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Why Seatrax Doesn't Use "Braden"-Type Winches

Seatrax does not use "Braden"-type hoists or other hoists of the "works in the drum" design. Instead, we make our own hoists, which are superior to the "Braden"-type hoists in this application. Our reasons for this are as follows:

- "Braden"-type hoists have the planetary reduction gearing and static brake mechanisms mounted inside the drum barrel. This means that a "Braden"-type hoist must be removed from its mount and completely dissembled to inspect or replace the gearing and other load transmitting components.

- **Seatrax hoists have the reduction gearing mounted externally. All gearing and load-transmitting components of a Seatrax hoist can be disassembled and inspected without removing the hoist from its mount or removing the wire rope or drum from the hoist. It is never necessary to remove a Seatrax hoist from its mount in order to perform any inspection or component replacement.**

- The drums on "Braden"-type hoists contain the gear train lubricant. Numerous different seals are involved in keeping this lubricant inside the drum. This method of lubricant retention is prone to leakage and has been a historical problem with hoists of this type. If the lubricant leaks out of the drum on a "Braden"-type hoist, this loss of lubricant can lead to a catastrophic failure in the drive train, which results in a loss of control of the load. This failure occurs because the gearing and majority of the drive train components in a "Braden"-type hoist are located between the brake and the drum. These hoists have no safety brake to hold the drum in the event of a failure in the drive train because of a lack of lubricant.

- **The drums on Seatrax hoists are not required to hold any lubricant. All gear lubricant is contained in the external gearcase. There is only one lip seal involved.**

- The "Braden"-type hoist does not have a solid, one-piece drum shaft on which to rotate the drum. Instead, a "Braden"-type hoist supports the drum by means of two large diameter cantilevered stub shafts connected to each side plate of the hoist frame. For this reason, "Braden"-type hoists do not have a one-piece frame. Instead, the frame consists of two separate end frames and one or more center section components. All of these pieces of the frame are connected together by dowel pins and bolts. This means that the completed hoist must be mounted to the crane structure by bolting. Please note that the portion of the crane structure to which the "Braden"-type hoist is mounted must be very rigid and flat. Otherwise, the hoist frame can "flex" or distort under load or even when bolted down tight to a warped surface. This deflection or distortion can then cause the two stub shafts to move out of line with one another. This then can lead to rapid drum bearing and seal failure. This seal failure can then lead to loss of the gear train lubricant.

- **In contrast, all Seatrax hoists are furnished with a solid, one-piece drum shaft, which is fixed to the hoist drum by means of a hardened steel spline connection. This shaft is supported by self-aligning anti-friction bearings mounted in the side plates of the hoist frame and is directly driven by the externally-mounted gear reduction. Because of this design feature, all Seatrax hoist frames**

are made from one piece, rigid weldments. There are no bolts, dowel pins, or multi-piece frames to contend with. This design feature eliminates the possibility of lubricant loss because of frame deflection and the possible catastrophic failure that might result.

- **In many instances, Seatrax hoists are mounted by welding the hoist frame directly to the crane's revolving superstructure. Bolt-related problems are eliminated. This is possible because it is not necessary to remove a Seatrax hoist from its mount in order to perform inspections or component replacement.**

- "Braden"-type hoists do not have a static parking brake, which acts directly on the hoist drum. The "Braden"-type static parking brake is located on the input side of the gear train and housed inside of the drum. This means that a single failure in the drive train can result in catastrophic and sudden loss of control of the load. With a "Braden"-type hoist, no redundant brake system is available. This design feature, in combination with the component locations and potential lubrication problems makes people uncomfortable with the idea of using a "Braden"-type hoist in an application where certification for personnel handling duties is required.

- **Seatrax hoists offer three spring-applied, pressure-released automatic static parking brake arrangements:**

    - **High-speed shaft brake fitted between the hydraulic drive motor and the gear reduction.**

    - **External contracting band brake acting directly on the hoist drum. (normal configuration)**

    - **Both of the above.**

- **The external contracting band brake provides the Seatrax hoist with two distinct load-holding devices, which do not share a common load or failure path. This brake will:**

    - **Engage in a progressive manner and bring a runaway drum to a safe stop without inducing unacceptable shock loads into the crane structure.**

    - **Hold in excess of 150% of the maximum stall torque of the hoist drive.**

    - **Not slip in the event that the brake drum and/or lining is covered with oil or water.**

    - **Provide visual indication of adjustment status.**

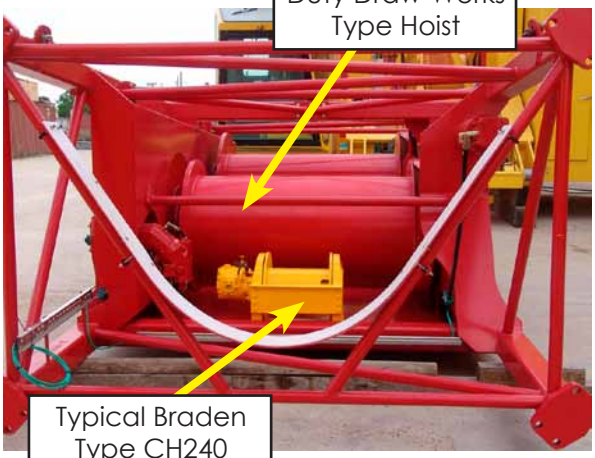
    - **Provide a means for lowering the load in the event of a power supply failure.**

    - **Permit the complete replacement of all gear train components with a load suspended on the hoist rope.**

    - **Provide a welcome level of comfort when certification for personnel handling duties is required.**

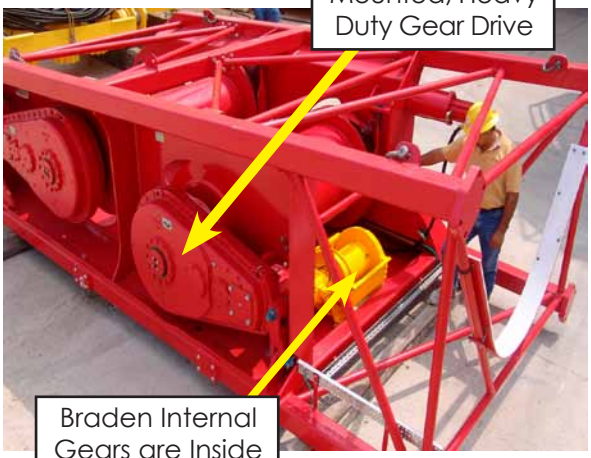
- The manufacturer requires that each "Braden"-type hoist be subjected to a complete internal inspection of the drive train and brake system components on a periodic basis. (In light of the design characteristics discussed above, we agree that this is a prudent and reasonable requirement). This inspection requires that the hoist be removed from its mount and disassembled. This is customarily done on an exchange" basis. The hoist is removed from the crane and sent to a manufacturer's "authorized" repair facility, where it is commonly "exchanged" for a "rebuilt" unit.

- **Seatrax also requires an inspection of the gear train and high-speed shaft brake systems on at least a periodic basis for those hoists that are not equipped with the external contracting drum brake. However, removal or complete disassembly of the Seatrax hoist is not required to perform these inspections. They can be done in place. For those Seatrax hoists that are equipped with the external contracting drum brake, no internal periodic inspections are required.**



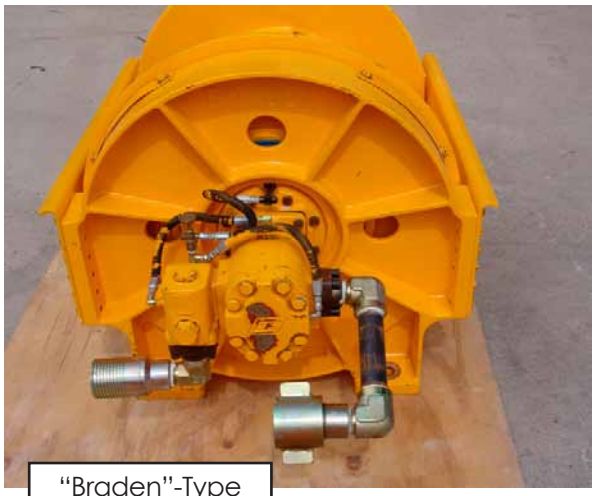
Seatrax Drilling Duty Draw-Works Type Hoist

Typical Braden Type CH240 Winch



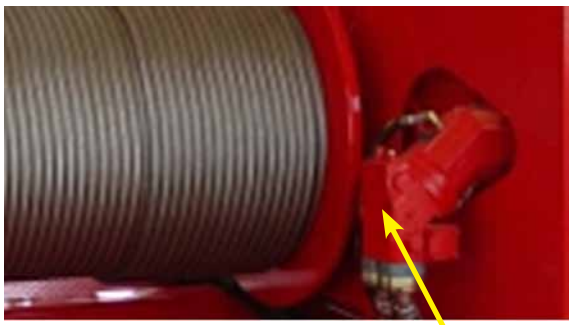
Seatrax Externally-Mounted, Heavy Duty Gear Drive

Braden Internal Gears are Inside the Drum

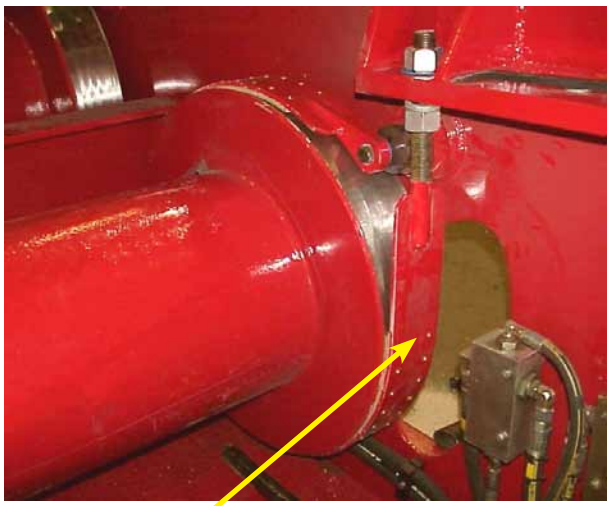


"Braden"-Type Winches Have All Brakes at High Speed Input

OLD TECHNOLOGY: A typical "Braden"-type winch (left) has all of the hydraulic and mechanical braking at the high-speed input of the hoist. The gears and brakes are inside the drum. With NO brake on the drum, a SINGLE drive-line failure can result in the loss of the load.



Seatrax Input Brake



Seatrax Draw-Works-Type Band Brake Works DIRECTLY on the Drum

Seatrax cranes are equipped with input hydraulic dynamic brakes AND brakes that act DIRECTLY on the drum. With a true brake acting directly on the drum, NO single drive-line or brake failure can affect both brakes. This is critical for personnel handling safety.

For more information, visit www.seatrax.com or call 1.713.896.6500.