

AUTOMOTIVE CONSULTING ENGINEERS LTD



CONFIDENTIAL COMPONENT REPORT

Client:			
Your File Ref:		Operators Name:	
Date Of Sale:		Del Miles:	
Failure Date:		Failure Miles:	
Policy No:		Your Contact:	
Vehicle:	Mazda 6 TS2 Diesel	Reg No:	
Vin No:		Engine No:	
Odometer:		Report No:	

Defendant:			
Report Date:		1st Reg:	
		Vat Reg:	

	CONTENT.
1.0	REPORTED CONDITION / FAULT.
2.0	CONDITION OF VEHICLE.
3.0	REPORT.
4.0	OPINION.
5.0	PARTS NEEDING REPLACEMENT.
6.0	CONCLUSION.
7.0	SERVICE HISTORY.
8.0	ENGINEERS C.V.
9.0	DUTY.
10.0	STATEMENT OF TRUTH.
11.0	SIGNATURE.

1.0	REPORTED CONDITION / FAULT
1.1	Engine failure 10 days, 400 miles after purchase on ****. To determine reasons for engine failure based on the description and pictures given by defendants' inspection report. To determine if the condition was pre-existing prior to purchase. To identify if ***** contributed towards engine failure. Any other comments that will help to elucidate the situation.

2.0	CONDITION OF VEHICLE.
2.1	Vehicle not seen. Copy report from ***** and images on that report supplied. Vehicle currently in dispute at ***** County Court.



AUTOMOTIVE CONSULTING ENGINEERS LTD

Report No:		Vehicle:	
Your Ref:		Reg No:	

3.0	REPORT:
3.1	We were informed by the owner of the vehicle that he/she purchased the vehicle and after 10 days of ownership and less than 400 miles, the engine failed.
3.2	The vehicle has been subject to an examination by *****
3.3	We have not had the opportunity to inspect the vehicle but have been presented with **** report and photographs and have been requested to comment with regard to the reports findings.
3.4	We have duly read the report completed by *****
3.5	You will note at No. 03.02.02, ***** confirms that during dismantling the lubricant was found to be in poor condition and found that the lubricant pick up strainer was clogged with carbon material and kindly took two images of the strainer to detail its condition and obviously at No. 03.02.03, proceeded to take an oil sample for laboratory analysis, which we have also had the opportunity to review.
3.6	The photographs provided by ***** of the oil pump strainer clearly show carbon contamination of the oil pump strainer, which is not an uncommon condition on some vehicles.
3.7	The condition visible in the photographs is normally associated with deterioration of the engine lubricant in service.
3.8	Many issues can lead to the condition identified, but the more significant causes are improper oil changes during the vehicles service history, increase in the service interval by the operator, the wrong grade of oil being used during replacement or topping up, allowing the oil to fall to a critical state where excessive carbon contamination develops due to combustion gas blow-by.
3.9	As such, under the above circumstances, normally the vehicles history will need to be carefully checked and investigated for any evidence of any improper servicing. Clearly, some of the items cannot be checked by such means, as oil level correction in service use is the operators' responsibility.
3.10	At No. 03.02.04, ***** indicates the numbers 3 and 4 connecting rods / big ends displayed evidence of elevated temperatures, which is normally associated with poor lubrication supply and most likely is connected with the restrictions found with the oil pump strainer, as identified in the two photographs supplied *****.
3.11	At No. 03.02.05, ***** indicates that he did check the low-pressure warning system on the vehicle and found this to be operating satisfactorily. The warning light on the instrument cluster illuminated. The manufacturers who design such warning instrumentation put it in a place to ensure that it can be easily seen from the driver's seat.



AUTOMOTIVE CONSULTING ENGINEERS LTD

Report No:		Vehicle:	
Your Ref:		Reg No:	
3.0	REPORT CONTINUED:		
3.12	At No. 03.02.06 ***** indicates that the lubricating oil from the engine was tested by ***** and a copy of the laboratory report was enclosed. We have reviewed the report provided by *****, the laboratory number being *****. The copy we have is not completely clear but there is a section of the report that starts "we note your comments", which we anticipate must be related to some comments made *****. Clarification of this will be required as to what those comments were.		
3.13	It goes on to indicate however the oil condition is desperate. Dirt contamination is present and we also note evidence of coolant leak, which may account for the very poor oil condition. Bearing material is also present, possibly due to coolant in the oil attacking the bearings and the iron level is very high, crankshaft / liner wear. These readings are expected from a failed engine. Recent service seems doubtful looking at the condition of the oil. It then goes on to indicate that if you have any queries or questions regarding this to please contact *****.		
3.14	Further down, it indicates "Mazda diesel engine failure primary oil filter mesh bloomed with carbon. Crankshaft bearings have failed due to oil starvation. Oil quality report required". These may be the comments referred to in the above section.		
3.15	We note that below is a particle analysis of the materials and / or additive pack for the oil. Clearly, the report provided by ***** indicates the condition of the oil at the time of the failure and also wear particles found within the oil would suggest that engine failure, revolving around the big ends / main bearings, had developed.		
3.16	The iron material identified would clearly indicate that the crankshaft pins had also become damaged, which is not inconsistent with the type of condition under consideration.		
4.0	OPINION		
4.1	Following review of the report we would conclude the following:		
4.2	The report provided by ***** clearly indicates that the engine oil is in a deteriorated state and was showing signs of coolant ingress. The cause of the coolant ingress into the lubricating oil is still to be established and can have a detrimental effect on the engine oil condition. The photos provided also show a condition, which is associated with oil deterioration. We consider the coolant contamination to be a likely contributory factor but not the primary cause. However, we can see an argument with regard to this contamination and if considered the primary cause, such a condition to have such a detrimental effect would suggest a long-term progression.		
4.3	Oil deterioration as identified has a range of possible causes, the most common being that the engine and / or oil had been subject to one or more of the following 1) improper oil changes, 2) the service interval had been increased allowing deterioration of the lubricant, 3) the wrong oil grade had been used during the replacement time or for topping up purposes 4) the engine oil had been allowed to fall to a critical state where excessive carbon contamination from blow-by had developed or 5) contamination of the oil by water or other contaminants has propagated oil deterioration.		



AUTOMOTIVE CONSULTING ENGINEERS LTD

Report No:		Vehicle:	
Your Ref:		Reg No:	

4.0	OPINION CONTINUED:
4.4	However, taking into consideration the photographs provided by ***** of the deteriorated oil condition, we would conclude that although coolant ingress had most likely developed, based on the analysis completed by *****, we consider this to be a contributory factor and not solely the cause and consider one or more of the range of conditions listed above to be also factors in the fault propagation.
4.5	Diesel engine oils have substantial amounts of cleaning additives in their general make-up to assist in preventing such deterioration from developing.
4.6	We accept that there is a coolant issue where coolant appears to be leaking into the engine lubricating oil, which can have an effect on deterioration of the lubricant and speed of development. We accept there is no 'cast in iron' rate of deterioration due to various factors. However, we do not consider this could have developed in the 10 days of service use and approximate 400 miles.
4.7	We would conclude, taking into consideration the level of deterioration apparent and that the condition is of a long-term nature and clearly exceeds the mileage covered and the time elapsed since the point of sale, the fault will have been developing at the time of delivery and laid latent until the condition reached a point where the engine failed.
4.8	Clearly, the deterioration and obstruction had caused restrictions in oil flow via the oil pump strainer, which would progressively worsen over a period of time and debris would be suspended within the oil flow from the blockage.
4.9	Finally, a tip point would be reached where the engine lubricant supply was insufficient to maintain the engine lubrication system, without causing damage to the bearing overlay for the big ends and main bearings and consequential damage to the crank pins.
4.10	The engine's hydrodynamic oil pressure would be affected by the poor supply of lubricant leading to the bearing failure as reported by *****.
4.11	We would conclude however, that this type of damage often develops without warning signs. The oil pressure warning light illumination would not be evident until a sufficient blockage had developed to cause a very low engine oil pressure level, in many cases this is not the warning that brings this type of fault to the operators attention. The fault becomes apparent as abnormal noise. If the warning light is the alert condition noted by the operator, in most cases by this time at least some damage has already developed, leading to extensive engine repairs. The hardened carbon deposits often accompanying this condition, which shell off the material blocking the strainer, over riding / over whelming the filter or the bypass fitted to most modern filters, if the filter is restricted / blocked allows the contaminated oil to reach the normally protected side of the lubrication system, causing scoring type damage to the bearing over lay and advancing the wear.
4.12	Eventually the progressive deterioration of the bearing overlay coupled with the continuing development of the oil starvation, would lead to a tip point where the combination of conditions led to sever damage and would become apparent in the form of excessive engine noise.

Allenby House, Knowles Lane, Bradford, West Yorkshire, BD4 9AB. Tel: 0845 074 3644 Fax: 0845 074 3645

E-mail: info@ace-uk.org Web Site: www.ace-uk.org

"Helping You Make Informed Decisions"

Registered Office: 1st Floor, 8 -12 London Street, Southport, Merseyside, PR9 0UE. Registered in England No 2878702



AUTOMOTIVE CONSULTING ENGINEERS LTD

Report No:		Vehicle:	
Your Ref:		Reg No:	
4.0	OPINION CONTINUED:		
4.13	We also consider that at the time the engine oil pressure warning light became illuminated, if in fact that it did, the engine damage would already have been in a substantial state, necessitating the replacement of the crankshaft bearings, oil pump, gaskets and seals.		
4.14	From our perspective, it is unclear what damage could have been prevented by a more prompt response from the operator, as we anticipate the damage was already well advanced at the time of sale.		
4.15	It will be evident to most engineers that the crank pins / big end shells do not run at the 40-60psi provided by most oil pumps and that engine crankshaft bearing pressure is normally several thousand PSI and relies on hydrodynamic oil pressure, created in the main bearings, to reach such high elevated potential. Clearly, reducing the base oil pressure would have a substantive effect on the big end pressure.		
4.16	The pressure at the big ends has to withstand the combustion pressure, which clearly is substantial in modern diesel engines, needs sufficient oil supply at very high pressures to prevent bearing overlay contact during engine operation.		
4.17	Although we note ***** opinion that the operator could have prevented the consequential damage by a more prompt response, we would have to disagree and are open to be enlightened as to how this could have come about. We cannot see how the operator could have foreseen the condition was developing as clearly the garage who supplied the vehicle could not detect the fault, which would be progressive and lay latent at the time of sale and that by the time the condition became apparent, most likely in the form of increased mechanical engine noise, substantial damage would have already developed.		
5.0	PARTS NEEDING REPLACEMENT.		
5.1	Cost comparison with an exchange engine and specialist repairs.		
6.0	CONCLUSION.		
6.1	We would conclude that we agree with ***** opinion that the condition was the result of interruption in or poor oil supply, as a result of carbon contamination of the oil pump strainer.		
6.2	We consider that such a condition is progressive in development and will have been developing prior to sale and most likely engine damage had already started to develop at the time the customer took delivery and most likely was well advanced.		
6.3	We would further conclude, it would have been impossible for the operator of the vehicle to know such damage was developing, as this type of damage often develops without warning signs until it reaches a level where extensive damage develops to the bearing shells and becomes evident in the form of increased mechanical engine noise.		
6.4	Oil pressure warning light illumination cannot be relied on as a warning sign of such damage developing, as clearly the oil pressure warning light will only illuminate at very low engine oil pressures at which time, extensive damage will have already developed.		

Allenby House, Knowles Lane, Bradford, West Yorkshire, BD4 9AB. Tel: 0845 074 3644 Fax: 0845 074 3645

E-mail: info@ace-uk.org Web Site: www.ace-uk.org

"Helping You Make Informed Decisions"

Registered Office: 1st Floor, 8 -12 London Street, Southport, Merseyside, PR9 0UE. Registered in England No 2878702



AUTOMOTIVE CONSULTING ENGINEERS LTD

Report No:		Vehicle:	
Your Ref:		Reg No:	
7.0	SERVICE HISTORY.		
7.1	Not presented at the time of our inspection.		
8.0	ENGINEERS CURRICULUM VITAE		

SAMPLE

Allenby House, Knowles Lane, Bradford, West Yorkshire, BD4 9AB. Tel: 0845 074 3644 Fax: 0845 074 3645

E-mail: info@ace-uk.org Web Site: www.ace-uk.org

"Helping You Make Informed Decisions"

Registered Office: 1st Floor, 8 -12 London Street, Southport, Merseyside, PR9 0UE. Registered in England No 2878702



AUTOMOTIVE CONSULTING ENGINEERS LTD

Report No:		Vehicle:	
Your Ref:		Reg No:	

9.0	DUTY
9.1	It is the duty of an expert to help the Court on the matters within his expertise. This duty over-rides any obligation to the person from whom he has received instructions or by whom he is paid. "I understand my duty to the Court and have complied and will continue to comply with it and I am aware of the requirements of Part 35 and Practice Direction 35, this protocol and the practice direction on pre-action conduct."
10.0	STATEMENT OF TRUTH
10.1	"I confirm that I have made clear which facts and matters referred to in this report are within my own knowledge and which are not. Those that are within my own knowledge I confirm to be true. The opinions I have expressed represent my true and complete professional opinions on the matters to which they refer."

11.0	For and on behalf of Automotive Consulting Engineers Ltd
11.1	

SAMPLE