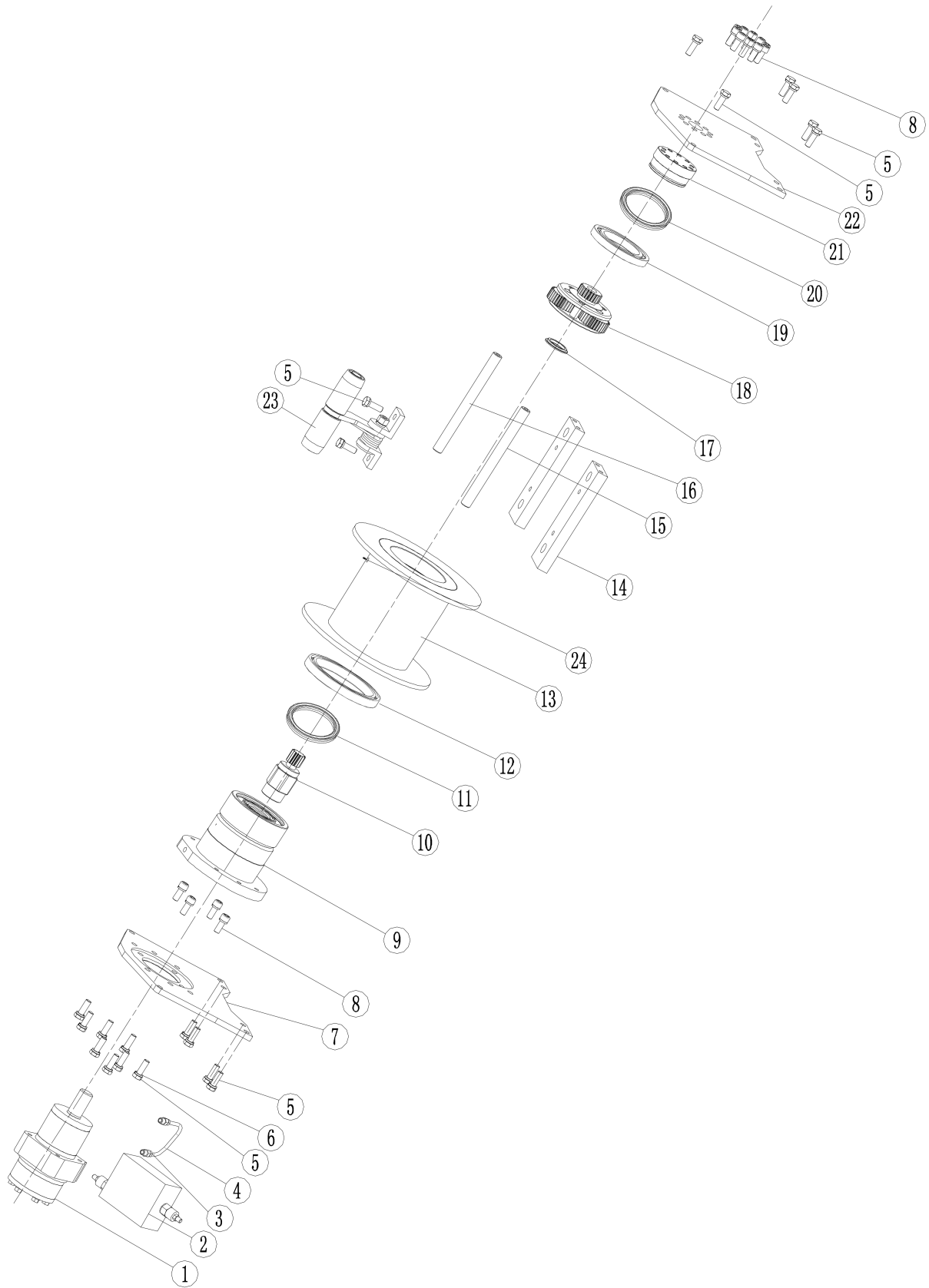
The main technical parameters

Rated line pull	3300 lbs(1500Kg)
Motor displacement	250ml/r
Pressure	13Mpa
Gear reduction ratio	5.7 : 1
Cable (Dia. × L)	Ø13/32" × 121.4' (Ø10.2mmx37m)
Drum size(Dia. × L)	Ø7 " × 6.5"(Ø178mmx165mm)
Mounting bolt pattern	6.1" × 8.94"(155mmx227mm) 4-M16
Overall dimensions (L × W × H)	13.7" × 12.3" × 11.7" 347mmx312mmx298mm

Pull , Speed, Pressure, Flow

Pressure	13Mpa			
Oil flow	50L/min			
Layer of wire rope	1	2	3	4
Rated line pull lbs(kg)	4372(1983)	3945(1789)	3594(1630)	3300(1500)
Line speed ft/min(m/min)	66.3(20.2)	73.5(22.4)	80.7(24.6)	87.9(26.8)
Total rope on drum ft (m)	26.2(8)	55.8(17)	88.6(27)	121.4(37)

WINCH ASSEMBLY DRAWING



WINCH PARTS LIST

No.	Part #	Qty	Description	Remark
1	HT150100	1	Hydraulic Motor	011/015
2	HT150001	1	Balanced valve	
3	HT150002	2	Oil connection	
4	HT150003	1	High-pressure oil tube	
5	HT150004	18	Cap Screw M10 x 30	
6	HT150005	34	Lock Washer Φ 10	
7	HT150006	1	Motor bracket	
8	HT150007	16	Cap Screw M10 x 25	
9	HT150200	1	Brake Assembly	
10	HT150008	1	Transmission Shaft	011/015
11	HT150009	1	Ring Seals	
12	HT150010	1	Bearing	
13	HT150300	1	Drum Assembly	011/015
14	HT150011	2	Stand bar	
15	HT150012	1	Tie bar	
16	HT150003	1	Support bar for Safety Stop	
17	HT150014	1	Trust Washer	
18	HT150015	1	Gear Carrier Assembly	011/015
19	HT150016	1	Bearing	
20	HT150017	1	Ring Seals	
21	HT150018	1	Bearing stents	
22	HT150019	1	End Bearing	
23	HT150500	1	Tensioned Of Steel Wire Supplied Assembly	
24	HT150021	1	Screw M8 \times 10	