

CRANKSHAFT REPLACEMENT & ENGINE OVERHAUL AND REBUILD FOR ROYAL SAUDI AIR FORCE POWER STATION

EXTENSIVE REPAIRS EXECUTED ON STORK WERKSPoor 8TM410 GENERATOR

After experiencing a crankshaft failure on one of its 6 SWD 8TM410 generators at its Tabuk Air Base Power Station, the Royal Saudi Air Force (RSAF) contacted Goltens Red Sea (Saudi) to perform a crankshaft replacement. Crankpin number 1 had extensive damage including cracks that exceeded manufacturer's limits and the crankshaft was condemned. As the engine was beyond the hours for scheduled overhaul, the crankshaft replacement was coupled with a complete overhaul of the engine.

The RSAF supplied a replacement crankshaft and all required special parts with the exception of replacement main and axial bearings, which were provided by Goltens.

Goltens deployed a Diesel Service Team of 1 Service Engineer and 5 diesel mechanics to perform the required work on the engine.

DISASSEMBLY AND CRANKSHAFT PREPARATION

Goltens disassembled the engine components and lifted the block from the bedplate to facilitate removal of the condemned crankshaft. During this process it was discovered that the replacement crankshaft flange holes did not match the existing flanges at the flywheel and vibration damper. As a result, Goltens' performed reaming on both flanges of the new shaft in order to make it suitable for installation.

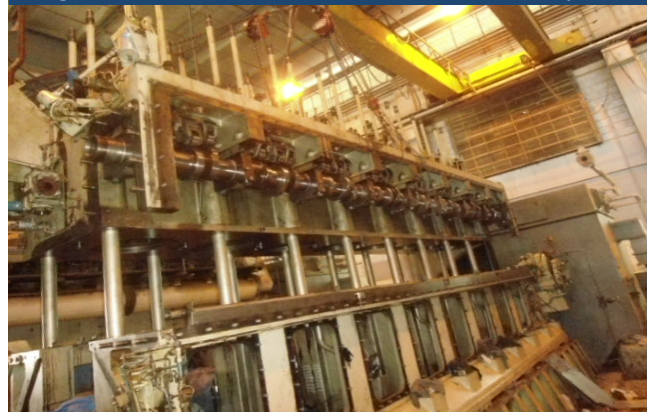
BEDPLATE AND MAIN BEARING POCKETS:

To ensure that the failure had not caused extensive damage to the bedplate a thorough inspection was completed. After the crankshaft was removed, Goltens tightened all of the bearing caps to the required 750 Bar pressure and Goltens' In-Situ machining specialists performed a laser check on the engine alignment and bores. Alignment was found to be acceptable but main bearing bore 3&4 had slight ovality and require minor polishing of the cap to get to the required diameter.

PROJECT FACTS: RSAF TABUK AIR BASE

Engine Maker:	Stork Werkspoor
Engine Model:	8TM-410
Engine Output:	2,900 KW @ 500 RPM

Engine disassembled with block lifted off bedplate



Replacement crankshaft pre-flange reaming



Reaming of crankshaft flange bolts holes



RECONDITIONING AND DIESEL ENGINE REBUILD:

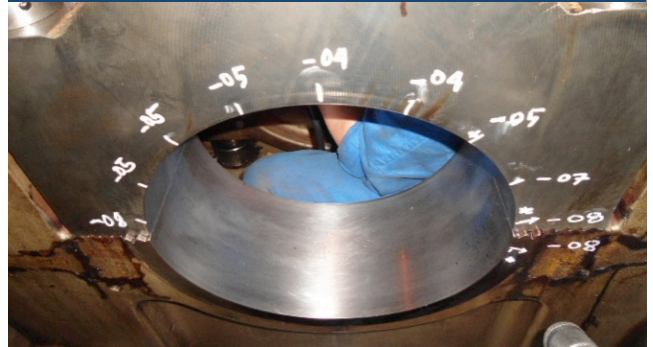
Once the preparations to bedplate and crankshaft were complete, the rebuild of the engine could begin with the replacement parts supplied by RSAF and the components reconditioned by Goltens. Goltens reconditioned and/or performed calibration checks on the following parts:

- Reconditioned 8 connecting rods
- Calibrated all 8 Pistons
- Honed the inner bore and lapped the landing surface of bottom area on 7 liners
- Reconditioned and hydro tested 8 cylinder heads
- Overhauled all fuel pumps and injectors and the L/O and LT and HT Water cooling pumps
- Reconditioned 2 vibration dampers
- Recondition and overhaul of Turbocharger
- Overhaul of governor
- Cleaner and reconditioned the charge air cooler and air starting valves
- Visual inspection and clearance check on camshaft and the gear train

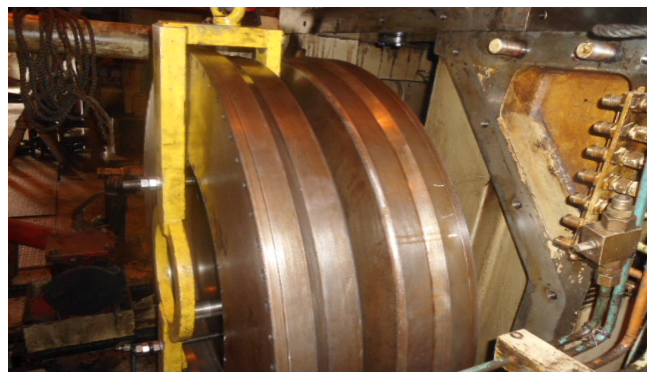
CRANKSHAFT REPLACEMENT AND ENGINE REBUILD AND COMMISSIONING RESULTS:

Goltens' team completed the reassembly of the engine and followed a disciplined commissioning process. The engine was run unloaded and at various increasing loads and times up to 2,500KW with intermediated checks of the engine temperatures and systems to ensure that all were running as designed and within parameters. Once completed, the repaired engine was turned over to the power plant personnel to be put back into operational status.

Pocket 3&4 after polishing to correct ovality



New crankshaft fitted on bedplate



Reconditioned vibration dampers being fitted



Connecting rod bolt/nut tightening