

# Reconditioning of 4-stroke engine components

Extending component lifetime while reducing maintenance costs and maintaining reliability



## Reconditioning services for 4-stroke engine

Four-stroke engines operate under continuous high-speed cycling, high combustion pressures, and sustained mechanical loads. Over time, these demanding conditions lead to wear, thermal fatigue, surface degradation, and dimensional distortion of critical components.

BWSC restores engine components within OEM requirements through controlled welding, precision machining, surface restoration, and verified inspection procedures, performed in accordance with approved standards.

### Benefits

Reconditioning provides a cost-effective alternative to replacement by reducing downtime, improving maintenance planning, and supporting sustainable operation through [extended component lifetime](#).

### Cylinder heads

High combustion pressure and thermal cycling may cause cracking, seat erosion, and sealing surface deformation.

#### Reconditioning could include:

- **Non-destructive testing (NDT) for crack detection**
- **Controlled welding repairs with appropriate heat control**
- **Machining of cracked and damaged areas to restore dimensional integrity**
- **Refacing of sealing surfaces to specified tolerances**
- **Restoration of valve seats and guides**
- **Final pressure testing to verify structural integrity and compression performance**

### Cylinder liners

Friction and thermal stress can result in wear, scuffing, loss of honing pattern, and cavitation damage.

#### Reconditioning helps extend the life of the cylinder liners:

- **Precision honing to restore cylinder geometry and surface finish**
- **Controlled welding repair of worn or damaged areas**
- **Restoration of sealing surfaces to specified tolerances**
- **Hydrostatic pressure testing to ensure lubrication integrity and thermal stability**

### Connecting rods

Cyclic loading can cause bore ovalization, bushing wear, and fatigue cracking.

#### Reconditioning includes:

- **Dimensional and NDT inspection, precision re-machining, honing and bushing replacement**
- **Restoration of mating surfaces to ensure alignment and bearing reliability**





## Exhaust valve assemblies

Extreme temperatures may cause burning, erosion, stem wear, and loss of seating geometry.

### Reconditioning includes:

- Grinding or lapping to restore sealing surfaces
- Machining or replacement of valve seats and guides
- Controlled welding repairs where required
- Final verification of concentricity and compliance with specified OEM-requirements

## Pistons

High thermal loading may lead to crown erosion, ring groove wear, coating loss, and dimensional distortion.

### Reconditioning helps extend the lifetime of the pistons:

- Cleaning and decarbonizing to remove deposits
- Controlled welding and machining repairs of damaged areas
- Restoration of ring grooves to specified dimensions
- Non-destructive testing (NDT) inspection
- Dimensional correction to ensure sealing efficiency and piston stability

## Crankshaft

Torsional and bending loads may result in journal wear, scoring, ovalization, and microcracks.

### Reconditioning includes:

- Non-destructive testing (NDT) inspection
- Polishing of journals to restore surface finish
- Verification of dimensional tolerances
- Inspection of critical stress areas
- Final assessment to restore rotational stability and bearing performance

# Operational Excellence

Operating in the Panama Canal requires precision, responsiveness, and reliable execution. BWSC Panama is structured to support time-critical marine and industrial operations where delays are not an option.

By combining advanced workshop capabilities with rapid on-site and onboard services, we ensure efficient project execution, minimized downtime, and seamless coordination from planning through completion.

## BWSC



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