Appendix A

Joint Claim Construction Chart

APPENDIX A.
JOINT CLAIM CONSTRUCTION CHART
IDENTIFICATION OF DISPUTED TERMS

AMSTED RAIL COMPANY, INC., v. HUM INDUSTRIAL TECHNOLOGY, INC., and BRENT WILSON
Civil Action No. 4:22-cv-00445-AGF

PATENT CLAIM	PLAINTIFF'S PROPOSED CONSTRUCTION	DEFENDANTS' PROPOSED CONSTRUCTION
1. "housing" **The '223 patent, claim 2.** 2. A system for monitoring a railcar, comprising: a plurality of sensor devices located on the railcar for monitoring parameters or conditions of the railcar, each of said sensor devices being separate from one another and including a sensor for monitoring one of said parameters or conditions of the railcar; said plurality of sensor devices including at least one temperature sensor device having: a **housing**; a temperature sensor in thermal communication with an item of the railcar for which the temperature is being	"an enclosure" ***Intrinsic Evidence***[1] • The '223 patent, FIGS. 1, 2, 3 and 3A; 3:60-63, 4:5-14, 4:23-29, and 15:19-24.) ***Extrinsic Evidence*** • Expert Testimony of John Martens.[2] • Plaintiff reserves the right to rely on any intrinsic and/or extrinsic evidence identified by Defendants.	"one or more parts that covers, encloses, supports, or protects other components" ***Intrinsic Evidence*** • '223 Patent, 3:60-4:29; 6:8-64; 15:18-24. ***Extrinsic Evidence*** Expert Testimony of Mr. Steven Ricca.[3] Defendants may also rely on the following dictionary definitions for "housing": HUM0061847, HUM0061889, HUM0061965, HUM0062009, HUM0062051, HUM0062180.

[1] Citations to the specification of the '223 Patent also apply to the '673 patent as they share a common specification.
[2] Pursuant to Local Patent Rule 4-3(b)(iv), Plaintiff is submitting an Expert Report of John Martens with this Joint Prehearing Statement and Claim Construction Chart. The Expert Report of John Martens is further incorporated by reference in its entirety as if fully set forth herein for each claim term identifying John Marten's expert testimony as extrinsic evidence.
[3] Pursuant to Local Patent Rule 4-3(b)(iv), Defendants are submitting a Declaration of Mr. Steven Ricca with this Joint Prehearing Statement and Claim Construction Chart. The Declaration of Mr. Steven Ricca is further incorporated by reference in its entirety as if fully set forth herein for each claim term identifying Mr. Ricca's expert testimony as extrinsic evidence.

monitored, which item is external to said housing; electrical circuitry in communication with said temperature sensor for obtaining information regarding the temperature being sensed, said electrical circuitry positioned within said housing; a power source electrically connected to said electrical circuitry for providing power thereto, said power source positioned within said housing; a communication device capable of broadcasting information regarding the temperature sensed via wireless communication, said communication device positioned within said housing; and a communication management unit, mounted on the railcar, capable of two way wireless communication with each of said plurality of sensor devices for receiving information therefrom, said communication management unit having a wireless communication device for broadcasting information about the parameter or condition being monitored.		Defendants may also rely on the following extrinsic evidence: HUM0002770; HUM0003936. Defendants reserve the right to rely on any intrinsic and/or extrinsic evidence identified by Plaintiff.
2. "communication management unit" **The '223 patent, claim 2.** 2. A system for monitoring a railcar, comprising: a plurality of sensor devices located on the railcar for monitoring parameters or	"a single device capable of receiving and transmitting information" ***Intrinsic Evidence***	"a device capable of receiving data and/or alarms from one or more motes (e.g., sensor units) and capable of transmitting data and alarm information to a remote receiver"

conditions of the railcar, each of said sensor devices being separate from one another and including a sensor for monitoring one of said parameters or conditions of the railcar; said plurality of sensor devices including at least one temperature sensor device having: a housing; a temperature sensor in thermal communication with an item of the railcar for which the temperature is being monitored, which item is external to said housing; electrical circuitry in communication with said temperature sensor for obtaining information regarding the temperature being sensed, said electrical circuitry positioned within said housing; a power source electrically connected to said electrical circuitry for providing power thereto, said power source positioned within said housing; a communication device capable of broadcasting information regarding the temperature sensed via wireless communication, said communication device positioned within said housing; and a **communication management unit**, mounted on the railcar, capable of two way wireless communication with each of said plurality of sensor devices for	• The '223 patent, FIG. 6; 2:55-59, 3:51-53, 5:12-23, 5:65-6:7, 6:65-8:4, 11:29-38. • The '915 patent, FIGS. 1-3; 1:66-2:20, 3:21-4:15, 4:8-15, 8:17-30, 8:65-9:7, 16:54-17:20. ***Extrinsic Evidence*** • AMSTED019591 (Unit, (3), Merriam-Webster Online Dictionary, archived by The Wayback Machine February 19, 2010.) • Expert Testimony of John Martens. • Plaintiff reserves the right to rely on any intrinsic and/or extrinsic evidence identified by Defendants.	***Intrinsic Evidence*** • '223 patent, Abstract; 2:55-3:7; 3:48-59; 4:66-5:23; 5:57-6:7; 6:65-8:10; 11:29-45 (and corresponding portions of the '673 Patent). • '915 patent, FIGS. 3, 8 and 11; 3:21-4:15; 4:47-53; 6:37-46; 7:45-10:54; 11:28-17:41. '223 File History, including: • March 15, 2013 Application • September 13, 2013 Preliminary Amendment • November 4, 2014 Non-Final Rejection • May 1, 2015 Reply to Office Action • August 24, 2015 Final Rejection • January 27, 2016 Amendment and Request for Continued Examination • February 10, 2016 Notice of Allowance ***Extrinsic Evidence*** Expert Testimony of Mr. Steven Ricca. Defendants reserve the right to rely on any intrinsic and/or extrinsic evidence identified by Plaintiff.

receiving information therefrom, said **communication management unit** having a wireless communication device for broadcasting information about the parameter or condition being monitored. **The '223 patent, claim 5.** 5. A system for monitoring the operation of a railcar comprising: a. one or more sensor units mounted on said railcar, each of said sensor units monitoring an operating parameter of said railcar wherein each of said sensor units comprises a sensor, a power source, a processor, memory, communications circuitry, and software, stored in said memory and executed by said processor, said software performing the functions of collecting data from said sensor at periodic intervals; and b. a **communication management unit**, mounted on said railcar, said **communication management unit** in wireless communication with said one or more sensor units; wherein said **communication management unit** applies heuristics to analyze data collected from said one or more sensor units (a) to determine if an actual failure exists and		

(b) to predict potential or imminent failures based on a statistical analysis of said collected data. **The '223 patent, claim 10.** 10. The system of claim 5 wherein said one or more sensor units and said **communication management unit** are in wireless communication with each other and form a local area wireless network for said railcar. **The '223 patent, claim 26.** 26. The system of claim 2 wherein said **communication management unit** applies heuristics to analyze data collected from said one or more sensor devices (a) to determine if an actual failure exists and (b) to predict potential or imminent failures based on a statistical analysis of said collected data. **The '223 patent, claim 32.** 32. The system of claim 5 wherein said **communication management unit** is capable of communicating with a remote location located off of a train of which said railcar is a part. **The '673 patent, claim 14.** 14. A method for monitoring the operation of a railcar performed by a **communication management unit**		

disposed on said railcar comprising the steps of: a. wirelessly receiving data from one or more sensing units which periodically collect readings from one or more sensors disposed on said railcar; b. heuristically analyzing said received data to determine if an actual failure exists on said railcar or to predict potential or imminent failures based on a statistical analysis of said received data; and c. communicating the results of said analysis to an off-railcar location. **The '673 patent, claim 21.** 21. A method for monitoring the operation of a railcar comprising: a. collecting data at periodic intervals about one or more operating parameters of said railcar using one or more sensor units provided on said railcar; b. communicating said collected data to a **communication management unit**; c. analyzing said collected data by applying heuristics thereto to (i) determine if an actual failure exists and (ii) to predict potential or imminent failures based on a statistical analysis of said collected data. **The '915 patent, claim 1.**		

1. A system for detecting operational anomalies on a train consist or railcar comprising: (a) one or more **communication management units** mounted on one or more railcars; (b) one or more sensors located on said one or more railcars configured to sense an operational parameter of said one or more railcars, said sensors being in communication with said one or more **communication management units**, wherein the one or more sensors comprise one or more sensors configured to measure accelerations of the railcar; and (c) one or more filters configured to filter at least a portion of the accelerations, wherein said **communication management units** perform the functions of: (i) collecting data regarding said one or more railcar operational parameters; (ii) analyzing said collected data for trends or events indicative of an anomalous operational condition; and (iii) communicating a message to a remote receiver when said trend or event is detected. **The '915 patent, claim 21.** 21. The system of claim 1 wherein at least one of said **communication management units** includes at least one of said sensors.		

The '915 patent, claim 25. 25. The system of claim 1, further comprising one or more wireless sensor nodes in communication with at least one of the **communication management units**, wherein the one or more sensors form part of the one or more wireless sensor nodes, wherein one or more of the wireless sensor nodes comprises a microprocessor configured to execute firmware to control operation of the one or more of the wireless sensor nodes, wherein the firmware comprises one or more software filters configured to isolate one or more types of accelerations. **The '915 patent, claim 30.** 30. A method for detecting operational anomalies on a train consist or railcar comprising the steps of: sensing, by one or more sensors located on one or more railcars, one or more operational parameters of the one or more railcars, wherein the one or more operational parameters comprise one or more accelerations of the one or more railcars; filtering, by one or more filters, at least a portion of the accelerations; and by one or more **communication management units** associated with the one or more railcars:		

collecting data regarding said one or more railcar operational parameters; analyzing said collected data for trends or events indicative of an anomalous operational condition; and communicating a message to a remote receiver when said trend or event is detected.		
3. "heuristics", "a heuristic", or "heuristically analyzing" **The '223 patent, claim 5.** 5. A system for monitoring the operation of a railcar comprising: a. one or more sensor units mounted on said railcar, each of said sensor units monitoring an operating parameter of said railcar wherein each of said sensor units comprises a sensor, a power source, a processor, memory, communications circuitry, and software, stored in said memory and executed by said processor, said software performing the functions of collecting data from said sensor at periodic intervals; and b. a communication management unit, mounted on said railcar, said communication management unit in wireless communication with said one or more sensor units; wherein said communication management unit applies **<u>heuristics</u>** to analyze data collected from said one or	Not indefinite "one or more rules to be applied to data" ***Intrinsic Evidence*** • The '223 patent, 1:65-2:1, 2:66-3:3, 2:60-62, 8:5-10, Table at cols. 8-12, 11:39-45 ***Extrinsic Evidence*** • AMSTED019555 (Heuristic, (1)(b), Oxford English Dictionary (2nd ed. 1989).) • AMSTED019555 (Heuristic, (2), Oxford English Dictionary (3rd ed. 2014).) • Expert Testimony of John Martens. • Plaintiff reserves the right to rely on any intrinsic and/or extrinsic evidence identified by Defendants.	Indefinite, or alternatively: "one or more rules to be applied to data to assist in drawing inferences from said data" ***Intrinsic Evidence*** • '223 Patent, 1:14-20; 1:65-2:17; 2:55-3:7; 8:5-10; Table at Cols. 8-12 (8:11-11:28); 11:39-45 (and corresponding portions of the '673 Patent). <u>'223 File History, including:</u> • March 15, 2013 Application • September 13, 2013 Preliminary Amendment • November 4, 2014 Non-Final Rejection • May 1, 2015 Reply to Office Action • August 24, 2015 Final Rejection

more sensor units (a) to determine if an actual failure exists and (b) to predict potential or imminent failures based on a statistical analysis of said collected data. **The '223 patent, claim 26.** 26. The system of claim 2 wherein said communication management unit applies **heuristics** to analyze data collected from said one or more sensor devices (a) to determine if an actual failure exists and (b) to predict potential or imminent failures based on a statistical analysis of said collected data. **The '673 patent, claim 1.** 1. A method of monitoring operational characteristics of a railcar comprising the steps of: a. receiving data or processed information regarding said operational characteristic from one or more sensing units on said railcar, said sensing units monitoring an operational characteristic of said railcar; b. applying **a heuristic** to said received data to determine deviations from nominal operating conditions; c. assigning a severity level to said deviations from nominal operating conditions; and d. determining an alarm condition based on said assigned severity level.		• January 27, 2016 Amendment and Request for Continued Examination • February 10, 2016 Notice of Allowance '673 File History, including: • May 18, 2016 Application • November 7, 2016 Preliminary Amendment • January 5, 2017 Preliminary Amendment • June 29, 2017 Non-Final Rejection • October 13, 2017 Response to Office Action • January 29, 2018 Notice of Allowance ***Extrinsic Evidence*** Expert Testimony of Mr. Steven Ricca. Defendants may also rely on the following dictionary definitions for "heuristics": HUM0061844, HUM0061929, HUM0061962, HUM0062006, HUM0062048, HUM0062099, HUM0062144, HUM0062177.

The '673 patent, claim 14. 14. A method for monitoring the operation of a railcar performed by a communication management unit disposed on said railcar comprising the steps of: a. wirelessly receiving data from one or more sensing units which periodically collect readings from one or more sensors disposed on said railcar; b. **heuristically analyzing** said received data to determine if an actual failure exists on said railcar or to predict potential or imminent failures based on a statistical analysis of said received data; and c. communicating the results of said analysis to an off-railcar location. **The '673 patent, claim 21.** 21. A method for monitoring the operation of a railcar comprising: a. collecting data at periodic intervals about one or more operating parameters of said railcar using one or more sensor units provided on said railcar; b. communicating said collected data to a communication management unit; c. analyzing said collected data by applying **heuristics** thereto to (i) determine if an actual failure exists and (ii) to predict potential or imminent failures based on a statistical analysis of said collected data.		Defendants reserve the right to rely on any intrinsic and/or extrinsic evidence identified by Plaintiff.

4. "actual failure" **The '223 patent, claim 5.** 5. A system for monitoring the operation of a railcar comprising: a. one or more sensor units mounted on said railcar, each of said sensor units monitoring an operating parameter of said railcar wherein each of said sensor units comprises a sensor, a power source, a processor, memory, communications circuitry, and software, stored in said memory and executed by said processor, said software performing the functions of collecting data from said sensor at periodic intervals; and b. a communication management unit, mounted on said railcar, said communication management unit in wireless communication with said one or more sensor units; wherein said communication management unit applies heuristics to analyze data collected from said one or more sensor units (a) to determine if an **actual failure** exists and (b) to predict potential or imminent failures based on a statistical analysis of said collected data. **The '223 patent, claim 26.**	Plain and ordinary meaning, no construction necessary or provided. ***Intrinsic Evidence*** • The '223 patent, 1:14-15, 1:29-35, 1:39-44, 2:21-28, 2:55-64, 3:8-13, 13:3-37. ***Extrinsic Evidence*** • Expert Testimony of John Martens. • Plaintiff reserves the right to rely on any intrinsic and/or extrinsic evidence identified by Defendants.	"a state where the component is no longer capable of performing its intended function" ***Intrinsic Evidence*** • '223 Patent, 1:14-18; 1:29-35; 1:39-44; 2:25-28; 2:57-62; 3:8-13; 11:39-45; 13:23-40 (and corresponding portions of the '673 Patent). <u>'673 File History, including:</u> • May 18, 2016 Application • November 7, 2016 Preliminary Amendment • January 5, 2017 Preliminary Amendment • June 29, 2017 Non-Final Rejection • July 6, 2017 Information Disclosure Statement • October 13, 2017 Response to Office Action • January 29, 2018 Notice of Allowance ***Extrinsic Evidence*** Expert Testimony of Mr. Steven Ricca. Defendants may also rely on the following dictionary definitions for "actual" and

26. The system of claim 2 wherein said communication management unit applies heuristics to analyze data collected from said one or more sensor devices (a) to determine if an **actual failure** exists and (b) to predict potential or imminent failures based on a statistical analysis of said collected data. **The '673 patent, claim 14.** 14. A method for monitoring the operation of a railcar performed by a communication management unit disposed on said railcar comprising the steps of: a. wirelessly receiving data from one or more sensing units which periodically collect readings from one or more sensors disposed on said railcar; b. heuristically analyzing said received data to determine if an **actual failure** exists on said railcar or to predict potential or imminent failures based on a statistical analysis of said received data; and c. communicating the results of said analysis to an off-railcar location. **The '673 patent, claim 21.** 21. A method for monitoring the operation of a railcar comprising: a. collecting data at periodic intervals about one or more operating		"failure": HUM0061826, HUM0061871, HUM0061910, HUM0061947, HUM0061986, HUM0062030, HUM0062075, HUM0062123, HUM0061838, HUM0061886, HUM0061926, HUM0062000, HUM0062042, HUM0062093, HUM0062138. Defendants may also rely on the following extrinsic evidence: HUM0056485. Defendants reserve the right to rely on any intrinsic and/or extrinsic evidence identified by Plaintiff.

parameters of said railcar using one or more sensor units provided on said railcar; b. communicating said collected data to a communication management unit; c. analyzing said collected data by applying heuristics thereto to (i) determine if an **actual failure** exists and (ii) to predict potential or imminent failures based on a statistical analysis of said collected data.		
5. "potential or imminent failures" **The '223 patent, claim 5.** 5. A system for monitoring the operation of a railcar comprising: a. one or more sensor units mounted on said railcar, each of said sensor units monitoring an operating parameter of said railcar wherein each of said sensor units comprises a sensor, a power source, a processor, memory, communications circuitry, and software, stored in said memory and executed by said processor, said software performing the functions of collecting data from said sensor at periodic intervals; and b. a communication management unit, mounted on said railcar, said communication management unit in wireless communication with said one or more sensor units; wherein said communication management unit applies heuristics to analyze data	Plain and ordinary meaning, no construction necessary or provided. ***Intrinsic Evidence*** • The '223 patent, 1:14-15, 1:39-44, 2:21-35, 2:55-64, 3:8-13, 11:39-45, and 12:34-38. ***Extrinsic Evidence*** • AMSTED019578-AMSTED019579 (Predict, (1)(a) and (1)(b), Oxford English Dictionary (3rd ed. 2007).) • AMSTED019577 (Predict, Merriam-Webster Online Dictionary, archived by The Wayback Machine February 20, 2010.) • AMSTED019568 (Potential, (2), Oxford English Dictionary, (2nd ed. 1989).) • AMSTED 019576 (Potential, (1), Merriam-Webster Online Dictionary, archived by The Wayback Machine February 10, 2010.)	"an increased likelihood of experiencing an actual failure in the future" ***Intrinsic Evidence*** • '223 Patent, 1:14-18; 1:29-35; 1:39-44; 2:25-28; 2:57-62; 3:8-13; 11:39-45; 13:23-40 (and corresponding portions of the '673 Patent). <u>'673 File History, including:</u> • May 18, 2016 Application • November 7, 2016 Preliminary Amendment • January 5, 2017 Preliminary Amendment • June 29, 2017 Non-Final Rejection • July 6, 2017 Information Disclosure Statement • October 13, 2017 Response to Office Action

collected from said one or more sensor units (a) to determine if an actual failure exists and (b) to predict **potential or imminent failures** based on a statistical analysis of said collected data. **The '223 patent, claim 26.** 26. The system of claim 2 wherein said communication management unit applies heuristics to analyze data collected from said one or more sensor devices (a) to determine if an actual failure exists and (b) to predict **potential or imminent failures** based on a statistical analysis of said collected data. **The '673 patent, claim 14.** 14. A method for monitoring the operation of a railcar performed by a communication management unit disposed on said railcar comprising the steps of: a. wirelessly receiving data from one or more sensing units which periodically collect readings from one or more sensors disposed on said railcar; b. heuristically analyzing said received data to determine if an actual failure exists on said railcar or to predict **potential or imminent failures** based on a	• AMSTED019559 (Imminent, (1), Oxford English Dictionary, (2nd ed. 1989).) • AMSTED019558 (Imminent, Merriam-Webster Online Dictionary, archived by The Wayback Machine February 19, 2010.) • Expert Testimony of John Martens. • Plaintiff reserves the right to rely on any intrinsic and/or extrinsic evidence identified by Defendants.	• January 29, 2018 Notice of Allowance ***Extrinsic Evidence*** Expert Testimony of Mr. Steven Ricca. Defendants may also rely on the following dictionary definitions for "potential", "imminent", and "failure": HUM0061865, HUM0061901, HUM0061941, HUM0061977, HUM0062024, HUM0062066, HUM0062111, HUM0062156, HUM0062186, HUM0061850, HUM0061892, HUM0061932, HUM0061968, HUM0062012, HUM0062054, HUM0062102, HUM0062147, HUM0061838, HUM0061886, HUM0061926, HUM0062000, HUM0062042, HUM0062093, HUM0062138. Defendants may also rely on the following extrinsic evidence: HUM0056485. Defendants reserve the right to rely on any intrinsic and/or extrinsic evidence identified by Plaintiff.

statistical analysis of said received data; and c. communicating the results of said analysis to an off-railcar location. **The '673 patent, claim 21.** 21. A method for monitoring the operation of a railcar comprising: a. collecting data at periodic intervals about one or more operating parameters of said railcar using one or more sensor units provided on said railcar; b. communicating said collected data to a communication management unit; c. analyzing said collected data by applying heuristics thereto to (i) determine if an actual failure exists and (ii) to predict **potential or imminent failures** based on a statistical analysis of said collected data.		
6a. "alarm" **The '223 patent, claim 22.** 22. The system of claim 5 wherein an **alarm** is raised based one or more of the following criteria: a. a pre-determined percentage of current data readings exceeds allowable peak readings;	Plain and ordinary meaning, no construction necessary, in the alternative: "a warning or notice" ***Intrinsic Evidence*** • The '223 patent, 2:10-17, 2:51-54, 3:53-55, 5:4-10, 5:57-6:7, 7:4-8, 11:29-38, 11:46-13:49. ***Extrinsic Evidence***	"an audible or visual warning or alert intended to draw immediate attention" ***Intrinsic Evidence*** • '223 Patent, 1:39-44; 2:10-17; 2:21-28; 2:51-54; 3:8-13; 3:54-55; 5:4-10; 5:57-6:7; 7:4-8; 11:28-15:17 (and corresponding portions of the '673 Patent specification); '673 Patent, Claim 8.

b. a pre-determined percentage of current data readings exceeds a determined value; c. a pre-determined percentage of current data readings exceeds a standard deviation from readings from the same railcar; d. a pre-determined percentage of current data readings exceeds a standard deviation from all railcars in the fleet; or e. the rate of change of current data readings exceeds a pre-determined threshold.	• Expert Testimony of John Martens. • Plaintiff reserves the right to rely on any intrinsic and/or extrinsic evidence identified by Defendants.	<u>'223 File History, including:</u> • March 15, 2013 Application • September 13, 2013 Preliminary Amendment • November 4, 2014 Non-Final Rejection • May 1, 2015 Reply to Office Action • August 24, 2015 Final Rejection • January 27, 2016 Amendment and Request for Continued Examination • February 10, 2016 Notice of Allowance <u>'673 File History, including:</u> • May 18, 2016 Application • November 7, 2016 Preliminary Amendment • January 5, 2017 Preliminary Amendment • June 29, 2017 Non-Final Rejection • October 13, 2017 Response to Office Action • January 29, 2018 Notice of Allowance ***Extrinsic Evidence*** Expert Testimony of Mr. Steven Ricca.

		Defendants may also rely on the following dictionary definitions for "alarm", "condition", and "alarm condition": HUM0061829, HUM0061874, HUM0061913, HUM0061950, HUM0061989, HUM0062033, HUM0062078, HUM0062126, HUM0062168, HUM0061835, HUM0061880, HUM0061919, HUM0061956, HUM0061996, HUM0062039, HUM0062084, HUM0062132, HUM0062165. Defendants reserve the right to rely on any intrinsic and/or extrinsic evidence identified by Plaintiff.
6b. "alarm condition" **The '673 patent, claim 1.** 1. A method of monitoring operational characteristics of a railcar comprising the steps of: a. receiving data or processed information regarding said operational characteristic from one or more sensing units on said railcar, said sensing units monitoring an operational characteristic of said railcar; b. applying a heuristic to said received data to determine deviations from nominal operating conditions;	Plain and ordinary meaning, no construction necessary, in the alternative: "a status or occurrence giving rise to a warning or notice" ***Intrinsic Evidence*** • The '223 patent, Abstract, 2:15-17, 2:21-37, 2:51-54, 3:54-55, 5:4-10, 5:57-6:7, 7:4-8, 11:46-13:49. ***Extrinsic Evidence***	"a condition that triggers an audible or visual warning or alert intended to draw immediate attention" ***Intrinsic Evidence*** • '223 Patent, 1:39-44; 2:10-17; 2:21-28; 2:51-54; 3:8-13; 3:54-55; 5:4-10; 5:57-6:7; 7:4-8; 11:28-15:17 (and corresponding portions of the '673 Patent specification); '673 Patent, Claim 8. <u>'223 File History, including:</u> • March 15, 2013 Application

c. assigning a severity level to said deviations from nominal operating conditions; and d. determining an **alarm condition** based on said assigned severity level. **The '673 patent, claim 6.** 6. The method of claim 2 further comprising the step of transmitting said **alarm condition** to a location remote from said railcar. **The '673 patent, claim 15.** 15. The method of claim 14 wherein each of said sensing units can make a determination of an **alarm condition** based on data collected by the sensing unit, said method further comprising the step of: a. wirelessly receiving notice of said **alarm condition** from said sensing unit; and b. communicating said **alarm condition** to an off-railcar location. **The '673 patent, claim 16.** 16. The method of claim 14 further comprising the steps of: a. making a determination of an **alarm condition** based on data received from two or more of said sensing units; and b. communicating said **alarm condition** to an off-railcar location.	• Expert Testimony of John Martens. • Plaintiff reserves the right to rely on any intrinsic and/or extrinsic evidence identified by Defendants.	• September 13, 2013 Preliminary Amendment • November 4, 2014 Non-Final Rejection • May 1, 2015 Reply to Office Action • August 24, 2015 Final Rejection • January 27, 2016 Amendment and Request for Continued Examination • February 10, 2016 Notice of Allowance '673 File History, including: • May 18, 2016 Application • November 7, 2016 Preliminary Amendment • January 5, 2017 Preliminary Amendment • June 29, 2017 Non-Final Rejection • October 13, 2017 Response to Office Action • January 29, 2018 Notice of Allowance ***Extrinsic Evidence*** Expert Testimony of Mr. Steven Ricca.

The '673 patent, claim 22. 22. The method of claim 21 further comprising the steps of: assessing the collected data to determine if an **alarm condition** exists; and wirelessly communicating said **alarm condition** to an off rail car location.		Defendants may also rely on the following dictionary definitions for "alarm", "condition", and "alarm condition": HUM0061829, HUM0061874, HUM0061913, HUM0061950, HUM0061989, HUM0062033, HUM0062078, HUM0062126, HUM0062168, HUM0061835, HUM0061880, HUM0061919, HUM0061956, HUM0061996, HUM0062039, HUM0062084, HUM0062132, HUM0062165. Defendants reserve the right to rely on any intrinsic and/or extrinsic evidence identified by Plaintiff.
7. "assigning a severity level" **The '673 patent, claim 1.** 1. A method of monitoring operational characteristics of a railcar comprising the steps of: a. receiving data or processed information regarding said operational characteristic from one or more sensing units on said railcar, said sensing units monitoring an operational characteristic of said railcar; b. applying a heuristic to said received data to determine deviations from nominal operating conditions;	"assigning one from a plurality of known values indicating seriousness" ***Intrinsic Evidence*** • The '223 patent, 2:10-17, and 11:46-13:49. ***Extrinsic Evidence*** • AMSTED019581 (Severity, (8), Merriam-Webster Online Dictionary, archived by The Wayback Machine February 19, 2010.) • AMSTED019530 (Assign, (3), Merriam-Webster Online Dictionary,	Plain and ordinary meaning, no construction needed. ***Intrinsic Evidence*** • '673 Patent, 2:15-22; 11:59-12:65; 13:30-15:46. <u>'673 File History, including:</u> • May 18, 2016 Application • November 7, 2016 Preliminary Amendment • January 5, 2017 Preliminary Amendment • June 29, 2017 Non-Final Rejection

c. **assigning a severity level** to said deviations from nominal operating conditions; and d. determining an alarm condition based on said **assigned severity level**.	archived by the Wayback Machine April 10, 2010.) • Expert Testimony of John Martens. • Plaintiff reserves the right to rely on any intrinsic and/or extrinsic evidence identified by Defendants.	• October 13, 2017 Response to Office Action • January 29, 2018 Notice of Allowance ***Extrinsic Evidence*** Expert Testimony of Mr. Steven Ricca. Defendants reserve the right to rely on any intrinsic and/or extrinsic evidence identified by Plaintiff.
8. "a pre-determined percentage of current data readings" **The '223 patent, claim 22.** 22. The system of claim 5 wherein an alarm is raised based one or more of the following criteria: a. a pre-determined percentage of current data readings exceeds allowable peak readings; b. **a pre-determined percentage of current data readings** exceeds a determined value; c. a pre-determined percentage of current data readings exceeds a standard deviation from readings from the same railcar; d. a pre-determined percentage of current data readings exceeds a standard deviation from all railcars in the fleet; or	Plain and ordinary meaning, no construction necessary, in the alternative: "a previously determined amount of data readings taken at a time or over a time span" ***Intrinsic Evidence*** • The '223 patent, claim 5, and 13:50-15:17. ***Extrinsic Evidence*** • Expert Testimony of John Martens. • Plaintiff reserves the right to rely on any intrinsic and/or extrinsic evidence identified by Defendants.	"a previously determined percentage calculated from two or more data points" ***Intrinsic Evidence*** • '223 Patent, 13:11-42; 13:57-14:2; 14:38-52. '223 File History, including: • March 15, 2013 Application • September 13, 2013 Preliminary Amendment • November 4, 2014 Non-Final Rejection • May 1, 2015 Reply to Office Action • August 24, 2015 Final Rejection • January 27, 2015 Amendment and Request for Continued Examination

e. the rate of change of current data readings exceeds a pre-determined threshold.		• February 10, 2016 Notice of Allowance ***Extrinsic Evidence*** Expert Testimony of Mr. Steven Ricca. Defendants may also rely on the following dictionary definitions for "pre-determined" and "percentage": HUM0061980, HUM0062069, HUM0062114, HUM0061859, HUM0061974, HUM0062060, HUM0062108. Defendants reserve the right to rely on any intrinsic and/or extrinsic evidence identified by Plaintiff.
9. "software filters" or "software filters configured to isolate one or more types of accelerations" **The '915 patent, claim 25.** 25. The system of claim 1, further comprising one or more wireless sensor nodes in communication with at least one of the communication management units, wherein the one or more sensors form part of the one or more wireless sensor nodes, wherein one or more of the wireless sensor nodes comprises a microprocessor	Only "software filter" requires construction: "a computer program capable of processing and passing selected data" The remainder of the terms are given plain and ordinary meaning. ***Intrinsic Evidence***	Defendants assert "software filters configured to isolate one or more types of accelerations" requires construction: "a software program executed by a processor programmed to decrease noise from unwanted acceleration frequencies and increase signals from acceleration frequencies of interest" ***Intrinsic Evidence***

configured to execute firmware to control operation of the one or more of the wireless sensor nodes, wherein the firmware comprises one or more **software filters** configured to isolate one or more types of accelerations.	• The '915 patent, FIG. 4, 12-14; 5:35-42, 6:28-36, 13:11-24, and 13:57-14:21. ***Extrinsic Evidence*** • AMSTED019583 (Software, (a) Merriam-Webster Online Dictionary, archived by The Wayback Machine December 24, 2013.) • AMSTED019587 (Software, (1)(a), Oxford English Dictionary (2nd ed. 1989).) • AMSTED019593-AMSTED019608 (Steven W. Smith, The Scientist & Engineer's Guide to Digital Signal Processing, *particularly* Chapter 14, (California Technical Publishing eds., 2nd ed. 1999) *available at* https://www.analog.com/en/education/education-library/scientist_engineers_guide.html.) • Expert Testimony of John Martens. • Plaintiff reserves the right to rely on any intrinsic and/or extrinsic evidence identified by Defendants.	• '915 Patent, 5:35-42; 6:28-46; 7:7-15. <u>'915 File History, including:</u> • June 24, 2016 Preliminary Amendment • November 1, 2017 Non-Final Rejection • March 29, 2018 Reply to Office Action • May 10, 2018 Notice of Allowance • September 6, 2018 Notice of Allowance • October 3, 2018 Corrected Notice of Allowance ***Extrinsic Evidence*** Expert Testimony of Mr. Steven Ricca. Defendants may also rely on the following dictionary definitions for "software", "filter", and "configured": HUM0061904, HUM0061944, HUM0061983, HUM0062117, HUM0062159, HUM0062190, HUM0061841, HUM0062003, HUM0062045, HUM0062096, HUM0062141, HUM0061923, HUM0061959, HUM0062087, HUM0062174.

		Defendants may also rely on the following dictionary definitions for "capable": HUM0062193, HUM0062196, HUM0062199, HUM0062202. Defendants reserve the right to rely on any intrinsic and/or extrinsic evidence identified by Plaintiff.
10. "**one or more mechanical filters that include a resilient material configured to filter out undesirable accelerations** " **The '915 patent, claim 23.** 23. The system of claim 1, wherein the one or more filters comprise **<u>one or more mechanical filters that include a resilient material configured to filter out undesirable accelerations</u>** from the accelerations, wherein the one or more mechanical filters are disposed to remove the undesirable accelerations before the undesirable accelerations reach the one or more sensors that are configured to measure accelerations.	Plain and ordinary meaning, no construction necessary, in the alternative: "at least one component made of a resilient material capable of suppressing or removing unwanted accelerations" ***Intrinsic Evidence*** • The '915 patent, FIG. 4, 5:23-6:11, claim 1. ***Extrinsic Evidence*** • Expert Testimony of John Martens. • Plaintiff reserves the right to rely on any intrinsic and/or extrinsic evidence identified by Defendants.	"a filter made of resilient material designed for the purpose of filtering high and low frequencies from the signal of interest" ***Intrinsic Evidence*** • '915 Patent, FIG. 4; 5:23-6:11. <u>'915 File History, including:</u> • June 24, 2016 Preliminary Amendment • November 1, 2017 Non-Final Rejection • March 29, 2018 Reply to Office Action • May 10, 2018 Notice of Allowance • September 6, 2018 Notice of Allowance • October 3, 2018 Corrected Notice of Allowance

		Extrinsic Evidence Expert Testimony of Mr. Steven Ricca. Defendants may also rely on the following dictionary definitions for "mechanical", "filter", and "configured": HUM0061856, HUM0062018, HUM0061841, HUM0062003, HUM0062045, HUM0062096, HUM0062141, HUM0061923, HUM0061959, HUM0062087, HUM0062174. Defendants may also rely on the following dictionary definitions for "capable": HUM0062193, HUM0062196, HUM0062199, HUM0062202. Defendants reserve the right to rely on any intrinsic and/or extrinsic identified by Plaintiff.
11. "digital filters" **The '915 patent, claim 28.** 28. The system of claim 1, wherein the one or more filters comprise one or more **digital filters**.	"a component capable of processing and passing selected data in a digital format" ***Intrinsic Evidence*** • The '915 patent, FIG. 4, 12-14; 5:35-42, 6:28-36, 13:11-24, and 13:57-14:21. ***Extrinsic Evidence*** • AMSTED019532-AMSTED019539 (Digital, (4) and (7), Merriam-Webster	Plain and ordinary meaning, no construction needed. ***Intrinsic Evidence*** • '915 Patent, 5:35-42; 6:28-36; 13:11-20; FIG. 12. '915 File History, including: • June 24, 2016 Preliminary Amendment

	Online Dictionary, archived by The Wayback Machine December 19, 2013.) • AMSTED019537 (Digital, (2)(a) and (2)(d), Oxford English Dictionary (3rd ed. 2014).) • AMSTED019593-AMSTED019608 (Steven W. Smith, The Scientist & Engineer's Guide to Digital Signal Processing, *particularly* Chapter 14, (California Technical Publishing eds., 2nd ed. 1999) *available at* https://www.analog.com/en/education/education-library/scientist_engineers_guide.html.) • Expert Testimony of John Martens. • Plaintiff reserves the right to rely on any intrinsic and/or extrinsic evidence identified by Defendants.	• November 1, 2017 Non-Final Rejection • March 29, 2018 Reply to Office Action • May 10, 2018 Notice of Allowance • September 6, 2018 Notice of Allowance • October 3, 2018 Corrected Notice of Allowance ***Extrinsic Evidence*** Expert Testimony of Mr. Steven Ricca. Defendants may also rely on the following dictionary definitions for "digital" and "filter": HUM0061883, HUM0062090, HUM0062135, HUM0061841, HUM0062003, HUM0062045, HUM0062096, HUM0062141. Defendants reserve the right to rely on any intrinsic and/or extrinsic evidence identified by Plaintiff.