

# ATW 19.5" WHEELS & TYRES

*The following information contains the facts and history behind the ATW Single Wheel Conversions (SWC) on Isuzu NPS's and Fuso Canters using Toyo M608Z 285/70R/19.5" tyres. We trust that we have covered the legal and technical details and dispelled the myths that are out there concerning this conversion.*

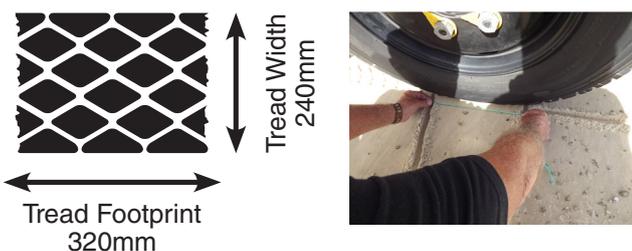
## **Toyo M608Z 285/70R/19.5" tyres.**

These tyres are extremely heavy duty. We have had our customers travel across some of the most harsh terrain on the planet. Many have done the entire life of their tyres, 70,000kms, 80,000 kms or more mostly offroad without a puncture or incident. Across Australian deserts, Russian tundra, the plains of Mongolia and the stoney trails through Africa.

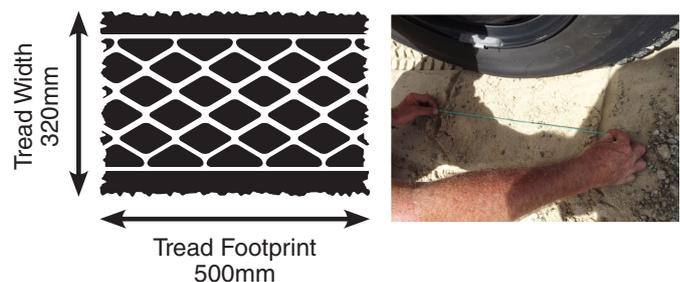
These tyres are not a dedicated steer tyre, anyone with truck experience would know that steer tyres have a straight grooved pattern and provide minimal drive or traction. However, the M608Z is a "drive" patterned tyre perfectly suited for use on a 4x4 truck with a Gross Vehicle Mass of 6 or 6.5 ton. If by chance you use your 4x4 Isuzu or Canter for "logging" then this tyre would be ideal, just as it would be ideal for a private expedition style motorhome, tour bus, mining truck or most other typical offroad application. According to Toyo, they have been designed as a high traction "drive" tyre for use in all types of road conditions, the correct design application for a 4x4 vehicle.

Many professional departments (Rural Fire Brigades, Parks & Wildlife Services, Police Departments, Shire Councils, etc) that operate in soft sandy conditions are now successfully converting their trucks to 19.5" tyres and airing down to very low pressures as required. The benefit of a strong side-walled tyre when aired down is that the footprint elongates rather than bags outwards. An elongated footprint still provides excellent floatation but has much less chance of sidewall damage and requires less power to drive through soft conditions.

## **TYRE INFLATION 65PSI**



## **TYRE INFLATION 20PSI**



Of all the Single Wheel Conversions that we have undertaken since making the change to the 19.5" tyres back in 2007, we have never had a customer report that they have broken a bead when aired down and many will air down well below our recommended minimum pressure in order to cope with a tricky situation. Actually in a recent training session we hosted for a local rural fire service, we purposely attempted to roll a tyre off a rim on a heavily loaded Isuzu NPS fire tender running very low pressures through tight corners... no luck. The tyres remained intact and functioned perfectly in the dry, loose and steep sand dunes throughout the session.

The maximum pressure of the M608Z is 120psi and this could be used if the load was the maximum allowable 2900kg per tyre. That's 11,600kg in total! Does your Isuzu NPS or Fuso Canter weigh that much? Typical highway pressures for these tyres on NPS's or Canters are between 65psi and 95psi depending on the axle loads. Pressures off highway, corrugated roads, sand, etc are reduced accordingly. For vehicles with an overall mass less than 6500kg, pressures may also be lowered but for a vehicle with a maximum weight of 6500kg, we recommend:

- **Highway @ 6500 Kgs. Front 70-75 PSI / Rear – 75-80 PSI**
- **Dirt Roads @ 6500 Kgs. Front 60-65 PSI / Rear – 65-70 PSI**
- **Off Road / Mud @ 6500 Kgs. Front 55-60 PSI / Rear – 60-65 PSI**
- **Beach Sand @ 6500 Kgs. Front 50-40 PSI / Rear – 55-45 PSI\***

*\* Lower pressures may be needed in very soft sand. 20-25 PSI but speed must be kept very low and tyres re-inflated when conditions clear.*

A 285/70R19.5" tyre is 899mm high. When fitted to rims that track in the same line, this is the maximum size that can comfortably fit under the wheel arch of an Isuzu NPS without the scrub radius substantially interfering with bodywork and also allows the modified lower cab steps to remain in place when tilting the cab.

As a result of the increased rolling diameter of the 285/70R/19.5" tyres, overall gearing will be increased by 8% over standard. This is in our opinion the optimum for these trucks. Larger rolling diameters will only decrease bottom end power and braking efficiency.

As mentioned, the tyre preferred by ATW for general offroad use is the Toyo M608Z. This is due to excellent aftersales and technical support, high quality products, availability and general performance in off-road applications. Other tyre options available in Australia in a 285/70R/19.5" size for 4x4 use are: Kuhmo KRD-02, Michelin XDE-2+, Aeolus HN-309 and the Goodride CM-986.

The main factors that led ATW into developing SWC's using 19.5" tyres were based on real world experiences and feedback from commercial operators and numerous privateers. Prior to 2007 all our SWC's were based mainly on 37" x 16" tyre packages. We had limited success with these on 4x4 vehicles that were downrated to under 4.5 ton but all of our other customers with slightly heavier trucks were plagued with constant wheel failures, costly tyre damage and excessive wear.

Typically 16" and 17" rims available from wheel builders are originally designed for lighter vehicles such as LandCruisers, Patrols, etc. The gauge of the steel is so light that most will only give an 1850kg load rating. It is very easy to use thicker centre plates to build a stronger wheel but the outer rim will always be too light in our opinion. While theoretically this load rating is still adequate to be compliant for Australian road use it does not provide any safety margin for off road use. Once offroad a vehicle can be placed in many situations where the weight of a vehicle is transferred unevenly and loads on each wheel greatly increase. Corrugations and washouts add to the strain and fatigue placed on wheels especially when asked to support up to 6 or 6.5 ton. New model Isuzu NPS's and Fuso Canter's have a rear axle load rating of up to 5800kg. Toyo M608Z tyres have a 2900kg load rating and ATW 19.5" wheels carry a 3000kg load rating. This means that the rear axle does not need to be downrated when using an ATW Single Wheel Conversion and you have a great safety factor for peace of mind.

As a result of this 2900kg load rating, the 19.5” tyres have a suitably strong sidewall. They do not undergo sidewall flex and deformation under typical high speed cornering on fast country roads that can be experienced with high and soft sidewalled tyres such as 37” x 16” and 37” x 17” tyres where body roll, mid-corner stability, braking, etc are noticeably affected.

Regarding wheels, it should be noted that if a wheel has been built to an Australian or International standard it does not mean that a Single Wheel Conversion will be “legal”. All vehicles in Australia will have a tyre placard stating the correct tyre size. For trucks you are only allowed a small tolerance within what is stated on the placard. If an individual with a truck over 4.5 ton fits tyres bigger than stated on the placard without proper engineering compliance and the vehicle is involved in an accident, then the owner (not the seller of the wheels) could be liable for all damages or even face prosecution. So regardless of whether the wheels are built to an Australian standard, and regardless of whether the tyres and rims are load rated, if the size of tyre that the manufacturer of a “heavy” vehicle has stated on the placard has changed and proper engineering approval has not been obtained, then the truck no longer complies with ADRs. Vehicles at 4.5 ton and over are classified as “Commercial” and require Federal Approvals for changes to OEM components – the compliance plates/certificates are issued at State or Territory level but must comply to the Federal Rules. Many people who come out of light vehicle 4x4 are not used to these rules as they do not apply to light vehicles.

Before a truck manufacturer can introduce a new model, they have to undergo very strict tests on braking performance, speedo accuracy, noise levels, emissions, etcetera to prove that the truck meets all ADRs. Taller tyres effect many things especially braking. A truck with a “legal” single wheel conversion (and bigger wheels) still needs to meet the relevant ADRs.

All ATW Single Wheel Conversions include modifications to the vehicles to meet all relevant ADR’s and carry either Federal or State Department of Transport engineering approvals. ATW has brake tested each model for which we hold compliance for at the vehicles full GVM – Approvals are on file with Federal Transport.

It should also be considered with a new truck fitted with a SWC, that if an issue arises in any part of the driveline, it will almost be certain that the truck manufacturer will not be held responsible. If a driveline issue occurs and is proven to be caused by the fitting a ATW SWC, then ATW’s Warranty policy will come into play.

Recently, we have had several vehicles brought into our workshop with “illegal” single wheel conversions, officially put off the road until rectified. Expensive and could have been avoided with the correct information as contained here, of course it could have been worse if the vehicle was in an accident.

Our ATW sales team are always happy to discuss this information with you further, but don’t take our word for it, please contact your local Transport Department for clarity.

### **The ATW Team.**

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