



Tire Track Imprint Evidence Test No. 18-5351/5 Summary Report

Each sample pack contained either digitally produced photographs (18-5351) or directly downloadable digital images (18-5355) of four questioned tire track imprints, photographs of a suspect tire, and test imprints made with that tire. Participants were requested to compare the imprints from the crime scene with the suspect tire and report their findings. Data were returned by 47 participants: 31 for 18-5351 and 16 for 18-5355 and are compiled into the following tables:

| | <u>Page</u> |
|---|---------------------------|
| <u>Manufacturer's Information</u> | <u>2</u> |
| <u>Summary Comments</u> | <u>3</u> |
| <u>Table 1: Examination Results</u> | <u>4</u> |
| <u>Table 2: Conclusions</u> | <u>13</u> |
| <u>Table 3: Additional Comments</u> | <u>21</u> |
| <u>Appendix: Data Sheet</u> | |

This report contains the data received from the participants in this test. Since these participants are located in many countries around the world, and it is their option how the samples are to be used (e.g., training exercise, known or blind proficiency testing, research and development of new techniques, etc.), the results compiled in the Summary Report are not intended to be an overview of the quality of work performed in the profession and cannot be interpreted as such. The Summary Comments are included for the benefit of participants to assist with maintaining or enhancing the quality of their results. These comments are not intended to reflect the general state of the art within the profession.

Participant results are reported using a randomly assigned "WebCode". This code maintains participant's anonymity, provides linking of the various report sections, and will change with every report.

Manufacturer's Information

Each sample pack contained either photographs or digital images of a suspect tire, inked exemplars of a suspect tire, and questioned tire track imprints. The suspect tire was photographed in segments (K1-7), with the start and end of each segment indicated by a red line and assigned a letter (A-G). The inked exemplars were segmented and captured in the same manner. Two photographs contained images of four questioned tire track imprints (Q1-Q4). Participants were asked to compare the suspect tire and inked exemplars with the questioned imprints to determine if any associations or identifications could be established.

SAMPLE PREPARATION -

The previously driven tires used in production of the test were gently cleaned to remove any loose debris from the surface prior to inking.

KNOWN EXEMPLARS (K1-K7, K1_2-K7_2): Inked exemplar imprints were created by pushing a vehicle containing the suspect tire across an inked surface and then white containerboard. The suspect tire was removed from the vehicle and photographed in segments after known exemplars and questioned imprints were collected.

QUESTIONED IMPRINTS (Q1-Q4): Questioned imprints were created by pushing a vehicle containing the suspect or elimination tire across an inked surface and then the substrate. The substrate was repositioned and the process repeated as necessary to capture all tire track imprints in question.

VERIFICATION -

Laboratories that conducted the predistribution examination of the images associated imprints Q1, Q2, and Q3 with the suspect tire. In addition, all predistribution labs eliminated imprint Q4.

SAMPLE PACK ASSEMBLY -

Once sample preparation, verification, and final image production were complete, each photo set was placed into a pre-labeled sample pack envelope, sealed with evidence tape, and initialed with "CTS." Digital download media were provided in a zipped file uploaded to the CTS portal.

| Imprint | Tire Brand | Tire Specs | DOT Info | Segment(s) |
|---------|-------------|-----------------------------|----------------|-------------------|
| Q1 | Kumho Solus | KR21 P185/65 R14 85T M&S | YOLA YP6V 4310 | C-E |
| Q2 | Kumho Solus | KR21 P185/65 R14 85T M&S | YOLA YP6V 4310 | G-B |
| Q3 | Kumho Solus | KR21 P185/65 R14 85T M&S | YOLA YP6V 4310 | E-G |
| Q4 | Kumho Solus | KR21 P185/65 R14 85T M&S | YOLA YP6V 4310 | N/A - Elimination |

Summary Comments

This test was designed to allow participants to assess their proficiency with tire track imprint examination. Test material consisted of two photographs containing four questioned tire track imprints (Q1-Q4), photographs of the suspect (known) tire, divided into segments (K1-K7), and photographs of inked exemplar imprints made with the tire (K1_2-K7_2). Participants were requested to determine if any of the questioned imprints were made by the known tire, utilizing a seven-point conclusion scale. Three of these imprints (Q1, Q2, Q3) were made by the known tire. The remaining one imprint (Q4) was made by a different tire (Refer to the Manufacturer's Information for preparation details).

For the following statistical tabulations, all responses of association (A-D) with the expected tire segments were tallied together, and all responses of non-association (F-G) were tallied together. For Item Q1, 44 of 47 participants (94%) associated the known tire with the questioned imprint (conclusion A-D). Two participants reported a non-association with the known tire (conclusion F-G), and one participant did not respond. For Item Q2, 43 participants (91%) found an association between the known tire and the questioned imprint. The remaining four participants reported a non-association between the known tire and the questioned imprint. For Item Q3, 44 participants (94%) reported an association between the questioned imprint and the known tire. Two participants reported non-association for the known tire, and one participant did not respond.

All 44 of the participants (100%) who reported an association between Q1 and the known tire identified one or both of the expected tire segments for Q1 (C-D, D-E). Of the 43 participants who reported an association for Q2, 41 participants (95%) reported one or both of the expected tire segments (G-A, A-B); one participant reported segment D-E; and one additional participant did not identify a segment. Finally, 42 out of 44 participants (95%) reported one or both of the expected tire segments for Q3 (E-F, F-G); the remaining two participants who reported an association did not identify a segment.

For Item Q4, no group consensus was reached, as fewer than 75% of participants reported consistent findings. Thirty-one of 47 participants (66%) reported an elimination or indications of non-association (F-G) for this item, which correlates to the expected results of the Manufacturer's Information. Many participants reported differing wear patterns and missing randomly acquired characteristics as their explanation for this finding. Fifteen participants reported some level of association (B-D), but none identified the known tire as the source of the questioned imprint (A). All but one of these who reported an association did so within the segments of B-C and C-D on the known tire. Finally, one participant provided no response for Item Q4. Because no consensus was established for this item, no outliers are indicated regarding both the conclusions and the segments.

Examination Results

Indicate the results of your comparisons of the suspect tire with the questioned imprints.

TABLE 1a (Parking Sign)

| Questioned Imprints | | | | | | |
|---------------------|------------|-------------------------|------------------|------------|-------------------------|--|
| WebCode- Test | Conclusion | <u>Q1</u> Segment(s) | WebCode- Test | Conclusion | <u>Q2</u> Segment(s) | |
| 2F4KXW- 5351 | A | C-E | 2F4KXW- 5351 | A | A-B | |
| 2WN977- 5351 | A | C-E | 2WN977- 5351 | A | G-B | |
| 33U7EA- 5355 | A | C-E | 33U7EA- 5355 | A | G-B | |
| 3QEC2W- 5351 | A | C-E | 3QEC2W- 5351 | A | G-B | |
| 3VCV2A- 5355 | A | C-E | 3VCV2A- 5355 | A | G-B | |
| 43Q2D7- 5351 | A | C-D | 43Q2D7- 5351 | A | G-A | |
| 49FEEU- 5355 | A | C-E | 49FEEU- 5355 | A | A-B | |
| 4WXWJ3- 5355 | B | C-E | 4WXWJ3- 5355 | B | G-B | |
| 6WDF4Z- 5351 | A | C-E | 6WDF4Z- 5351 | A | G-B | |
| 796N2T- 5351 | A | C-E | 796N2T- 5351 | A | G-B | |
| 79RXBW- 5351 | A | C-E | 79RXBW- 5351 | A | G-B | |
| 8J6EJU- 5351 | A | C-D | 8J6EJU- 5351 | A | D-E | |
| 8RXPQ4- 5351 | A | C-E | 8RXPQ4- 5351 | A | G-B | |
| 8VV9VN- 5351 | A | C-E | 8VV9VN- 5351 | A | G-B | |

TABLE 1a (Parking Sign)

| Questioned Imprints | | | | | | |
|---------------------|------------|-------------------------|------------------|------------|-------------------------|--|
| WebCode- Test | Conclusion | <u>Q1</u> Segment(s) | WebCode- Test | Conclusion | <u>Q2</u> Segment(s) | |
| 9CY6P7- 5351 | A | C-E | 9CY6P7- 5351 | A | A-B | |
| AEK9X4- 5351 | A | C-E | AEK9X4- 5351 | A | G-B | |
| AEZRH2- 5355 | A | C-E | AEZRH2- 5355 | A | G-B | |
| AGPWEE- 5355 | A | C-E | AGPWEE- 5355 | A | A-B | |
| B36VWU- 5351 | G | | B36VWU- 5351 | G | | |
| CP9A4P- 5351 | G | | CP9A4P- 5351 | G | | |
| DBPLUQ- 5351 | A | C-E | DBPLUQ- 5351 | C | G-B | |
| DJ233Q- 5351 | A | C-E | DJ233Q- 5351 | A | G-B | |
| DPRF2U- 5351 | B | C-E | DPRF2U- 5351 | G | | |
| EJGJWJ- 5355 | A | C-E | EJGJWJ- 5355 | A | G-B | |
| EP8YLQ- 5351 | A | C-E | EP8YLQ- 5351 | A | G-B | |
| EXGKAK- 5355 | A | C-E | EXGKAK- 5355 | A | G-B | |
| FNULJF- 5351 | A | C-E | FNULJF- 5351 | A | G-B | |
| FWYTYF- 5351 | A | C-E | FWYTYF- 5351 | B | G-B | |
| G2QHUD- 5355 | A | C-E | G2QHUD- 5355 | A | G-B | |

TABLE 1a (Parking Sign)

| Questioned Imprints | | | | | | |
|---------------------|------------|-------------------------|------------------|------------|-------------------------|--|
| WebCode- Test | Conclusion | <u>Q1</u> Segment(s) | WebCode- Test | Conclusion | <u>Q2</u> Segment(s) | |
| GTE4AW-5355 | A | C-E | GTE4AW-5355 | A | G-B | |
| LB2BBA-5351 | A | C-E | LB2BBA-5351 | B | G-B | |
| NDGKD8-5355 | B | C-E | NDGKD8-5355 | C | A-B | |
| PNDRUN-5351 | A | C-E | PNDRUN-5351 | A | A-B | |
| Q3BJQD-5351 | A | C-E | Q3BJQD-5351 | A | G-B | |
| Q786HF-5355 | A | C-E | Q786HF-5355 | A | G-B | |
| TJQA63-5351 | B | C-E | TJQA63-5351 | A | G-B | |
| TYKYXD-5351 | B | C-D | TYKYXD-5351 | C | | |
| U6PVHD-5355 | B | C-E | U6PVHD-5355 | B | G-B | |
| ULE64F-5355 | A | C-D | ULE64F-5355 | A | A-B | |
| UYFYD4-5355 | A | C-E | UYFYD4-5355 | A | G-B | |
| W3THB4-5351 | | | W3THB4-5351 | G | A-B | |
| WBJ2QX-5355 | B | C-E | WBJ2QX-5355 | A | G-B | |
| Y9PZXE-5351 | B | C-E | Y9PZXE-5351 | B | G-B | |
| YFCK72-5351 | A | C-E | YFCK72-5351 | A | A-B | |

TABLE 1a (Parking Sign)

| Questioned Imprints | | | | | | |
|---------------------|------------|-----------|------------|--------------|------------|------------|
| WebCode-Test | Conclusion | <u>Q1</u> | Segment(s) | WebCode-Test | Conclusion | <u>Q2</u> |
| | | | | | | Segment(s) |
| YTGZRW-5351 | A | | C-E | YTGZRW-5351 | A | G-B |
| ZA3NY7-5351 | A | | C-E | ZA3NY7-5351 | A | G-B |
| ZU7QC2-5351 | A | | C-D | ZU7QC2-5351 | A | G-A |

| Response Summary | | | | Participants: 47 | | | |
|---------------------------|-------------------|--------------------------|-------------------|---------------------------|-------------------|--------------------------|-------------------|
| Q1 Conclusion | | Segment(s), by frequency | | Q2 Conclusion | | Segment(s), by frequency | |
| Identification (A) | 36 (76.6%) | C-E | 39 (83.0%) | Identification (A) | 35 (74.5%) | G-B | 31 (66.0%) |
| High Degree of Ass'n. (B) | 8 (17.0%) | C-D | 5 (10.6%) | High Degree of Ass'n. (B) | 5 (10.6%) | A-B | 9 (19.1%) |
| Association (C) | 0 (0.0%) | | | Association (C) | 3 (6.4%) | G-A | 2 (4.3%) |
| Limited Ass'n. (D) | 0 (0.0%) | | | Limited Ass'n. (D) | 0 (0.0%) | D-E | 1 (2.1%) |
| Inconclusive (E) | 0 (0.0%) | | | Inconclusive (E) | 0 (0.0%) | | |
| Non-Ass'n. (F) | 0 (0.0%) | | | Non-Ass'n. (F) | 0 (0.0%) | | |
| Exclusion (G) | 2 (4.3%) | | | Exclusion (G) | 4 (8.5%) | | |

Examination Results

Indicate the results of your comparisons of the suspect tire with the questioned imprints.

TABLE 1b (Cardboard Box)

| Questioned Imprints | | | | | | |
|---------------------|------------|-------------------------|------------------|------------|-------------------------|------------|
| WebCode- Test | Conclusion | <u>Q3</u> Segment(s) | WebCode- Test | Conclusion | <u>Q4</u> Segment(s) | Segment(s) |
| 2F4KXW- 5351 | B | E-G | 2F4KXW- 5351 | D | B-D | |
| 2WN977- 5351 | B | E-G | 2WN977- 5351 | B | B-C | |
| 33U7EA- 5355 | A | E-G | 33U7EA- 5355 | G | | |
| 3QEC2W- 5351 | A | E-G | 3QEC2W- 5351 | G | | |
| 3VCV2A- 5355 | A | E-G | 3VCV2A- 5355 | G | | |
| 43Q2D7- 5351 | A | E-F | 43Q2D7- 5351 | G | B-C | |
| 49FEEU- 5355 | A | F-G | 49FEEU- 5355 | C | B-C | |
| 4WXWJ3- 5355 | B | E-G | 4WXWJ3- 5355 | F | | |
| 6WDF4Z- 5351 | A | E-G | 6WDF4Z- 5351 | G | | |
| 796N2T- 5351 | A | E-G | 796N2T- 5351 | G | | |
| 79RXBW- 5351 | A | E-G | 79RXBW- 5351 | G | B-D | |
| 8J6EJU- 5351 | A | F-G | 8J6EJU- 5351 | G | | |
| 8RXPQ4- 5351 | A | E-G | 8RXPQ4- 5351 | G | | |
| 8W9VN- 5351 | A | E-G | 8W9VN- 5351 | D | B-C | |

TABLE 1b (Cardboard Box)

| Questioned Imprints | | | | | | |
|---------------------|------------|-------------------------|------------------|------------|-------------------------|--|
| WebCode- Test | Conclusion | <u>Q3</u> Segment(s) | WebCode- Test | Conclusion | <u>Q4</u> Segment(s) | |
| 9CY6P7- 5351 | A | F-G | 9CY6P7- 5351 | G | A-G | |
| AEK9X4- 5351 | A | F-G | AEK9X4- 5351 | C | B-C | |
| AEZRH2- 5355 | A | E-G | AEZRH2- 5355 | G | | |
| AGPWEE- 5355 | A | F-G | AGPWEE- 5355 | F | | |
| B36WU- 5351 | G | | B36WU- 5351 | G | | |
| CP9A4P- 5351 | G | | CP9A4P- 5351 | G | | |
| DBPLUQ- 5351 | B | E-G | DBPLUQ- 5351 | F | | |
| DJ233Q- 5351 | A | F-G | DJ233Q- 5351 | G | | |
| DPRF2U- 5351 | D | | DPRF2U- 5351 | F | | |
| EJGJWJ- 5355 | A | E-G | EJGJWJ- 5355 | C | B-D | |
| EP8YLQ- 5351 | A | E-G | EP8YLQ- 5351 | G | | |
| EXGKAK- 5355 | B | E-G | EXGKAK- 5355 | C | B-C | |
| FNULJF- 5351 | A | E-G | FNULJF- 5351 | G | | |
| FWYTYF- 5351 | B | E-G | FWYTYF- 5351 | F | | |
| G2QHUD- 5355 | A | E-G | G2QHUD- 5355 | G | A-G | |

TABLE 1b (Cardboard Box)

| Questioned Imprints | | | | | | |
|---------------------|------------|-------------------------|------------------|------------|-------------------------|--|
| WebCode- Test | Conclusion | <u>Q3</u> Segment(s) | WebCode- Test | Conclusion | <u>Q4</u> Segment(s) | |
| GTE4AW- 5355 | A | E-G | GTE4AW- 5355 | F | B-D | |
| LB2BBA- 5351 | C | E-G | LB2BBA- 5351 | G | B-D | |
| NDGKD8- 5355 | C | F-G | NDGKD8- 5355 | C | B-C | |
| PNDRUN- 5351 | A | F-G | PNDRUN- 5351 | C | B-C | |
| Q3BJQD- 5351 | A | E-G | Q3BJQD- 5351 | G | | |
| Q786HF- 5355 | A | F-G | Q786HF- 5355 | F | | |
| TJQA63- 5351 | C | F-G | TJQA63- 5351 | C | B-D | |
| TYKYXD- 5351 | C | | TYKYXD- 5351 | C | | |
| U6PVHD- 5355 | B | E-G | U6PVHD- 5355 | C | B-D | |
| ULE64F- 5355 | A | F-G | ULE64F- 5355 | G | | |
| UYFYD4- 5355 | A | E-G | UYFYD4- 5355 | C | B-C | |
| W3THB4- 5351 | | | W3THB4- 5351 | | | |
| WBJ2QX- 5355 | C | E-G | WBJ2QX- 5355 | G | B-D | |
| Y9PZXE- 5351 | B | F-G | Y9PZXE- 5351 | C | B-C | |
| YFCK72- 5351 | A | F-G | YFCK72- 5351 | G | | |

TABLE 1b (Cardboard Box)

| Questioned Imprints | | | | | | |
|---------------------|------------|---------------|--------------|------------|---------------|--|
| WebCode-Test | Conclusion | Q3 Segment(s) | WebCode-Test | Conclusion | Q4 Segment(s) | |
| YTGZRW-5351 | C | E-G | YTGZRW-5351 | C | B-D | |
| ZA3NY7-5351 | A | E-G | ZA3NY7-5351 | F | B-D | |
| ZU7QC2-5351 | C | E-F | ZU7QC2-5351 | G | | |

| Response Summary | | | | Participants: 47 | | | |
|---------------------------|-------------------|--------------------------|-------------------|---------------------------|-------------------|--------------------------|--|
| Q3 Conclusion | | Segment(s), by frequency | | Q4 Conclusion | | Segment(s), by frequency | |
| Identification (A) | 28 (59.6%) | E-G | 27 (57.4%) | Identification (A) | 0 (0.0%) | N/A for non-assoc. | |
| High Degree of Ass'n. (B) | 8 (17.0%) | F-G | 13 (27.7%) | High Degree of Ass'n. (B) | 1 (2.1%) | | |
| Association (C) | 7 (14.9%) | E-F | 2 (4.3%) | Association (C) | 12 (25.5%) | | |
| Limited Ass'n. (D) | 1 (2.1%) | | | Limited Ass'n. (D) | 2 (4.3%) | | |
| Inconclusive (E) | 0 (0.0%) | | | Inconclusive (E) | 0 (0.0%) | | |
| Non-Ass'n. (F) | 0 (0.0%) | | | Non-Ass'n. (F) | 8 (17.0%) | | |
| Exclusion (G) | 2 (4.3%) | | | Exclusion (G) | 23 (48.9%) | | |

Examination Results

TABLE 1c - Complete Results

| Response Summary | | | | Participants: 47 | | | |
|---------------------------|-------------------|--------------------------|-------------------|---------------------------|-------------------|--------------------------|-------------------|
| Q1 Conclusion | | Segment(s), by frequency | | Q2 Conclusion | | Segment(s), by frequency | |
| Identification (A) | 36 (76.6%) | C-E | 39 (83.0%) | Identification (A) | 35 (74.5%) | G-B | 31 (66.0%) |
| High Degree of Ass'n. (B) | 8 (17.0%) | C-D | 5 (10.6%) | High Degree of Ass'n. (B) | 5 (10.6%) | A-B | 9 (19.1%) |
| Association (C) | 0 (0.0%) | | | Association (C) | 3 (6.4%) | G-A | 2 (4.3%) |
| Limited Ass'n. (D) | 0 (0.0%) | | | Limited Ass'n. (D) | 0 (0.0%) | D-E | 1 (2.1%) |
| Inconclusive (E) | 0 (0.0%) | | | Inconclusive (E) | 0 (0.0%) | | |
| Non-Ass'n. (F) | 0 (0.0%) | | | Non-Ass'n. (F) | 0 (0.0%) | | |
| Exclusion (G) | 2 (4.3%) | | | Exclusion (G) | 4 (8.5%) | | |
| Q3 Conclusion | | Segment(s), by frequency | | Q4 Conclusion | | Segment(s), by frequency | |
| Identification (A) | 28 (59.6%) | E-G | 27 (57.4%) | Identification (A) | 0 (0.0%) | N/A for non-assoc. | |
| High Degree of Ass'n. (B) | 8 (17.0%) | F-G | 13 (27.7%) | High Degree of Ass'n. (B) | 1 (2.1%) | | |
| Association (C) | 7 (14.9%) | E-F | 2 (4.3%) | Association (C) | 12 (25.5%) | | |
| Limited Ass'n. (D) | 1 (2.1%) | | | Limited Ass'n. (D) | 2 (4.3%) | | |
| Inconclusive (E) | 0 (0.0%) | | | Inconclusive (E) | 0 (0.0%) | | |
| Non-Ass'n. (F) | 0 (0.0%) | | | Non-Ass'n. (F) | 8 (17.0%) | | |
| Exclusion (G) | 2 (4.3%) | | | Exclusion (G) | 23 (48.9%) | | |

Conclusions

TABLE 2

| WebCode-Test | Conclusions |
|--------------|---|
| 2F4KXW-5351 | Q1 and Q2 are identified as being made by the known tire (K1 thru K7). Q3 has a high degree of association as being made by the known tire (K1 thru K7). Q4 has a limited association of class characteristics and may have been made by the known tire (k1 thru K7) or any other tire with a similar tread pattern design. Greater association of Q3 and Q4 could not be made due to the submission of substandard known impressions from the known tire (K1 thru K7), poor quality of submitted photographs of the surface of the known tire (K1_2 thru K7_2), as well as the lack of availability for an examination of the known tire itself. |
| 2WN977-5351 | Question samples 1 - 4 were compared with suspect tyre being a Kumho Solus KR21 P185/65 R14. The suspect tyre was in good condition with even wear over the entire tread. After comparison between the question samples and the suspect tyre, the following results were obtained - Q1 and Q2 were identified due to the highest degree of association in that both the questioned prints and the suspect tyre showed both class characteristics in size and tread pattern design and also had several randomly acquired individual characteristics of sufficient quality. It was identified that these marks were made by the suspect tyre. Q3 and Q4 were identified due to a high degree of association with the suspect tyre. Both prints had corresponding class characteristics in size and design of tread pattern and both consisted on more than one randomly acquired individual characteristic. It was identified that these marks were made by the suspect tyre. |
| 33U7EA-5355 | The impressions in Q1, Q2 and Q3 were made by the submitted tire. The impression in Q4 was not made by the submitted tire. |
| 3QEC2W-5351 | Four (4) questioned, partial tire impressions, previously marked Q1 through Q4, were found on the two (2) photographs in Submission 001. The questioned, partial tire impressions, Q1 through Q4, have been compared with the pictures of the known tire and known tire test impressions found in Submission 001. The questioned, partial tire impression, Q1, has been identified within segments C through E of the known tire test impressions and was made by this tire. The questioned, partial tire impression, Q2, has been identified within segments G through B of the known tire test impressions and was made by this tire. The questioned, partial tire impression, Q3, has been identified within segments E through G of the known tire test impressions and was made by this tire. The questioned, partial tire impression, Q4, although corresponding in physical size, shape and tread design as the known tires and test impressions depicted in Submission 001, was not made by that tire. The questioned impression and known tire exhibit sufficient differences of individual randomly acquired characteristics. |
| 3VCV2A-5355 | Item 1 contained two images of four unknown tire track impressions, Q1-Q4, said to be from the scene of a hit and run incident. These impressions were compared to images and known impressions from a tire recovered from the suspect vehicle. A complete evaluation of an unknown impression and a known tire includes looking at correspondence in tread design, physical size and shape of design present, wear characteristics, and any distinctive characteristics randomly acquired on the tread of the tire that are represented in the unknown impression. The known tire corresponded in physical shape, tread design, size of tread and randomly acquired characteristics to the Q1, Q2 and Q3 unknown impressions. Therefore, the known tire is the source of the unknown impressions from the scene (Type I Association/Identification). The tread pattern seen in the Q4 unknown impression was different than the known tire in wear and/or randomly acquired characteristics and, therefore, the known tire can be eliminated as being a possible source for the unknown impression (Elimination). |
| 43Q2D7-5351 | The evidence impressions Q1 through Q4 were compared to the known tire, as represented by the exhibit 3 images, with the following results: Q1: The Q1 impression was similar in tread design, physical size, and general wear to sections C-D of the tire. Additionally, several randomly acquired characteristics corresponded between the impression and the tire. In the opinion of this examiner, the tire represented in exhibit 3 was the source of, and made, Q1. |

TABLE 2

| WebCode-Test | Conclusions |
|--------------|--|
| | <p>Another tire being the source of Q1 is considered a practical impossibility. Q2: The Q2 impression was similar in tread design, physical size, and general wear to sections G-A of the tire. Additionally, several randomly acquired characteristics corresponded between the impression and the tire. In the opinion of this examiner, the tire represented in exhibit 3 was the source of, and made, Q2. Another tire being the source of Q2 is considered a practical impossibility. Q3: The Q3 impression was similar in tread design, physical size, and general wear to sections E-F of the tire. Additionally, several randomly acquired characteristics corresponded between the impression and the tire. In the opinion of this examiner, the tire represented in exhibit 3 was the source of, and made, Q3. Another tire being the source of Q3 is considered a practical impossibility. Q4: The Q4 impression was similar in tread design and physical size to sections B-C of the tire; however, there were significant differences in general wear observed between the impression and the tire. In the opinion of this examiner, the tire was not the source of, and did not make, the Q4 impression.</p> |
| 49FEEU-5355 | <p>Impressions Q1, Q2 & Q3 were made by the recovered tire. Impression Q4 could not be identified or eliminated as being made by the recovered tire.</p> |
| 4WXWJ3-5355 | <p>The results of the examination strongly support that the imprint ITEM Q1 was made with the recovered tire ITEM K (Level +3). The results of the examination strongly support that the imprint ITEM Q2 was made with the recovered tire ITEM K (Level +3). The results of the examination strongly support that the imprint ITEM Q3 was made with the recovered tire ITEM K (Level +3). The results of the examination support that the imprint ITEM Q4 was not made with the recovered tire ITEM K (Level -2)</p> |
| 6WDF4Z-5351 | <p>The evidence in items 1C and 1D (CTS # Q1 through Q4) was visually examined for impression evidence. Four (4) questioned imprints of value were determined to be present in items 1C and 1D (CTS # Q1 through Q4). All four (4) of the questioned imprints of value in items 1C and 1D (CTS # Q1 through Q4) were visually examined and compared against the recovered tire in items 1A and 1B (CTS # K1 through K7 and K1_2 through K7_2). One of the questioned imprints of value in item 1C (CTS # Q1) was determined to have been made by the recovered tire in items 1A and 1B (CTS # K3_2 through K4_2). One of the questioned imprints of value in item 1C (CTS # Q2) was determined to have been made by the recovered tire in items 1A and 1B (CTS # K7_2 through K1_2). One of the questioned imprints of value in item 1D (CTS # Q3) was determined to have been made by the recovered tire in items 1A and 1B (CTS # K5_2 through K6_2). One of the questioned imprints of value in item 1D (CTS # Q4) was determined not to have been made by the recovered tire in items 1A and 1B (CTS # K1_2 through K7_2). Further analysis is pending submission of an additional tire for comparison.</p> |
| 796N2T-5351 | <p>The partial, questioned tire track impression, Q1, was made by the known tire in Submission K, Segments C-E. The partial, questioned tire track impression, Q2, was made by the known tire in Submission K, Segments G-B. The partial, questioned tire track impression, Q3, was made by the known tire in Submission K, Segments E-G. The partial, questioned tire track impression, Q4, shares similar, size, wear and tire tread design elements with the known tire in Submission K, but was not made by that tire. The partial, questioned tire track impression, Q4, was made by another tire of the same size, wear and tire tread design as the known tire in Submission K.</p> |
| 79RXBW-5351 | <p>Marks Q1, Q2 and Q3 all bear a similar pattern, pitch sequence, degree of wear and corresponding areas of fine detail to sections of the tread from the recovered tyre. In our opinion, the recovered tyre is responsible for each of these three marks. Mark Q4 bears a similar pattern to an area of the tread of the recovered tyre however significant differences were noted. As such, the recovered tyre is not responsible for this mark.</p> |
| 8J6EJU-5351 | <p>Q1, Q2, Q3 have individual characteristics that identify them. Q4 do not have individual characteristics that identify it.</p> |
| 8RXPQ4-5351 | <p>The known tire depicted in photographs K1 through K7 was the source of, and made, the questioned tire impressions marked Q1, Q2 and Q3, in exhibit TIEP. Another tire being the</p> |

TABLE 2

| WebCode-Test | Conclusions |
|--------------|---|
| | <p>source of the impressions is considered a practical impossibility. The known tire depicted in photographs K1 through K7 was not the source of, and did not make, the questioned tire impression marked Q4, in exhibit TIEP. Images of the questioned tire impressions have been retained in our files.</p> |
| 8VV9VN-5351 | <p>The known tire was identified as having made the questioned impression depicted in Q1 based on a correspondence of observed class characteristics (specific tread design and size), general wear, and randomly acquired characteristics of sufficient quality and quantity. The correspondence was observed in segments C to E (K3_2 and K4_2) of the known tire. The known tire was identified as having made the questioned impression depicted in Q2 based on a correspondence of observed class characteristics (specific tread design and size), general wear, and randomly acquired characteristics of sufficient quality and quantity. The correspondence was observed in segments G to B (K7_2 and K1_2) of the known tire. The known tire was identified as having made the questioned impression depicted in Q3 based on a correspondence of observed class characteristics (specific tread design and size), general wear, and randomly acquired characteristics of sufficient quality and quantity. The correspondence was observed in segments E to G (K5_2 and K6_2) of the known tire. A limited association of class characteristics (tread design) was determined to exist between the known tire and the questioned impression depicted in Q4. Some correspondence was observed in segment B to C (K2_2) of the known tire, however there were significant limiting factors. Differences in wear and spacing between tread design elements was observed, however these differences lacked sufficient detail for a stronger conclusion. The known tire exemplar, as submitted, is unlikely to be the source of the impression, this does not preclude the possibility that wear and use changed the tire resulting in the observed differences.</p> |
| 9CY6P7-5351 | <p>Results and Interpretations: There was an identification between the Known Tire (segments C and D, and D and E) submitted known tire and the Q-1, questioned impression. The known tire was the source of, and made, questioned impression. Another tire being the source of the impression is considered a practical impossibility. There was an identification between the Known Tire (segments A and B) submitted known tire and the Q-2, questioned impression. The known tire was the source of, and made, questioned impression. Another tire being the source of the impression is considered a practical impossibility. There was an identification between the Known Tire (segments F and G) submitted known tire and the Q-3, questioned impression. The known tire was the source of, and made, questioned impression. Another tire being the source of the impression is considered a practical impossibility. The submitted known tire was excluded from being the source of the Q-4 questioned impression. Although the know tire was the same general design as the questioned impression, sufficient differences were noted in the comparison of class characteristics and wear and random acquired characteristics between the questioned impression and the known tire. The known tire was not the source of, and did not make the Q-4 questioned impression.</p> |
| AEK9X4-5351 | <p>Impression Q1 was made by the tire that made known imprints K3_2 and K4_2. Impression Q2 was made by the tire that made known imprints K1_2 and K7_2. Impression Q3 was made by the tire that made known imprint K6_2. Impression Q4 could have been made by the tire that made known imprint K2_2 based on class characteristics; however, a lack of detail precludes a more conclusive determination.</p> |
| AEZRH2-5355 | <p>Impression "Q1" corresponds in physical shape, physical size, tread design, general wear characteristics, pitch sequence, and individual characteristics with the respective portion of the submitted known Kumho Solus KR21 tire. "Q1" is identified as being made by the submitted known Kumho Solus KR21 tire. Impression "Q2" corresponds in physical shape, physical size, tread design, general wear characteristics, pitch sequence, and individual characteristics with the respective portion of submitted known Kumho Solus KR21 tire. "Q2" is identified as being made by the submitted known Kumho Solus KR21 tire. Impression "Q3" corresponds in physical shape, physical size, tread design, general wear characteristics, pitch sequence, and individual characteristics with the respective portion of the submitted known Kumho Solus KR21 tire. "Q3"</p> |

TABLE 2

| WebCode-Test | Conclusions |
|--------------|--|
| | is identified as being made by the submitted known Kumho Solus KR21 tire. Impression "Q4" corresponds in physical shape, physical size, tread design, and pitch sequence with the respective portion of the submitted known Kumho Solus KR21 tire. However, "Q4" does not correspond in general wear characteristics or individual characteristics with the respective portion of the submitted known Kumho Solus KR21 tire. "Q4" is excluded as being made by the submitted known Kumho Solus KR21 tire. |
| AGPWEE-5355 | Questioned imprints Q1, Q2, Q3, Q4 were compared to the known impressions of the recovered tire (Items K1 through K7) and photographs of the recovered tire (Items K1.2 through K7.2). Item Q1 was identified* as having been made by segments C-D and D-E. Item Q2 was identified* as having been made by segments A-B. Item Q3 was identified* as having been made by segments F-G. There were indications of non-association** when Item Q4 was compared to the known impressions of the recovered tire. *Identification - Questioned and known items share agreement of class and randomly acquired characteristics of sufficient quality and quantity. Highest degree of association. **Indications of non-association - Questioned item exhibits dissimilarities in comparison to the known item. Additional documentation, including notes and annotated images of the latent prints for both the primary and any verifiers, is retained as part of the case file and can be provided upon request. |
| B36VVU-5351 | The submitted Kumho Solus tire did not make any of the imprints Q1, Q2, Q3, or Q4. |
| CP9A4P-5351 | Q1 through Q4 were not made by the recovered Kumho tire. |
| DBPLUQ-5351 | Imprint 'Q1' : The conclusion about Q1 is A (Identification), and Imprint Q1 is associated with segments C-E. These items share sufficient characteristics and the same shapes of imprinted tire's sipes are found. Imprint 'Q2' : The conclusion about Q2 is C (Association of class characteristics), and Imprint Q2 is associated with segments G-B. The design and physical size and general wear between the questioned and known item have similarity, respectively. Imprint 'Q3' : The conclusion about Q3 is B (High degree of association), and Imprint Q3 is associated with segments E-G. These items have same design, physical size and similar wear and share the sipes characteristics generally. But it has undeterminable characteristics in some points, it concluded to B. Imprint 'Q4' : The conclusion about Q4 is F (Indications of non-association), and Imprint Q4 can be compared with segments B-C. These items have similar design and physical size, but the shapes of imprinted tire's sipes between the questioned and known item are different. |
| DJ233Q-5351 | Tire impressions suitable for comparison were noted in Exhibits Q1 - Q4. One (1) tire impression noted in Exhibit Q1 was made by the tire in Exhibits K3, K4, K3_2 and K4_2 (segments C-D, D-E) based on design, physical size, noise treatment, wear and randomly acquired characteristics. One (1) tire impression noted in Exhibit Q2 was made by the tire in Exhibits K7, K1, K7_2 and K1_2 (segments G-A, A-B) based on design, physical size, noise treatment, wear and randomly acquired characteristics. One (1) tire impression noted in Exhibit Q3 was made by the tire in Exhibits K6 and K6_2 (segment F-G) based on design, physical size, noise treatment, wear and randomly acquired characteristics. One (1) tire impression noted in Exhibit Q4 was not made by the tire in Exhibits K1 - K7 and K1_2 - K7_2 based on differences in wear. |
| DPRF2U-5351 | After examining the four impressions recovered from the scene and the impressions made for the suspect car tyre I come to the conclusion that Q1 was made by this tyre. Q2 I believe was not made by this tyre. Q3 I could not rule out as they had the same limited association of class characteristics. Q4 had some indicators of non association. |
| EJGJWJ-5355 | The impression Q1, Q2, and Q3 were identified as having been made by the tire represented by K1 through K7. The impression Q4 could have been made by the tire represented by K1 through K7; however, no identification or elimination could be made. |

TABLE 2

| WebCode-Test | Conclusions |
|--------------|--|
| EP8YLQ-5351 | <p>Q1- There is correspondence of design, physical size of design, degree and location of wear, as well as two Randomly Acquired Characteristics (RAC's) which correspond in size, shape, location, and orientation between questioned Impression Q1 and the known tire K1. This is an identification on the SWGTREAD scale. In my opinion the known tire K1 was the source of, and made, the questioned impression Q1. Another tire being the source of the impression is considered a practical impossibility. Q2- There is correspondence of design, physical size of design, degree and location of wear, as well as four Randomly Acquired Characteristics (RAC's) which correspond in size, shape, location, and orientation between questioned Impression Q2 and the known tire K1. This is an identification on the SWGTREAD scale. In my opinion the known tire K1 was the source of, and made, the questioned impression Q2. Another tire being the source of the impression is considered a practical impossibility. Q3- There is correspondence of design, physical size of design, degree and location of wear, as well as three Randomly Acquired Characteristics (RAC's) which correspond in size, shape, location, and orientation between questioned Impression Q3 and the known tire K1. This is an identification on the SWGTREAD scale. In my opinion the known tire K1 was the source of, and made, the questioned impression Q3. Another tire being the source of the impression is considered a practical impossibility. Q4- There is general correspondence of design and physical size of design between Q4 and the known tire K1, however there are significant differences in the degree of wear between Q4 and the known tire K1. The questioned impression has design elements worn away which are clearly present in the known tire K1 and in the known impression K1_2. This is an exclusion on the SWGTREAD scale. It is my opinion that the known tire K1 was not the source of, and did not make, the impression Q4.</p> |
| EXGKAK-5355 | <p>The photographs of the soles of the suspect tire and test imprints were visually examined and compared to the photographs of questioned imprints Q1 through Q4 using transparent overlays and printed copies of the submitted digital images. Item Q1-Q2 was converted to a black and white image using Adobe Photoshop Elements 12 to aid comparison. Based on a correspondence of physical size, design, wear characteristics, and randomly acquired characteristics of the known tires and the questioned imprints, it was determined that questioned imprint Q1 was made by segments C-E of the known tire and Q2 was made by segments G-B of the same tire. Based on a correspondence of physical size, design, wear characteristics, and some randomly acquired characteristics, it was determined there is a high degree of association between questioned imprint Q3 and segments E-G of the suspected tire. Based on a correspondence of physical size and design, questioned imprint Q4 exhibits an association of class characteristics with segment B-C of the suspected tire; however, no randomly acquired characteristics were observed to indicate a more definitive association.</p> |
| FNULJF-5351 | <p>It was determined that the impressions, Q-1, Q-2, and Q-3 were made by the submitted tire, K-1. It was also determined that the impression, Q-4, was not made by the submitted tire, K-1.</p> |
| FWYTYF-5351 | <p>Q1: The questioned tire imprint marked Q1 found on the plastic "Garage Sale" sign was found to have been made by the recovered tire from the suspect vehicle. Q2: The questioned tire imprint marked Q2 found on the plastic "Garage Sale" sign was very likely to be made by the recovered tire from the suspect vehicle. However, the possibility that another tire with similar class characteristics and wear could also have made the print cannot be ruled out. Q3: The questioned tire imprint marked Q3 found on the posterboard "Yard Sale" sign was very likely to be made by the recovered tire from the suspect vehicle. However, the possibility that another tire with similar class characteristics and wear could also have made the print cannot be ruled out. Q4: The questioned tire imprint marked Q4 found on the posterboard "Yard Sale" was found to have correspondence with the recovered tire from the suspect vehicle in terms of class characteristics and some dissimilarities in terms of the randomly acquired characteristics. The questioned tire imprint marked Q4 was unlikely to have been made by the recovered tire from the suspect vehicle.</p> |
| G2QHUD-5355 | <p>Test impressions from the submitted tire were used for comparison to questioned impressions Q1, Q2, Q3, and Q4. The tire impressions in Q1, Q2, and Q3 were made by the submitted</p> |

TABLE 2

| WebCode-Test | Conclusions |
|--------------|---|
| GTE4AW-5355 | <p>tire. The tire impression in Q4 was not made by the submitted tire.</p> <p>The Q1, Q2 and Q3 impressions correspond with the respective portions of the known tire in physical size and design, general condition of wear, specific locations of wear, and a number of randomly acquired characteristics. Therefore, the known tire is identified as the source of the Q1, Q2, and Q3 impressions. The Q4 impression corresponds with the respective portions of known tire in physical size and design, and general condition of wear. However, the known tire exhibits dissimilarities in specific locations of wear and randomly acquired characteristics with the respective portions of the known tire. Although these dissimilarities are not sufficiently clear to allow for an exclusion of the known tire, the evidence indicates a likelihood of non-association between the known tire and Q4 impression.</p> |
| LB2BBA-5351 | <p>The questioned imprint Q1 shares agreement of class characteristics and randomly acquired characteristics of sufficient quality and quantity with the recovered tire (Kumho Solus KR21, P185/65 R14) and the known imprints (K3_2 - segment C-D and K4_2 - segment D-E), which were made with the tire. The recovered tire was the source of, and made, the questioned imprint Q1. Another item of tire being the source of the imprint is considered a practical impossibility. The class characteristics of both design and physical size correspond between the questioned imprint Q2 and the known imprints (K7_2- segment G-A and K1_2 - segment A-B) and the questioned imprint Q3 and known imprints (K5_2 - segment E-F and K6_2 - segment F-G). The characteristics observed exhibit strong associations between the questioned imprint Q2 and the known tire. The quality of the questioned imprint and the known imprints were insufficient for an identification. The known tire is a possible source of the questioned imprint Q3 and therefore could have produced the imprint. Sufficient differences were noted in the comparison of class characteristics between the questioned imprint Q4 and the known imprints (K2_2 - segment B-C and K3_2 - segment C-D) of the tire. The recovered tire was not the source of, and did not make, the questioned imprint Q4.</p> |
| NDGKD8-5355 | <p>From our investigations, it results that : The tire impression from Q1 (plastic "garage sale" sign) matches with segments C-E. The same sculpture succession is found on the tire tread and on the impressions of Q1. An identical characteristic shape is similar located on the tires segment D-E and on the impression Q1. The tire impression from Q2 (plastic "garage sale" sign) matches with segment A-B. The same sculpture succession is found on the tire tread and on the impressions of segment Q2. The tire which had let the impression from Q2 could present the same wear level than the tire from the suspected vehicle. The tire impression from Q3 (posterboard "yard sale" sign) matches with segment F-G. The same sculpture succession is found on the tire tread and on the impressions of segment Q3. The tire which had let the impression from Q3 could present the same wear level than the tire from the suspected vehicle. The tire impression from Q4 (posterboard "yard sale" sign) matche with segment B-C. The same sculpture succession is found on the tire tread and on the impressions of segment Q4. The tire which had let the impression from Q4 could present the same wear level than the tire from the suspected vehicle. To conclude : The tires impressions Q1 to Q4 corresponding with tire KUMHO Solus KR21 size 185 (same size, same wear and same sculptures successions) Only Q1 have an identical characteristic shape is similar located on the tires segment D-E.</p> |
| PNDRUN-5351 | <p>1) Impression Q1 was made by the submitted tire (items K3_2 & K4_2 (segments C-E)). 2) Impression Q2 was made by the submitted tire (item K1_2 (segment A-B)). 3) Impression Q3 was made by the submitted tire (item K6_2 (segment F-G)). 4) Impression Q4 could have been made by the submitted tire (item K2_2 (segment B-C)). based on class characteristics; however, there were no significant individual characteristics to suggest that it was.</p> |
| Q3BJQD-5351 | <p>The evidence in items 1C (CTS# Q1-Q2) and 1D (CTS# Q3-Q4) was visually examined for impression evidence. Four (4) partial tire track impressions of value (Q1, Q2, Q3, and Q4) were determined to be present on the evidence in items 1C (CTS# Q1-Q2) and 1D (CTS# Q3-Q4). The four (4) partial tire track impressions of value (Q1, Q2, Q3, and Q4) in items 1C (CTS# Q1-Q2) and 1D (CTS# Q3-Q4) were visually examined and compared against the tire</p> |

TABLE 2

| WebCode-Test | Conclusions |
|--------------|--|
| | <p>in item 1A (CTS# K1-K7) and the known imprints in item 1B (CTS# K1_2-K7_2). Three (3) partial tire track impressions of value (Q1, Q2, and Q3) in items 1C (CTS# Q1-Q2) and 1D (CTS# Q3-Q4) were determined to have been made by the tire in item 1A (CTS# K1-K7). One partial tire track impression of value (Q4) in item 1D (CTS# Q3-Q4) was determined not to have been made by the tire in item 1A (CTS# K1-K7). Further analysis is pending submission of an additional tire for comparison.</p> |
| Q786HF-5355 | <p>The questioned imprints (Q1 and Q2) found on the plastic "Garage Sale" sign and the questioned imprint (Q3) on the posterboard "Yard Sale" were made by the recovered tire. The questioned imprint (Q4) found on the posterboard "Yard Sale" have the same class characteristics with the recovered tire, however, the questioned imprint Q4 also exhibited dissimilarities with the recovered tire; the available information was not sufficient to permit an exclusion.</p> |
| TJQA63-5351 | <p>The partial tire impression labeled Q1 corresponds in design, physical size, general wear and some individual characteristics with the known tire and was most likely made by it. The partial tire impression labeled Q2 was identified as having been made by the known tire. The partial tire impressions labeled Q3 and Q4 correspond in design, physical size and general wear with the known tire and either one could have been made by it or by another tire with similar characteristics.</p> |
| TYKYXD-5351 | <p>I conducted a comparative examination of the four questioned impressions Q1, Q2, Q3 and Q4 to the test impressions made with the suspect tyre. The results of my examinations are as follows: Q1. There was a high degree of association found between the Q1 impression and the letter "D" area which straddled the section C-E impressions from the suspect tyre (shown in the top of the C-D and D-E photos). A lack of clarity and the number of sufficiently distinctive features in the impressions prevent a more definitive conclusion being made. Q2, Q3 and Q4. The results of these three comparisons were inconclusive. The overall tread pattern in Q2, Q3 and Q4 was the same as found on various areas of the test made impressions from the suspect tyre. However a lack of clarity and the number of sufficiently distinctive features in these impressions prevent a more definitive conclusion being made.</p> |
| U6PVHD-5355 | <p>In my opinion, the tire impressions Q1, Q2 and Q3 could have been made by the Kumho Solus KR21 tire or any other tire tread with the same physical size, shape, pattern, degree of wear and randomly acquired characteristics. In my opinion, the tire impression Q4 could have been made by the Kumho Solus KR21 tire or any other tire tread with the same physical size, shape and pattern.</p> |
| ULE64F-5355 | <p>In the opinion of the examiner, the known tire (K1-K7) was not the source of, and did not make, the impression Q4. Due to the differences in tread design, K1-K7 could not have made this questioned impression. The known tire (K3) was the source of, and made, the questioned impression Q1. Another tire being the source of the impression is considered a practical impossibility. The known tire (K1) was the source of, and made, the questioned impression Q2. Another tire being the source of the impression is considered a practical impossibility. The known tire (K6) was the source of, and made, the questioned impression Q3. Another tire being the source of the impression is considered a practical impossibility.</p> |
| UYFYD4-5355 | <p>A. Imprint Q1 is a partial imprint of a tire and it corresponds in shape, design, size and in some wear and individual characteristics with the C-E segments of the suspect tire. It is my opinion there is Identification between the suspected tire (K1-K7) and this imprint. B. Imprint Q2 is a partial imprint of a tire and it corresponds in shape, design, size and in some wear and individual characteristics with the G-B segments of the suspect tire. It is my opinion there is Identification between the suspected tire (K1-K7) and this imprint. C. Imprint Q3 is a partial imprint of a tire and it corresponds in shape, design, size and in some wear and individual characteristics with the E-G segments of the suspect tire. It is my opinion there is Identification between the suspected tire (K1-K7) and this imprint. D. Imprint Q4 is a tire imprint and it corresponds in shape, design and size but differ in the wear and individual characteristics from</p> |

TABLE 2

| WebCode-Test | Conclusions |
|--------------|--|
| | the segments K1-K7 of the suspected tire. It is my opinion there is Association of class characteristics between the suspected tire (K1-K7) and this imprint. |
| W3THB4-5351 | Compare the imprints recovered at the scene with photographs imprints made with the recovered tire reveal that: 1) The imprints in item Q1, Q2, Q3, Q4 has same shape and size. 2) The imprints in item Q2 has the same imprints in segments GA-AB. and made with the recovered tire. 3) The imprints in item Q1, Q3 and Q4 made from another tire. |
| WBJ2QX-5355 | Impressions Q1 and Q3 display similar tread pattern size and design to the submitted tire [Q1 to K3_2 (Segment C-D) through K4_2 (Segment D-E) and Q3 to K5_2 (Segment E-F) through K6_2 (Segment F-G)]; however, no identification or elimination could be made. Impression Q2 was made by the submitted tire [K7_2 (Segment G-A) through K1_2 (Segment A-B)]. Impression Q4 was not made by the submitted tire. |
| Y9PZXE-5351 | Q1 through Q3 could have been made by the submitted Kumho tire based on class characteristics, general wear, and some individual characteristics; however, insufficient detail prohibits a more conclusive finding. Q4 could have been made by the submitted Kumho tire based on class characteristics; however there are no individual characteristics to suggest that it was. |
| YFCK72-5351 | The questioned imprints Q1, Q2 and Q3 were identified as having being made by the recovered tires as observed on the photographs. Q1 had a highest degree of association with class and random characteristics between C and E. Q2 had a highest degree of association with class and random characteristics between A and B. Q3 had a highest degree of association with class and random characteristics between F and G. Q4 exhibited class and random characteristics different to the photos of the recovered tires. |
| YTGZRW-5351 | In this test we used TrasoScan system and Lucia Forensic 7.40 program. We compared photographs of the tire K1-K7 and their imprints (K1_2-K7_2) with photographs of questioned imprints (Q1-Q2). Comparisons concerned the physical size and shape of the tire, the tires design and random individual identifying characteristics. From the performed comparative analysis we observed that on the surface of the tires, being the comparative material, there were present some individual identifying characteristics. Similar individual characteristics were also found in the evidence material marked Q1 and Q2 and therefore, we assigned grade A to them. Items Q3 and Q4 demonstrated the similarity only in the physical size, shape and design of the tires to comparative materials. Items Q3 and Q4 revealed also some individual characteristics that could be classified as possible general wear in comparison to the known materials and therefore, we assigned grade C to them. |
| ZA3NY7-5351 | Impressions Q1, Q2, and Q3, are similar in class characteristics and wear to the known tire. Impressions Q1, Q2, and Q3, have randomly acquire characteristics that are present on the known tire. The known tire made impressions Q1, Q2, and Q3. Impression Q4 is similar in class characteristics to the known tire. Impression Q4 is dissimilar in wear to the known tire. Impression Q4 does not have the randomly acquired characteristics that are present on the known tire. The known tire is no available for further analysis; therefore, it can't be eliminated as the source of Q4. Impression Q4 shows indications of non-association to the known tire. |
| ZU7QC2-5351 | In my opinion, my findings provide conclusive support for the proposition that two tyre impressions present on the 'Garage Sale' sign have been made by the submitted tyre. In my opinion, my findings provide conclusive support for the proposition that one of the tyre impressions present on the 'Yard Sale' sign has not been made by the submitted tyre. |

Additional Comments

TABLE 3

| WebCode-Test | Additional Comments |
|--------------|--|
| 43Q2D7-5351 | Please make the known imprints be less patchy and show the various marks from the tire more clearly. Also please take the images of the known tire with somewhat oblique lighting so any randomly acquired characteristics appear more clearly. Lastly, specify in the instructions if reporting the tire sections on the answer sheet (e.g. B-C) were expected or required for exclusion conclusions. |
| 4WXWJ3-5355 | The appearance of the tire was very specific and highly detailed. Though the submitted pictures of the tire (K1-K7) were of good quality, having access to the actual tire would have been valuable and helpful in confirming the observed details. |
| 796N2T-5351 | Another tire of the same size, wear and tire tread design as the tire in Submission K made the partial, questioned tire track impression, Q4. |
| DJ233Q-5351 | while there were a few elements from segment E-F in the Q3 impression, there were not enough confirmable randomly acquired characteristics. |
| EP8YLQ-5351 | Inked known impressions should be better quality. Suggest replicate set of known inked impression for RAC examination of replication and wear. Suggest photographs of known tire with some oblique lighting |
| LB2BBA-5351 | The quality of the known imprints was insufficient. |
| NDGKD8-5355 | Regarding Q1, according to our method, we should consider 3D tireprint to take in consideration its general wear in order to answer "A". In this case we are asked to consider 2D tireprint, and as consequence, we answered "B" as far as the defaults. |
| Q786HF-5355 | Without the duplicate of the control imprint made by the recovered tire, the reproducibility of the control imprint made by the recovered tire could not be assessed. |
| TJQA63-5351 | The individual characteristics observed were limited to the outermost ribs of the tire impressions. Clearly visible individual characteristics in the form of cuts/nicks observed on the photographs of the known tires did not reproduce on the question or test impressions. |
| TYKYXD-5351 | This test was challenging and problematic for a number of reasons; I believe it was poorly presented overall. This definitely impacted on my ability to arrive at reliable conclusions. The underlying print on the sign (Q1 and Q2) and the marker print and impression overlap (Q3 and Q4) also contributed to the difficulty in making determinations. However, the three points outlined below, taken in combination, are such that making an "inconclusive" finding for Q2, 3 & 4 is the only appropriate (and rightly conservative) response. Q1 is quite likely to have been made by the suspect tyre, but under the circumstances it would be foolhardy to report Q1 as an Identification. Only one set of test impressions were provided. How can the examiner then assess how reliably any of the features are reproducing? It is not possible without a second set; in this test I can see there is a wide variation in the quality and quantity of the marks in the impressions. In casework I would make at least two (or more) sets of test impressions which would then allow me to see what does and does not reliably reproduce, the quality of that reproduction and the overall number of distinctive and random features available for comparison. If the patterns between two sets of test impressions from the same tyre show a low level of correspondence, how can a questioned impression then be compared with any confidence? This lack of a second test set greatly affects my ability to make confident conclusions. There is a marked difference in the density of the ink used to make the questioned impressions and the test impressions. This has created a large range of variation in the detail in the impressions, which affects the clarity of most of the distinctive features. If this occurred in casework, I would try and make as similar as possible the depth and density of test impression in my tests as seen in the questioned impressions. Otherwise like is not being compared with like. The variation between the questioned impressions being quite dark as compared to the much lighter test impressions greatly affects my ability to make confident conclusions. The letter markings in red on the test tyre impressions to indicate where segments meet are often misleading in position, if not in the |

TABLE 3

| WebCode-Test | Additional Comments |
|--------------|--|
| | <p>wrong position; ie the wrong lug is indicated. Aligning the pattern of edge lugs on the tyre photos to the corresponding test impressions reveal this to be true. I suggest that in future the edge of the tyre itself is clearly marked with the letters right next to an edge lug, so that there can be no ambiguity as to which lug on the tyre aligns with which lug on the test imprint. I would do this in casework to quickly and accurately orientate each area, so why not do it more clearly and accurately in these tests?</p> |
| WBJ2QX-5355 | <p>Q1 displays some possible areas of unique wear and some possible individual features. These areas cannot be reconciled to the image of the tyre provided and possible individual areas are poorly represented in the provided test impressions. Further examination of the physical tyre and better quality test impressions advised. Q2 displays multiple areas of distinct wear and individual features that can be reconciled to the provided images of the tyre and the provided test impressions. Q3 displays similar general wear to the submitted tyre. Details of wear and one potential individual feature cannot be reconciled to the image of the tyre provided. Further examination of the physical tyre and better quality test impressions advised. Q4 displays similar tread pattern size and design to the submitted tyre (K2_2 (Segment C-B) through K3_2 (Segment B-A), flip test upside down); elimination based on distinct differences in wear patterns to the submitted tyre as well as one discrepancy in the sequence of the opposite rib (one element size difference = 2 mm).</p> |
| ZA3NY7-5351 | <p>It would have been helpful to have two sets of known impressions. One light and one heavy known rolled tyre similar to what is sent for the shoe impression tests.</p> |
| ZU7QC2-5351 | <p>It was noted that the photographs of the actual tyre were found to be relatively dark. Consequently, some of the finer detail evident in the test impressions, that also corresponded to features present in the scene impressions, could not be clearly visualised in the photographs of the corresponding area of the tyre.</p> |

-End of Report-
(Appendix may follow)

Appendix: Data Sheet

Collaborative Testing Services ~ Forensic Testing Program

Test No. 18-5351: Tire Track Imprint Evidence

DATA MUST BE RECEIVED BY September 10, 2018 TO BE INCLUDED IN THE REPORT

Participant Code:

WebCode:

Accreditation Release Statement

CTS submits external proficiency test data directly to ASCLD/LAB, ANAB, and A2LA. Please select one of the following statements to ensure your data is handled appropriately.

- This participant's data is intended for submission to ASCLD/LAB, ANAB, and/or A2LA. (Accreditation Release section on the last page must be completed and submitted.)
- This participant's data is **NOT** intended for submission to ASCLD/LAB, ANAB, or A2LA.

Scenario:

Police are investigating a pedestrian hit and run incident near a yard sale event. Tire track imprints were recovered on several items found near the event, and it is believed that they may have been left by the suspect vehicle. A day after this incident, a vehicle matching witness descriptions was located approximately 25 miles from the site. Investigators were able to recover one tire directly from the vehicle. You are asked to compare the imprints recovered at the scene with photographs of the tire and known imprints made with the tire. The recovered tire contains the following information on the sidewall: Kumho Solus KR21 P185/65 R14 85T M&S; DOT YOLA YP6V 4310.

Known, inked imprints (K1_2 through K7_2) have been labeled with an arrow to indicate directionality of movement. These inked imprints were made by placing the vehicle in neutral, and then pushing it across inking material and a continuous piece of white containerboard.

Items Submitted (Sample Pack TIEP):

- K1-K7: Photographs of the recovered tire (segments), lighted from above.
- K1_2-K7_2: Photographs of known imprints made with the recovered tire (segments).
- Q1-Q2: Photographs of questioned imprints found on a plastic "Garage Sale" sign.
- Q3-Q4: Photographs of questioned imprints found on a posterboard "Yard Sale" sign.

Please return all pages of this data sheet.

Page 1 of 4

Participant Code:

WebCode:

Instructions:

Select from the following list of conclusions and insert the appropriate letter in the spaces provided. If the wording below differs from the normal wording of your conclusions, adapt these conclusions as best you can and use your preferred wording in your written conclusions. These conclusions are adapted from the SWGTREAD Range of Conclusions standard.

- A. **Identification** - Questioned and known items share agreement of class and randomly acquired characteristics of sufficient quality and quantity. Highest degree of association.
- B. **High degree of association** - Correspondence of class characteristics, in addition to unusual wear and/or one or more randomly acquired characteristics between the questioned and known item.
- C. **Association of class characteristics** - Correspondence of design and physical size and possibly general wear between the questioned and known item.
- D. **Limited association of class characteristics** - Some similar class characteristics between the questioned and known item with significant limiting factors.
- E. **Inconclusive*** - Questioned item lacks sufficient detail for a meaningful conclusion in comparison to the known item. *(adapted from SWGTREAD "Lacks sufficient detail" conclusion)*
- F. **Indications of non-association** - Questioned item exhibits dissimilarities in comparison to the known item.
- G. **Exclusion** - Questioned and known items exhibit sufficient differences of class and/or randomly acquired characteristics. Highest degree of non-association.

**Should the response "E" be used, please document the reason in the Additional Comments section of this data sheet.*

1.) Indicate the results of your comparisons of the recovered tire with the questioned imprints by writing the letter of your conclusion next to each questioned imprint in the table.

If an identification or positive association is made (A-D), indicate to which segment(s) of the tire the association has been made (indicate the letters at the beginning and end of the corresponding segments).

Example:

| <u>Imprint</u> | <u>Segment(s)</u> | <u>Imprint</u> | <u>Segment(s)</u> |
|------------------|-----------------------------|------------------|-----------------------------|
| Q1: <u> B </u> | <u> C </u> - <u> E </u> | Q2: <u> A </u> | <u> G </u> - <u> H </u> |

| <i>Plastic Sign</i> | | <i>Posterboard</i> | |
|---------------------|-------------------|--------------------|-------------------|
| <u>Imprint</u> | <u>Segment(s)</u> | <u>Imprint</u> | <u>Segment(s)</u> |
| Q1: _____ | ____ - ____ | Q3: _____ | ____ - ____ |
| Q2: _____ | ____ - ____ | Q4: _____ | ____ - ____ |

Participant Code:

WebCode:

2.) What would be the wording of the Conclusions in your report?

3.) Additional Comments

| | |
|--|---|
| <p>Return Instructions: Data must be received via online data entry, fax (please include a cover sheet), or mail by <i>September 10, 2018</i> to be included in the report. Emailed data sheets are not accepted.</p> <p>QUESTIONS? TEL: +1-571-434-1925 (8 am - 4:30 pm EST) EMAIL: forensics@cts-interlab.com www.ctsforensics.com</p> | <p>Participant Code:</p> <p>ONLINE DATA ENTRY: www.cts-portal.com</p> <p>FAX: +1-571-434-1937</p> <p>MAIL: Collaborative Testing Services, Inc. P.O. Box 650820 Sterling, VA 20165-0820 USA</p> |
|--|---|

Please return all pages of this data sheet.

Collaborative Testing Services ~ Forensic Testing Program

RELEASE OF DATA TO ACCREDITATION BODIES

The following Accreditation Releases will apply only to:

Participant Code:

WebCode:

for Test No. **18-5351: Tire Track Imprint Evidence**

This release page must be completed and received by **September 10, 2018** to have this participant's submitted data included in the reports forwarded to the respective Accreditation Bodies.

Have the laboratory's designated individual complete the following steps **only if your laboratory is accredited in this testing/calibration discipline** by one or more of the following Accreditation Bodies.

Step 1: Provide the applicable Accreditation Certificate Number(s) for your laboratory

ANAB Certificate No. _____
(Include ASCLD/LAB Certificate here)

A2LA Certificate No. _____

Step 2: Complete the Laboratory Identifying Information in its entirety

Signature and Title _____

Laboratory Name _____

Location (City/State) _____

Accreditation Release

Return Instructions

Please submit the completed Accreditation Release at the same time as your full data sheet. See Data Sheet Return Instructions on the previous page.

*Questions? Contact us 8 am-4:30 pm EST
Telephone: +1-571-434-1925
email: forensics@cts-interlab.com*

Please return all pages of this data sheet.