

**Automotive Department**

**Elizabeth Campus**

**Woodford Road**

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**South Australia 5112**

6<sup>th</sup> May 2010.

To Whom It May Concern.

This is to confirm that during April 2010 I performed investigative tests on 2 vehicles in the endeavour to confirm the effectiveness of Envirotemp treatment on Automotive Air Conditioning systems.

Information and oil samples which were supplied to me by Enrico Sgarbi were used to undertake the exploratory test.

The results that were achieved backed up the expectations which were conveyed to me during our preliminary discussions.

Please find attached an outlined copy of the events which took place with comparative figures indicating the positive effect of the processes and oil additive.

Yours sincerely



Bruce Cock M.I.A.M.E

Automotive Lecturer / Air Conditioning Coordinator TAFE SA.

## **TAFE SA Adelaide North Elizabeth Campus**

The results of an Evaluation and effects of Envirotemp oil additive used on two separate vehicles with two different sets of scenarios but with similar positive outcomes.

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Prepared and performed by;

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for

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## Introduction

The aim of this report is to examine the effects of Envirotemp oil as an additive to an existing operational Automotive Air Conditioning system and monitor and record any variation in results both before and after the introduction of the oil.

## Environment

All tests were conducted in the Automotive Workshop at the Elizabeth Campus of TAFE SA. The Ambient temperature was recorded at 30 minute intervals to ensure any variations would be considered in the results.

## First Vehicle: VT Commodore 1999

This vehicle was serviced by me in January 2010 at which time a new compressor was installed, the Receiver / Drier replaced and the system charged according to manufacturer's specifications. At the time of the repair the final results were not as spectacular as I would have liked even though it met the owner's expectations for operation.

For this reason I chose this vehicle for this experiment to see if what I had diagnosed initially as the cause for a poor outcome was in fact correct. The reason was, that the system when the initial recovery of refrigerant occurred a significant amount of dye was also recovered indicating that at some time an excess of dye had been inserted which unfortunately creates a barrier between the refrigerant and the condenser and evaporator tubes preventing a positive heat transfer as required for a system to function as designed.

Prior to undertaking the process of inserting the test charge of oil the specifications were recorded for a comparison for the post operation tests.

To perform the test I needed to recover 200 grams of refrigerant using a recovery unit and scales for complete accuracy.

Inserting 12 ml of Envirotemp oil into the Low side charge hose, I then reintroduced 200 grams of new R134a refrigerant into the vehicle Air Conditioning system flushing in with it the oil.

At the completion of the oil introduction the vehicle was allowed to run increasing and decreasing engine revs to ensure a complete oil circulation.

At this point I then recorded the specifications again as was performed prior to the test.

## The specifications taken were:

1. Airflow temp at the Centre Vent with an Evaporator fan speed of 4
2. Airflow temp at the Centre Vent with a fan speed of 1
3. Temperature of the Suction line at its entry point through the Fire Wall into the engine compartment.
4. Engine revs held at 1500 rpm.
5. Ambient Temperature 28°C with a Relative Humidity of 41%.
6. High Side gauge reading.
7. Low Side gauge reading.
8. Temperature of change of state at Condenser with infrared Thermometer.

## Results

Position of Reading for Results	Pre Treatment	Post Treatment	Change
1. Airflow temp at the Centre Vent with an Evaporator fan speed of 4	11.4° C	7.2° C	-4.2° C
2. Airflow temp at the Centre Vent with a fan speed of 1	9.7° C	4.7° C	-5.0° C
3. Temperature of the Suction line at its entry point through the Fire Wall into the engine compartment.	14.0° C	5.6° C	-8.4° C
4. Engine revs held at 1500 rpm.	1500rpm	1500rpm	0rpm
5. Ambient Temperature 28°C with a Relative Humidity of 41%.	28° C	28° C	0° C
6. High Side gauge reading	62° C	56° C	-6° C
7. Low Side gauge reading.	11° C	0° C	-11° C
8. Temperature of change of state at Condenser with infrared Thermometer.	64° C	55° C	-9° C

### Second Vehicle:

**Toyota Vienta Grande**

**2000**

This vehicle has never had the Air Conditioning system serviced and is not performing as well as it was when new. (It is my own vehicle)

All operations were performed in exactly the same manner as with Vehicle 1 and the results were also recorded following the same procedures.

The only difference in the configuration between the two vehicles is that vehicle two has Climate Control.

### The specifications taken were:

1. Airflow temp at the Centre Vent with an Evaporator fan speed of 4
2. Airflow temp at the Centre Vent with a fan speed of 1
3. Temperature of the Suction line at its entry point through the Fire Wall into the engine compartment.
4. Engine revs held at 1500 rpm.
5. Ambient Temperature 28°C with a Relative Humidity of 41%.
6. High Side gauge reading.
7. Low Side gauge reading.
8. Temperature of change of state at Condenser with infrared Thermometer.

## Results

Position of Reading for Results	Pre Treatment	Post Treatment	Change
1. Airflow temp at the Centre Vent with an Evaporator fan speed of 5	19.2° C	7.7° C	-11.5° C
2. Airflow temp at the Centre Vent with a fan speed of 1	17.0° C	5.8° C	-11.2° C
3. Temperature of the Suction line at its entry point through the Fire Wall into the engine compartment.	26.0° C	10.2° C	-15.8° C
4. Engine revs held at 1500 rpm.	1500rpm	1500rpm	0rpm
5. Ambient Temperature 30°C with a Relative Humidity of 40%.	30° C	30° C	0° C
6. High Side gauge reading	65° C	58° C	-7° C
7. Low Side gauge reading.	16° C	4° C	-12° C
8. Temperature of change of state at Condenser with infrared Thermometer.	66° C	59° C	-7° C

## Additional Significant Factors

One significant factor on vehicle two was that Pre Treatment the evaporator fan continuously stayed on fan speed 5 all the times where as post treatment within 3 minutes of running it brought itself back to the 1<sup>st</sup> speed and maintained it. This in itself proves to be a significant achievement as the slower the evaporator fan operates the more efficiently it removes the heat from the cabin.

Secondly the noise of engagement and disengagement of the compressors were significantly quieter and both operate quieter when engaged.

## Conclusion

The tests carried out on both vehicles indicated a much improved Air Conditioning performance with quieter operation. Due to the better performances the vehicles had a very small differentiation between cycling out and back in again adding to a much more efficient system. In addition obviously their running cycle was also significantly shorter.

Even though I have no way of measuring an improvement in vehicle performance and economy it appears obvious to me that it would make a remarkable difference experiencing the ease at which both systems achieved their outcomes very efficiently.

As was pointed out to me by Enrico Sgarbi initially was the way the oil works is to eliminate any contamination or barrier between the refrigerant and the tubes in the Evaporator and Condenser (heat exchangers) to ensure heat transfer is not impaired. This obviously occurs.

Finally, the owner of vehicle 1 is very appreciative of the improvement in performance and **isn't that what it's all about.**