



TiLite ZRA Transit Tie-Down Option

TiLite has crash tested its ZRA with Transit Tie-Down Option in accordance with Section 5.3 and Annex A of RESNA WC-4: 2013 Section 19 (“WC19”) and Section 5.2 and Annex A of ISO 7176-19 (2008) (“ISO 7176-19”). The TiLite ZRA with Transit Tie-Down Option has been found to meet or exceed the performance requirements of WC19 and ISO 7176-19.¹ WC19 and ISO 7176-19 require that transit wheelchairs be frontal impact tested to 30 mph (48 km/h). In such testing, a wheelchair is loaded with a suitable crash test dummy, accelerated to 30 mph and brought to a controlled stop, simulating a frontal impact generating 20 g of force on the crash test dummy. Therefore, the TiLite ZRA with Transit Tie-Down Option must be secured facing forward when used as a seat in a motor vehicle.

TiLite has crash tested the ZRA with Transit Tie-Down Option in one configuration. In this configuration, the chair tested was compliant with WC19 and ISO 7176-19. The ZRA wheelchair was tested under WC19 and ISO 7176-19 utilizing a 170 lb. (77 kg) crash test dummy, which corresponds to a weight of 165 to 300 lbs. (75 to 136 kg). It was tested using a vehicle-anchored shoulder belt and a wheelchair-anchored pelvic belt. The chair tested was configured as follows: reinforced frame, 16” seat width; 17” seat depth; 19” front seat height; 17” rear seat height; 80° front angle; standard angle adjustable footrest set at 16.5”; tall folding aluminum adjustable height backrest set at 20.5” and 95° angle; 2.5” center of gravity; 2° camber; 5” LiteSpeed Billet Aluminum Casters with soft roll tires; standard forks; 24” Shadow wheels with stainless axles and Primo tires; tension adjustable by straps padded nylon backrest upholstery; and tension adjustable bolt on seat sling. The total mass of the chair tested was 25 lbs. (11.4 kg).



This option is labeled “Transit Tie-Down Option” on the TiLite ZRA order form. When this option is ordered, the product ships with four factory-installed, transit tie-down brackets, two factory-installed, wheelchair-anchored, pelvic belt brackets, and the reinforced frame. The four tie-down brackets are used to secure the wheelchair within the vehicle using a four-point, strap-type wheelchair tie-down system. The two pelvic belt brackets provide anchorage points to secure a crashworthy wheelchair-anchored pelvic belt that conforms to the requirements of WC19 and that can be used in conjunction with a vehicle-anchored shoulder belt with a standard lower-anchorage connector for effective crashworthy three-point belt restraint in a motor vehicle. The occupant is to be secured within the wheelchair using a three-point restraint system consisting of a wheelchair-anchored pelvic belt and a vehicle-anchored shoulder belt.

¹ Crash testing is a simulation of a frontal impact only. It does not simulate any other type of impact. Furthermore, TiLite wheelchairs are highly customized and can be ordered in millions of combinations and it is impossible to test every conceivable combination. Therefore, TiLite recommends that wheelchair users transfer to the vehicle seat when being transported in a vehicle. The vehicle seat offers the greatest degree of safety because it is secured to the chassis of the vehicle and is designed with the primary purpose of protecting the occupant in a crash. By contrast, the primary purpose of any wheelchair is to maximize mobility, which in turn requires that the product be as light as possible. As of this date, the U.S. Department of Transportation has not approved any tie-down system for transportation of a user while in a wheelchair in a moving vehicle of any type.



The TiLite ZRA with Transit Tie-Down Option was tested using a Q'Straint® WC19 Wheelchair-Anchored Pelvic Belt. However, the TiLite ZRA with Transit Tie-Down Option does not ship with such pelvic belt as standard equipment. The Q'Straint® WC19 Wheelchair-Anchored Pelvic Belt may be ordered from TiLite as an optional accessory either at the time of purchase of the wheelchair or thereafter. TiLite recommends that the TiLite ZRA be used only with a vehicle-anchored shoulder belt and a wheelchair-anchored pelvic belt.

While the Transit Tie-Down Option is compatible with, and can be purchased with, additional seat sizes, optional components and varied configurations, TiLite makes no claim that any other components or configurations have been tested beyond the above-described WC19 and ISO 7176-19 conforming configuration. **Please refer to the TiLite ZRA/Aero Z Owner's Manual available at www.tilite.com for full information, including all warnings and restrictions, regarding the TiLite ZRA Transit Tie-Down Option.** TiLite does not claim that its Transit Tie-Down Option will prevent injury or death in the event of a motor vehicle accident.

Annex C of WC19 provides a method of testing a wheelchair for its lateral stability. The TiLite ZRA had a rating of "Good" when tested in accordance with Annex C of WC19. ISO 7176-19 does not require a lateral stability test.

Annex E of WC19 provides a method of testing a wheelchair for its ability to accommodate vehicle-anchored pelvic and shoulder belts. When tested in accordance with Annex E of WC19, the TiLite ZRA had a score of "Good" with respect to the ease of optimizing proper pelvic belt placement and an overall score of "Excellent" (16 of 16 points) with respect to the ability to achieve proper positioning and geometry of the three-point belt restraints.

Annex D of ISO 7176-19 provides a method of testing a wheelchair for its ability to accommodate vehicle-anchored pelvic and shoulder belts. When tested in accordance with Annex D of ISO 7176-19, the TiLite ZRA had an overall score of "Good" (15 of 16 points).

The ease of access to, and maneuverability in, motor vehicles can be significantly affected by wheelchair size and turning radius. Smaller wheelchairs and/or wheelchairs with a shorter turning radius will generally provide greater ease of vehicle access and maneuverability to a forward-facing position.

