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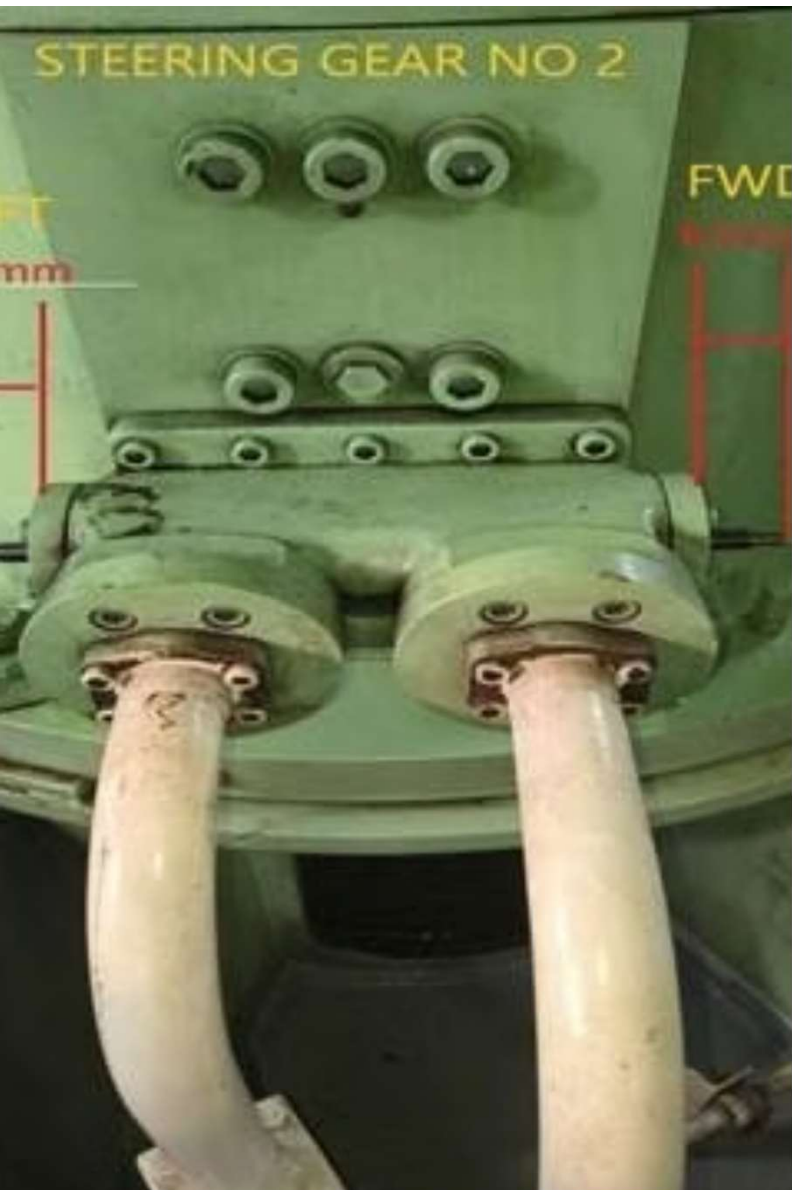
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Vessel: ROMANCE | **IMO:** 9468815

Steering Gear Fault Report

Make/Model: Rolls Royce Frydenbo |



Issue Overview: Pump No. 1 Steering Gear

Vessel ROMANCE is experiencing a critical fault with **Steering Gear Pump No. 1**. The issue is present during both **bridge and local operation**, indicating a systemic hydraulic problem rather than a control-side fault.

- ⊗ Hydraulic lock alarm triggered with audible hissing noise during PORT to STBD movement. Immediate engineering intervention required.

Observed Performance Data

Physical timing and pressure measurements recorded for Pump No. 1 reveal a significant asymmetry between port and starboard movements.

STBD → PORT Angle: 30° to 35° Time: 26 Seconds Pump Pressure: 5 bar Normal operation — no alarms triggered.	PORT → STBD Angle: 35° to 30° Time: 43 Seconds Pump Pressure: 15 bar Hydraulic lock alarm active. Hissing noise observed. Severely delayed response.
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Fault Symptoms Summary



Delayed Stroke Time

PORT to STBD takes 43 seconds — nearly **double** the reverse direction at 26 seconds, indicating restricted hydraulic flow.



High Pressure Spike

Pump pressure rises to **15 bar** during PORT to STBD movement, compared to only 5 bar in the opposite direction.



Hydraulic Lock Alarm

Alarm activates consistently during PORT to STBD stroke, accompanied by an audible **hissing noise** — indicative of internal bypass or valve failure.

Troubleshooting Already Carried Out

The vessel's engineering team performed the following corrective actions onboard prior to TMB service engineer involvement — all without resolving the fault.

1 Solenoid Block Replaced

Swapped with the solenoid block from Pump No. 2 unit. Issue persisted unchanged.

2 Control Block Replaced

Direction control valve block replaced with onboard spare. Problem continued without improvement.

3 Lock Valve on Actuator Inspected

Lock valve for Pump No. 1 opened and inspected physically. Free movement confirmed — no visible obstruction found.

Lock Valve Adjusting Screw Measurements

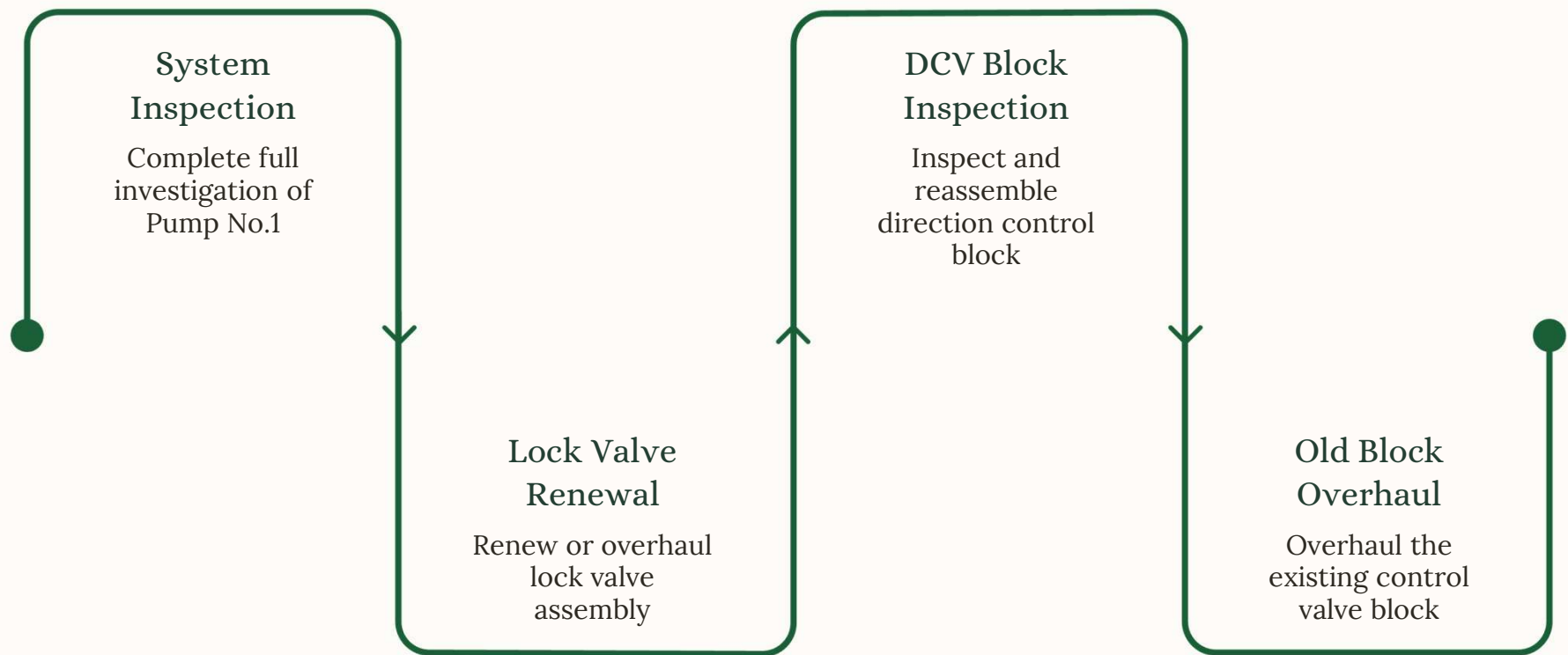
Vessel engineers physically measured the adjusting screw lengths on the STBD and PORT steering gear safety/lock valves to compare symmetry.

Location	Aft Screw Length	Fwd Screw Length
STBD — Steering Gear #1	60 mm	64 mm
PORT — Steering Gear #2	61 mm	63 mm

 Screw lengths are broadly similar between port and starboard, suggesting the fault may not be attributable to mechanical misadjustment of the lock valves alone.

TMB Hydraulic Service Engineer: Scope of Work

TMB Hydraulic Service Engineers / Technicians has been assigned to conduct a full investigation and rectification of the Pump No. 1 fault. The planned work scope covers four key areas.



Each phase is designed to systematically eliminate potential fault sources and restore full steering gear functionality to class-compliant standards.

Work Item Detail: Valve Block & Lock Valve

Lock Valve — Renewal or Overhaul

The lock valve is suspected to be defective based on symptom analysis. TMB engineer will either overhaul or renew the component to restore correct hydraulic sealing and flow control.

New Direction Control Valve Block (Alang Spare)

The newly supplied spare from Alang appears visually acceptable but its **operational fitness is uncertain**. Detailed inspection and proper assembly are required before commissioning.

Old Direction Control Valve Block

The original onboard direction control valve block will also be inspected and overhauled. Pressure testing will be performed to verify integrity and identify any internal defects.

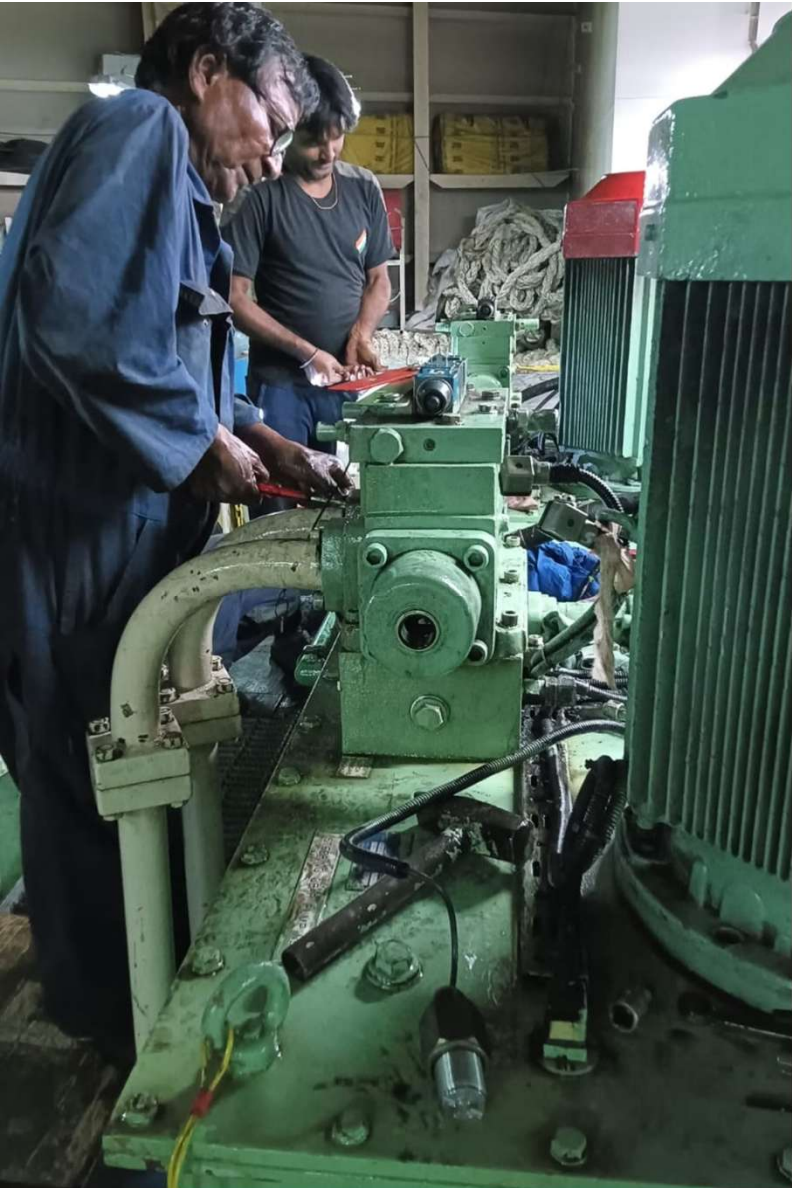
Root Cause Assessment

Most Likely Cause

A **defective lock valve** on the Pump No. 1 actuator is the primary suspect. The valve appears to be allowing hydraulic bypass or failing to release fully during PORT to STBD movement, causing pressure build-up, alarm activation, and delayed stroke time.

Contributing Factors

- Spare direction control valve block from Alang — operational fitness unverified
- Asymmetric pressure readings (5 bar vs. 15 bar) confirm directional restriction
- Solenoid and control block replacements ruled out as primary fault sources
- Free movement confirmed in actuator lock valve — but internal sealing may still be compromised



Next Steps & Recommendations

01

TMB Engineer Mobilization

Deploy TMB Hydraulic Service Engineer to vessel for complete hands-on inspection.

02

Lock Valve Overhaul / Renewal

Prioritize lock valve rectification as the primary suspected defect.

03

Pressure Test Both Valve Blocks

Test and verify both the Alang spare and the original onboard direction control valve blocks before use.

04

Full System Recommissioning

After repairs, conduct full steering gear performance test from bridge and local control to confirm resolution.



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