

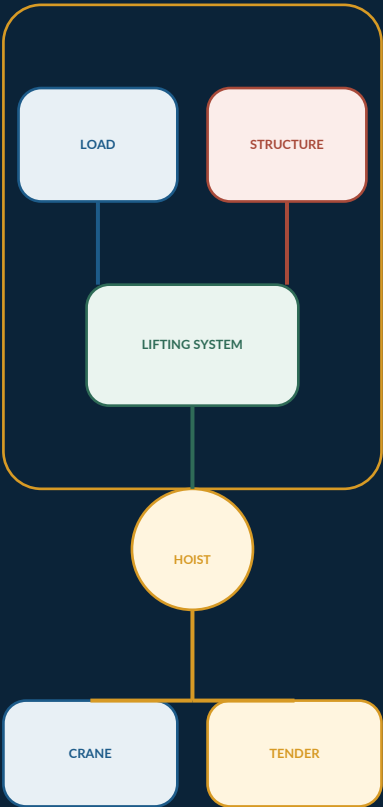
Understanding Tender-Lifting and Crane Systems

An owner's guide to rated loads, rigging,
dynamic forces and safe recovery

A tender may be light ashore but highly dynamic at sea.
Cranes and davits depend on rated load, radius, rigging,
foundations, controls and disciplined communication.
A successful lift ends only when the load is secured.

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Commercial thinking for private cruising.



PLAN | LIFT | SECURE

GUIDE OVERVIEW

What tender-lifting and crane systems are designed to do

Tender-lifting systems raise, lower and position tenders, personal watercraft or stores while controlling static load, outreach, vessel motion and dynamic forces.

SCOPE	This guide covers cranes, davits, booms, winches, brakes, wire or synthetic rope, hooks, slings, hydraulic or electric power, limit switches, foundations and tender securing arrangements.
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By the end of this guide, you should be able to:

- Trace the complete path from command or supply to the physical result.
- Identify the principal components, controls, protection and monitoring.
- Recognise common failure modes and early warning signs.
- Understand hidden dependencies and safe degraded operation.
- Ask better questions during purchase, survey, sea trial, refit and offshore preparation.

CORE PRINCIPLE	Every lift should remain within the certified load and radius envelope, use suitable lifting gear and preserve a clear exclusion zone and escape route.
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Safety

Suspended loads can kill. Never stand beneath a load or place hands between tender and yacht. Isolate stored hydraulic, electrical and gravitational energy before maintenance; follow certified lifting procedures.

SYSTEM ARCHITECTURE

How the complete system produces its intended effect

Understanding Tender-Lifting and Crane Systems depend on a complete chain of command, control, power, physical equipment, feedback and safe shutdown.



Area	Why it matters	Owner focus
Foundation and pedestal	Transfer vertical, overturning and dynamic loads into structure.	Inspect design approval, fasteners, welds or laminate and corrosion.
Boom, jib or davit arms	Set outreach and lifting geometry.	Know load chart, radius and articulation limits.
Winch, brake and line	Raise, lower and hold the load.	Inspect spooling, brake, drum, rope and end termination.
Hook, slings and lifting points	Connect the appliance to the tender or stores.	Use rated compatible gear and balanced lift points.
Controls and limits	Manage movement and prevent overtravel or overload.	Test emergency stop, limits, interlocks and remote control.

CORE PRINCIPLE	Rated capacity depends on outreach and configuration; the same crane may lift safely close in but be overloaded at full radius.
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MAIN COMPONENTS

What owners should be able to identify

The installation should be traceable from controls and power to working equipment, protective devices, monitoring and manual isolation.



Area	Why it matters	Owner focus
Crane or davit structure	Carries the complete lifting load.	Corrosion, cracking, deformation, pins and foundation condition.
Hydraulic or electric power	Moves boom, slew and winch.	Pressure or current, cooling, hoses, cables and shared loads.
Winch and brake	Control hoisting and suspended-load holding.	Brake test, gearbox, drum, motor and emergency lowering.
Wire rope or synthetic line	Carries the suspended load.	Broken wires, glazing, abrasion, diameter, end fitting and replacement criteria.
Hooks, blocks and slings	Connect and redirect load.	SWL, latches, sheaves, certificates and compatibility.
Controls and limit switches	Prevent unsafe movement and manage speed.	Waterproofing, direction, emergency stop and override control.

ACCESS AND LABELLING	Access, identification and service history are part of system reliability.
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SYSTEM ARRANGEMENTS

Cranes, davits, platforms and power arrangements

Different arrangements trade simplicity, performance, redundancy, maintenance burden and failure consequence.

PEDESTAL CRANE

Rotating boom with variable outreach

DAVIT

Fixed or articulated launch system

HYDRAULIC

High-force power and cylinders

ELECTRIC

Motor, gearbox and winch

Area	Why it matters	Owner focus
Pedestal crane	Rotating boom with variable radius and often telescoping.	Capacity changes sharply with outreach.
Fixed or articulated davit	Purpose-designed for one tender or side launch.	Simpler load path but limited flexibility.
Hydraulic crane	High force and smooth control.	Adds oil, hoses, cylinders, power pack and stored energy.
Electric crane or winch	Uses motor and gearbox, sometimes with manual brake release.	Requires generator or battery capacity and overheating protection.
Platform or garage system	Tender moves on rails, cradle or hydraulic platform.	Adds doors, watertight boundaries and securing complexity.

PRACTICAL DISTINCTION	Installed redundancy should be judged by shared dependencies and usable remaining capacity.
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OPERATION AND CONTROL

Planning, lifting and securing without shock load

Safe operation requires correct preparation, clear mode awareness, monitoring and a controlled return to standby or safe state.



Area	Why it matters	Owner focus
Lift planning	Confirm actual tender weight, fuel, stores, radius, weather and route.	Use the current load chart and certified rigging.
Crew roles	Assign one operator and clear signal person.	Stop on any unclear signal.
Rigging	Attach correct slings and tag lines with load balanced.	Keep hands clear of pinch points.
Hoisting and slewing	Use smooth movements and minimise suspended time.	Avoid side loading and shock load from vessel motion.
Securing	Land in cradle, fit independent lashings and remove lifting load.	Do not rely on the hook or hydraulic pressure at sea.

OPERATOR FOCUS

A lift is not complete until the tender is landed and secured independently for sea.

DEPENDENCIES AND RESILIENCE

What can remove apparently independent capability

Apparently separate equipment can share power, structure, cooling, sensors, hydraulics, networks or one vulnerable compartment.



Area	Why it matters	Owner focus
Hydraulic power	Crane may share pumps or reservoir with steering, fins or thrusters.	Define priority and isolation.
Electrical generation	Motors and power packs can be large intermittent loads.	Maintain voltage and generator reserve.
Deck or hull structure	One hidden foundation defect compromises the complete lift.	Inspect after overload or impact.
Tender lifting points	The tender structure and slings are part of the system.	Verify builder ratings and modifications.
Remote controls and sensors	One radio remote, receiver or limit circuit can stop operation.	Keep local control and spare batteries.

COMMON-MODE RISK

Follow the shared power, cooling, structural and control paths before describing equipment as independent.

MONITORING AND NORMAL VALUES

Recognising normal condition and early deterioration

Useful monitoring combines displayed values with sound, temperature, movement, leakage, vibration and actual performance.



Area	Why it matters	Owner focus
Load creeps while suspended	Brake, hydraulic valve, cylinder seal or winch fault.	Lower to safe support immediately.
Line spools unevenly	Fleet angle, tension, drum or level-wind issue.	Stop before crushing or jumping turns.
Pressure or current rises	Overload, excess radius, jam or mechanical resistance.	Reduce load and investigate.
Boom or foundation movement	Loose fasteners, structural damage or overload.	Stop lifting and inspect.
Limit or overload alarm	Approaching geometry, travel or load restriction.	Do not bypass to complete the lift.

TREND, DO NOT GUESS

Trend comparable operating conditions rather than relying on a single reading.

FAILURE AWARENESS

Common weaknesses and warning signs

Most serious faults begin with small changes, intermittent alarms, unusual noise, heat, leakage or declining performance.

BRAKE / WINCH
Load creeps or drops

LINE / RIGGING
Wear, damage or wrong connection

HYDRAULIC / ELECTRIC
Loss of movement or uncontrolled drift

STRUCTURE / LIMIT
Foundation or interlock fault

Area	Why it matters	Owner focus
Winch or brake cannot hold	Wear, oil contamination, control or mechanical fault.	Suspended load can descend unexpectedly.
Wire or synthetic line damaged	Fatigue, corrosion, crushing, UV or heat.	Load capacity may be severely reduced.
Hydraulic hose or cylinder fails	Burst, seal or fitting fault.	Load can move and oil can create fire or slip hazard.
Remote control fails	Battery, link, receiver or mode problem.	Operator may lose movement at a critical position.
Foundation cracks or deforms	Overload, corrosion or design issue.	Future lifts are unsafe until engineered assessment.

DO NOT NORMALISE CHANGE

A recurring alarm or unusual behaviour is evidence of a defect, not a normal characteristic.

FAILURE RESPONSE

Managing a suspended load after power, brake or control failure

The first response should protect people and the wider yacht, stop further damage and move to a safe reduced-capability plan.

STOP MOVEMENT
Hold or lower to safe place

CLEAR AREA
Protect crew and boat

ISOLATE ENERGY
Power and hydraulic controls

RECOVER LOAD
Manual or alternate procedure

Area	Why it matters	Owner focus
Unexpected load movement	Stop, keep area clear and lower to a safe support if possible.	Reach into the load path.
Loss of power with suspended load	Use designed brake and emergency-lowering procedure.	Release a brake without controlling descent.
Hydraulic leak	Stop power pack, contain oil and protect shared systems.	Continue operating to finish the lift.
Tender swinging	Stop slew, use tag lines and wait for safer motion.	Fight the load with hands or stand between hulls.
Crane stranded outboard	Secure boom and load, then use approved manual recovery.	Sail with an unsecured suspended load.

PROTECT THE WIDER YACHT

No equipment or tender is worth putting a person beneath or between a moving suspended load.

TESTING AND DEMONSTRATION

Testing movement, brakes, load capacity and emergency lowering

A meaningful test should operate the system under representative load, verify protective functions and demonstrate safe manual or degraded operation.



Area	Why it matters	Owner focus
No-load function test	Confirms direction, smoothness, limits and emergency stop.	Does not prove brake or structure under load.
Operational load test	Shows real tender handling, pressure and control.	Use competent supervision and safe conditions.
Proof-load or statutory test	Verifies rated appliance capability.	Requires approved weight and certification procedure.
Brake-hold test	Shows the load remains stationary and lowers controllably.	Use defined load and exclusion zone.
Manual or emergency recovery	Shows operation after power or remote-control loss.	Practise without placing crew under load.

MEANINGFUL EVIDENCE	A no-load start or green status light does not demonstrate performance under real conditions.
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MAINTENANCE STRATEGY

Maintaining structure, hoist, rigging and controls

Maintenance should preserve the energy source, working machinery, structure, controls, sensors, protection and correct fluid or electrical condition.



Area	Why it matters	Owner focus
Structure and foundations	Inspect corrosion, cracks, pins, welds, bolts and deck support.	Protects primary load path.
Winch, gearbox and brake	Service lubrication, brake, drum, motor and holding ability.	Prevents uncontrolled descent.
Wire or synthetic line	Inspect and replace to defined criteria; maintain spooling.	Preserves actual load capacity.
Hydraulic or electric drive	Maintain hoses, cylinders, valves, pumps, cables and cooling.	Supports smooth controlled movement.
Lifting accessories	Inspect hooks, shackles, blocks and slings with certificates.	Ensures every connection is rated.
WORK TO REFER	High-energy, structural, pressure, lifting and safety-critical work should be completed by competent specialists.	

RECORDS, SPARES AND SUPPORTABILITY

Keeping documentation, spares and supportability current

Useful onboard records should show the current arrangement, normal values, service history, safe isolation, selected spares and specialist support.

LOAD CHART
SWL versus radius

CERTIFICATES
Crane and lifting accessories

BASELINE
Pressure, current and movement

PROCEDURES
Lift plan and emergency recovery

Area	Why it matters	Owner focus
Load chart and SWL	Capacity by radius, boom position and configuration.	Prevents overload by geometry.
Certificates	Crane, proof load and accessory inspection records.	Shows legal and technical status.
Tender weight record	Actual ready-to-lift weight including fuel and equipment.	Avoids relying on dry brochure weight.
Service and defect history	Brake, line, hydraulic, structural and overload events.	Reveals hidden future cost.
Lift and emergency procedure	Crew roles, rigging, weather limits and recovery.	Supports repeatable safe operation.

SUPPORTABILITY	A spare part is useful only when its compatibility, tools, settings and installation procedure are understood.
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BUYER AND SURVEY PERSPECTIVE

Assessing rated capacity, certification and practical launch risk

A buyer should see the system operate under representative conditions and understand structural, power, control and support implications.

CAPACITY

Tender weight and operating radius

CONDITION

Structure, line and brake

CERTIFICATION

Tests and lifting records

OPERABILITY

Sea-state and crew requirements

Area	Why it matters	Owner focus
Capacity match	Does rated capacity at actual radius exceed loaded tender weight with margin?	Verify weight and load chart.
Structural condition	Are crane, deck foundation and tender lifting points sound?	Seek specialist structural inspection.
Line and brake	Are rope, winch and brake within service and test limits?	Observe a real loaded lift.
Certification	Are appliance and lifting-accessory records current?	Budget testing or replacement.
Operational practicality	Can the tender be launched safely in expected sea and crew conditions?	Assess more than calm-marina demonstration.

BUYER FOCUS	Use actual loaded tender weight, not brochure dry weight, and compare it with the load chart at the real operating radius.
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OFFSHORE READINESS

Questions before relying on tender-lifting systems offshore

A ready system has verified capacity at the real radius, sound structure and rigging, reliable brakes and a crew able to recover or secure the load after failure.

Area	Question to resolve
Load	What is the actual ready-to-lift tender weight?
Radius	What is the rated capacity at the furthest operating outreach?
Structure	Are crane, deck foundation and tender lift points documented and sound?
Rigging	Are line, hook, slings and accessories certified and compatible?
Failure	How is the load lowered or secured after power or remote loss?
Sea state	What motion and wind limits govern launch or recovery?

Quick readiness check

	Readiness statement
☐	Crane structure, foundations, power, winch, line and rigging are identified.
☐	Actual tender weight and the applicable load chart are available.
☐	No-load, loaded and brake-hold performance are satisfactory.
☐	Wire or synthetic line and lifting accessories meet inspection criteria.
☐	No unresolved hydraulic leak, structural crack, brake creep or limit fault remains.
☐	Emergency stop and manual or emergency lowering are understood.
☐	Tender cradle and sea-fastening arrangements are independent and secure.
☐	Certificates, procedures, selected spares and specialist contacts are available.

KEY TAKEAWAY

Dependable tender lifting combines verified load and radius, sound structure, reliable hoist and brakes, certified rigging, disciplined crew communication and secure sea fastening.

Guidance to consult

Use current vessel structural, crane, hydraulic and electrical drawings and the installed crane, winch, rope, hook and lifting-accessory manufacturers' instructions, together with applicable lifting-appliance inspection and certification requirements.

Understanding Yacht Systems

Practical guides for owners, buyers
and offshore cruising crews.

AMTG-052

Understanding Tender-Lifting and Crane Systems

RELATED GUIDES

AMTG-007 Understanding Hydraulic Systems

AMTG-023 Understanding AC and DC Distribution

AMTG-027 Understanding Automation and Vessel-Control Systems

AMTG-046 Understanding Bow and Stern Thrusters

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