

TECHNICAL BULLETIN

TB NO. 1010
REV. 1

**SUBJECT: Water Cooled Exhaust Manifolds
on Superior Engines**

HISTORY: Water cooled exhaust manifolds on Superior as well as other types of engines develop leaks. Some can be attributed to the quality of the welding, internal design, but most can be created by external stress or improper installation.

INSPECTION & INSTALLATION SUGGESTIONS

1. Use a machinist straight edge or string line to check for bending or warpage of the flanges on both the exhaust and intake manifolds. If required, the flanges can be milled inline to relieve stress or prevent leaks.
2. Fill the water section of the exhaust manifold with hot water and hydrostatically test with air at 50 PSIG. Check for leaks.
3. With the cylinder heads installed, nuts hand tight, install the intake manifold and tighten the flanges slightly (approximately 15-20 ft. lbs.). Use machinist straight edge or string line to verify the cylinder head exhaust flanges are inline.
4. Install the exhaust manifold and tighten the flanges the same as the intake manifold (approximately 15-20 ft. lbs.).

NOTE: "V" series engines are equipped with exhaust elbows. Special adjustments and alignments are required as follows:

- A. With the intake manifolds installed as instructed in 3 above, install an elbow on each cylinder head.
- B. Use a machinist straight edge or string line to adjust and tighten all elbows (both right and left banks) slightly (approximately 15-20 ft. lbs.). Install and tighten the exhaust manifold to the elbows.

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5. With the manifolds or a combination of manifolds and elbows installed as instructed. Torque all cylinder heads using the proper sequence to the specified torque.
6. Tighten manifolds and elbows ("V" engines) to the cylinder heads. Normal torque for 1/2" - 13 capscrews is 46-48 ft. lbs.
7. Exercise care and make the necessary checks to eliminate stress on the exhaust manifold during the installation of the water piping, expansion joint, exhaust piping, and turbocharger if applicable. The water piping should be equipped with Aeroquip type couplings, properly located. Expansion joints should be installed with the proper stretch to eliminate stress at normal operating temperatures. Turbochargers require proper shimming and adjustments to avoid stress, and exhaust piping supports should not be connected to the exhaust manifold.

For assistance and additional information, please contact **EnDyn's** Technical Service Department or your local authorized **PowerParts**[®] Distributor.

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