

## Roadsafe Heavy Duty Tow Point Testing

There are no standards against which the heavy duty upgraded tow points should be tested. Unfortunately, none exist. In this regard, and with the safety of users in mind, Roadsafe implemented their own set of **voluntary standards** against which to measure the Roadsafe designed upgraded heavy duty tow points.

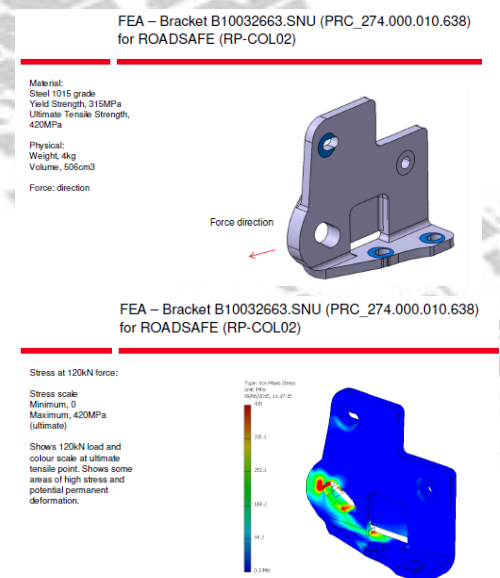
Learn more about the difference between Australian standards, voluntary and mandatory standards [here](#).

Since 2014, Roadsafe heavy duty tow points have been designed on vehicle by Roadsafe development staff in conjunction with a performance upgrade engineer, who has been involved in vehicle upgrades and modifications for over 35 years. It all starts with the vehicle on the hoist, and assessment of the chassis inc. air bag trigger points, crumple zones, locations of bull bar mounts (if a bull bar is fitted), existing chassis mounting points etc. – and determining the optimal location for the upgraded tow point. The tow point needs to be far enough forward to enable easy access and clearance, but in a location on the chassis strong enough to withstand the straight line constant pull of the vehicle weight. The tow point also needs to be high enough so as not to become a hang up point, but low enough so when in operation the attachment rope clears the front bar. There are many factors to take into consideration when determining the design and mounting location.

After the vehicle analysis, a prototype tow point is manufactured. This is made from steel and modified as required along the way. There is lots of welding and cutting involved in getting the tow point to the initial sample stage. This initial process usually takes about two days minimum, with constant referral back to the vehicle.



The initial sample is then scanned and drawn up in a CAD program – and FEA testing conducted by a third party engineer. The FEA testing works to mimic a constant load pull in various directions to determine the potential fatigue locations in the newly designed tow points. During FEA testing, modifications are made to the design to eliminate the weak points, and a final 'optimal' design determined. The optimal design is then reflected on the prototype tow point to ensure for clearances and any possible changes to fitment. FEA testing also advises the pull force that the points will endure, prior to both initial deformation and destruction. The FEA testing results aid in determining the Working Load Limit (WLL) applied to the tow point.



To set the Working Load Limit (WLL) both the points, and vehicle weight, are taken into consideration. As a minimum, Roadsafe work with a safety factor of x2 to set the WLL. During FEA testing, if the points test to the equivalent of 10,000kg (in kN or similar) the WLL will be set 5000kg. However, if the points test to the equivalent of 20,000kg (in kN or similar) depending on the application, vehicle weight etc., the WLL will still only be set to 5000kg. There are many differing opinions on this, but in Roadsafe's opinion there is no need to rate the points any higher, because at the end of the day, any recovery system is only as strong as its weakest link – and in the majority of cases, this will be the 4750kg rated shackle that is used to attach to the tow point. With this in mind, the majority of Roadsafe Tow Points are rated at WLL 5000kgs or WLL 3250kgs.



Roadsafe heavy duty tow points have not been rated for lifting purposes. They have been rated for the purposes of a straight line constant pull, to ensure the tow point is strong enough to sustain a constant load, to a specified level, without failing.

Following the completion of FEA Testing, and a final design approved, a number of production test samples are manufactured. These are used for both on vehicle testing, and additional testing requirements including physical destruction testing.

Destruction testing for Roadsafe heavy duty tow points is conducted in a NATA Accredited Laboratory, accredited for compliance with ISO-IEC 17025. The Roadsafe team construct a jig, to mimic the end section (or area that the tow point will bolt up to on the vehicle) of the chassis, and bolt the tow point to it. The end of the chassis jig is secured in a pull test machine with a high rated shackle, an additional high rated shackle is attached to the tow point itself, and a constant load pull applied. The initial deformation load, and failure load is recorded – and subsequently compared to the FEA testing results and WLL's to ensure the point acts, in real life, as expected during the FEA testing.

Following confirmation of the FEA testing via the NATA accredited destruction testing, the points (if passed) are approved for production. Each production is batch coded, and factory tested for compliance against the final sample drawings and WLL's. If the points do not pass (and we have not experienced this yet!) it will be back to the drawing board!

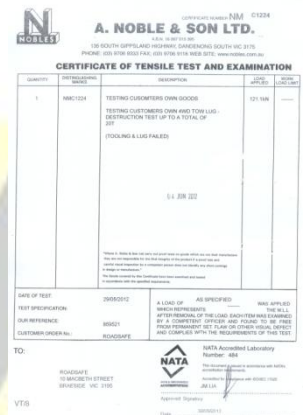
Following production, various ongoing testing of different batches is undertaken to ensure the tow point destruction test rating is maintained.

Roadsafe are very conscious of the safety requirements of tow point use. We know what the tow points are used for, and the necessity for them to work. To this end Roadsafe are keen on ensuring that the best Aussie steel is used in their manufacture, and all hardware bolts meet or exceed grade 8.8-12.9. A set of installation instructions, for each tow point, are included on the Roadsafe website for [download](#) as required.

Roadsafe recommend fitting tow points as a matched pair, bolted in accordance with installation instructions, and used in conjunction with each other in all recovery situations with the use on an Equalising Bridle.

An Equalising Bridle is designed to evenly distribute the load on the vehicle during the recovery operation when connected to the two tow points. When bolted in accordance with instructions, the use of Roadsafe heavy duty tow points, in conjunction with an Equalising Bridle attached with an adequately rated Bow Shackle, creates a safer vehicle attachment system for recovery situations.

*Recovery of stuck vehicles can be dangerous. Always INSPECT the Tow Points and shackles before each use. Do not use if there are visible signs of damage or wear (including cracking or elongation). Do not exceed the working load limit of the shackle or Tow Points. Always STAY A SAFE DISTANCE away from the recovery area – at least 1.5 times the length of the recovery strap. Incorrect use of recovery equipment can result in serious injury or death. Always ensure that adequate PREPARATION for the recovery, to minimise the strain on either vehicle, has been undertaken ie. Digging etc. If you do not understand how to use this equipment safely or are uncomfortable with your abilities in the use of recovery equipment, please complete a course that specialises in four wheel driving & 4WD vehicle recovery.*



| NO. | DESCRIPTION | REMARKS  | DATE    | TESTER |
|-----|-------------|--|---------|--------|
| 1   | TOW POINT   | TESTING CUSTOMER'S OWN GOODS<br>TESTING CUSTOMER'S OWN AND TOW LUG<br>DESTRUCTION TEST UP TO A TOTAL OF 20T<br>TYPING & LOGS FILED | 12/1/88 |        |

MADE OF TEST: JWB02TC      A LOAD OF: AS SPECIFIED      WLL APPLIED: THE WLL  
 TEST SPECIFICATION:      REFERENCE:      OUR REFERENCE:      CUSTOMER ORDER NO.:  
 TO:      ROADSAFE      NATA Accredited Laboratory      ROADSAFE      NATA Accredited Laboratory  
 10 SPENCER STREET      10 SPENCER STREET      3004      3004  
 MELB VIC 3004      MELB VIC 3004