No.: 05 TS - 38
August 22, 2005

TO: DDC Distributors, FLLC Dealers, Global Dealers

FROM: Technical Support

SUBJECT: **MBE4000 - Cylinder Head and Gasket Sealing Area Inspection**

ISSUE
Cylinder head coolant and oil leaks

CAUSE
Engine oil or coolant leak can be result of a damaged cylinder head or gasket

REQUIRED ACTION
Complete inspection and repair procedure of the cylinder head and gasket

REQUIRED MATERIAL
Straight edge bar - 500 mm (20 in).

REPAIR PROCEDURE

1. Check cylinder head gasket (see Figure 1) at fire deck (combustion chamber) sealing area.
    - Sealing surface (A) at the fire deck (combustion chamber bore), the cylinder head gasket is gas-tight.
    - Sealing surface (B) at the fire deck (combustion chamber bore), the cylinder head gasket is not gas-tight.

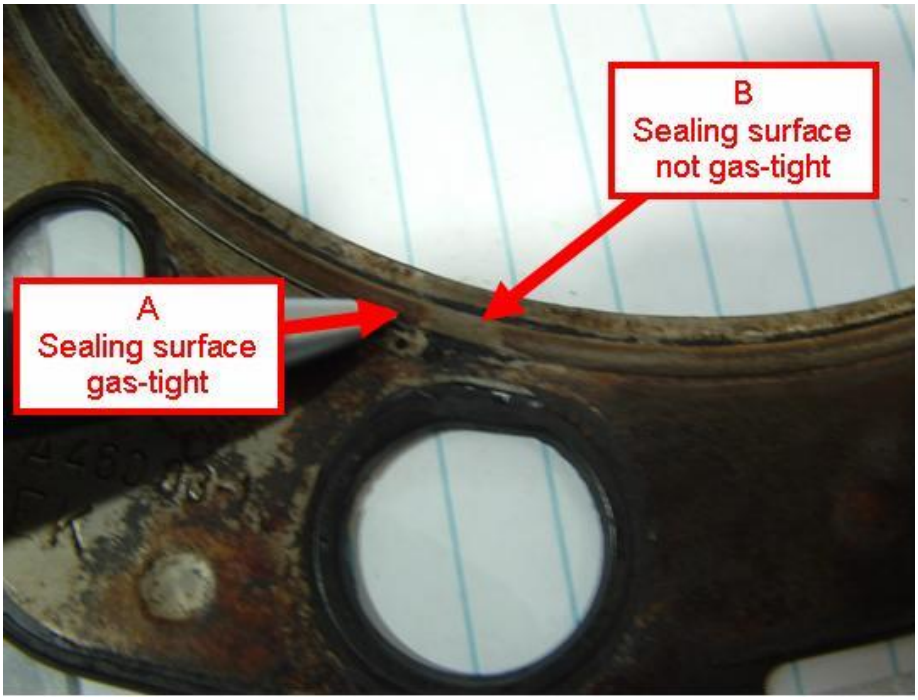


Figure 1

2. Check cylinder head gasket (see Figure 2) at the seal rings.

    - A damaged seal ring (elastomer) (C) in the engine oil bore or coolant bore is the result of a cylinder head gasket, which is not gas-tight.
    - In case of a leaky cylinder head gasket, the cylinder head sealing surface must also be taken into account.

Figure 2

3. Clean cylinder head sealing surface.
4. Check cylinder head in the area of the bores and contact surfaces of the cylinder head bolts for cracks (Figure 3).Visible cracks always appear in conjunction with grooves around the cylinder head bolt bores and more frequently, on the exhaust manifold side.

5. If cracks are present, the cylinder head must be exchanged.
6. Check contact surfaces around the bores of the cylinder head bolts for grooves (Figure 3).

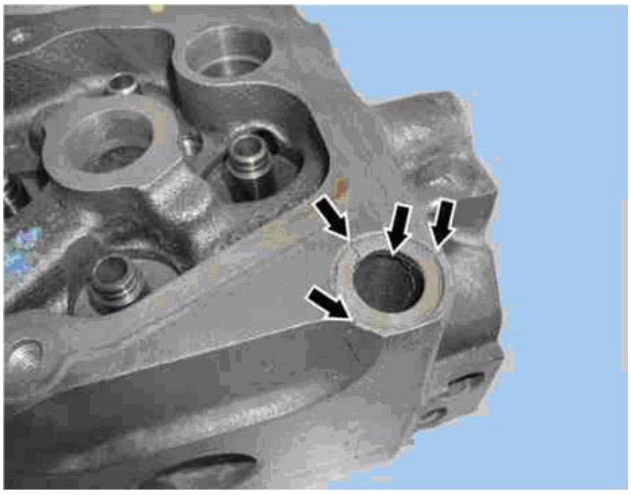


Figure 3

7. Grooves & Dimensions

    a. If grooves are present, the height (H) of the cylinder head must be measured.

    b. If the dimension is below the limit for minimum cylinder head height (113.5 mm or 4.46 in), the cylinder head must be replaced (Figure 4).

    c. The cylinder head bolts must always be replaced.

8. Check the cylinder head sealing surface.

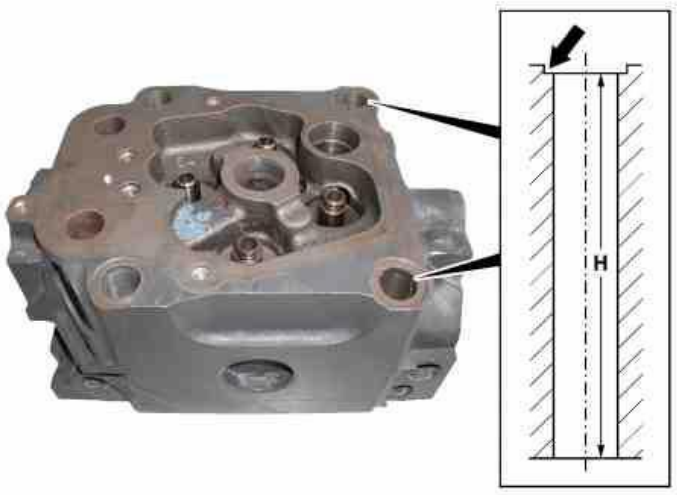


Figure 4

9. By means of a visual inspection, check the cylinder head and sealing surface for flatness. Place straightedge above both coolant bores (WR, WZ) onto the cylinder head sealing surface. Only check flatness within the sealing ring area (X) of the cylinder head gasket.

10. If a gap, big enough to allow light to pass through, appears between the sealing ring area (X) and the straightedge, then the cylinder head must be replaced.

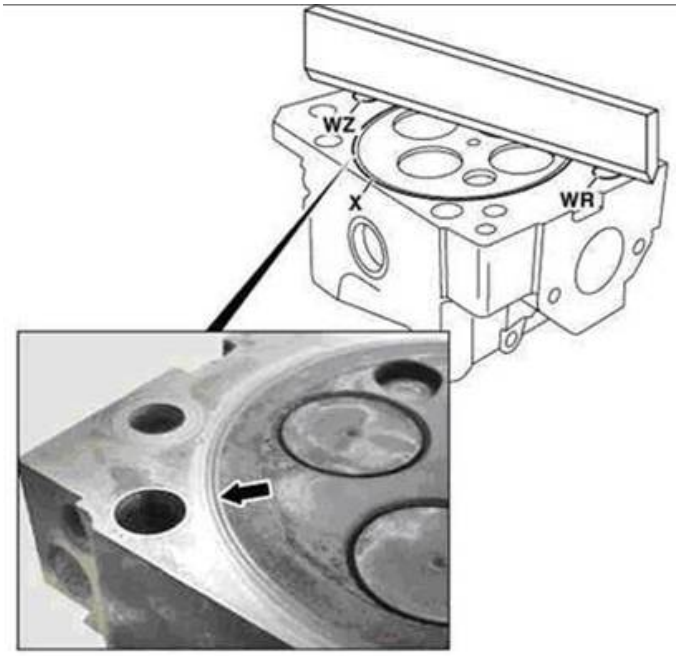


Figure 5

Note: With a cylinder head sealing surface with four inductive hardenings (Figure 5), a surface evenness inspection may only take place in the area where increases have not taken place due to the inductive hardening.

- If a light gap appears below the straightedge of the cylinder head gasket (bead), the cylinder head must always be exchanged.

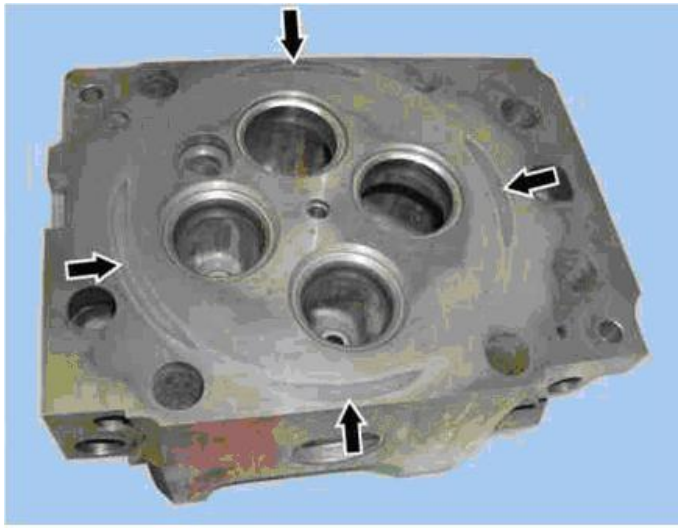


Figure 6

ADDITIONAL INFORMATION

Assignment of ports in the cylinder head gasket

1 - Dowel pin

2 - Cylinder head bolt

3 - Push rod

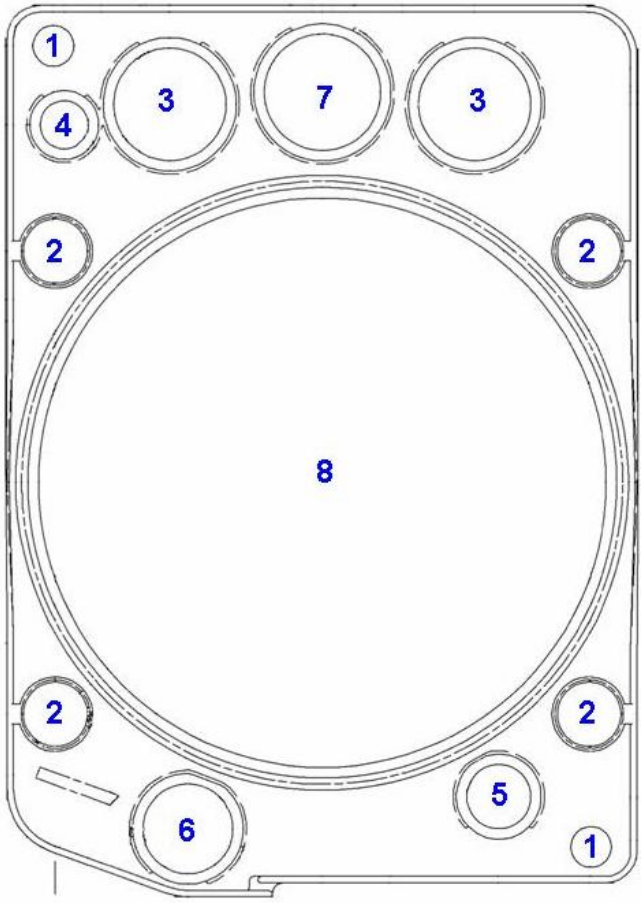
4 - Engine oil supply

5 - Engine oil return

6 - Coolant supply

7 - Coolant return

8 - Combustion chamber



CONTACT INFORMATION

Please contact the DDC Customer Support Center at 313-592-5800 if you have any questions.