CLAIMS

1. A restraint system for a ride vehicle, the restraint system comprising:

seating of the ride vehicle comprising one or more seats; and

a lap bar, wherein the lap bar is configured to transition between an open configuration and an engaged configuration, wherein the lap bar comprises:

one or more prongs configured to be disposed about one or more occupants of the seating of the ride vehicle when the lap bar is in the engaged configuration, wherein the one or more prongs comprise a first prong, a second prong, and a third prong, wherein at least one prong of the one or more prongs comprises a first tensioner, and wherein, in the engaged configuration, the first prong of the one or more prongs and the second prong of the one or more prongs are configured to be disposed at least partially about a first occupant of the one or more occupants of the seating, and the first prong of the one or more prongs and the third prong of the one or more prongs are configured to be disposed about a second occupant of the one or more occupants of the seating; and

a restraint comprising one or more straps, wherein the one or more straps conform about at least a portion of each of the one or more occupants with the lap bar in the engaged configuration.

2. The restraint system of claim 1, comprising a first strap of the one or more straps, wherein the first tensioner is:

coupled with the first prong of the one or more prongs and, the first strap of the one or more straps extends from the first prong of the one or more prongs to the second prong; or

coupled with the second prong, and the first strap of the one or more straps extends from the second prong to the first prong.

3. The restraint system of claim 2, comprising a second tensioner and a second strap of the one or more straps, wherein the second tensioner is coupled with:

the third prong of the one or more prongs, and the second strap of the one or more straps extends from the second tensioner to the first prong of the one or more prongs.

4. The restraint system of claim 1, wherein the first tensioner is coupled with:

the first prong of the one or more prongs, and a first strap of the one or more straps extends from the first tensioner to the second prong and the third prong of the one or more prongs.

5. The restraint system of claim 1, comprising one or more tensioners including the first tensioner, wherein at least one tensioner of the one or more tensioners comprises:

a spool about which a portion of a respective strap of the one or more straps is wrapped; and

a biasing feature configured to pull the respective strap of the one or more straps toward the spool.

6. The restraint system of claim 5, wherein the respective strap of the one or more straps extends from the first tensioner of the one or more tensioners to conform, in the engaged configuration, at least partially about at least a first occupant of the one or more occupants and at least a second occupant of the one or more occupants.

7. The restraint system of claim 1, comprising a single strap that engages each of the first prong of the one or more prongs, the second prong of the one or more prongs, and the third prong of the one or more prongs.

8. The restraint system of claim 1, wherein each of the first prong of the one or more prongs and the second prong of the one or more prongs, comprises a respective tensioner.

9. The restraint system of claim 1, comprising a sensor system configured to detect a tension level of at least one strap of the one or more straps.

10. The restraint system of claim 9, comprising:

one or more tensioners including the first tensioner; and

a tension management system configured to control at least one tensioner of the one or more tensioners to adjust an extended length of the at least one strap of the one or more straps based on the tension level of the at least one strap of the one or more straps.

11. The restraint system of claim 9, comprising a lock system configured to lock the at least one strap of the one or more straps into place in response to the tension level of the at least one strap of the one or more straps being within a defined range.

12. The restraint system of claim 11, wherein the defined range is selected based on a weight of at least one occupant of the one or more occupants, a size of the at least one occupant of the one or more occupants, a property of the ride vehicle, an operating parameter of the ride vehicle, a feature in an environment that the ride vehicle rides in, or any combination thereof.

13. The restraint system of claim 12, wherein the defined range is stored in a look-up table with corresponding values of the weight of the at least one occupant of the one or more occupants, the size of the at least one occupant of the one or more occupants, the property of the ride vehicle, the operating parameter of the ride vehicle, the feature in the environment that the ride vehicle rides in, or any combination thereof.

14. The restraint system of claim 11, wherein an extended length of the at least one strap of the one or more straps is not adjustable while it is locked by the lock system.

15. The restraint system of claim 9, wherein the sensor system comprises a weight sensor, a force or torque sensor, a motion sensor, an image sensor, a touch sensor, or any combination thereof.

16. The restraint system of claim 1, comprising an alert system configured to transmit an alert when a tension sensor detects a tension value on at least one strap of the one or more straps that is lower than a threshold value when the lap bar is in the engaged configuration.

17. The restraint system of claim 1, wherein the one or more straps comprises a flexible belt, a flexible pad, a series of pads, a cord, a net, parallel cords, or any combination thereof.

18. A ride system, comprising:

a ride vehicle comprising seating configured to support a plurality of riders; and

a lap bar assembly comprising a neck and a pronged lap bar structure, wherein the neck is coupled to the ride vehicle at a first end of the neck and coupled to the pronged lap bar structure at a second end of the neck such that the lap bar assembly is configured to actuate between an open configuration and an engaged configuration,

wherein the pronged lap bar structure comprises:

a plurality of prongs configured to be disposed about the plurality of riders when the lap bar assembly is in the engaged configuration, wherein the plurality of prongs comprise a first prong, a second prong, and a third prong, wherein at least one prong of the plurality of prongs comprises a tensioner, and wherein, in the engaged configuration, the first prong and the second prong are configured to be disposed at least partially about a first rider of the plurality of riders, and the first prong and the third prong are configured to be disposed about a second rider of the plurality of riders; and

a restraint comprising one or more straps configured to conform about at least a portion of each rider of the plurality of riders with the lap bar assembly in the engaged configuration.

19. The ride system of claim 18, wherein the neck is:

rotatably coupled to the ride vehicle via a pivot at the first end of the neck such that the lap bar assembly is configured to rotate about the pivot between the open configuration and the engaged configuration; or

slidably coupled to the ride vehicle at the first end of the neck such that the lap bar assembly is configured to translate between the open configuration and the engaged configuration.

20. The ride system of claim 18, wherein the tensioner comprises an elastic coupler securing the strap to the lap bar assembly.

21. The ride system of claim 18, comprising a sensor system configured to detect a tension level on the one or more straps and a tension management system configured to control the tensioner to adjust an extended length of the one or more straps based on the tension level.

22. A method of operating a restraint system in a ride environment, the method comprising:

conforming a strap at least partially about one or more occupants positioned in seating of a ride vehicle, wherein:

the strap extends from a tensioner and extends between a first prong and a second prong of a lap bar structure; or

the strap extends from the tensioner and extends between a first prong and the seating of the ride vehicle;

detecting, with one or more sensors, a force level on the strap;

receiving, at one or more processors, data indicative of the force level from at least one sensor of the one or more sensors;

determining, via at least one processor of the one or more processors, a predefined range for the force level based on a condition of at least one occupant of the one or more occupants, an operating parameter of the ride vehicle, a feature of the ride environment, or any combination thereof;

adjusting, in response to determining the force level is not within the predefined range, an extended length of the strap from the tensioner to adjust the force level to be within the predefined range; and

transmitting a notification indicating the force level is within the predefined range.

23. The method of claim 22, wherein the force level comprises a tension level or a pressure level.

24. The method of claim 22, wherein the one or more sensors comprise a torque sensor, a touch sensor, a resistance sensor, a voltage sensor, a current sensor, or any combination thereof.

25. The method of claim 22, wherein the condition is associated with a ride parameter.

26. The method of claim 22, wherein the condition comprises a size of the strap.

27. The method of claim 22, comprising monitoring a time period required to adjust the force level to be within the predefined range.