

Seatrax Boom Suspension Systems



Pendant and Bridle System



Continuously Reeved System

Seatrax offers two types of boom suspension systems. This includes pendant and bridle as well as continuously reeved.

The **boom suspension system** is the collection of **wire ropes, sheaves, shafts, blocks** and other rigging components used to support the **boom**.

The **pendant and bridle system** consists of:

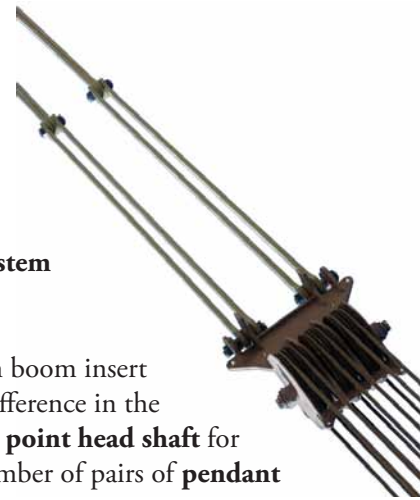
- **Boom hoist cable or luffing cable:** This is the cable spooled on the **boom hoist drum** and is the **wire rope** that actually lifts the **boom**.
- **Gantry sheave cluster:** This is the collection of **sheaves** located at the **gantry peak**. There are usually four or five **sheaves** in this cluster, and they revolve about a common **shaft**.
- **Bridle block:** This is the framework that contains the **forward sheave cluster**. This set of **sheaves** is identical to that contained in the **gantry sheave cluster**.
- **Bridle spreader bar:** This structure connects the **pendant lines** to the **bridle block** by means of a pin connection. This ensures the load is equally shared by the two sets of **pendant lines**.
- Traditional **pendant lines** are matched pairs of large **wire ropes** that have pin connecting **sockets** permanently attached to the ends. Usually one pair of **pendant lines** is used for each straight **boom insert** section furnished with the crane **boom**. Normally, two to four pairs are used, depending on the **boom** length required. These pairs of **pendant lines**, when pinned together, are used to connect the **bridle spreader bar** to the boom **point anchor ears**.

- Through its **pendant bars**, Seatrax incorporates the use of fabricated links in lieu of traditional **pendant lines**. The **pendant bars** offer lower maintenance and longer service life. Fabricated out of high strength steel, the **pendant bars** are easier to inspect, last longer, have higher design factors, do not require lubrication and are not susceptible to corrosion issues normally associated with **pendant lines**.
- **Boom point anchor ears**: These are the fittings that attach the **pendant lines** to the **boom point head shaft**. There are two of these, one on each side of the **boom point**.
- **Boom point head shaft**: This **shaft**, located on the centerline of the **boom** when viewed from the side, is used to connect the lines of action of the **pendant line** tensile loads, the **main load block** load and the compressive load in the **boom** together at a common point. The **boom point sheaves** revolve about this shaft.

Bottom-supported structures, non-floating applications and cranes configured with excessively long boom lengths are best suited for a pendant and bridle boom suspension system.

Advantages of the **pendant and bridle type of boom suspension system** include:

- The length of the **boom hoist cable** does not change when boom insert sections are added to or subtracted from the **boom**. The difference in the distance between the **gantry sheave cluster** and the **boom point head shaft** for various **boom** lengths is accommodated by varying the number of pairs of **pendant lines** installed in the system.
- Having the lines of action of the three primary forces at the **boom head** all act through the center of the **boom point head shaft** maximizes the allowable **safe working load (SWL)** of the crane for those cases where the **SWL** is governed by the allowable tensile loading in the **boom suspension system**.



Another type of boom suspension is the **continuous reeved boom suspension system**, which consists of:

- **Boom hoist cable or luffing cable**: This is the **cable** spooled on the **boom hoist drum** and is the **wire rope** that lifts the **boom**.
- **Gantry sheave cluster**: This is the collection of **sheaves** located at the **gantry** peak. There are usually four or five **sheaves** in this **cluster**, and they revolve about a common **shaft**.
- **Forward sheave cluster**: This group of **sheaves** is identical to that in the **gantry sheave cluster** and is located on top of the **boom point** section at the **boom tip**. The **boom hoist cable** is reeved between the two **sheave clusters**.
- No **bridle block**, **bridle spreader bar**, **pendant lines** or **boom point anchor ears** are necessary

or used. Neither is a common **boom point head shaft**.

- The **forward sheave cluster**, mounted on top of the **boom point**, has its own **shaft**. This **shaft** is identical to and interchangeable with the one used with the **gantry sheave cluster**.
- The **load block sheave cluster** is now located below the bottom face of the **boom point structure** and also has its own **shaft**. This means that the **main load block** does not have to travel inside the **boom point** when the crane is operated at close radii.

Cranes with shorter boom lengths and those mounted on floating vessels, such as drillships and semi-submersibles, are best suited for a continuously reeved boom suspension system.