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TECHNICAL BULLETIN

May 2011

TB 2566

Cylinder Head Damage On
2003-09 Mazda 2.0L Engines

The AERA Technical Committee offers the following information regarding cylinder head damage on 2003-2009 Mazda 2.0L engines. The damage related to this bulletin may be resulting from previous engine noises heard prior to the driver's complaints. If previous repairs have been performed, the vehicle owner may want to contact Mazda directly for possible reimbursement.

This bulletin provides guidelines for repairing internal engine noise issues (such as Knocking, Ticking, Tapping, Rattling, Grinding, Squealing, Squeaking, Thumping, Whining, Creaking, Popping, Clicking, Roaring, Loud, High-pitched etc.). When engine replacement is necessary, use short block or long block according to following guideline. Do not replace long block assembly if short block assembly or cylinder head assembly will resolve concern.

The following service points will assist in determining the correct repair.

Cylinder Head

Check for contact marks between the cylinder head chamber (A) and piston (B) shown in Figure 1. Check for carbon or valve to piston interference.

If ok, flush cylinder head with valves assembled with kerosene and blow oil passages with regulated shop air.

If no good, contact Mazda for authorization to replace cylinder head assembly and related damaged components.

Figure 1: Cylinder Head & Piston Contact Damage

Oil Control Valve Filter

Check for any visual damage to the filter itself.

If ok, remove foreign material and clean as needed.

Reference:	

If no good, replace filter.

Oil Pump

Check for any unusual resistance felt when turning the oil pump by finger.
If ok, remove foreign material and clean as needed.
If no good, replace oil pump.

Timing Chain & Oil Pump Chain

Though the Mazda Service Manual suggests reusing, replace both chains because there is a possibility that foreign material may have gotten wedged into the chain links.

Variable Valve Timing Actuator

Check for damage or cracks near lock pin stopper. Check for locked VVT at the most retarded position.
If ok, remove foreign material and clean as needed.
If no good, replace the variable valve timing actuator.
If piece of VVT is broken off, locate piece in oil pan or chain area as shown in Figure 2. Not locating any broken pieces could result in engine damage later.

Figure 2: Broken Piece Of VVT

Chain Tensioner

Check for any visual damage
If ok, remove foreign material and clean as needed.
If no good, replace chain tensioner.

Oil Filter

Always replace filter anytime that there is engine damage.

Oil Filter Body

Check for any visual damage
If ok, clean and blow out oil passages with regulated shop air.
If no good, replace oil filter body.

Oil Strainer

Check for any visual damage
If ok, clean and blow out oil passages with regulated shop air.
If no good, replace oil strainer.

Oil Pan

Check for any visual damage
If ok, remove foreign material and clean as needed.
If no good, replace oil pan.

Camshaft & Journals

Check for any visual damage to the camshaft and journals. Camshaft surface should be smooth.

If ok, clean as needed for reuse.

If no good, contact Mazda for authorization to replace cylinder head assembly and camshafts. Refer to Figure 3 for camshaft failure pictures.

Figure 3: Camshaft Failure

Cylinder Head

Check for any visual damage to cylinder head. Cylinder head surface should be smooth.

If ok, clean as needed for reuse.

If no good, contact Mazda for authorization to replace cylinder head assembly and camshafts. Refer to Figure 3 for camshaft failure pictures.

Figure 4: Cylinder Head Cam Bore Failure

The AERA Technical Committee

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Bulletin Diagram: FIGURE1. CYLINDER HEAD REPLACEMNET GUIDELINE - FAILURE ANALYSIS

Guideline for Short Engine/Cylinder Head Replacement

			Short Engine Assembly	
			Is any condition below observed? – Visible Cylinder liner damage – Visible damage to connecting rod bearing – Visible damage to main bearing – Piston top contact damage	
			Yes, short engine is No Good	No, short engine is OK
Cylinder Head Assembly	Is any condition below observed? – Cylinder head contact damage – Cam shaft journal damage	Yes, C/Head Assy. is No Good	Contact MASH for authorization to replace long block assembly	Contact MASH for authorization to replace cylinder head assembly
		No, C/Head Assy. is OK	Contact MASH for authorization to replace short block assembly	No need to replace engine (Engine itself seems OK, or can be fixed by adjustment / small parts replacement)

Reference:

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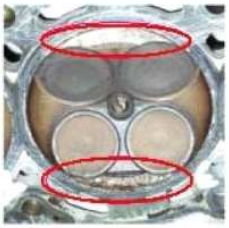
Bulletin Diagram: FIGURE 2. CYLINDER HEAD & PISTON CONTACT DAMAGE - FAILURE ANALYSIS

	OK	No Good (Carbon peeling or contact mark due to interference with piston)	
A			
B			

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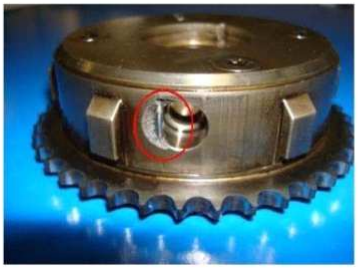
Reference:	

Bulletin Diagram: FIGURE 3. VVT COMPARISON BROKEN PIECE - FAILURE ANALYSIS

OK	No Good (Broken piece)	
		

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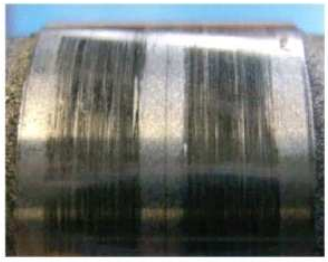
Bulletin Diagram: FIGURE 4. CAMSHAFT LOBE SURFACE COMPARISON - FAILURE ANALYSIS

OK (Smooth surface)	No Good (Rough surface)	
		

Reference:	

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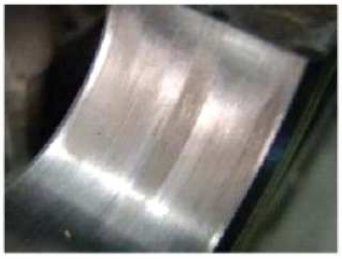
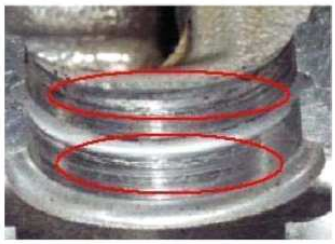
Bulletin Diagram: FIGURE 5. CAMSHAFT BORE BEARING SURFACE COMPARISON - FAILURE ANALYSIS

OK (Smooth surface)	No Good (Rough surface)	
		

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Reference:	