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The following covers tests and trials of vehicle air conditioning systems and components using AA1 Automotive A/C compressor lubricant supplied by the Refrigerant Oil Co. of Tullamarine Victoria.

The trialing of vehicle A/C systems was done by adding AA1 refrigerant oil to air conditioning systems that required retrofitting to HFC 134a.

In most cases these vehicles were originally CFC12 systems that had been accident damaged, most of the existing mineral oil discharged at the time of the accident.

After component repair and or replacement the A/C system was evacuated to a high vacuum and the specified lubricant amount was added to the system no solvent flushing or any attempt to remove residual oil was done (see chart) a new filter drier was used in all cases.

Some vehicles required the refrigerant to be recovered to allow for component repair or replacement.

The specified lubricant amount of AA1 refrigerant oil was added to these systems prior to regassing.

No flushing or attempt to remove existing mineral oil was attempted with these vehicles(see chart).

AA1 refrigerant oil was used in A/C compressors that were repaired then refitted to the vehicle in some cases (depending on the vehicle and it's A/C system) oil was flushed from the condenser and in some cases the whole A/C system was flushed.

At no time was flushing with solvent or refrigerant carried out on the compressor.

AA1 refrigerant oil was used in rotary vane compressors that required repair with encouraging results. These particular compressors have given trouble when the A/C systems they are fitted to have been retro-fitted to HFC134a particularly when the lubricant has been replaced with Castrol SW100 Ester.

Some compressors had sustained damage to the carbon tips on the vane extremity causing the compressor to rattle severely followed shortly by complete compressor failure.

When these systems had the lubricant changed to AA1 although the compressors were still noisy there have been no reported failures to date.

Tests were done on mixing of AA1 with 3 types of lubricants currently being used with HFC134a namely:

Poly alkaline Glycol 1 (PAG1), PAG2 and SW100 Polyol ester (POE).

Although PAG1 and PAG2 did not mix well with the AA1 after several weeks of allowing the oils to settle a trace amount of AA1 could still be seen in the PAGS. There was no evidence of discolouration, thickening, moisture ingress or noticeable loss of lubricity in either of the two oil stratas.

This in laymans terms would indicate the oil travelling through a system will not lose it's lubricity and will not have a deleterious effect on the carrier lubricant in this case PAGS. AA1 mixed completely with Castrol's POE SW100 and there is no evidence of thickening discolouration or loss of lubricity with POE SW100.

In saying this they are not scientific tests but rather a crude attempt to understand what maybe occurring in an automotive air conditioning with mixtures of different lubricants.

Further tests were done by removing oil from systems that had a mixture of mineral oil and AA1 and AA1 and POEs.

Where mineral oil and AA1 were mixed the system appeared clear with no sludge or discolouration.

Where SW100 POE was mixed with AA1 there was a darkening of the oil but no evidence of any damage.

Castrol SW100 appears to darken in all vehicle A/C systems and there is some concern this maybe an acidic effect on hose material and elastomer seals.

At this time these tests and trials are not fully complete however early indications appear positive.

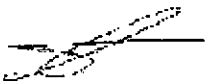
A good result was obtained when retrofitting a 1991 Porshe 911. The compressor shaft seal and the drier were replaced and both front and rear condensers were flushed. The vent discharge air was measured at 5 degrees C with gauge pressures operating normally and the ambient temperature at approx. 28 degrees C.

What is encouraging is the best discharge air temperature under these conditions for this particular vehicle has been 10 degrees C.

Seventy four (74) vehicles are recorded in these charts a further one hundred and twenty seven (127) vehicles have been recharged with AA1 lubricant.

All vehicles are recorded and labelled so any failures or service problems will be reported and followed up.

Yours Faithfully,



C.J. Lindeman MIAME.

	A	B	C	D	E	F	G	H	I
1	VEHICLE AIR CONDITIONING SYSTEMS TRIALED USING ROC AA1 LUBRICANT								
2									
3									
4	VEHICLE MAKE	YEAR	SYSYTEM TYPE	R12	R134A	RETROFIT	REPAIR	PARTS REPLACED	REMARKS
5	Nissan skyline	89	cyc clt	X			X	drier, hose	AA1 added performance good
6	Nissan Pintara	91	"	X		X	X	drier	AA1 added performance good
7	Toyota Celica	86		X		X	X	drier	AA1 added performance good
8	Audi 90	91		X			X	hose drier	AA1 added performance good
9	Comm VP	92		X		X	X	drier heater tap	AA1 added performance good
10	Ford Telstar	86		X		X	X	Cond repair front seal flush drier	AA1 added performance good
11	Toyota Hi ace	91		X			X	hose drier	AA1 added performance good
12	comm VK	85		X		X	X	drier	AA1 added performance good
13	Toyota 4 Runner	94		X		X	X	Tx valve drier press switch	AA1 added performance good
14	Nissan Navara	92		X		X	X	drier	AA1 added performance good
15	Triumph 2000	76		X		X	X	3 hoses drier TX valve	AA1 added performance good
16	BMW 323i	87		X		X	X	hose drier wiring	AA1 added performance good
17	Ford Telstar	87		X		X	X	drier	AA1 added performance good
18	Toyota Hi Ace	90		X		X	X	drier	AA1 added performance good
19	Falcon EL	96			X		X	drier	AA1 added performance good
20	Nissan Maxima	90		X		X	X	drier	AA1 added performance good
21	Comm VR	96			X		X	drier	AA1 added performance good
22	Comm VN	89		X		X	X	drier condenser	AA1 added performance good
23	Falcon EB	93		X		X	X	drier	AA1 added performance good
24	Comm VN	90		X		X	X	drier hose	AA1 added performance good
25	Comm VN	90		X		X	X	drier o rings leaks	AA1 added performance good
26	BMW 528i	85		X		X	X	drier flush switch	AA1 added performance good
27	Mazda 626	87		X		X	X	drier	AA1 added performance good
28	Toyota ST 141	84		X		X	X	drier condenser repair	AA1 added performance good
29	Volvo 244	78		X			X	drier	AA1 added performance good
30	Mitsu Pajero	93		X			X	drier switch	AA1 added performance good
31	Falcon XF	87			X		X	drier	AA1 added performance good
32	Falcon EA	89		X		X	X	drier	AA1 added performance good
33	Falcon EA	90			X	prior retro	X	drier	AA1 added performance good
34	Toyota Camry	93			X		X	drier Tx valve evaporator fan as	AA1 added performance good
35	Mitsu Magna TR	92		X		X	X	drier	AA1 added performance good
36	Falcon XF	87		X		X	X	drier	AA1 added performance good

	A	B	C	D	E	F	G	H	I
1	VEHICLE AIR CONDITIONING SYSTEMS TRIALED USING ROC AA1 LUBRICANT								
2									
3									
4	VEHICLE MAKE	YEAR	SYSYTEM TYPE	R12	R134A	RETROFIT	REPAIR	PARTS REPLACED	REMARKS
5	Toyota Tarago	87	cyc clt	X			X	drier ice maker	AA1 added performance good
6	toyota Hilux	91	"	X		X	X	compressor drier flush	AA1 added performance v. good
7	Mazda 121	86		X		X	X	hose drier	AA1 added performance good
8	Mazda 626	92		X			X	drier	AA1 added performance good
9	toyota Corolla	93		X		X	X	drier	AA1 added performance good
10	Jaguar XJ6	81		X		X	X	drier hose	AA1 added performance fair
11	Mercedes 116	86		X			X	hose drier switch	AA1 added performance good
12	Falcon EA	89		X		X	X	drier	AA1 added performance good
13	Toyota Corolla	94			X		X	drier	AA1 added performance good
14	Mitsu Lancer	90		X		X	X	TX valve drier	AA1 added performance good
15	Holden Barina	96			X		X	drier hose	AA1 added performance good
16	Honda Accord	91		X		X	X	drier O rings	AA1 added performance good
17	Toyota Cressida	83		X		X	X	drier O rings	AA1 added performance good
18	Toyota Hi Ace	92		X		X	X	drier tx valve	AA1 added performance v. good
19	SAAB 900	88		X		X	X	drier hose set TX valve	AA1 added performance V. good
20	Hyundai Excel	95			X		X	drier	AA1 added performance good
21	Falcon EF	96			X		X	drier	AA1 added performance good
22	Comm VN	89		X		X	X	drier	AA1 added performance good
23	Falcon EB	92		X		X	X	drier condenser	AA1 added performance v. good
24	Commodore VR	95			X		X	TX valve drier	AA1 added performance good
25	Mazda 121	90			X		X	drier	AA1 added performance good
26	Ford Laser	91		X		X	X	drier	AA1 added performance good
27	Falcon XD	82		X		X	X	drier	AA1 added performance good
28	Ford Laser	93		X		X	X	drier	AA1 added performance good
29	Mitsu Triton	88		X			X	drier	AA1 added performance good
30	Hyundai Excel	88		X			X	drier	AA1 added performance good
31	Commodore VR	95			X		X	drier	AA1 added performance good
32	Falcon EA	89		X		X	X	drier	AA1 added performance good
33	Falcon EB	92		X		X	X	drier	AA1 added performance good
34	Commodore VL	89		X		X	X	Compressor TX valve drier flush	AA1 added performance V. good
35	Mitsu Magna TR	91		X		X	X	drier	AA1 added performance good
36	Audi A4	93		X		X	X	drier hose	AA1 added performance good

