

SB001

Liner flange cracking

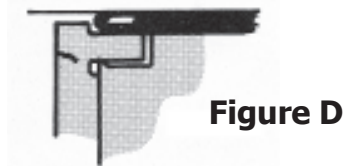
Liner flange fractures may go unnoticed if the liner body stays in position, but if the liner body is pulled down the cylinder, the result could be a completely wrecked engine.

Cylinder liners are made from centrifugally cast iron, with wear resistance as their main quality. Liners can be fractured if dropped or crushed - this usually appears as a crack running down the liner.

Cracks which follow the underside of the flange are caused when fitting the liner to its cylinder block or when fitting the cylinder head. With care these cracks can be avoided.

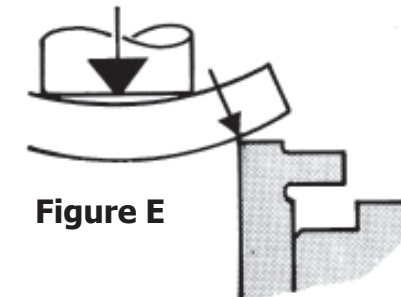
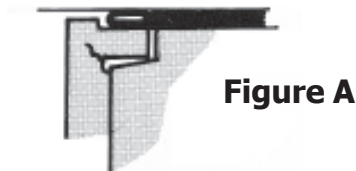
Cracks which start under a liner flange are caused by the flange being twisted and the liner material being pulled apart. A torsional stress of this type can be caused by:-

Leaving a sharp corner or burrs of machining on the cylinder block. (fig. D)



Faults A, B, C & D will form a crack when the cylinder head bolts are tightened and the gasket is forced down on to the liner flange. If a press is used to push the liner into position, a rigid plate must be placed between the press and the liner. If the plate bows, a bursting stress will be imposed on the liner. (fig. E)

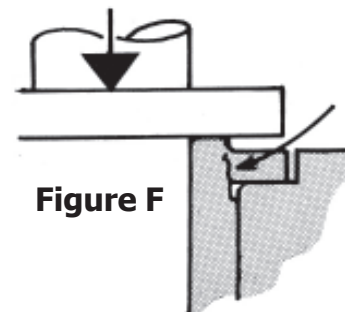
The cylinder block recess out of square (fig. A)



Dirt trapped between the flange and its recess (fig. B)



Care must be taken to ensure that excessive pressure is not used which could shear off part of the liner flange once it has been pushed fully home in its recess. (fig. F)



Incorrect location of the cylinder head gasket or using the wrong gasket (fig. C)



If any lubrication is to be used to assist fitting a liner, the cylinder block may be lubricated but not the liner, otherwise the lubricant will be scraped off the liner as it is pushed home. The lubricant will accumulate in the block recess and prevent the flange seating. The lubricant will dissipate and leave the flange unsupported and vulnerable to fracture. When correctly installed, a cylinder liner will become an integral part of the cylinder block, which can only be removed intentionally or by a severe engine malfunction.