Royston

**Case Study**
Niigata 6L28AHX
Tug

# Royston Australia Delivers Major Multi-Scope Overhaul for International Towage Company

**Overview**
Royston Australia successfully completed a major multi-discipline overhaul project aboard a tug during a scheduled shipyard period in Singapore.

The programme brought together extensive engine, turbocharger, clutch and propulsion system works, requiring careful planning, technical supervision and close coordination with shipyard and specialist workshop teams. Delivered within a demanding 30-day window, the project demonstrated Royston Australia's ability to mobilise internationally and manage complex marine engineering scopes across multiple critical tug boat systems.

As service and spare parts agents for Niigata, Royston Australia's engineers are OEM trained by Niigata in Japan, bringing specialist product knowledge and manufacturer-led technical understanding to projects of this scale.

**The Challenge**
The international towage company required a comprehensive overhaul package to be completed during a limited shipyard availability period.

The tug's scope included major works across three Niigata 6L28AHX main engines, associated turbocharger cartridges, clutch units and ZP propulsion systems. With several critical systems being worked on at the same time, the project required detailed coordination to keep the programme on track and ensure all works were completed to the required technical and operational standards.

The work also had to support the tug's return to service following testing, recommissioning and sea trials.

**The Solution**
Royston Australia mobilised its team to Singapore to oversee and deliver a multi-scope overhaul programme covering the tug's engines, turbochargers, clutches and propulsion systems.

With OEM training from Niigata in Japan, Royston Australia's engineers were well placed to support the overhaul of the Niigata equipment package, combining hands-on marine engineering experience with detailed product knowledge.

The engine scope included overhaul works across all three main engines, including cylinder head, piston, liner, connecting rod, fuel injection, pump, cooler and inspection works. Key inspections included crankshaft, camshaft, crankcase and drive train checks, alongside component cleaning, calibration and replacement where required.

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The turbocharger scope included removal of the turbocharger cartridges from the three main engines. Two cartridges were overhauled, including inspection, cleaning, seal and bearing replacement, and rotor assembly balancing. During the works, one nozzle ring was also replaced following inspection. For the centre/aft engine, which had the highest running hours, the complete cartridge was replaced with a new unit, including an upgraded sealing version.

The clutch scope involved removal, workshop overhaul and reinstallation of the port, starboard and aft clutch units. Critical components including friction plates, steel plates, springs, bearings, seals and related service items were inspected, serviced or replaced as part of the overhaul programme.

The propulsion scope included work on the tug's ZP thruster systems, with the aft thruster undergoing a full rebuild of the upper and lower gearbox. Further work included seal and liner replacement, bearing replacement, gearbox measurement checks, gear contact inspections, pressure testing and recommissioning across the propulsion units.

Throughout the project, Royston Australia coordinated with shipyard and workshop partners to manage the workflow, witness key inspection stages and ensure quality checks were completed before reassembly and testing.

**The Result**
All major works were completed during the shipyard period, with the tug successfully recommissioned and taken through testing and sea trial checks.

The completed programme included:

- Overhaul works across three Niigata 6L28AHX main engines
- Removal of three turbocharger cartridges
- Overhaul and rotor assembly balancing of two turbocharger cartridges
- Replacement of one complete turbocharger cartridge on the highest running-hours engine
- Removal, overhaul and reinstallation of three clutch units
- ZP propulsion system overhaul works, including gearbox, seal, liner and bearing activity
- Pressure testing and leak checks
- Alarm, shutdown and performance testing
- Sea trial support and operational verification

The successful completion of the project highlights Royston Australia's capability to support international towage companies with complex, multi-discipline marine engineering projects, both locally and internationally.

By combining OEM-backed Niigata expertise, diesel engine capability, turbocharger knowledge, propulsion system experience and practical shipyard coordination, Royston Australia helped the operator complete a significant overhaul programme and return the tug to service with confidence.