

	TRACE-PM 4.0 Filament Analysis	
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	<i>Revision #: 1</i>	<i>Issued Date: 04/10/2018</i>
	<i>Document Manager: Cheryl Lozen</i>	<i>Approved By: Jeffrey Nye</i>

4.0 Filament Analysis

4.1 Filament Examination

4.1.1 Principles

The examination of the filaments from headlamps and bulbs is a skill acquired through the understanding of the following: manufacturing process of the lamps and bulbs, the function of the filaments themselves, the conditions resulting from impact or damage to the bulb and experience under controlled conditions.

4.1.2 Equipment

Multimeter, stereoscopic microscope and SEM (if available), glass cutter and torch.

4.1.3 Procedure

4.1.3.1 Intact headlamp or bulb

Examine filaments through glass if possible.

Check for continuity with multimeter.

Bulb may be opened if it is felt that verification or additional information could be obtained.

- Follow proper procedures for opening sealed beam headlamps to examine the filaments. Remove glass nipple on the back of the sealed beam in the middle of the receptacle plugs. This allows for escaping hot air generated by heating the headlamp. Score a circular area around the back of the lamp before heat is applied. Heat the headlamp with a propane torch while turning the lamp on its' face. While hot, a cold wet cloth is placed over the lamp. The lamp will break if hot enough.
- There are different configurations of halogen bulbs from vehicle headlamps. The bulb is usually self-contained and can be either permanently installed or replaceable inside the outer covering. Use caution when opening these bulbs as they may explode!

For lamp styles, filament function and filament configuration refer to Lamp Examination for (ON) or (OFF) in Traffic Accidents, Baker and Lindquist, Published by the Traffic Institute, Northwestern University.

Examine filaments using stereomicroscope or SEM.

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Note darkening, oxidation, pitting, stretch. etc. Refer to guidelines below and/or the FA worksheet as a guide for lamp analysis.

4.1.3.2 Broken headlamp or bulb

Examine filaments and portions of the remaining headlamp or bulb.

Check for continuity with multimeter.

For lamp styles, filament function and filament configuration refer to Lamp Examination for (ON) or (OFF) in Traffic Accidents, Baker and Lindquist, Published by the Traffic Institute, Northwestern University

Examine filaments using stereomicroscope or SEM.

Note oxidation, fused glass, stretch, etc. Refer to guidelines below and/or FA worksheet as a guide or lamp analysis.

4.1.4 Results

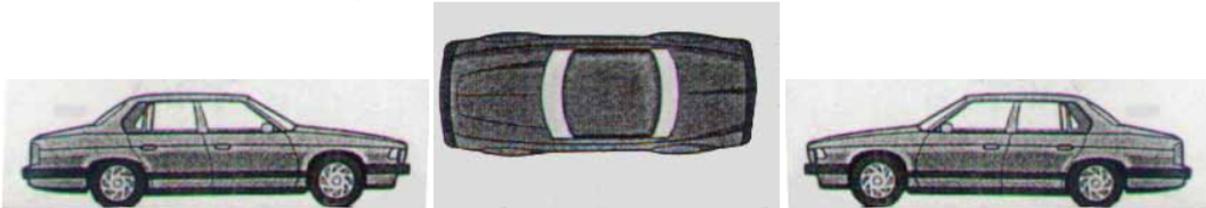
Report results according to physical observations.

4.1.5 References

Lamp Examination for (ON) or (OFF) in Traffic Accidents, Baker and Lindquist, Published by the Traffic Institute, Northwestern University

Auto Lamp Examination Guidelines

Show: (1)Location of Lamp; (2)Damage to auto; (3)direction of force



Description of Lamp	Trade #	Manufacture	Base	Bulb	Filaments



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Condition of Lamp	Base	Bulb (% remaining)	Stem
	White oxide on Near Surface?	Dark deposits on glass?	Glass etched by filament?

Condition of Filaments

#1 __Smaller	Function	#2 __Larger	Function
___intact ___broken		___intact ___broken	
	% attached		
	Fused Glass Fragments		
	Parted (Burned or Melted)		
	Broken		
	Filament Loose in Bulb		
	Sag		
	Silver Luster		
	Light Colors		
	Black or Dark Color		
	Stretched; Compressed		
	Arch-looped		
	Tangled		
	White Oxide Deposit		
	Pitted		
	Continuity		

Comments and Conclusions