

# Volvo Ocean 65 Scope of Works

Composite	Tim Collen
Hull & Deck Structure	
Hull Shell	
	Full NDT Survey including Ultrasound to standard procedure by QI Composites Any repairs as required by NDT Survey to maintain VO65 Compliance charged at Cost Fit External Bobstay Waterproofing Cover
Hull Internal	
Bulkheads	
	Full NDT Survey including Ultrasound to standard procedure by QI Composites Any repairs as required by NDT Survey to maintain VO65 Compliance charged at cost. Enlarge existing wiring penetrations in Blk/hd G and H
Bulkhead Hatches	
	Replace bulkhead hatch hinges. Through bolt hinges Add hatch securing devices to hold in open position
Galley Area	
	Add galley protection rail. Remove non-standard foot chocks
Internal Finishing	
	New non-skid paint in principle floor areas. Replace vinyl where required. All Machinery and Locker Lids re-finished.
Modifications & Repairs	
	Enlarge hole in longitudinal for watermaker hose Fit new water tank brackets Enlarge holes in longitudinal for ballast hoses Move ballast tank valve brackets to new position Move ballast tank pump brackets to new position Move DC pump soft start bracket to new position Move DC pump switch to new position Move manifold bracket to water tank compartment Install new engine intake valve L brackets Modification to steering pedestal with access hole to allow cable change. MFD bracket installed on rope tunnel Nav desk hole enlarged Modification to media desk- cut outside shape for more room Modify live wire screen in media area- install rotating bracket Primary & mainsheet gearbox bracket - Drill drainage holes X-Box Bracket - add backing plate to mounting face Add One Design Foul Weather Gear Hanging Racks Add One Design internal grab handles Add depth sounder cover
Deck	

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	<p>Full NDT Survey including Ultrasound to standard procedure by QI Composites          Any repairs as required by NDT Survey to maintain VO65 Compliance charged at cost.          Fit new Aerial Frame and LifeRaft Supports          Replace cockpit rope bag tracks with batten support system          Fit updated Outrigger Base Plate Fittings          Fit standard rope tunnel water deflectors, inboard and outboard          Remove cockpit foot chocks and replace with standard design          One-Design Helm platform hinge positioning          Replace Helm Platforms with updated standard design. To be supplied at later date TBC          Replace all chafe guards with Standard design.          VHF handpiece to be added to mainsheet pod          Add standard c-plate cover for keel control panel          Replace staunchion base top hats          Open up fwd line tunnel separator moulding          Modify bow sprit dogbone seating          Fit new design Bowsprit End Fitting          Replace J1 Tack Release Cover with Standard Design          Add standard design ballast tank deck plug</p>
<b>Appendages</b>	
Keel Fin & Bulb	
	<p>Full NDT Survey including Ultrasound to standard procedure by QI Composites          Addition of speed sensor in bulb.          Strip, Sandblast and re-finishing to standard specification.</p>
Rudders	
	<p>Full NDT Survey including Ultrasound to standard procedure by QI Composites          Repairs carried out as required by NDT Survey at COST          Strip, re-fair as required and re-finishing to standard specification.</p>
Daggerboards	
	<p>Full NDT Survey including Ultrasound to standard procedure by QI Composites          Fit updated One Design daggerboard stopper system          Re-shape deck cover plates to accept new stopper system          Strip, re-fair as required and re-finishing to standard specification.          Replace DaggerBoard Bearing Set</p>
<b>Rig &amp; Standing Rigging</b>	<b>Fernando Sales</b>
Mast	
NDT Inspection	
	<p>Full NDT Survey including Ultrasound to standard procedure by QI Composites          DP Crack Testing for metal structural elements.</p>
Batten Car Track	
	<p>Track laminate UPGRADE to new SSNZ specification          Replace and re-glue alloy mast track.          Inspect and re-use lock sections and lock inserts          Modify Headboard Car Grub Screw System          Replace Headboard Car Slide Rods and Bushings          Service Batten Cars including new ball bearings and pin bushings</p>

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Spreader Brackets	<p>Install updated One Design spreader buckets at all spreader roots  Fit bucket locking devices to all spreader bracket cups.  Replace all spreader roots.  Measure, standardise and lock spreader rakes to factory setting.</p>
Mast Tube and Fittings	<p>Enlarge slot for hydro hose to pass quick connect fitting.  Full service of all halyard lock cassettes.  REPLACE all radial composite bearings in sheaves.  Remove all fittings and properly isolate them on refitting.  Standardise wind gear set up in all masts, including fast connectors.  FIT J1 halyard chafeguard on tube.</p>
Tube Refinishing	<p>Mast stripped and sanded.  Any required composite repairs carried out by SSNZ Representatives  Filled and faired to factory finish.  Fully repainted to factory standard with Team Colour above Headstay.</p>
Measurement and compliance	<p>Rig re-weighed in standard measurement condition  Rig equalized for weight and VCG to VO65 v2 Condition.</p>
C6 Rigging	
Side Rigging	<p>Install shroud cone chafe protection.  Full visual inspection of all cables.  OPTIONAL full service of C6 Cables</p>
Fore and Aft Rigging	<p>Full visual inspection of all cables.  Checkstay ferrule size up.  OPTIONAL full service of C6 Cables</p>
Boom	
NDT Survey	<p>Full NDT Survey including Ultrasound to standard procedure by QI Composites  DP Crack testing of metal structural elements.</p>
Full service and minor modifications of boom	<p>Outhaul OBE sheave re-design to prevent chafe.  Replace all reef lock chafe protection covers.  Modify Boom lock cassette edges to prevent chafe to lock strops.  Modify reef lock cassettes to ADD opening limit system in locks.  Replace lazy jack ferrules.  External patch to hold outhaul ram on boom.  Replace Gooseneck friction washers.  Remove all fittings and properly isolate them on refitting.</p>
Outriggers	
Deck Fitting	<p>Upgrade deck fitting to revised specification.</p>

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Tube	Upgrade tube and end fittings to revised specification. (2 supplied)
<b>Running Rigging</b>	<b>Richard Fryer</b>
Mast Refit running rigging	<p>Remove and inspect PBO deflector cables (Reuse or Replace as required at additional cost)</p> <p>Replace topmast deflector bridles x 2</p> <p>Replace checkstay deflector bridle x2</p> <p>Replace topmast deflector ram strop</p> <p>Replace checkstay deflector ram strop</p> <p>Replace deflector loops</p> <p>Reinstall deflectors in mast and attach to backstays</p> <p>Replace trip lines in mast</p> <p>Install spare mouse lines</p> <p>Replace backstay take up bungee system</p> <p>Replace lazy jack fixed loop</p> <p>Remove J2 and J3 tracer lines unless requested not to</p> <p>Replace Reef line redirect at gooseneck</p> <p>Replace Main Cunno</p>
Running backstay textile fittings	<p>Replace topmast stay tang loops</p> <p>Replace checkstay tang loops</p> <p>Replace topmast runner cable to fly block loop</p> <p>Replace topmast fiddle to fly block loop</p> <p>Install new checkstay cable to block strop</p> <p>Replace runner deck block strops</p> <p>Reinstall aft running rigging</p>
Boom	<p>Replace lazy jack adjust bungee take up</p> <p>Replace lazy jack bungee take up block loops</p> <p>Replace lazy jack boom block loop</p> <p>Replace outhaul strop</p> <p>Replace reef trip lines</p> <p>Replace lazy jack A, B and C lines</p> <p>Install new boom jack line</p> <p>Mouse out and reinstall reef lines</p>
Bowsprit	<p>Replace pigsnout with updated design</p> <p>Replace Bobstay as standard at additional cost in One Design 'Sail Handling Pack'</p> <p>Replace pull back deflector</p> <p>Replace tack lines</p> <p>Refit rock back lines</p> <p>Replace bowsprit life lines</p>
Steering system	<p>Replace all steering cables with new setup</p> <p>Replace steering car loops with new lash attachment</p>

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Deck	Replace 4 x steering block loops in pedestal and adjust correctly
	Install Control lines/Furling lines etc (Inspect & Replace as required at additional cost)
	Furling lines
	Rock back lines
	Traveller lines
	Tack line 6:1
	Jib Up/Down lines
	Daggerboard down lines
	Install new main sheet 90 block strops on car
	Install new traveler 180 loops on car
	Replace main sheet dead end connect
	Replace main sheet 180 block strop on deck
	Replace lash tang short loops
	Replace fixed jib block loop
	Replace Lash Tang stacking loop with fixed jib block loop
	Replace Masthead zero inboard sheeting long strops.
	Replace IB MHO fixed point loop
	Replace J2 tack strop
	Replace J2 tack strop
	Replace J1 cunningham strop
	Replace mast base block loops
	Replace trip adjust purchase in tunnel
	Replace transom grab line
	Replace Life line bow strop
	Repace life line lashings
	Replace jack stay lashings
	Replace Halyard Parking loops
	Replace Stacking Loops
	Replace Vang A, B and C
	Replace Vang boom strop
	Replace J1 tack shuttle lashing
Replace Runner block lifter	
Replace Bow Guardrail Netting	
Replace J1 tack Safety webbing and strop	
Internal	Replace Bunk Control lines
	Replace Nav seat adjustment assembly
	Replace Media Seat adjustment assembly
	Replace Stacking net purchases
Outrigger system	Replace forward bridle with new One Design Version
	Replace down bridle with new One Design Version
	Replace Outboard End Strops with new One Design Version
Safety equipment tie downs	

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	Replace Life raft tie downs to suit updated rafts and positions
<b>Deck Gear</b>	<b>Sam Bourne</b>
Deck Hardware & Equipment	
Harken	
	All Harken TTR Blocks full workshop service. Replace all roller cage frames and thrust washers. Replace base plates for C10558 6.5T Wide Footblocks. Replace Base Plate, Head Spacer & Top Plate for C10555 5.0T Footblock. Add G10 Isolating Washer on 5.0 TTR Footblocks. Replace Traveller Car roller bearings with Solid Machined Torlon Rollers Replace Traveller Car Roller Cover Plates and Fasteners Replace Mainsheet Track Fasteners
Winmar	
	Workshop Service for all Winmar blocks Replace components as required at additional cost
Spinlock	
	Replace all Jammers and Clutches. Upgrade all XT/XC Units to Ceramic cam and base. Standardise all XT/XC units to CAM0814 size. Service Organisers Replace Organiser Base Plates Replace bow PD12/C padeye. Replace all fasteners
Lewmar	
	Replace Foredeck and Cockpit hatches.
Wichard	
	Replace all Titanium Jib Padeyes. Replace all Fasteners in Jib Padeyes Replace all fasteners in Stacking and Jackstay Padeyes Replace outboard padeye for outrigger with new custom loop design.
Antal	
	Service tulip sheaves.
JP3 / Steering System	
	Strip and Service all Components Replace steering head bearing holders with SS versions. Replace Bearings in Steering Head Service Toe In/Out mechanism on Steering Car Replace Thrust Bearings in Steering Car Replace Steering Car Track Replace Ball Bearings in Steering Car Replace Bearings in Steering Sheaves Full JP3 Factory Inspection and Service of Upper and Lower Rudder Bearings. Replace all seals.
Misc	
	Remachine rope tunnels in J2/J3 Deck Fittings

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	Replace / Modify J1 Tack Plate with Jib Tack Line Ferrule
	Service Karver Dagger Board Down 90 Block
Winch System – Winches	
Primary 1111 Winches	
	Replace Primary Lower Drum with upgrade ceramic-coated version.
	Replace Housing and Base.
	Full workshop service.
	Replace Primary Fasteners.
	Replace Final Pinion Gear Pin.
	Replace all washers and bearings.
	Upgrade base sheave washer for better drainage.
	Replace all pawls and pawl springs.
	Replace ST pinion bushings.
	Add G10 sealing and isolating washer under base.
	Re-Grip and Re-Clearcoat Carbon Upper Jaw and Stripper
Runner / Pit / Main 990 Winches	
	Replace Drum with Upgrade solid machined ceramic-coated version.
	Replace Housing Assembly and Base with Upgrade solid machined versions.
	Full workshop service.
	Replace primary fasteners.
	Replace Final Pinion Gear Pin.
	Replace all washers and bearings.
	Replace all pawls and pawl springs.
	Update 1st speed system to 'big button' design.
	Replace 1st speed cam.
	Replace 1st Speed Pawl Carrier to reduce jaw spacing with updated RH/LH design.
	Replace ST pinion bushings.
	Re-Grip and Re-Clearcoat Carbon Upper Jaw
Wing Pit 65 Winches	
	Replace base.
	Full workshop service.
	Replace primary fasteners.
	Replace final pinion ratchet gear.
	Replace gear pins.
	Replace all washers, bushings and internal bearings.
	Replace all pawls and pawl springs.
	Re-Grip and Re-Clearcoat Carbon Upper Jaw and Stripper Arm
Winch System – Drive System	
Pedestals	
	Strip all Mechanics, Workshop Service and Refit
	Replace chains.
	Replace all sprockets.
	Replace all plastic bearings.
	Replace pedestal handles.
	Replace all smalley clips and fasteners.

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	Service other components as required.
Gearboxes	Remove, strip and reinstall Full workshop service and oil change. Replace pit gearbox housing. Replace all pinions. Replace all seals. Replace all smalley clips and fasteners. Add drainage holes to Primary and Mainsheet Gearbox Brackets. Modify X-Box bracket mounting detail to prevent movement of box.
Buttons	Workshop Service. Replace rubber cap. Replace sealing O-ring.
<b>Engineering</b>	<b>Alvaro de Haro</b>
Keel System	
Full system	Full disassembly and inspection. Replace Orkot Bushings in keel bearing. Replace Head Pin Bronze Bushing set. Replace all high pressure hoses. Replace rubber boots. Replace filter. Replace SKF grease bombs. Replace all high load bolts. NDT keel pins and bulb studs
Keel Rams	Full Cariboni factory inspection and rebuild. Replace seals. Upgrade clevis locking grubscrew.
Manifold	Full Cariboni factory service. Replace valves seals Move manifold out of engine space to water tank space
DC Pump	Full Cariboni factory service. Re location of DC pump battery switch Re location of soft start
PTO Pump	Full Cariboni / Rexroth factory service.
PLC	Replace Relay kits.
Service Unit	Update clutch bearing to sealed greased version. Replace shaft bearings and seals



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	Replace flexible joint.
	Replace alternator belts.
Sailing Hydraulics	
Full system	
	Disassembly and inspection.
	Oil change and filter clean.
	Navtec Test cam valves and manifold
	Replace outhaul flexible hose and quick connector
Rams	
	Full Navtec workshop service.
	Replace all Seals
	Replace rods.
	Upgrade Cunningham Ram to M25 from M19 size.
Rotary Pump	
	Full Navtec workshop Service.
	Replace all seals.
	Replace drive shaft bearings.
Hand pump	
	Upgrade to waterproof shaft design.
Propulsion	
Main Engine	
Full Volvo Penta Workshop Service.	
	Replace all consumable items (oil, filters, belt, coolant..)
	Test injectors
	Inspect turbo charger
	Replace exhaust elbow.
	Replace sea water pump
	Inspect and replace heat exchanger seals.
	Valves clearance adjusting.
	Replace all hoses.
	Replace Engine Start Battery.
	Upgrade Engine Space Ventilation System to 24V Fans.
	Upgrade to new ROV Inlet System.
	Replace Spinlock throttle control.
SailDrive Leg	
Volvo Penta Workshop Service	
	Replace complete gearbox
	Service sail drive leg
	Replace seals
	Replace anode
Ballast Systems	
	Replace Pumps
	Replace all hoses.
	Replace aft tank check valves
Modify Aft Ballast Configuration	

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	Relocate position of valves and pumps
	Upgrade to ball valve system.
	Modify ballast scoop ports.
	Upgrade scoop rod deck bushing with O-ring seal
Fresh/Sea Water Systems	
	Plumbing configuration to same one design set up
	Replace all hoses and fittings.
	Replace current Water Tank with new 40L tank.
	Move Water Tank to new location in port locker.
	Replace and modify to smaller sea water pump.
	Replace Galley hand pump and tap.
Watermaker	
	Replace feed pumps.
	Replace hoses.
	Basic service and inspection
	Full Spectra Service available in UK Pre-Race Assembly Period
Electrical & Electronics	Dan Jowett
B&G	
	Factory refurbishment of the wands to ensure 'as new' performance.
	Replace all H3000 with H5000 displays
	Replace all mast displays with newer CANbus version
	Upgrade to new CANbus hi-res barometer
	Addition of CANbus 3D motion sensor
	Upgrade of depth sensor to NMEA2000 version.
	Upgrade to CANbus air temperature sensor
	Upgrade of both chartplotters to newer version and 9inch screen for Navdesk.
	Replacement of the Halcyon2000 compass with new Precision-9 Multi axis sensor.
	Inspect and replace MOB buttons.
	Change 4 way connectors.
	Remove EOL KVH compass.
Mastervolt / Czone	
	Replace both batteries
	Replace both Alternators
	Replace all cables and terminations with new ANCOR product.
	Addition of Czone COI to replace engine accesories control box. Will be used to manage the ROV's and engine box fans.
	Remove master shunt and replace with analog shunt for alternator monitoring.
	Replace fume sensors and cables
	Swap DI for new screen touch 5inch
	Remove 1 x 6a and alarm in Mast Junction Box.
	Addition of alternative energy monitoring system
Livewire	
	Replace all Livewire cables and terminations
	Install new small LWD camera on 3rd spreader of mast
	Install new small LWD camera on Pullpit.
	Addition of 4 x 3g/4g Antennas to aerial frame.

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	Replacement of both Mac Minis in media desk
	Service all cameras
	Modifications to media desk layout
Diverse	
	Grounding testing throughout refit.
	Remove Cosworth Logger on rope tunnel.
	New looms in all new masts, inspect and replace for refit
	Addition of Terminal connection from Nav PC to WTP3
	Remove and Replace All coax - All N2k network - Nav desk cabling - All Cat-5.
	Electronics in Aft compartment in watertight boxes - clear covers in place. Binnacle jnc box to be separated from LWD box.
	Hardwire all loadcells.
	Change engine Fans to 24v supply.
	Replace Keel panel buttons / membrane.
	Replace rotary rudder sensors with string pots
	Replace VHF co-ax cable between MJB and splitter.
	Move bow paddle wheel to keel bulb.
	Addition of N2K Fuel flow meter.
	Replacement of both Navigation PC's
	Addition of new Yellow brick tracker.
Cobham	
	Replace all satellite domes
	Addition of a VHF handset in cockpit
	Addition of one more FB250 dome
	Removal of positioning Sat C
	Replacement of Messaging Sat C
Other	
	Addition of Alternative Energy Source– TBC
	Replacement of the aerial frame with new composite structure. Optimisation of aerial / dome layout.
Canvas	Nathan Quirk
Bunk Meshes	
	Replace all with new design
Cockpit Bags	
	Replace Runner Tail Bags
	Replace Primary Sheet Bag
	Replace Pit Bag - Inboard
	Replace Pit Bag - Outboard
	Add Main Traveller Rope Bag
Other Canvas	
	Replace Galley Bag/Net
	Replace Food Bags
Webbings	
	Replace Forestay Jib webbing
	Replace Mainsheet Block Boom Strop webbing
	Replace Mainsail Clew Strap
	Replace Jack Stay Set - upgrade from existing blank weddings - adding loops + high vis at points

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Misc Canvas	
	Replace all standard canvas items and tie-downs.
<b>Paint</b>	<b>Dave Salmon</b>
Hull	
	Sand back to undercoat (touching carbon) Finish to VO65 v2 Standard Specification (see Akzo Nobel Paint Specification)
Deck	
	Sand back to undercoat (touching carbon) Gloss all fitting surrounds and cockpit sides to VO65 v2 Standard Specification Finish to VO65 v2 Standard Specification (see Akzo Nobel Paint Specification)
Internal	
	Repaint non-skid in floor areas
Appendages	
Keel Fin	
	Sandblast to bare steel and prepare Prime and Undercoat Finish to VO65 v2 Standard Specification (see Akzo Nobel Paint Specification)
Rudders	
	Fair back to undercoat Finish to VO65 v2 Standard Specification (see Akzo Nobel Paint Specification)
Daggerboards	
	Fair back to original mould surface and fill/fair to suit Repaint leading edge Finish to VO65 v2 Standard Specification (see Akzo Nobel Paint Specification)
Components	
	Re-Clearcoat Carbon Components Re-Finish all locker lids Re-Finish Mast and Boom
<b>Measurement &amp; Compliance</b>	<b>Jack Lloyd</b>
Weighing	
	Weigh Boat at various key stages through the refit process in Standard Condition
Compliance	
	Regular inspections of process and works to ensure compliance with VO65 v2 Class Rules
Equalisation	
	All Boats to be re-equalised with addition of Corrector Weights, as decided by Measurement Team All Masts to be re-equalised with addition of Corrector Weights, as decided by Measurement Team
<b>Safety Equipment</b>	<b>Abby Ehler</b>
Deck Safety Equipment	
	Replace Aerial Farm Replace LifeRafts with updated Design and updated Stowage System Replace Jackstays Replace Transom Safety Line
Internal Safety Equipment	
	Anchor and related equip (chain/warp) to be serviced and reused Foam horseshoes to be serviced and re-used

## VO65 - Scope of Works

Remove Ships hardwired torch - to be replaced with handhelds
Spare rudder to be checked and re-used
Emergency steering gear to be serviced and re-used
Emergency Watermaker - service and re-use
Emer Bilge pumps - service and re-use
Items not listed above will NOT be re-used (Fire/LJ/Smoke hoods/Epirbs/Spare liquids/JonBuoy etc)
Replace all Items as noted Above
Finalise Safety Inventory and positioning
Load new safety items - delivery dates and delivery location TBC - August 2017 UK for Pyrotechnics