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19100-01/SQ&EA

CHORNCO TRIAL RESULTS REPORT APRIL 2002 – SEPTEMBER 2002

BACKGROUND

1. Chornco 2082 is a 100% petroleum, pure hydrocarbon, product that contains no aromatic solvents, metals, ashes or wear precursor additives and is therefore safe for use in diesel engines. 2082 reduces the surface tension of the diesel fuel resulting in improved fuel flow and smaller droplets of fuel entering the combustion chamber through the injectors. The smaller droplet size ensure a more complete burn of the fuel on compression ignition thereby improving the combustion efficiency and resulting in both fuel economy and an improvement in power. Due to the more complete burn of the fuel droplets there is a resulting lower exhaust temperature and a reduction in exhaust emissions such as particulates, total hydrocarbons, carbon monoxide, oxides of nitrogen, sulphur and sulphur dioxide. Additional benefits include the following:
 - a. 2082 fully disperses and re-absorbs foreign particles thus cleaning bulk storage tanks, fuel tanks, lines and injector bodies.
 - b. 2082 inhibits the formation of sulphuric, nitric, hydrochloric and hydrobromic acids thus extending the life of metal components by resulting rust formation.
 - c. 2082 provides a bacteriostatic and emulsification action that controls the growth of bacteria (diesel bug) and absorbs a percentage of suspended water in the fuel carrying it harmlessly through the combustion chamber to be burned off harmlessly.
 - d. 2082 retards oxidation thus slowing down the fuel aging process in storage while preventing the formation of gums and varnishes.
 - e. It is also claimed that Chornco 2082 is an effective lubricity enhancer. This aspect will become increasingly important as NZ (and the rest of the world) moves continually to lower the Sulphur content of automotive diesel fuel by the hydro-cracking processing at the Marsden Point Refinery. Lubricity tests were conducted at DTA early in 2003 by comparing diesel/Chornco 2082 with straight diesel and with other lubricity enhancing additives. A separate report covers the results of these tests.

TRIAL OBJECTIVES

3. This evaluation sought only to determine the fuel saving and power performance aspect of this diesel fuel conditioner due to the lack of resources and specialist testing equipment within the Army required to evaluate other aspects of Chornco's 2082's characteristics. This evaluation was conducted in two phases being, dynamometer testing at SPEL on the 27-28 May 02 and road testing in the lower North Island from 4 April 02 to Nov 02.

Dynamometer Testing

4. Following a 30 hour run in period, a one hour power run was conducted using pure diesel fuel only in order to establish the baseline. Chornco 2082 was then added to the fuel at a ratio of 1:640. This resulted in a 4.2% gain in fuel economy over a one hour power run with the economy still rising at the end of that run. Chornco 2082 was then added to the fuel at a ration of 1:1280 (recommended optimum dosage). This resulted in a 5.6% gain in fuel economy over a one hour power run with the economy still rising at the end of that run. A 2KW increase in power output and a significant reduction in exhaust manifold temperature were also recorded. The results of this test are contained in Appendix 1.

Road Testing in Lower North Island

5. The Unimog 1700L chosen for these series of road tests was prepared by receiving a full engine flush and fuel system purge treatment using prototype equipment and products. The fuel lines and fuel tank were replaced as new. This was done to ensure that the fuel saving benefits of Chornco 2082 were independent and additional to any previous initiatives to conduct engine flushing and fuel system purging to the Army's fleet of diesel vehicles. This would ensure that only the Chronco 2082's effects on diesel fuel were measured, there being no lost efficiencies being recorded as systems were cleaned.

6. Three series of tests were conducted in the following order:

- a. Pure diesel fuel only,
- b. Chornco/diesel at 1:640 and
- c. Chronco/diesel at 1:1280.

7. Each series of test runs involved 5 trips around a pre-determined circuit involving winding roads, long straight flat country roads and built up urban areas

8. The overall best results from these tests was a fuel saving of 6.9% at a Chornco/diesel ratio of 1:1280 which supported the finding of the dynamometer test. These results are contained in appendices 2 to 4.

CONCLUSION

9. Having carried out the trials over an extended period of time, under a balanced cross section of weather and road conditions and under detailed scrutiny the results obtained supports Chornco's product statements. The test proves that the use of Chornco does result in a reduction of fuel consumption and a general overall improvement in engine performance. Whilst other characteristics of this product were not evaluated in this test, and despite their significance, the 6.9% fuel savings obtained in the tests represent a significant net cost saving to the Army.

RECOMMENDATIONS

10. It is recommended that Army:
- a. Adopt the use of Chornco 2082 diesel Fuel Conditioner,
 - b. Install automatic dispensing equipment at the five camps with priority based on annual consumption figures, i.e. Waiouru first, then Linton, Burnham, Trentham and Tekapo, and,
 - c. Purchase an initial stock of 25 x 208 litre drums



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Appendices:

1. Dynamometer Test Results
2. Baseline Series of Runs – Straight Diesel Only
3. First Chornco/Diesel Series of Runs – Ratio Chornco/Diesel – 1:640
4. Second Chornco/Diesel Series of Runs – Ratio Chornco/Diesel – 1:1280

DYNAMOMETER TEST RESULTS

Timed Runs:

Monday 27 May 2002

- | | | |
|----|---|---|
| 1. | 1115 to 1214 hours
Straight Diesel | Temperature - 482°C
Run Time - 3540 Seconds
Power - 126KW |
| 2. | 1312 to 1410 hours
Diesel with Chornco 2082
Treatment ratio = 1:640 | Temperature - 478°C
Run Time - 3493 Seconds
Power - 124KW |

Tuesday 28 May 2002

- | | | |
|----|--|---|
| 3. | 1015 to 1116 hours
Diesel with Chornco 2082
Treatment ratio = 1:640 | Temperature - 470°C
Run Time - 3690 Seconds
Power - 128KW |
| 4. | 1239 to 1340 hours
Diesel with Chornco 2082
Treatment ratio = 1:1000 | Temperature - 478°C
Run Time - 3660 Seconds |
| 5. | 1345 to 1445 hours
Diesel with Chornco 2082
Treatment ratio = 1:1280 | Temperature - 478°C
Run Time - 3660 Seconds |

Wednesday 29 May 2002

- | | | |
|----|--|---|
| 6. | Diesel with Chornco 2082
Treatment ratio = 1:1280 | Temperature - 462°C
Run Time - 3740 Seconds
Power - 128KW |
|----|--|---|

RESULTS SUMMARY

The timed runs started after the engine was fully run in (30 hours). A baseline power run was conducted the results of which are detailed in 1 above. A second run established the repeatability of the test protocol.

The manufacturer states that initially the results would show a slight deterioration before any noticeable improvements, which proved to be the case as the fuel economy slipped back by 1.3% and a reduction in power of 2KW. A reduction in exhaust manifold temperature of 4°C indicated that the product was having an effect.

After this first run with Chornco 2082 treated fuel a trend was noted using the trial figures as two separate entities i.e. morning and afternoon figures as the afternoon figures demonstrated slightly higher exhaust temperatures and slightly less overall power readings on the power runs. The trial run times were unaffected either way.

As the Chornco 2082 product worked its way through the motor the results improved steadily, with the second 1:640 mix providing a 2KW power increase and a 4.2% fuel economy gain followed by a slight drop off in overall performance as the 2082 mixture was leaned out. (This happened faster than the norm due to dynamometer time constraints.

The final results, when compared with baseline data, showed the following:

1. A 2KW power gain.
2. A 5.6% economy gain.
3. A 20°C reduction in exhaust manifold temperature.

CONCLUSION

The results detailed above demonstrated the overall improvement in performance of the engine when using Chornco 2082 Diesel Fuel Treatment with the best results coming from the manufacturers optimum treatment ration of 1:1280. There was no other possible explanation for this performance and the exercise will prove indicative of the capabilities of this product when compared with the results obtained from the road trials.

BASELINE SERIES OF RUNS**STRAIGHT DIESEL ONLY****CHORNCO TRIAL – RUN 1**

Test date: 4th April 2002

Test vehicle: Unimog 1700L Tractor 1983

Tyre pressures: Front 60 psi
Rear 50 psi

Hubbo reading: Start 081799
Finish 082116

Test conditions:
Weather – clear, sunny, no cloud cover.
Temperature: Camp (0830 hrs) 4°C

Weather – 25% cloud cover
Temperature: Pahiatua (1120 hrs) 10°C
Turbo temp 184°C

Weather – 50% cloud cover
Temperature: Shannon (1300 hrs) 17°C
Turbo temp 240°C

Weather – 40% cloud cover
Temperature: Trentham (1450 hrs) 17°C
Turbo temp after 5 min 104°C

Total distance travelled: 317 kilometres
Total fuel consumed: 80.0 litres
Km/litre = 3.96

CHORNCO TRIAL – RUN 2

Test date: 12th April 2002

Test vehicle: Unimog 1700L Tractor 1983

Tyre pressures: Front 60 psi
Rear 50 psi

Hubbo reading: Start 082116
Finish 082429

Test conditions:
Weather – Overcast 90% cloud cover
Temperature: Camp (0840 hrs) 10°C

Weather – 100% cloud cover, light rain
Temperature: Pahiatua (1130 hrs) 11°C
Turbo temp 202°C

Weather – 90% cloud cover
Temperature: Shannon (1310 hrs) 18°C
Turbo temp 220°C

Weather – 70% cloud cover
Temperature: Trentham (1450 hrs) 16°C
Turbo temp after 5 min. 110°C

Total distance travelled: 313 kilometres
Total fuel consumed: 82.3 litres
Km/litre = 3.80

**APPENDIX 2 TO
19100-01/SQ&EA
DATED 21 MAY 2003****CHORNCO TRIAL – RUN 3**

Test date: 3rd May 2002

Test vehicle: Unimog 1700L Tractor 1983

Tyre pressures: Front 60 psi
Rear 50 psi

Hubbo reading: Start 082547
Finish 082859

Test conditions:
Weather – Overcast 90% cloud cover.
Temperature: Camp (0840 hrs) 7°C

Weather – 100% cloud cover (light rain)
Temperature: Pahiatua (1115 hrs) 11°C
Turbo temp 244°C

Weather – 90% cloud cover
Temperature: Shannon (1255 hrs) 14°C
Turbo temp 290°C

Weather – 70% cloud cover
Temperature: Trentham (1450 hrs) 13°C
Turbo temp after 5 min. 107°C

Total distance travelled: 312 kilometres
Total fuel consumed: 85.0 litres
Km/litre = 3.67

CHORNCO TRIAL – RUN 4

Test date: 16th May 2002

Test vehicle: Unimog 1700L Tractor 1983

Tyre pressures: Front 60 psi
Rear 50 psi

Hubbo reading: Start 082872
Finish 083185

Test conditions:
Weather – clear, sunny, 5% cloud cover.
Temperature: Camp (0830 hrs) 0°C

Weather – 70% cloud cover
Temperature: Pahiatua (1115 hrs) 9°C
Turbo temp 200°C

Weather – 50% cloud cover
Temperature: Shannon (1305 hrs) 14°C
Turbo temp 268°C

Weather – 70% cloud cover
Temperature: Trentham (1455 hrs) 12°C
Turbo temp after 5 min 97°C

Total distance travelled: 313 kilometres
Total fuel consumed: 85.8 litres
Km/litre = 3.65

CHORNCO TRIAL – RUN 5

Test date: 17th May 2002
Test vehicle: Unimog 1700L Tractor 1983
Tyre pressures: Front 60 psi
Rear 50 psi
Hubbo reading: Start 083185
Finish 083498

Test conditions:

Weather – clear, sunny, 5% cloud cover.

Temperature: Camp (0840 hrs) 5°C

Weather – clear, sunny

Temperature: Pahiatua (1130 hrs) 14°C
Turbo temp 242°C

Weather – 5% cloud cover

Temperature: Shannon (1305 hrs) 11°C
Turbo temp 288°C

Weather – 70% cloud cover

Temperature: Trentham (1450 hrs) 11°C
Turbo temp after 5 min. 103°C

Total distance travelled: 313 kilometres
Total fuel consumed: 82.9 litres
Km/litre = 3.78

Notes:

- In all tests the vehicle was loaded with 1600kgs of water.**
- The same driver made all journeys**

CHORNCO BASELINE TEST SUMMARY

The tests were carried out between 4th April and 17th May 2002 (5 individual round trip journeys)

The test vehicle was a Unimog 1700L Tractor manufactured in 1983 with an approximate odometer reading of 88,000 kilometres.

The total distance covered = 1568 Km

The total diesel fuel consumed = 416 litres

Average fuel consumption = 3.769 Km/Litre

For fuel consumption alone this trial provides a measurable and if need be, repeatable benchmark. The overall figures for the first four trips exactly equals the individual result for the fifth, and final trip.

A wide range of weather conditions were experienced during the test runs, which allows for a moderating factor for day-to-day weather variables.

The hot running turbo temperatures (flat ground high speed cruise) taken at Nth Pahiatua readings were 184,220,244,200,242 degrees centigrade. The relevant readings are 220,242 and 244 degrees centigrade. These were obtained after a "good controlled final run" to the reading areas.

The hot running turbo temperature (flat ground high speed cruise) taken at Sth Shannon readings, were 240,220,290,268,288 degrees centigrade. The relevant readings are 290 and 288 degrees. These were obtained after an uninterrupted full power run up hill prior to the reading area.

The engine idle turbo temperatures were 104,110,107,97,103, degrees centigrade. These were obtained after a 5 minute idle down period and show the "at rest" temperature of the turbo housing. These readings will be monitored as the trial progresses.

SUMMARY DATA USING FRESH DIESEL FUEL					Ave: 3.769
Date or Day No.	Odometer reading km or miles - Start	Odometer reading km or miles - Finish	Fuel volume used in fill ups - litres	2082 Fuel Treatment used (mls)	Kilometers per Litre
04-Apr	81799	82116	80.0	nil	3.963
12-Apr	82116	82429	82.3	nil	3.803
03-May	82547	82859	85.0	nil	3.671
16-May	82872	83185	85.8	nil	3.648
17-May	83185	83498	82.9	nil	3.776

**FIRST CHORNCO/DIESEL
SERIES OF RUNS
RATIO CHORNCO/DIESEL – 1:640**

**APPENDIX 3 TO
19100-01/SQ&EA
DATED 21 MAY 03**

CHORNCO TRIAL – RUN 6

Test date: 14th June 2002
Test vehicle: Unimog 1700L Tractor 1983

Tyre pressures: Front 60 psi
Rear 50 psi

Hubbo reading: Start 083499
Finish 083817

Test conditions:

Weather – light rain, 100% cloud cover.
Temperature: Camp (0850 hrs) 12°C

Weather – 90% cloud cover
Temperature: Pahiatua (1125 hrs) 11°C
Turbo temp 263°C

Weather – 100% cloud cover
Temperature: Shannon (1310 hrs) 9°C
Turbo temp 283°C

Weather – 40% cloud cover
Temperature: Trentham (1440 hrs) 7°C
Turbo temp after 5 min 93°C

Total distance travelled: 318 kilometres
Total fuel consumed: 79.3 litres
Km/litre = 4.01

CHORNCO TRIAL – RUN 7

Test date: 28th June 2002
Test vehicle: Unimog 1700L Tractor 1983

Tyre pressures: Front 60 psi
Rear 50 psi

Hubbo reading: Start 083817
Finish 084131

Test conditions:

Weather – Light rain 100% cloud cover
Temperature: Camp (0850 hrs) 12°C

Weather – 90% cloud cover
Temperature: Pahiatua (1135 hrs) 11°C
Turbo temp 250°C

Weather – 90% cloud cover
Temperature: Shannon (1325 hrs) 11°C
Turbo temp 285°C

Weather – 100% cloud cover, heavy rain.
Temperature: Trentham (1450 hrs) 10°C
Turbo temp after 5 min. 97°C

Total distance travelled: 314 kilometres
Total fuel consumed: 78.1 litres
Km/litre = 4.02

CHORNCO TRIAL – RUN 8

Test date: 11th July 2002
Test vehicle: Unimog 1700L Tractor 1983

Tyre pressures: Front 60 psi
Rear 50 psi

Hubbo reading: Start 084132
Finish 084445

Test conditions:

Weather – Clear and sunny 5% cloud cover.
Temperature: Camp (0855 hrs) 3°C

Weather – 5% cloud cover
Temperature: Pahiatua (1145 hrs) 10°C
Turbo temp 243°C

Weather – 90% cloud cover
Temperature: Shannon (1330 hrs) 11°C
Turbo temp 283°C

Weather – 100% cloud cover, heavy rain
Temperature: Trentham (1505 hrs) 9°C
Turbo temp after 5 min. 97°C

Total distance travelled: 313 kilometres
Total fuel consumed: 79.0 litres
Km/litre = 3.96

CHORNCO TRIAL – RUN 9

Test date: 25th July 2002
Test vehicle: Unimog 1700L Tractor 1983

Tyre pressures: Front 60 psi
Rear 50 psi

Hubbo reading: Start 084445
Finish 084762

Test conditions:

Weather – Overcast and drizzle, 95% cloud cover.
Temperature: Camp (0855 hrs) 8°C

Weather – Overcast and drizzle, 100% cloud cover
Temperature: Pahiatua (1115 hrs) 8°C
Turbo temp 249°C

Weather – Overcast and drizzle, 100% cloud cover
Temperature: Shannon (1315 hrs) 6°C
Turbo temp 272°C

Weather – 100% cloud cover
Temperature: Trentham (1455 hrs) 8°C
Turbo temp after 5 min 94°C

Total distance travelled: 317 kilometres
Total fuel consumed: 78.0 litres
Km/litre = 4.06

CHORNCO TRIAL – RUN 10

Test date: 1st August 2002
Test vehicle: Unimog 1700L Tractor 1983
Tyre pressures: Front 60 psi
Rear 50 psi
Hubbo reading: Start 084765
Finish 085079

Test conditions:

Weather – clear and frosty
Temperature: Camp (0855 hrs) -1°C

Weather – 100% cloud cover, heavy fog.
Temperature: Pahiatua (1145 hrs) 3°C
Turbo temp 243°C

Weather – 5% cloud cover, clear and sunny
Temperature: Shannon (1315 hrs) 7°C
Turbo temp 269°C

Weather – 5% cloud cover, clear and sunny
Temperature: Trentham (1450 hrs) 8°C
Turbo temp after 5 min. 98°C

Total distance travelled: 314 kilometres
Total fuel consumed: 79.1 litres
Km/litre 3.97

Notes:

3. In all tests the vehicle was loaded with 1600kgs of water.
4. The same driver made all journeys

CHORNCO 1:640 RATIO TEST SUMMARY

The tests were carried out between 14th June and 1st August 2002 (5 individual round trip journeys)

The test vehicle was a Unimog 1700L Tractor manufactured in 1983 with an approximate odometer reading of 88,000 kilometres.

The total distance covered = 1576 Km
The total diesel fuel consumed = 393.5 litres
Average fuel consumption = 4.01 Km/Litre

For fuel consumption alone this trial provides a useful and measurable increase in fuel economy when comparing the base line data of 3.77 Km/Litre (Tests 1-5) and the data when fuel was treated (Tests 6-10) of 4.01 Km/Litre. An increase of 6.3%

A wide range of weather conditions were experienced during with everything from frosty still conditions to wind and rain. The average ambient temperature was down by 2.4°C at the Nth Pahiatua stop and down by 6°C at the Sth Shannon stop. These changes could conceivably have an impact however, the nature of the weather experienced was quite changeable and often we had extremes of temperature for short periods. This will cause readings that do not show the true nature of the weather of a particular day.

The hot running turbo temperatures (flat ground high speed cruise) taken at Nth Pahiatua readings were 263,250,243,249 & 243 degrees centigrade.

The hot running turbo temperature (up hill under full load) taken at Sth Shannon readings, were 283,285,283,272 & 269 degrees centigrade. The relevant readings are 283, 285 and 283 degrees. These were obtained after an uninterrupted full power run up hill prior to the reading area and show a slight reduction in peak turbo temperature.

The fuel savings provide evidence that the product is having an effect.

SUMMARY DATA TREATING FRESH DIESEL FUEL @ 1:640					Ave: 4.01
Date or Day No.	Odometer reading km or miles - Start	Odometer reading km or miles - Finish	Fuel volume used in fill ups - litres	2082 Fuel Treatment used (mls)	Kilometers per Litre
14-Jun	83499	83817	79.3	124 mls	4.010
28-Jun	83817	84131	78.1	122 mls	4.020
11-Jul	84132	84445	79.0	124 mls	3.962
25-Jul	84445	84762	78.0	122 mls	4.064
01-Aug	84765	85079	79.1	124 mls	3.970

**SECOND CHORNCO/DIESEL
SERIES OF RUNS
RATIO CHORNCO/DIESEL – 1:1280**

**APPENDIX 4 TO
19100-01/SQ&EA
DATED 21 MAY 03**

CHORNCO TRIAL – RUN 11

Test date: 8th August 2002
Test vehicle: Unimog 1700L Tractor 1983

Tyre pressures: Front 60 psi
Rear 50 psi

Hubbo reading: Start 085079
Finish 085391

Test conditions:

Weather – Overcast.

Temperature: Camp (0855 hrs) 5°C

Weather – 100% cloud cover, heavy rain

Temperature: Pahiatua (1145 hrs) 8°C
Turbo temp 237°C

Weather – 100% cloud cover, showers

Temperature: Shannon (1315 hrs) 8°C
Turbo temp 282°C

Weather – 40% cloud cover

Temperature: Trentham (1505 hrs) 8°C
Turbo temp after 5 min 98°C

Total distance travelled: 312 kilometres

Total fuel consumed: 78.0 litres

Km/litre = 4.00

CHORNCO TRIAL – RUN 12

Test date: 9th August 2002

Test vehicle: Unimog 1700L Tractor 1983

Tyre pressures: Front 60 psi
Rear 50 psi

Hubbo reading: Start 085391
Finish 085704

Test conditions:

Weather – 100% cloud cover, raining

Temperature: Camp (0855 hrs) 4°C

Weather – 100% cloud cover, showers.

Temperature: Pahiatua (1145 hrs) 5°C
Turbo temp 238°C

Weather – 20% cloud cover

Temperature: Shannon (1315 hrs) 9°C
Turbo temp 279°C

Weather – 20% cloud cover, fine

Temperature: Trentham (1505 hrs) 6°C
Turbo temp after 5 min. 93°C

Total distance travelled: 313 kilometres

Total fuel consumed: 78.5 litres

Km/litre = 3.987

CHORNCO TRIAL – TEST 13

Test date: 15th August 2002

Test vehicle: Unimog 1700L Tractor 1983

Tyre pressures: Front 60 psi
Rear 50 psi

Hubbo reading: Start 085704
Finish 086018

Test conditions:

Weather – Showers.

Temperature: Camp (0855 hrs) 8°C

Weather – 30% cloud cover, fine.

Temperature: Pahiatua (1145 hrs) 11°C
Turbo temp 229°C

Weather – 50% cloud cover

Temperature: Shannon (1315 hrs) 8°C
Turbo temp 280°C

Weather – 50% cloud cover, fine.

Temperature: Trentham (1505 hrs) 8°C
Turbo temp after 5 min. 96°C

Total distance travelled: 314 kilometres

Total fuel consumed: 78.3 litres

Km/litre = 4.01

CHORNCO TRIAL – RUN 14

Test date: 22nd August 2002

Test vehicle: Unimog 1700L Tractor 1983

Tyre pressures: Front 60 psi
Rear 50 psi

Hubbo reading: Start 086072
Finish 086386

Test conditions:

Weather – Sunny, slight frost.

Temperature: Camp (0855 hrs) 1°C

Weather – 10% cloud cover, sunny.

Temperature: Pahiatua (1130 hrs) 13°C
Turbo temp 265°C

Weather – 15% cloud cover, sunny.

Temperature: Shannon (1315 hrs) 10°C
Turbo temp 292°C

Weather – 10% cloud cover, sunny.

Temperature: Trentham (1505 hrs) 8°C
Turbo temp after 5 min 91°C

Total distance travelled: 314 kilometres

Total fuel consumed: 78.0 litres

Km/litre = 4.025

CHORNCO TRIAL – RUN 15**Test date:** 24th August 2002**Test vehicle:** Unimog 1700L Tractor 1983**Tyre pressures:** Front 60 psi
Rear 50 psi**Hubbo reading:** Start 086386
Finish 086699**Test conditions:**

Weather – Overcast

Temperature: Camp (0855 hrs) 6°C

Weather – 90% cloud cover, overcast.

Temperature: Pahiatua (1130 hrs) 7°C
Turbo temp 274°C

Weather – 100% cloud cover, raining.

Temperature: Shannon (1315 hrs) 11°C
Turbo temp 283°C

Weather – 80% cloud cover, showers.

Temperature: Trentham (1450 hrs) 8°C
Turbo temp after 5 min. 93°C

Total distance travelled: 313 kilometres

Total fuel consumed: 78.1 litres

Km/litre = 4.01

Notes:

5. In all tests the vehicle was loaded with 1600kgs of water.
6. The same driver made all journeys

CHORNCO 1:1280 RATIO TEST SUMMARYThe tests were carried out between 14th June and 24th August 2002 (5 individual round trip journeys)

The test vehicle was a Unimog 1700L Tractor manufactured in 1983 with an approximate odometer reading of approximately 88,000 kilometres.

The total distance covered = 1566 Km
The total diesel fuel consumed = 389.5 litres
Average fuel consumption = 4.02 Km/Litre

For fuel consumption alone this trial provides a useful and measurable increase in fuel economy when comparing the base line data of 3.77 Km/Litre (Tests 1-5) and the data when fuel was treated (Tests 11-15) of 4.02 Km/Litre. An increase of 6.9%

A wide range of weather conditions were experienced during with everything from frosty still conditions to wind and rain. The average ambient temperature was down by 2.2°C at the Nth Pahiatua stop (up 0.2°C from the 1:640 runs) and down by 5.6°C (from baseline). At the Sth Shannon stop (up by 0.4 from the 1:640 runs). Since the temperatures were very close to the 1:640 runs the results stand.

The hot running turbo temperatures (flat ground high speed cruise) taken at Nth Pahiatua readings were 237,238,229,265 & 274 degrees centigrade.

The hot running turbo temperature (up hill under full load) taken at Sth Shannon readings, were 282,279,280,292 & 283 degrees centigrade. These were obtained after an uninterrupted full power run up hill prior to the reading area and show a slight reduction in peak turbo temperature.

The fuel savings provide evidence that the product continues to have an effect and the treatment ration of 1:1280 is confirmed as the optimum for the product.

SUMMARY DATA TREATING FRESH DIESEL FUEL @ 1:1280					Ave: 4.02
Date or Day No.	Odometer reading km or miles - Start	Odometer reading km or miles - Finish	Fuel volume used in fill ups - litres	2082 Fuel Treatment used (mls)	Kilometers per Litre
08-Aug	85079	85391	77.7	60 mls	4.015
09-Aug	85391	85704	78.0	61 mls	4.013
15-Aug	85704	86018	78.1	61 mls	4.020
22-Aug	86072	86386	78.0	61 mls	4.025
24-Aug	86386	86699	77.7	60 mls	4.028