Technical Procedure for Tire Tread Impression Examinations

1.0 Purpose - This procedure describes the method of comparing a questioned tire tread impression to a known tire tread impression and the conclusions that may be drawn as a result of the examination.

2.0 Scope - This procedure applies to items of evidence that are to be examined for the presence of tire tread impressions.

3.0 Definitions

- **Class characteristics** - An intentional or unavoidable characteristic imparted to the tire tread design during the manufacturing process. These characteristics repeat and are shared by more than one (1) tire. These characteristics include, size, shape, tread design and any mold characteristics that appear in more than one (1) tire.
- **Individual characteristics -** Cuts, wear, tears, holes and other characteristics that are imparted to a tire as a result of general wear. These characteristics, also called accidental characteristics, are unique to a particular tire.
- **General wear characteristics** - Gradual change of a tread design as a result of general wear and tear acquired as a tire interacts with the driving surface.

4.0 Equipment, Materials and Reagents

4.1 Equipment and Materials

- Known tires and/or known tire standards
- Ruler

4.2 Reagents - N/A

5.0 Procedure

5.1 Procedure

5.1.1 Conduct a visual examination using both the clear acetate overlay of the known tire or the known tire and the questioned impression. If the impression is of a different tread design than the known tire, it can be eliminated as the source of the questioned impression and the examination is complete. If the class characteristics correspond, the examination shall continue.

Note: If the questioned tire impression and the known tires do not correspond in class characteristics at any point during the examination, the known tires shall be eliminated as being the source of the questioned tire tread impression. The examination is complete. Correspondence of the class characteristics dictates that the examination proceeds to the next step. Additionally, an examination of the sidewall of the known tires may reveal the date on which the tire was manufactured. Prior to conducting an examination, cross-check the date of manufacture with the date of the criminal offense. Tires that were manufactured after the date of offense shall be eliminated as the source of the impression.

5.1.2 The clear acetate overlay of the known tires is placed directly over the questioned impression (cast, photograph or lift of a hard surface tire track impression). They are visually compared to determine if the size, tread design elements and general wear characteristics correspond to the known tire standards.

Note: When the questioned tire track impression is submitted as a cast, a gelatin lifter or an electrostatic dust lift, any photographs of the impressions or the known tire standards shall be reversed in order to compensate for the lifted orientation of the evidence.

5.1.3 If the class and general wear characteristics correspond, an in-depth examination of the questioned tire track impression shall be conducted to locate any unique, identifying characteristics that may be present within the impression. The known tire/tire standard shall be examined for the presence of any unique characteristics. The unique characteristics present within the questioned tire track impression shall then be compared to the unique characteristics present within the known tires/known standards.

5.1.4 The Forensic Scientist shall determine if the unique identifying characteristics present in both the questioned tire track impression and the known tires effect a positive identification. An identification indicates that the questioned tire track impression was made by a particular tire to the exclusion of all others.

Note: A lack of unique identifying characteristics or insufficient characteristic significance does not eliminate the known tire from having made a questioned tire track impression. In this case, a conclusion of *could have made* shall be rendered. The Forensic Scientist shall include the following statement in the report: *due to the lack of detail within the questioned tire track impression a more positive association could not be made* (see Section Technical Procedure for Writing Results Statements 5.2.6).

5.1.5 A copy of the questioned tire track impression(s) and the known tire standards shall be retained in the object repository. For lengthy impressions and standards, only a portion of the impression shall be retained in the case record object repository. All original standards or impressions made shall be returned to the submitting agency.

5.2 Standards and Controls - N/A

5.3 Calibration - N/A

5.4 Sampling - N/A

5.5 Calculations - N/A

5.6 Uncertainty of Measurement - N/A

6.0 Limitations - N/A

7.0 Safety - N/A

8.0 References

Belcher, G.L. *Methods of Casting and Latent Print Recovery.*

Bodziak, W.J. "Shoe and Tire Impression Evidence." *FBI Law Enforcement Bulletin*. (July 1984): 1-11.

Bodziak, W.J. *Casting a Footwear or Tire Impression with Dental Stone.*

Cook, C.W. "Comparative Analysis (Footprint and Tire Track Information." *Identification News.* (April 1979): 3–5.

Doller, D.W. *Interpretations of Shoe and Tire Impressions at the Crime Scene.* Suffolk County Crime Laboratory.

Freels, R.H. *Improved Test Impressions and Prints.* Kentucky State Police.

Hamm, E.D. "Chemical Developers in Footwear Prints." *Fingerprint Whorld.* (1984): 17-118.

Heafner, H.J. *Demonstrative Evidence Preparation, Use and Effectiveness of Trial Exhibits for Courtroom Presentation.*

Hebrard, J., et al. "Experimental and Comparative Study of New Casting Materials." *International Symposium of the Forensic Aspects of Footwear and Tire Impression Evidence.* (1994): 1-3.

McDonald, P. *Tire Imprint Evidence.* CRC Press LLC, Florida (1993).

Nause, L. *Forensic Tire Impression Identification.* Canadian Police Research Centre, Canada (2001).

Navarro, R.L. *The Collection, Preservation, and Examination of Footwear and Tire Track Impressions* (Aug. 1987).

Olsen, R.D. *Need for Defining Nomenclature of Class and Individual Characteristics.* Kansas Bureau of Investigation.

Preservation and Identification of Shoe and Tire Impressions. North Carolina State Bureau of Investigation.

Steigmann, J.P. "An Inexpensive Latent Fingerprint, Footprint, Shoeprint, and Tire Mark Lifter. p. 13.
Tips on Making Casts of Shoe and Tire Prints." *FBI Law Enforcement Bulletin.* (Oct. 1963): 1-5.

"Tire Forensics: A Presentation of Tire Print Identification with an Emphasis on Tire Design and Tire Manufacturing." Presentation at the International Association for Identification International Educational Conference. Dallas, TX (2004).

9.0 Records - N/A

10.0 Attachments - N/A

Revision History		
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