



7 Quick Reference

Water Pump Failures

Leakage

| Location | Symptom | Cause |
|------------------|--|--|
| Weep hole | Foreign material caught in the mechanical seal | <ul style="list-style-type: none"> ● Rusting caused by coolant degradation ● Excess sealant (RTV) entered the water pump cavity |
| | Rough surface of the mechanical seal | <ul style="list-style-type: none"> ● Rust caused by coolant degradation ● Insufficient cleaning of the radiator |
| | Burned mechanical seal | <ul style="list-style-type: none"> ● Engine started without coolant |
| | Fracture | <ul style="list-style-type: none"> ● Excessive pulley tension |
| Mounting surface | Contamination (dirt/grime) | <ul style="list-style-type: none"> ● Insufficient removal of the sludge on the engine mounted surface |
| | Installation error | <ul style="list-style-type: none"> ● Damage/deformation of the mounting surface ● Sealant (RTV) applied unevenly ● Bolts tightened unevenly |
| | Fractured/deformed gasket | <ul style="list-style-type: none"> ● Gasket damaged in shipping ● Bolts tightened unevenly or an impact wrench was used |
| Body fracture | Cavitation | <ul style="list-style-type: none"> ● Coolant degradation ● Insufficient air bleeding ● Insufficient flushing of the radiator |
| | Blowhole | <ul style="list-style-type: none"> ● Cast failure |
| | Mounting screw fracture | <ul style="list-style-type: none"> ● Bolts were tightened excessively |

Water Pump Failures

Abnormal noise

| Location | Symptom | Cause |
|-----------------|-----------------------------------|--|
| Bearing | Noise: Rumbling Locked bearing | <ul style="list-style-type: none"> ● Bearing fracture caused by excess belt tension ● Bearing fracture caused by excess vibration of the fan coupling pulley |
| Mechanical seal | Noise: Whining | <ul style="list-style-type: none"> ● Dry turning of the pulley caused carbon residue to form on the ceramic block ● Engine started without coolant |
| Pulley | Noise: Squeak | <ul style="list-style-type: none"> ● Slipping belt (insufficient belt tension) |

Water Pump Failures

Others

| Location | Symptom | Cause |
|-------------------------------|-------------------------|---|
| Impeller crimp | Damaged crimp | <ul style="list-style-type: none"> ● Corrosion caused by coolant degradation ● Insufficient flushing of the radiator |
| Impeller corrosion | Impeller wear/corrosion | <ul style="list-style-type: none"> ● Corrosion caused by coolant degradation ● Insufficient flushing of the radiator |
| Run-out of the pulley bearing | Pressure Leak | <ul style="list-style-type: none"> ● Excessive runout of the fan coupling pulley ● Contamination (dirt/grime) on the mounting surface ● Sealant (RTV) applied unevenly |