

## WELCOME TO THE NINTH ISSUE OF THE AIR CTI NEWSLETTER

My apologies to all readers for being somewhat tardy this month in getting the newsletter out. Basically I have no excuse except that our Sales Manager, Andrew Kee, is on a well-deserved, and long-awaited, six week holiday and when this is combined with an above average sales month it resulted in me being a little overrun with ensuring all our customers are well looked after.

In Andrew's absence I have fielded numerous enquiries about Central Tyre inflation and, although general knowledge is quite good, I thought I would devote this newsletter to explaining some of the finer points of the AIR CTI system in more detail. I have also written in the Australian Diesel Mechanics Magazine recently on the very same topic although in the magazine I go into more depth about the traction circle and forces generated by the vehicle.

### CENTRAL TYRE INFLATION SYSTEMS

Central Tyre Inflation systems give the driver the ability to readily control and adjust the air pressure in each tyre and so improve vehicle performance, ride comfort and tyre wear while decreasing infrastructure damage, soil compaction, carbon dioxide emission, the release of cancer causing micro-particles as well as markedly reducing the sedimentation of waterways within the environment.

The Australian designed, engineered and manufactured AIR CTI system is also able to maintain pressure in the tyres if there is a slow leak or puncture. In this scenario, the system controls the tyre pressure automatically based on the driver's selection. This will allow the driver, in all but the most extreme circumstances, to continue their journey until a convenient time and place is located to fix the problem.

The science behind these well researched and confirmed claims revolves around the tyre contact area or footprint and the optimal traction circle that is an illustrative mathematical model of the vectoral summation of forces acting on the vehicle.

The way a vehicle 'talks' to the bitumen and the way the driver communicates his/her intentions is through the tyres. When the tyres are at their optimal pressure then all other technical componentry can function and perform at their best.

The AIR CTI system is made up of several components;

- Dashboard Controller
- Pressure Protection valve
- Inflate solenoid and filter assembly
- Deflate solenoid and isolator assembly
- Drop pipes
- Rotator assembly

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# TECHNICAL TALK

# AIR CTI THE ULTIMATE Tire Pressure Management System

The AIR CTI assembly kit is prepacked and either pre-sent to the fitting address or travels with the fitter. It takes an experienced AIR CTI fitter about 6 hours to install. This is inclusive of testing and instruction. AIR CTI view the "education" of the driver as essential. Without the background understanding the system will not be used to its potential and many of the substantial benefits forgone. AIR CTI is on call 7 days a week to provide the most comprehensive back-up service in the industry. The company is very proud of its product and takes the view that, such is the benefits Central Tyre Inflation systems provide, it has an obligation to the transport industry as a whole to always be available for educational presentations to client staff.

## AIR CTI Central Tyre Inflation system – a brief overview

A Visual Display Unit is mounted on the cabin dashboard in an unobtrusive, easily observed, position.



The unit is roughly 110mm x 45mm and allows the driver to select tyre-pressure modes to match terrain conditions. These modes are clearly seen in the attached photo as P1, P2, P3 while P4 is for an automated system. The unit displays current tyre pressures, selected modes and system status.

It is instructive to consider the operation of P4 since it encompasses the whole concept of adjusting tyre pressures to suit load. The automated system takes a Low pressure reading when the vehicle is empty and a High pressure reading when the vehicle is fully loaded. It then determines a linear scale between these two values directly connecting the tyre pressure to the load on the vehicle. As the load increases/decreases the tyre pressure is continually adjusted to match. This ensures that the tyre pressure is always at the optimal level and reaping the benefits that follow. The automated system is specially designed for vehicles that have a gradual increase/decrease in loading, for example garbage trucks.

The Visual Display connects to the Central Processing Unit. This is secured in a case behind the dashboard within roughly 300 mm to the Visual Display Unit. The CPU is the 'brain' of the system and monitors input and feedback. It is continuously monitoring the tyre pressure to ensure the selected pressure is being maintained.

When the driver selects a tyre-pressure setting a signal travels from the Visual Display to the Central Processing Unit where it is interpreted. The main controlling manifold, with a built-in filter, receives the air and distributes to the front and rear axles so the appropriate Inflate/Deflate solenoid opens and adjusts the tyre pressure as directed.

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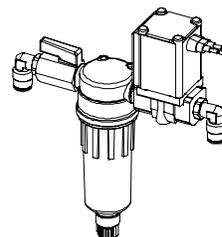
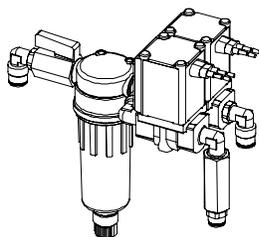
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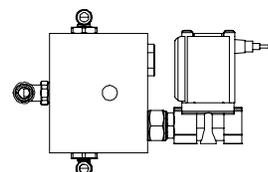
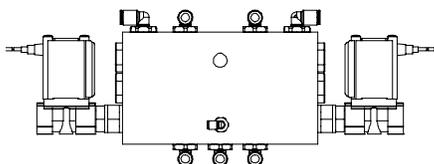
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# TECHNICAL TALK

# AIR CTI THE ULTIMATE Tire Pressure Management System



AIR CTI taps into the existing air-brake system on the truck thus removing the need for an additional compressor. Importantly, a VASS certified, pressure protection valve or safety cut-out is incorporated to ensure the air pressure in the main brake tanks does not drop below 85 psi to guarantee there is always sufficient air pressure for the brakes.



Isolation and exhaust solenoids are mounted near the axles. The large solenoid is for dumping air when you want to lower pressures. Each axle group has one of these components thereby allowing different pressures for the front, as opposed to, rear tyres.

The isolator stops air from transferring from the left to right tyres and vice versa when standing.



Fitted wheels have centre rotators which "rotate" with the tyre when the vehicle is in motion while allowing air pressure into the tyre.

There are small shut off taps on each rotator that allow each wheel to be isolated. This is to ensure air will not escape from the system as well as allowing ease of maintenance and tyre changes.

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# TECHNICAL TALK

# AIR CTI THE ULTIMATE Tire Pressure Management System

The beauty of the AIR CTI system is that everything is controlled from inside the cabin. The 3 preset pressure ranges which can be collated for loaded/unloaded or bitumen (P1), dirt roads (P2) and sand/mud (P3). These preset pressures can then be manually adjusted or fine-tuned. The change in tyre pressure takes about a two to five minutes – more than adequate for changes in loading or terrain.

Over the next few newsletters I will show how, by using a Central Tyre Inflation system, enormous cost savings can be made.

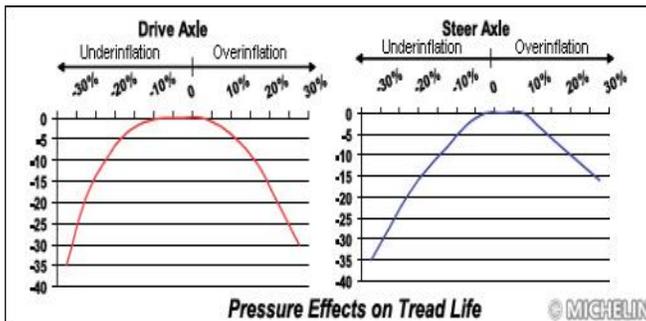
If you wish to speak with an CTI expert please refer below for AIR CTI contact details.

Did you know that driving on anything but the optimal tyre pressure as recommended by tyre manufacturer's increase tyre wear. In fact, in house records indicate that a tyre can wear over 30% faster due to underinflation AND overinflation. Michelin charts confirm this as shown below. Note this is for roads in the United States - Australian roads are much worse and thus tyre wear is much higher.

## MICHELIN EFFECTS OF TYRE LIFE

### Inflation Pressure

The most critical factor in tyre maintenance is proper inflation. Inflation pressure has a direct impact in tyre pressure – tread and endurance– as shown in the following United States charts.”



“Driving on any tyre that does not have the correct inflation pressure is dangerous and will cause tyre damage. Any under inflated tyre builds up excessive heat that may result in sudden tyre destruction. Pressures which are too high can lead to more rapid and uneven wear as well as being more vulnerable to road hazard damage. Consult a Michelin tyre dealer or Technical Data Book for the proper inflation pressures for your application.”

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**HAVE A GREAT MONTH, TELL YOUR FAMILY YOU LOVE THEM  
AND  
CHECK YOUR TYRE PRESSURE!**

Regards  
The AIR CTI Team



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