

What does TMA stand for?

Truck Mounted Attenuator (TMA)

When do I have to use a TMA?

TMA's are used on Level 2 and Level 3 roads to reduce the severity of vehicle crashes into the back of work site vehicles. TMA's may be used on Level 1 roads where extra protection is needed and practicable.

While TMA's are primarily used for mobile operations, they can also be useful in some high-risk static and semi-static operations. For static operations, TMA's are generally only considered for sites occupied by personnel or objects that will present a hazard to road users and are generally only justified on level 2 and level 3 roads but may be used for work sites on the shoulder to increase road worker and road user safety.

For more information, refer to sections C18 and D5 of CoPTTM.

Is the Scorpion TL-2 TMA Transit NZ CoPTTM compliant?

Yes.

How does a TMA work?

The basic objective of a TMA is to slow a vehicle down that impacts with it in a controlled manner to protect the occupants from injury. How this is achieved will differ between situations but it involves the TMA unit compressing to absorb the impact force. The Scorpion TMA crushes progressively in stages.

- 1 The vehicle impacts with the rear most part of the unit – called the 'A' absorber and this unit starts to absorb the impact.
- 2 As this unit becomes fully crushed it transfers the energy of the impact into the arms running down each side. These arms have a specific curve which allows them to absorb a certain amount of force before folding at their mid point.
- 3 After these arms fold and the force of the impact continues forward, the 'B' and 'C' absorbers make contact to absorb the rest of the energy.

**What is the weight of the truck I should have if I'm going to fit a Scorpion TL-2 TMA to it?**

Independent testing has been done to NCHRP 350 test level 2 testing criteria and performs on a truck with a tare weight of 5500 kg, however, NZTA specify the minimum weight of support vehicle be 6000 kg.

What does TL-2 Stand for and what is it?

TL-2 stands for Test Level 2 and comes from the definitions given in NCHRP Report 350. To comply to test level 2 an attenuator has to be able to absorb an impact of up to 70km/h from vehicles weighing up to 2000kg.

What does TL-3 Stand for and what is it?

TL-3 stands for Test Level 3 and comes from the definitions given in NCHRP Report 350. To comply to test level 3 an attenuator has to be able to absorb an impact of 100km/h from vehicles weighing up to 2000kg.

Is the Scorpion TL-2 Upgradeable to TL-3?

Yes. A Scorpion TMA unit can be upgraded to TL-3 with the simple installation of an additional cartridge (Strut) . This lengthens the unit and gives it the greater capacity needed to comply with TL-3 requirements.



Why would I have to upgrade to TL-3?

At the moment NZTA specifications only require the use of a TL-2 attenuator. If you had to upgrade in the future this would most like come through a change to TL-3 requirements in these specifications. Initially this change was to happen by 1 January 2008 however this has not happened and is now not proposed to happen at all.

What is NCHRP 350?

NCHRP 350 refers to the National Co-operative Highway Research Program Report 350 "Recommended Procedures for the Safety Performance Evaluation of Highway Features". The procedures that the document contains are based on a comprehensive literature review, an analysis of the state of the art for performance evaluation and the advice of a selected group of acknowledged experts. The evaluation criteria from this document for TMA's has been adopted by New Zealand in Section B10 of CoPTTM.

I have heard that the TL-2 Scorpion TMA has not passed the required NCHRP 350 tests. Is this true?

No, that is not true. The TL-2 Scorpion TMA has passed both mandatory tests 50 and 51. There is a false and misleading rumour (from our competition) that the TL-2 Scorpion has also not passed the optional tests. The reality is that the optional tests 52 and 53 have not been attempted as they are not necessary to meet the specifications required.

How often does a Scorpion need to be serviced?

It is suggested that before each use of the attenuated vehicle that a check is done on the mounting bolts, hydraulics and absorber connections. Additionally 'as required' maintenance should be done to ensure continued trouble free usage, including cleaning the unit and greasing moving parts. Also the hydraulic fluid should be changed annually. For more information refer to the maintenance instructions.

What are the technical specifications of the Scorpion TMA?

Please refer to the technical specifications sheet.

How do I operate a Scorpion TMA?

The Scorpion TMA can be raised or lowered using either external or in-cabin controls. An important point to note is that to lock the TMA in place when being deployed the down button needs to be held for an extra two seconds to engage the tilt velocity fuses. This ensures that the TMA does not lift up in the case of an impact. Additionally, the same needs to be done when raising the TMA so that it is locked in place for transit to lengthen the life of the hydraulic rams.

How long does it take to raise/lower a TMA?

There is no standard but somewhere between 10-12 seconds depending on the condition of the hydraulics.

Why and how do the arm welds split in the event of an impact?

The curve of the arm is engineered to have a specific force / deflection curve when impacted. The length, curve, material, and wall thickness all work together to make sure this is achieved. The tubes for the arms are welded in a full 360 degree to the vertical end plates at both ends. The welds separate on one side during an impact due to the bending moment imparted into the joint between the tube and the end plate. This separation is designed into the product and part of how the unit attenuates the energy of the impact.

Do TMA's need to have LED lights?

No, however, LED lights can be supplied as an option and can be better for use on trucks that are commonly used on rough roads or on trucks that do not have good voltage control.

What voltage is a Scorpion TMA?

24 volt - although a 12 volt system can be supplied if requested.

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