

TECHNICAL BULLETIN

TB NO.1003

REV. 0

**SUBJECT: Cylinder Liner Installation Procedures
Superior Engines**

**PROBLEM: Inadequate Liner to Block Seal
825 Series Engines - 10" Bore, 10-1/2" Stroke**

If you are a Superior engine user you most probably have experienced jacket water leakage past the liner either in the top or bottom bore in the cylinder block or have had a piston seize in a new liner at start-up. The following are procedures and recommendations to follow when installing cylinder liners:

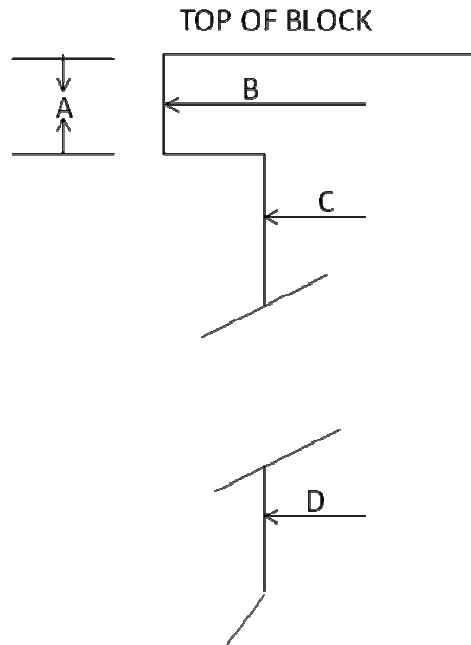
- A. After removal of the liners it is imperative that the top and bottom bores in the cylinder block be clean and smooth to obtain a good seal in both areas. Additionally, any pitting will prohibit the gasket on the top of the liner and the o'ring on the bottom of the liner from sealing properly. If severe pitting due to cavitation-corrosion is present consideration should be given to sleeving the bores. (See attached for correct dimensions.) The complete lock does not have to be replaced in most cases.
1. The top counter-bore of the cylinder block should be thoroughly cleaned and the liner flange seating area lapped to obtain a flat sealing surface. A lapping tool can be made by cutting off the top of an old cylinder liner and turning it over where the liner flange will fit in the top bore of the block. A fine grit lapping compound can be used. Be sure to clean this area after lapping and remove all grit and metal.
 2. The bottom bore should also be thoroughly cleaned and all rust and residue removed. The o'ring seating area can be smoothed over by using emery cloth or a fine grade sand paper.
- B. Thoroughly clean the new liners and measure the I.D. before installation to ensure that the liner is round and has not been damaged or distorted in shipment or storage. Special attention should be given to the under side of the liner flange and o'ring grooves to make sure that they are clean of all debris. The o'ring grooves should also be checked for excessive buildup of any special coating that has been applied, such as lubrite.

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- C. Install the top gasket and o'rings. Lubricate the o'rings after they are installed on the liner. Never lubricate both sides of the o'rings as they will tend to roll during installation. The bottom bore in the cylinder block can also be lightly lubricated. Do not use a heavy grease for lubrication.
- D. With the use of the liner insertion tools slowly lower the liner through the top bore and press into position. Make sure that the liner to block gasket is not cocked and is seated in the block counter bore before pressing the liner all the way in. This will eliminate the possibility of the gasket catching the top edge of the block and rolling.
- E. After the liner is installed it is recommended that the I.D. be checked and honed to ensure that an o'ring did not roll during installation possibly distorting the lower liner inside diameter. You can measure the liner with inside micrometers, set your hone at engine bore and pass the hone through the liner in the piston travel area. If the liner is out of round it will be immediately detected. This type of check will eliminate any possibility of the piston seizing in the liner after start-up or when the load is applied to the engine.
- F. Remember that cylinder head torque is the only thing that holds the liner in the cylinder block and prevents excessive liner movement. If the head is loose the liner movement will be excessive. The cylinder head should be torqued in an alternating sequence and be brought down as evenly as possible. It is imperative to keep the cylinder heads torqued to the proper value at all times.
- G. To reduce liner movement and reduce the amount of water pressure on the head to liner gasket, some users have elected to go with oversize liners. The oversize portion of the liner is the shoulder just below the gasket or liner seating area. The liner is either built up or a .020" oversize new **PowerParts**[®] liner can be furnished by **EnDyn** and machined to fit in the block bore. Clearance between the liner and block at this point is recommended to be .001" to .002".

For further information concerning Superior liner installation or parts pricing and availability, please contact **EnDyn's** Technical Service Department direct or your local authorized **PowerParts**[®] Distributor.

CYLINDER BLOCK - 825 SERIES ENGINE
STANDARD DIMENSIONAL DATA



OLD STYLE BLOCK

- A. Counter Bore Depth -.388"-.390"
- B. Counter Bore Diameter-11.625"
- C. Lower Top Bore Diameter-11.250"
- D. Bottom Bore Diameter-11.125"

NEW STYLE BLOCK

- A. Counter Bore Depth-.432"-.434"
- B. Counter Bore Diameter-11.625"
- C. Lower Top Bore Diameter-11.250"
- D. Bottom Bore Diameter-11.125"

- NOTE: 1. The top bore seating surface is to be perpendicular with the bottom bore diameter within .001" T.I.R.
2. The flatness of the liner seating area in the block should not exceed a variation of more than .002" T.I.R. around the full circumference of the seat. The finish on the seat area should be a minimum of 63 RMS.

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