

# Patented API 2C Anti-Two-Blocking System

For many years, Seatrax has used its innovative solution to remedy crane operations accidents caused by the unintentional contact between the **hook block** (or **ball**) and the **boom point**, often referred to as **two-blocking**.

One type of **two-blocking**, often described as “**booming down into the block**,” occurs on most cranes because of the location of the **hoist drum**, which is typically mounted on the **revolving superstructure**. (See Figure 1). Through this arrangement, the distance between the **hoist drum** and the **boom tip sheaves** increases as the **boom** is lowered, causing the **lower block** (**hook block**) to move closer to the **upper block** (**boom tip sheaves**).

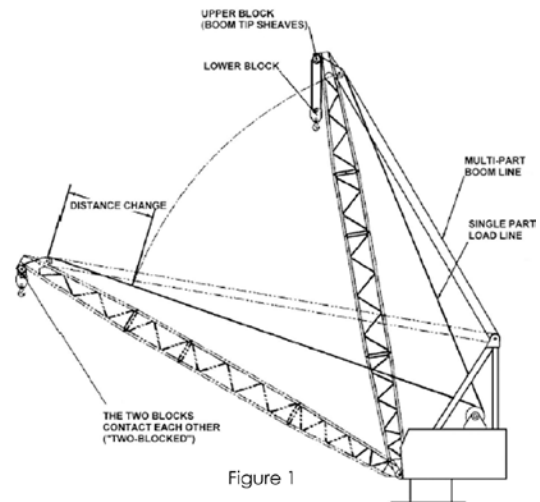


Figure 1

Seatrax fixes this common problem by locating its **hoist drums** in the base section of the **boom** rather than the **revolving superstructure**. Through Seatrax's ground-breaking arrangement, as shown in Figure 2, the **hook block** cannot be drawn into the **boom tip sheaves** as the **boom** is lowered. The **hoist** moves with the **boom**, allowing the distance between the **hoist** and the **boom tip sheaves** to remain unchanged.

With its basic design, Seatrax cranes require no external power source, switches or valves, solutions other conventional cranes have used to combat **two-blocking**. Most often, these cranes utilize a switch or valve, which interrupts power to the **load hoist** and/or the **boom hoist** and stops the offending motion. The switch is activated when the **hook block** approaches the **boom tip sheaves** and collides with a weight hanging from a rope or chain. This weight normally has a hole through which one of the lines to the **hook block** passes. When the **block** is hoisted to a predetermined position, it “lifts” the hanging weight and activates the switch or valve.

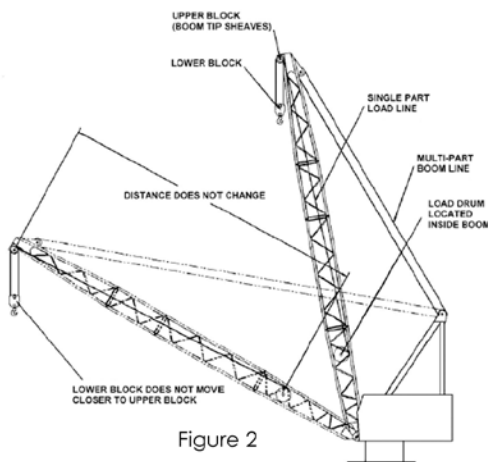


Figure 2

**Two-blocking** may also occur when crane operators over hoist the **hook block** (or **auxiliary hook**), regardless of the position or angle of the **boom**. Seatrax, through straightforward geometry, easily solves this problem. This simple system, depicted in Figures 3, 4 and 5, takes advantage of the hydraulic motors Seatrax cranes use to power their **hoists**. Unlike standard cranes, Seatrax uses a design that limits the maximum line pull the **hoist** develops to a safe value through the **hydraulic system's pressure relief valves**.

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As Figure 3 demonstrates, the system includes a **swinging bumper frame** that follows the angle of the **main block**. Fixed to the **main block** is a v-shaped **bumper frame** that allows the **main block** to come into contact with the **swinging bumper frame**.

In a similar manner, a **bumper frame** is provided on the **jib** to receive the **auxiliary hook weight** as shown. The **wedge socket** is enclosed inside of, and protected by, the **overhaul ball**.

Put simply, Seatrax cranes are designed not to produce sufficient pull to break the line. Rather than attempting to prevent the operator from running into the **boom** if the **blocks** are over hoisted, the Seatrax system provides **bumpers** allowing this action to occur in a controlled manner without causing any damage.

Seatrax's patented **anti-two blocking system**, in use since 1977, is accepted by international certifying authorities, including ABS, DNV and Lloyds. This system also meets the requirements of API Specification 2C, Sixth Edition. Its advantages include:

- The prevention of damage to any component in the event that the **auxiliary hook** or **main block** is over hoisted.
- "Parking places" for the **auxiliary hook** and **main block** that prevent fouling of the **auxiliary hook** with the **main block** when the **auxiliary hook** is not in use.
- The ability to raise or lower the boom without regard to the position of the **auxiliary hook** or **main block**.
- A "caged" path for both the **main** and **auxiliary lead lines**, which protects the operator and other personnel in the event of wire rope breakage.
- The ability to check the **weight indicator** and maximum lift capability of the crane prior to each lift

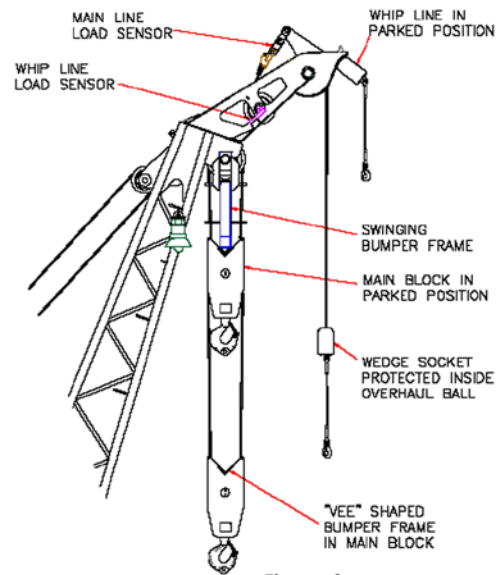


Figure 3

by pulling the **main block** into its "parking place." (Performance of the **engine** and **hydraulic system** can be checked in the same manner. This action will cause the **hydraulic pressure** to rise to the relief valve setting and safely place the machinery under full load.

Simply by changing its **hoist's** location, Seatrax eliminates the possibility of increasing tension in the **hoist ropes** by lowering the **boom**. Coupled with the patented Seatrax's **bumper frame**, these cranes easily prevent all **two-blocking** problems associated with offshore crane operations.



Figure 5



Figure 4