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APPROVED BY ASTM D02.B 12/8/99
(DATE)

SEQUENCE VE INFORMATION LETTER 99-2

June 15, 1999

ASTM consensus has not been obtained on this information letter. An appropriate ASTM ballot will be issued in order to achieve such consensus.

TO: Sequence VE Mailing List

SUBJECT: Removal of the Requirement to Document Cam Lobes with Hardness Measurements <50 Rockwell C
Use of Reworked Cylinder Heads

At the May 20, 1999 Sequence VE Surveillance Panel meeting, the panel approved a motion to delete the requirement to note any camshaft lobes which have hardness values < 50 Rockwell C on the Supplemental Information Data Sheet (A7.5). Section 7.8.6.4 (b) of Test Method D 5302 has been revised to delete this requirement. This change is effective May 20, 1999.

Also at the May 20, 1999 meeting, the panel agreed to allow laboratories to reuse cylinder heads, once their supply of existing new cylinder heads has been exhausted. Sections 7.2 and 7.3 have been revised and Annex A15 has been added to Test Method D 5302. Cylinder heads may be reused on any test starting on or after May 20, 1999, provided the laboratory has run out of new heads and an acceptable reference oil test has been completed with reused heads.

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Attachment

(Revises Test Method D 5302-98a)

Annexes

7.2 *Required New Engine Parts*—Install the following new parts in each new test engine assembly: cylinder head (may be reused for tests starting on or after 5/20/99), cylinder head bolts (torque-to-yield), camshaft, camshaft bearings, camshaft drive belt, rocker arms, hydraulic lifters, intake and exhaust valves, valve stem seals, pistons, piston rings, wrist pins, connecting rod bearings, main bearings, oil pump, oil filter, PCV valve, spark plugs, and gaskets and seals.

7.3 *Reusable Engine Parts*—The following parts can be reused: cylinder block (can be reused for approximately two tests, depending on bore wear); valve springs (can be reused as long as they meet the specifications detailed in Annex A3); cylinder heads (for tests started on or after 5/20/99, provided an acceptable reference oil test has been completed incorporating reused cylinder heads and they meet the requirements in Annex A15); auxiliary shaft and bearings, connecting rods, front seal housing, crankshaft ignition trigger, fuel management wiring harness, intake manifold, throttle body, camshaft drive parts, water pump drive parts, crankshaft, fuel injectors, ignition module, ignition wires, oil pump screen and pick up tube, timing belt sprockets and water pump (all of these can be used in numerous engine assemblies, as long as they remain serviceable).

7.8.6.4 (b) *Lobe Hardness Measurement*—Measure and record the lobe hardness 180° from the maximum lift point and 0.05 in. (1.3 mm) from the forward edge of each lobe. Include the individual cam lobe hardness measurements on the hardness measurement data sheet (see Fig. X1.4).

A15. Required Inspections and Operations for Reuse of Cylinder Heads

A15.1 Cylinder heads may be reused more than once, provided the head remains within the specifications in Table A15.1. Replacement part numbers and part number for the suggested cam bearing tool are listed in Table A15.1.

A15.2 Cleaning Process

A15.2.1 Remove the cam bearing galley plugs.

A15.2.2 Soak the cylinder head in agitated organic solvent (see 7.7.3) or other approved solvent until all sludge is dissolved. As an alternative, the head may be cleaned using a caustic cleaning solution followed by a one-hour soak in agitated organic solvent.

A15.2.3 Rinse the cylinder head in tri-sodium phosphate/hot water bath.

A15.2.4 Spray the cylinder head with a solution of aliphatic naphtha and 50% Mobil EF-411.

A15.2.5 Dry the cylinder head with forced air.

A15.2.6 Check the cylinder head for flatness (No machining allowed). Scrap any cylinder head which does not meet the flatness requirements listed in Table A15.1.

A15.2.7 Measure the diameter of the valve guide bores. The valve guides may be reamed, or bored to use 0.0015 in. diameter oversize Ford valves, if necessary, to maintain specified stem to guide clearance. Scrap any cylinder heads that do not meet the valve guide diameter clearances specified in Table A15.1 with standard or oversize valve stems.

A15.3 Rebuilding Method

A15.3.1 Remove any remaining combustion chamber deposits by using a rotary wire brush.

A15.3.2 Recondition the valve seats. Lapping the valve seats is the preferred method of valve seat reconditioning. Lapping results in an insignificant amount of metal being removed, thus having little if any effect on the installed valve spring height (see 7.8.8.4). Seats may be ground, providing the installed valve spring height and combustion chamber volume comply with the values specified in Table A15.1.

A15.3.3 Clean with aliphatic naphtha spray and use bristle brushes on the combustion chambers, valve deck, and through the valve guides. Final spray with aliphatic naphtha containing 50% Mobil EF-411.

A15.3.4 Dry with forced air.

A15.3.5 Install new cam bearings. Any method of installation may be used which insures free movement of the camshaft.

A15.3.6 Install new camshaft oil seal.

A15.3.7 Assemble the cylinder head in accordance with 7.8.6 of this test procedure. Use new intake and exhaust valves and lubricate all parts with Mobil EF-411.

Table A15.1 Sequence VE Cylinder Head Specifications and Required Part Numbers

Specifications

Combustion Chamber Volume	59.8 - 62.8 cm^3
Valve Guide Bore Diameter	0.3433 - 0.3443 in. (8.72 – 8.75 mm)
Valve Stem to Guide Clearance:	
Intake	0.0014 - 0.0027 in. (0.035 – 0.069 mm)
Exhaust	0.0019 - 0.0032 in. (0.048 – 0.081 mm)
Valve Springs:	
Free Length	1.9 - 2.0 in. (48.3 – 50.8 mm)
Out-of-Square	0.075 in. maximum (1.91 mm)
Compression Force	167 ± 8 lbf @ 1.16 ± 0.03 in. (743 ± 36 N @ 29. 5± 0.76 mm)
Installed Height	1.53 - 1.59 in. (38.86 – 40.39 mm)
Intake and Exhaust Valve Seat Angle	45 degrees
Intake Valve Seat Width	0.060 - 0.080 in. (1.52 – 2.03 mm
Exhaust Valve Seat Width	0.070 - 0.090 in. (1.78 – 2.29 mm)
Seat Runout Limit (T.I.R. max.)	0.0016 in. (0.041 mm)
Flatness, Cylinder Head Deck (no machining allowed)	0.006 in. maximum (0.15 mm)

Ford Part Numbers

Cam Bearings	D4FZ-6261-C
Camshaft Oil Seal	E8ZZ-6700-A
Intake Valve	E8ZZ-6507-A
Intake Valve (0.0015 in. oversize)	E8ZZ-6507-B
Exhaust Valve	E43Z-6505-A
Exhaust Valve (0.0015 in. oversize)	E43Z-6505-B
Cam Bearing Tool (suggested)	T71P-6250-A
Expander Screw (not supplied with tool)	T65L-6250-A13