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).

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.

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.
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, Seventh 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 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.