

From: "Dennis Brunson" <dbrunson@dynacon.com>
Date: Wed, 19 Jun 2002 13:57:01 -0500
Subject: Re: OSU Traction Winch

Jay, It is good to hear that the system is working well.

Looking back at the Factory Acceptance Test Reports the maximum system pressure was set at 2300 psi.

The hydraulic power unit has a PAVC38 Parker pump with Horsepower Limiting controller set based on 5HP.

The controller proportionally limits the flow as the pressure increases to limit the hydraulic power output to 5 horsepower. This allows higher speeds at lower loads and lower speeds at higher loads while staying within the electric motor rating.

So at 500 PSI the pump will provide 16 GPM , and at 1750 PSI will provide only 5 GPM.

Points in between can be estimated based on the following formula:

Flow (GPM) x Pressure (PSI) / 1714 = Hydraulic HP

Estimated flow at a particular pressure would be $5 \text{ HP} \times 1714 / \text{pressure} = \text{estimated flow}$

Recorded average performance was as follows:

| Pressure | Line Pull | Line Speed | Calculated Flow |
|----------|----------------|--------------------|-----------------|
| 1950 psi | 1237 pounds | 62 feet per minute | 3.7 gpm |
| 2300 psi | 1500 pounds | stall (zero speed) | 0 gpm |
| 500 psi | zero (no load) | 200 fpm | 12 gpm |

All this being said, the simple answer to your question is that if the ship can provide 2300 psi @ 16 gpm, then you will have full speed and full line pull capability at the same time.

As a minimum you will want 2300 psi, unless you can accept a lower line pull. You can estimate the line pull that can be achieved at a lower pressure by taking a ratio of the line pull versus pressure from the recorded performances.

For example: If the ship can only supply 1500 psi, then $1500 \times (1237 \text{ lbs}/1950 \text{ psi}) = 951$ pounds line pull would be the maximum line pull achievable. You will want to make sure that the achievable line pull will be sufficient to recover the weight of the cable(rope) and payload you will be handling and it would be a good idea to have 1.25 times the anticipated load to account for dynamic factors.

You can use this same method to estimate achievable line speed based on available flow as follows: If the ship can only supply 10 gpm, then $10 \times (62 \text{ fpm}/3.7 \text{ gpm}) = 167 \text{ fpm}$ line speed would be the maximum line speed achievable

Yes, it is possible to oversupply the winch.

The hydraulic power to the winch should not exceed the following values to stay within the ratings of the hydraulic motors:

Maximum Pressure: 2500 PSI
Maximum Flow: 25 GPM

The third line is a case drain line for the motors. This line allows case leakage to drain out of the motors to the reservoir. This line must be used. Otherwise, pressure would build up in the motor case and blow the seals out of the motor.

The ship's hydraulic system should have a low pressure return, or zero pressure return which returns directly to the reservoir. Dennis

If you have any questions, want us to confirm performance once you have information from the ship, or need additional information do not hesitate to contact us. Good luck and keep in touch to let us know how things are going.

Regards, Dennis Tel: (979) 823 – 2690 Fax (979) 823 - 0947

From: "Dennis Brunson" <dbrunson@dynacon.com>
Date: Tue, 25 Jun 2002 16:27:40 -0500
Subject: Re: Small Hose

Jay,

The third line is a case drain line for the motors. This line allows case leakage to drain out of the motors to the reservoir. This line must be used. Otherwise, pressure would build up in the motor case and blow the seals out of the motor.

The ship's hydraulic system should have a low pressure return, or zero pressure return which returns directly to the reservoir. Dennis

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From: "Dennis Brunson" <dbrunson@dynacon.com>
Date: Wed, 03 Jul 2002 19:11:13 -0500
Subject: Re: Winch Meeting

Jay, The OSU winch is "closed center, open loop".

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The existing hoses on the HPU are 14' long. The existing electrical power cord is 4 conductor, #6 AWG, 50' long. Switch box is a Cutler-Hammer, type 4 water resistant enclosure 20 amp. The motor is rated at 15hp, 440vAC, 3 phase, TEFC.

The high pressure input line on the winch has a Snap Tite SVHN...8 male connector. The low pressure return line on the winch has a Snap Tite SVHC...8 female connector. The zero pressure return line on the winch has a Snap Tite SVHC...4 female connector.

The hoses on the HPU are terminated with mating Snap Tite connectors to match the winch connectors.