

## CUSTOMER INFORMATION SHEET – NO. 006

# CRUISEMASTER™ XT AIR INDEPENDENT SUSPENSION SYSTEM

## 1 WHY INDEPENDENT SUSPENSIONS?

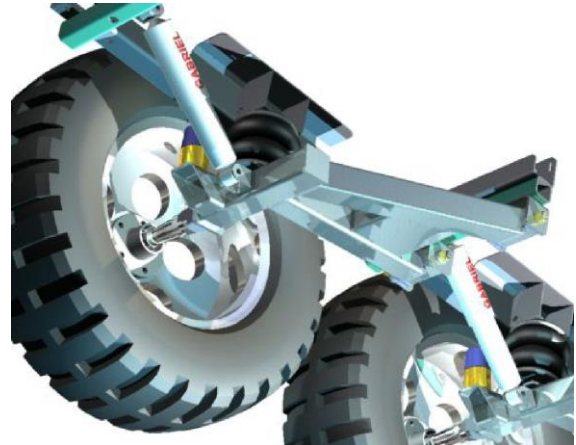
Beam axles have passed the test of time and are generally a good workhorse. However, you don't see them any more on cars. Why is this?

The first reason is geometry. That is the path the wheel takes as it moves up and down on the suspension. A traditional axle does not allow the wheel/tyre to travel in a manner that allows the tyre to follow the road surface. One side influences the other introducing problems such as bump steer. Handling, tyre wear and braking becomes compromised.

Secondly, the large unsprung weight of the axle has high inertia not allowing it to follow road undulations easily putting excessive loads into the chassis. Thirdly, the axle beam reduces ground clearance in the centre of the vehicle.

### FEATURES

- Low maintenance polyurethane bushes/steel sleeves in all moving parts
- Get you home bump stop facility
- Single and load sharing tandem configurations
- Low stress loading into chassis
- Easy fitment
- Optional 12" Marinised electric brakes with 2.6t VT stub axles
- Optional SA5 finish on all major parts to reduce corrosion



*Independent A-Frame complete with Air Spring, Shock Absorber and Bump Stop shown above. For detailed installation instructions please contact CRUISEMASTER™.*

## 2 HEIGHT SETTING

The air springs on your trailer/caravan are designed to operate at an optimum running height. This is most easily checked by measuring the vertical gap between the bottom of the chassis rail and the bump stop (Do not measure the air spring bracket). The correct height varies depending on the air springs fitted as per the table below:

To identify which air spring is fitted refer to the compliance plate supplied with the suspension.

Air Spring Type	Min/Max Axle Load (T)	Ave Height of Air Spring (mm)	Bump Stop to Chassis (mm) CRUISEMASTER® GEN 3+
AB 0121-V (255)	0.75/1.4	130 (5.0")	65
AB 0136-V (224)	0.9/1.7	150 (6.0")	75
AB 0140-V (26)	1.2/2.6	165 (6.5")	85

Check heights with the vehicle on level ground. Adjust the air pressure until the correct height is reached, operating pressure is likely to be between **50 and 90psi**. At the nominated height the chassis of the vehicle should be parallel to the ground. Ensure that any adjustments are carried out with the brakes off in order to avoid wind up of the suspension. It may be necessary to move the trailer forward and back to allow settling of the components.

With the position set it is recommended that you select a new reference point on the vehicle which is easy to measure which can be used for future checks. **All normal road use must be at this height.**

## 2.1 OPERATING AT NON-STANDARD HEIGHT

It is permissible to use the air springs to level the vehicle on site when stationary. This should be done with the brakes off but with the vehicle safely secured (eg: attached to the tow vehicle). If it is required to raise the vehicle above the normal ride position then speed must be limited to 10kph and under.

## 2.2 OPERATING IN GET YOU HOME MODE (EMERGENCIES ONLY)

In the event of air loss it is possible to run the vehicle on the bump stops. The 'get you home' feature of the suspension has been successfully used on normal roads. Extreme care and very slow speeds are required if running with airbags deflated. Off-road conditions especially can cause damage to air springs and A-frame mounting brackets may occur. It may be advisable in these circumstances to lower tyre pressures to provide additional cushioning to road bumps. Warranty does not apply under these conditions.

## 3 MAXIMUM PRESSURE

Under no circumstances should the operating pressure be set above **100PSI**.

## 4 SPARES

The nature of an air suspension system is no different to other suspensions which may get damaged on route and as is the case of normal axles with springs many owners choose to carry spares for problems that might crop up on route. CRUISEMASTER™ is happy to advise and supply spare air hose fittings, air bags, wheel bearings etc. These parts may be difficult to source in remote places.

## 5 LOSS OF PRESSURE

It is considered normal for air springs to lose some air pressure over time. Normal pressure loss should not exceed 3-4psi per week when the air springs are inflated to 50psi. Air leaks above this rate should be addressed immediately. We recommend the use of Loctite 567 on all threaded joints. Tube ends must be cut square to avoid leaks. Leaks can cause excessive compressor usage, premature wear and possible over-heating as well as overloading of jacks, jockey wheels and stands.

## 6 STORAGE

If storing your vehicle for long periods the suspension should be set at normal operating height to protect the bump stop and air spring from compression damage.

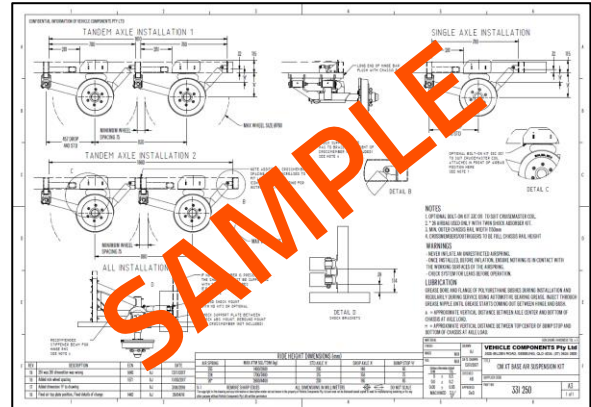
## 7 JACKING

If it is necessary to raise the vehicle, first release the air pressure from the springs. Re-inflate after the vehicle has been lowered to the ground.

## 8 SUSPENSION INSTALLATION

**CRUISEMASTER®** suspensions must be fitted in accordance with **CRUISEMASTER™** Engineering Design recommendations. These are usually in the form of installation drawings (as pictured) and are supplied with each suspension kit. Copies are also available upon request.

The installation drawing contains all the necessary dimensions and information required to correctly fit suspension hardware.



## 9 AIR CONTROL INSTALLATION

The air control system is used to control pressure in the airbags. Installation of the air control system varies according to the level of system selected. A system diagram is supplied with each suspension kit.

	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4
Airbags	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Manual inflation points	<input checked="" type="checkbox"/>	-	-	-
10m pneumatic tube & fittings	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Standard 12V Compressor	-	<input checked="" type="checkbox"/>	-	-
Heavy duty 12V compressor	-	-	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Dual control panel with gauges	-	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Inflation coil & wand, quick connect bulkhead coupling	-	-	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Air tank (11 litres, 3 port, drain tap)	-	-	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
LED power switch	-	-	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Pressure switch	-	-	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Auto height control valves & fittings (Self Leveling)	-	-	-	<input checked="" type="checkbox"/>

Please refer to **Customer Information Sheet No. 12 – General Maintenance**

The suspension fitted has been selected according to the vehicle manufacturer's recommended Aggregate trailer Mass (ATM) which can be found on the vehicles compliance plate. It is important that these figures are not exceeded.

**AIR SPRINGS** (as necessary)

Air springs must be protected from other items rubbing on the bellows. Hose off any mud or stones caught between the bellows and mounts by inflating to maximum travel height or up to 100psi.

### **AIR SYSTEM** (every 3 months or 5,000kms)

Check compressor filter for dirt, wash out or replace if necessary. Check mountings for wear and replace if necessary. Check fasteners for tightness.

### **AIR TANKS**

Drain water from systems with drain cord. Drain air tanks on vehicles without drains every 20,000kms.

### **VALVES** (every 2 years or 200,000kms)

Clean and rebuild or replace all valves.

#### **SAFETY**

1. Never inflate the air springs beyond 100psi.
2. Never attempt to remove any component of the air springs assembly when the air springs are inflated.
3. If an air spring fails when you are on the road, operate vehicle at reduced speed to reduce damage to components.
4. Never cut, weld or modify air springs or brackets.
5. Do not attempt to repair an air spring.

## **10 DRIVING WITH AIR SUSPENSION**

The benefits of Air Suspension fall into two categories, improved ride and the ability to adjust the suspension to compensate for load and angle. The improved ride comes about from the suspension geometry and the reduction in vibration and stress transferred into the caravan chassis and ultimately the tow vehicle. This results in better protection of the structure and contents of the caravan.

Unlike leaf suspensions Air Suspensions (and coil suspensions) heavily depend on damping provided by the shock absorbers to prevent undesirable body roll and harmonic movement of the suspension. They also control the rebound speed of the suspension.

Many drivers judge the correct speed based on the feel of the vehicle/trailer they are towing. The smoothness of the suspension compared to leaf springs for example does not give away how hard the suspension and shock absorbers are working. This is particularly true of corrugated roads. In this case shock absorbers can start to overheat and become less effective causing over travel of the suspension.

In the bump condition (minimum length) the bump stop helps protect the shock absorber and air spring. In the rebound condition the shock absorber will bottom out to protect the air spring from over travelling.

Like all suspensions the CRUISEMASTER™ Air Suspension has its limits and care needs to be taken when driving in off-road conditions and speeds need to be limited to what is appropriate for the conditions. As this is not under CRUISEMASTER™ control we cannot give warranty for damage experienced under these conditions.

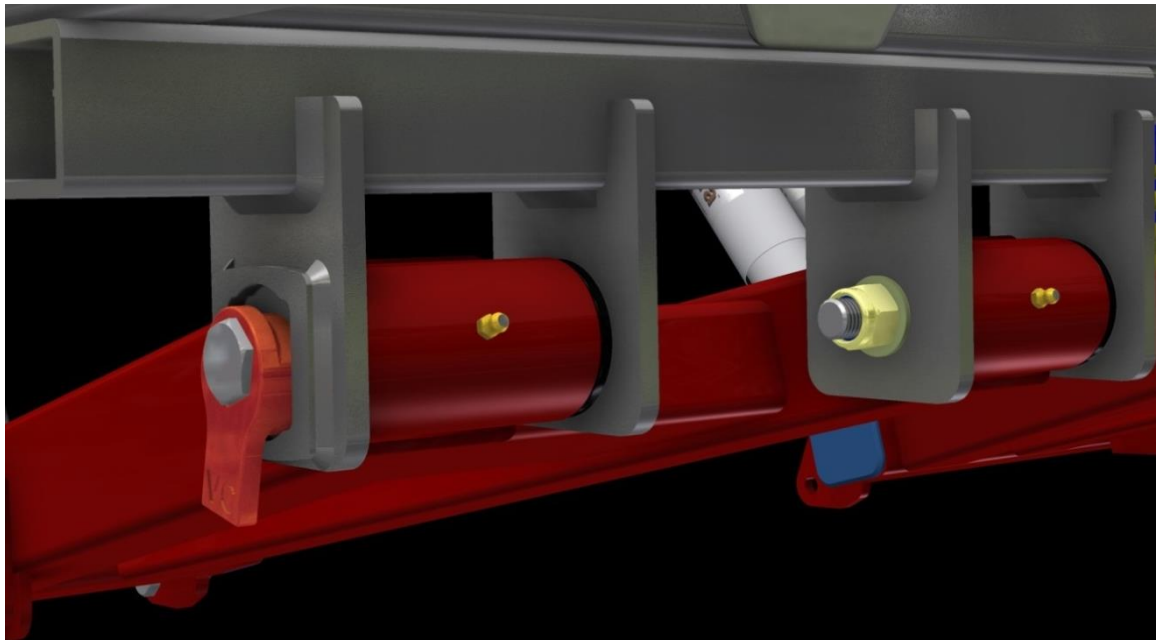
## **11 SELF LEVELING**

If fitted with automatic ride-height feature it is recommended that the system is set to manual when driving. It is important that both manual/automatic selection switches are both set to the same setting.

## **12 NIGHT-USE**

If the system is used in a caravan application it is recommended that the compressor is switched off at night to avoid start up should the pressure drop below the set level.

### 13 CRUISEMASTER® INDEPENDENT HINGE



- Improved round bush and machined housing
- Increased surface area
- Bore and flange grease grooves
- Pre-set positive camber (0.5° +ve)
- Toe & camber adjustment of approx 1.4°
- Increased material thickness of hinge plates

**For initial A-Frame fitment, position adjuster levers as follows:**

- Toe-in: Lever pointing downwards
- Camber: Lever pointing forward/backward

**Adjusting:**

- With hinge bolts fastened firm (not tight), set toe-in as required
- Set camber as required, ensuring that toe-in is not altered
- Fasten bolts to recommended torque setting

*Position the hinge assembly with toe-in adjuster (horizontal slot) towards the outside. (chassis side rail)*



## 14.1 General

- The toe and camber adjuster levers are used to adjust wheel alignment and are located on the hinge assembly.
- The adjuster levers also improve bolt retention and ensure that, when correctly fitted, the hinge bolts are securely fixed within the hinge assembly.
- The outer “wheel side” adjuster is used for toe-in/out adjustment and the inner for camber adjustment.



## 14.2 INSTALLATION PROCEDURE

This procedure describes recommended fitment of the adjustment lever and fasteners only and does not describe general fitment of suspension A-Frames.

1. Place bolt through adjuster lever locating bolt head into hex recess in lever.
2. Align frame assembly with hinge slot and insert bolt/adjuster, ensuring round end of adjuster locates within U-bracket on hinge.
3. Fit Nylon Insert nut to bolt but do not tighten as yet.
4. Check wheel alignment in both toe and camber directions (see below) and if necessary adjust by rotating the lever using an open ended spanner or the special VC spanner.
5. Fasten the Nylon Insert nut (always use new nuts) whilst holding the adjuster lever, ensuring it does not rotate from the adjusted position.
6. Torque Nylon Insert nut to 190N.m using a suitable torque wrench whilst holding the adjuster lever if required.



*Hold adjuster with spanner whilst tightening Nylon Insert nut*



*Torque Nylon Insert nut to 190N.m (140lb.ft)*

### 14.3 WHEEL ALIGNMENT PROCEDURE

1. Place the trailer/caravan on a smooth level surface and, if possible, at typical operating load.
2. Move the trailer backwards and forwards to eliminate any twist in the wheels.
3. Run a straight edge across the face of the tyre (watch for surface irregularities) then measure the distance from the straight edge to the chassis rail. Do this in front and behind the tyre. Record these two measurements. (A jig can be made up to take measurements straight from the wheel)



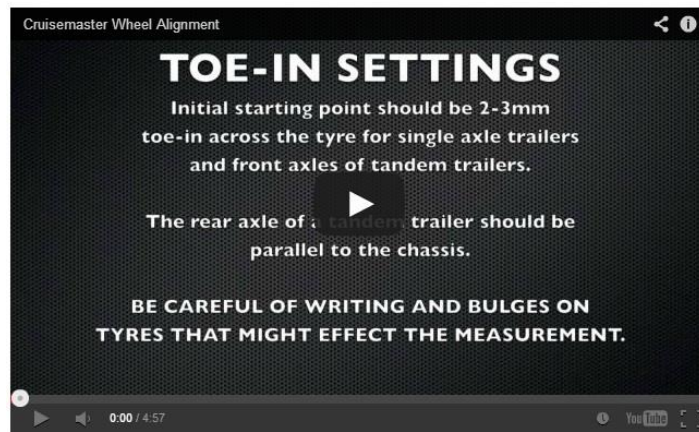
*It is also possible to measure alignment directly from the brake drum/disc face to the chassis rail. However, this does not take into account the effect of load on the suspension and may be more prone to measurement errors.*

4. A single axle or front axle on a tandem should be adjusted to have 2 - 3mm toe-in. That is, the measurement taken in front of the tyre should be 2 - 3mm less than the rear measurement.
5. Rear wheels on a tandem should measure parallel from the chassis rail, so the two measurements should be equal.
6. When setting the wheel camber, we recommend to use a digital spirit level on the rim and to set the camber at 0° to 0.5° negative to the vertical for all wheels. (Negative camber is where the top of the wheel is leaning in towards to trailer)



*Exact measurements will depend on the type and loading configurations. However, experience has shown that the figures given are a good starting point. Modifications to these figures may need to be made to suit individual installations.*

7. If adjustments need to be made, loosen all hinge bolts (and U-Bolts on leaf suspensions) and adjust by rotating the adjuster lever using an open ended spanner.
8. Check measurement again and repeat adjustment until correct.
9. Fasten all hinge bolts to the prescribed torque as detailed above, whilst ensuring that the adjuster lever does not move from the set position.
10. If correct toe/camber adjustment cannot be achieved (insufficient adjustment or earlier models without adjustment facility), special offset bushes and/or spindles can be used to gain additional adjustment. Please contact us for further information.



For information on factors affecting tyre wear, see Customer Information Sheet 23 – Prolonging Tyre Life, or visit the Information section of our website at [www.cruisemaster.com.au](http://www.cruisemaster.com.au)

For a detailed video on how to perform a wheel alignment on CRUISEMASTER™ Independent Suspension systems, follow the links from our website at [www.cruisemaster.com.au](http://www.cruisemaster.com.au)