

## SOP-GEN-020 Lifting Gear

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### 1.0 Introduction

Lifting gear consists of a specified set of tested and load rated items that are approved for use in TDI-Brooks operations. **This gear meets specific engineering requirements and must be provided by the College Station Resupply department.** It is NOT ACCEPTABLE for a vessel or individuals to purchase gear directly for use in lifting operations.

The purpose of this SOP is to establish specific procedures for placing gear in and out of service, documenting gear inspection and use and assigning responsibility for these tasks.

### 2.0 Responsibility

It is the responsibility of the Lifting Gear Manager in conjunction with the Staffing Managers to establish the criteria that will be used to train and qualify riggers.

The vessel HSE Officer on board (Chief Mate) is ultimately responsible to ensure that all lifting gear on the vessel meets TDI-Brooks requirements and lifts are carried out by a qualified crane/ winch operator.



The Staffing Managers are responsible for ensuring that each vessel has the required number of qualified Riggers and crane operators necessary for vessel activities and operations.

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It is the responsibility of the rigger to conduct pre-use inspections of all gear to be used in an operation for defects or wear and to properly destroy/ mark the gear as out of service if damaged.

## Definitions

**Approved for use-** Approval for use means that gear has been inspected by a qualified rigger and painted the current year's color to indicate it has passed annual inspection.

<p><b>Brummel hook-</b> Manganese Bronze or Stainless Steel hook pairs of various sizes- most commonly used to connect the trigger weight to the trigger assembly on the PC rig.</p>	
<p><b>Chain Hoist/ Fall-</b> a device used for lifting or lowering a load by means of a chain wrapped around a drum or wheel lift.</p>	

**In Service-** When a piece of lifting gear is taken from storage and placed into an assembly for active use, it is considered "In service". At this point any identification tags are documented in the lifting gear register and the "in service" date noted. Only approved gear may be placed in service.

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**JPC Rig-** Jumbo Piston Core rig with a 4-inch diameter barrel that runs on a track on the back deck.

**Lifting Gear-** For TDI-Brooks purposes, lifting gear is defined as anything between the lifting appliance (winch, crane, chain fall, fixed lifting point) and the load being lifted. This includes slings, blocks, pendants, shackles, Brummel hooks, harnesses and anything else used to support a load.

**Liner Extraction tigger-** a small winch used to remove the core liner from the Jumbo Piston Core rig.

**Moon Pool-** an open shaft through the hull of the vessel through which survey gear may be deployed into the water below.

**PC Rig-** smaller Piston Core rig with a 3-inch diameter barrel that is lowered by main winch and positioned off the vessel by a-frame.

**Pendants-** are rotation-resistant wire rope assemblies of various lengths with Spelter sockets at each end. Pendants are used as the connection interface between the main rope and the seabed sampling rigs to facilitate the triggered free-fall of the rig.



**Pendant & Shackle Color Chart-** a chart that is issued annually to indicate the year's color codes for qualified, in-service shackles. Pendants are color coded by length. The shackle should be painted in such a way as to make it easily identifiable, on sight, of the year it was last inspected; The threads and bolt of a shackle should **never** be painted. The chart should be posted on the deck in an easily accessible area as well as in the ship's Lifting Gear Registry.

**Plasma Line-** an ultra-high strength synthetic rope this is used by TDI-Brooks in place of steel wire for most coring operations. It has no weight in water, is resistant to most oils and fuels and is significantly safer to use than wire rope. It is subject to UV degradation and should be covered with a dark tarp when not in use.

**Qualified Rigger-** a person who has been trained as a rigger by an approved outside company or qualified by TDI-Brooks to inspect and approve lifting gear for use.



**Removed from Service-** any gear removed from active use must **either** be repaired and inspected by a qualified rigger before being returned to service, **or** permanently taken out of service by being destroyed or marked with red paint and thrown away.

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<p><b>Safe Working Load (SWL)-</b> The amount of load that the lifting gear can safely handle. This should be clearly marked on all lifting points, cranes, and A-frames. Lifting gear shall not be loaded beyond its safe working load.</p>	
<p><b>Shackles-</b> Shackles are U shaped connections of various sizes that form part of most of our lifting assemblies. They are to be qualified for use by inspection by a qualified rigger annually and painted the correct color for that year. Any shackle that is not painted with the correct year's color must NOT be used in any lifting gear assembly and must be removed from service immediately.</p>	

**Sheave-** a wheel with a groove for a rope to run on. An integral part of a block.

**Shock Load-** a rapid application of force (such as impacting or jerking), or the rapid movement of a static load.

<p><b>Snatch Block-</b> a block that can be opened on one side to receive the looped part of a rope.</p>	
<p><b>Spelter Socket-</b> the metal termination piece at the end of a pendant that is used to connect to the main rope or the rig to the pendant</p>	


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**Termination-** the loop at the end of the mainline Plasma rope to which coring equipment is attached, or the act of splicing that loop.

**Trigger Assembly-** a set of parts that compose the trigger arm of either the PC or JPC rig.

**Trigger Tugger-** a small winch for lifting the trigger weights during PC or JPC operations.

**USBL Pole-** a long pole mounted on the side or through a moon pool of the vessel that properly holds the USBL transducer below the vessel during coring operations.

<p><b><u>Working Load Limit (WLL)-</u></b> the maximum working load permitted by a specific piece of equipment (often used interchangeably with Safe Working Load). On smaller pieces it may be stamped into the metal or raised on the surface.</p>	
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### 3.0 Types of Lifting Gear

Lifting gear is generally divided into three categories. However, ALL lifting gear must be inspected at least annually by a qualified rigger and painted the appropriate year's color to indicate it is approved for use.

Gear is frequently brought aboard for each project. Before being put in service, it must be verified that the gear is approved for use and should be properly entered into the vessel's Lifting Gear Registry.

- **Vessel Lifting Gear-** defined as part of the vessel and necessary for regular vessel operations. This category includes:
  - Stern and side A-frames
  - Back deck crane
  - SOLAS Davit or rescue boat crane
  - Lifting points integrated into the vessel structure, overhead beams or decks

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- **Survey / Scientific lifting gear-** defined as gear specific to the coring and survey work of the scientific crew. This category includes:
  - Main winch
  - Coring related winches (Moon Pool, USBL pole, JPC liner removal, trigger tuggers, JPC deployment and retrieval tuggers)
  - Pendants, pendant connections
  - Plasma rope on tuggers and winches
  
- **Common lifting gear-** defined as part of the vessel gear but used for both ship and scientific operations. This category includes:
  - Chain falls and hoists
  - Blocks and sheaves
  - Shackles and hooks
  - Slings and bridles
  - Plasma rope on main winch
  - Harnesses and fall arrest devices

#### 4.0 Lifting Gear Registers

Each vessel has a lifting gear registry binder. **New gear should be entered into the binder before being put into use.** The Lifting Gear Register contains the manufacturer’s specifications for each purchased piece of lifting gear or their assemblies as well as the history of the gear on that vessel.

The Captain is ultimately responsible for ensuring that any new gear brought aboard the vessel is entered into the Lifting Gear Register.

**Anyone taking damaged gear out of service is responsible for logging this in the Lifting Gear Register and ensuring the gear is painted red or destroyed beyond use and stored with other condemned gear.**

#### 5.0 Lifting Gear Inspections & Maintenance

**Inspections-** annual inspections of all lifting gear must be conducted by a qualified rigger and the gear painted the appropriate color to indicate it has been approved for use.

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The person using the gear is responsible for inspecting lift gear before each use. They must be sure it is painted with the current year's color and in good condition. Worn out or damaged gear must be painted red and removed from service.

The Captain is responsible for ensuring the annual inspection has been conducted and documented in the maintenance program (it is an annual standard job) and that gear in service is painted the appropriate color.

**Maintenance-** is the responsibility of the Chief Engineer on board.

The Engineer and Captain cannot anticipate the needs of individual projects. Therefore, the **Party Chief is responsible for ensuring that the lifting gear he needs to complete that job is on board in sufficient quantity and with spares before leaving the dock.**

**\*\*Damaged lifting gear is to be condemned with red paint and/or destroyed beyond use and discarded or quarantined below decks to prevent accidental use.** If gear can be repaired, it will be repaired and inspected by a qualified rigger, then tested, painted the correct color and put back into service. If not, it will be disposed of at the next port call.

Lifting gear not in use shall be removed from the immediate work area so as not to present a hazard to employees.

## 6.0 Winch & Crane

While winches and cranes are part of the lifting gear system, they are addressed in a separate SOP.

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