GLR injection PTY LTD
TECHNOLOGIES
ACN 106 876 439

Gold Fields – Independent Test Report

Gold Fields' St Ives Gold Mine carried out before and after tests on 3 randomly selected 6 cylinder diesel vehicles.

The average Performance Improvements and fuel savings were extremely impressive and can be summarised as follows:

- kW – 15 % average improvement
- Torque – 20 % average improvement
- Fuel saving on fuel consumed per kW – 15 % average improvement
- Reduced emissions KW corrected – 19 % average improvement

These results, extrapolated over 12 months for the 50 light vehicles Gold Fields have on site, reduce greenhouse gas emissions by a staggering 223 tonnes and reduce fuel consumption by 83,000 lt. For more details on these results please refer to Gold Fields Australia test report.

MR INJECTOR
COMPARATIVE RESULTS OF DYNOMETER TRAIL

INTRODUCTION

Results of fuel injection cleaning trial for Goldfields Australia Pty Ltd:

Location:	B&R Motors 107 Dugan Street KALGOORLIE WA			
Present at Trial:	Dyno Technian	–	Tony Barnwall	(Ph: 902-1170)
	Emissions Testing	–	Brian Complete Industry Occupational Health Services Pty Ltd	(Ph: 9093-1100)
	Goldfields Rep	–	Peter Jasper	
	Mr Injector Rep	–	Colin Gilbert	(PH: 9272-7028)

Results compiled by Servate Consultants' Mechanical Engineer (Albert De Boer) from data provided from the above.

kW @ (4000 RPM)
Torque Nm
350
300
250
200
150
100
50
0
kW (Spec)
BEFORE CLEAN
AFTER CLEAN
- Increase
118
172
54
7
kW (Spec)
BEFORE CLEAN
AFTER CLEAN
- Increase
160
181
21
kW (Spec)
BEFORE CLEAN
AFTER CLEAN
- Increase
kW @ (4000 RPM)
6
4

SUMMARY OF IMPROVEMENTS AFTER TRAIL:

Average performance improvements and fuel savings:

▪ KW	=	14.66%
▪ Torque	=	20.22%
▪ Remaining Fuel	=	4.20%
▪ Fuel saving on fuel consumed per kW	=	15.25%
Total Fuel Savings:		**19.45%**

Independent emission test results conducted by Complete Industry - Occupational Health Services Pty Ltd
Company Rep: Brian
Phone: 9093 1100

The emission results before and after cleaning overall did not vary by a large degree. However, if the after cleaning results were kW corrected, you would find that the emissions have improved to a similar order of magnitude as the combined initial fuel savings and fuel consumed per kW. The approximate improvement over the trail is as follows:

▪ Hilux CG479	=	16.69% approx.
▪ Hilux CG4667	=	30.06% approx.
▪ Landcruiser CG4993	=	11.62% approx.
Approximate Average:		**19.45%**

Factors contributing to these figures are how well vehicles have been maintained. Mining industry underground requirements are as follows:

- Nox less than 1,000ppm
- Co less than 1,500ppm
- Opacity no scientific requirement

SAVING IN DIESEL FUEL PER YEAR PER 50 VEHICLES

4.109L FOR 15 MINS @ 100 KPH = 25 KMS
= 16.436 L FOR 60 MIN @ 100 KPH = 100 KMS
= 164.36L = 1,000 KMS
= 3287.2L = 20,000 KMS
- 19.45% = 26487L
= 639L DIESEL SAVED PER 20,000 KMS PER VEHICLE
X 50 = 31968L PER 50 VEHICLES PER 20,000 KMS
= 31968 DIVIDED BY 20 X 52
THEREFORE 83,117L DIESEL FUEL SAVED PER 50 VEHICLES PER YEAR
DIESEL SPECIFIC GRAVITY = .75 KG/L
THEREFORE 83,117L = 62338 KG = 62.34 TONNES

GREEN HOUSE EMISSIONS SAVED

83117L X 2.69 (KGCO2/L)*
= 223.6 TONNES OF (CO2-e) SAVINGS

* EMISSION FACTOR SUPPLIED BY THE AUSTRALIAN GREENHOUSE OFFICE

SAVING IN FUEL COST PER YEAR PER 50 VEHICLES

BEFORE MR INJECTOR SERVICE PER 1000 KMS = 164.36L
PER VEHICLE IN 20,000 KMS = 3,287.2L
19.45% FUEL SAVING AFTER MR INJECTOR SERVICE
BEFORE = 3287.2L
AFTER = 2648.0L
SAVINGS PER VEHICLE PER 20,000 KMS = 639L
THEREFORE SAVINGS IN $ @ 0.50 CENTS/L PER 20,000 KMS

	1 VEHICLE	**50 VEHICLES**
	$319.50	$15,975.00
MR INJECTOR COST	$220.00	$11,000.00
SAVINGS	**$ 99.50**	**$ 4,975.00**

THEREFORE SAVINGS PER YEAR IN DOLLARS

	1 VEHICLE	**50 VEHICLES**
	99.5 DIVIDED 20 X 52	4975 DIVIDED 20 X 52
SAVINGS	**= $ 258.70**	**= $12,935.00**

I.E DIRECT FUEL COST SAVINGS PER YEAR PER 50 VEHICLES **$12,935/-**

MR INJECTOR
COMPARATIVE RESULTS OF DYNOMETER TRIAL

Comparative results of dynometer trail before injection cleaning and after...

Method cars were placed on dynometer to simulate road conditions. Each car was given a measured quantity of fuel. After each simulated trail, the residual fuel was measured. The before cleaning fuel residual was subtracted from the after cleaning residual to be expressed as a percentage of fuel saved, then the consumed fuel was expressed as fuel consumed per kW. The after cleaning gains in kW were then expressed as percentage gain on before cleaned kWs. These two totals are then expressed as percentage gain total.

Note - Hilux CG799 was running rough and over heating. It had a new radiator and new injection pump. Test results indicate that injection timing is out (also indicated by car overheating).

	Vehicle ID	Odometer Reading	kW Spec Manuf.	kW before clean (4000 RPM)	Torque before Clean	Fuel at Start	Fuel Remaining	Fuel Consumed	Fuel Cons. kW (ML)	Total Fuel Saving
BEFORE CLEAN	Hilux CG479	126,012	75	57	118	4,000	529	3,471	60.80	
AFTER CLEAN				64	172	4,000	634	3,366	52.59	
- Increase				7	54		105		Saving = 13.5%	**16.69%**
- Percentage				12.28% Increase	45.76% Increase		3.19%			
							Initial fuel saving:			
							= 105ML			
							= 3.19%			
BEFORE CLEAN	Hilux CG4667	178,821	75	58	160	4,000	640	3,360	57.93	
AFTER CLEAN				74	181	4,000	830	3,170	42.83	
- Increase				16	21		190		Saving = 24.5%	**30.06%**
- Percentage				27.5% Increase	13.12% Increase		5.6%			
							Initial fuel saving:			
							= 190ML			
							= 5.6%			
BEFORE CLEAN	L/C CG4993	218,520	98	95	330	5,000	891	4,109	43.25	
AFTER CLEAN				99	336	5,000	1,050	3,950	39.89	
- Increase				4	6		159		Saving = 7.768%	**11.62%**
- Percentage				4.2% Increase	1.8% Increase		3.86%			
							Initial fuel saving:			
							= 159ML			
							= 3.86%			

B R MOTORS

For All Your Mechanical Repairs

Anthony Barnewall & Sharon Tate
197 Dugan Street
KALGOORLIE WA 6430
Phone / Fax : 08 9021 1170

ABN# 64 660 907 975

Mr Injector
68 The Strand
BAYSWATER WA 6053

Tax Invoice # 00000466

Date : 3/07/03

Cust ABN #

Description	Order No:	Amount
TESTING OF INJECTOR CLEANER		
Charge for Dyno and output test on 3 vehicles.		$450.00
4 hours workshop time @ $50 p/hr		$200.00
7/95 HILUX REGO: CG4799 ODO: 126016		
Test on vehicle before injector clean	- 57kw @ 4000 rpm	
	- 118kw @ 2400 rpm	
After injection clean was performed	- 64kw @ 4000 rpm	
	- 172kw @ 2400 rpm	
Suggest injector pump timing out.		
11/95 HILUX REGO: CG4667 ODO: 178821		
Test on vehicle before injector clean	- 58kw @ 4000 rpm	
	- 160kw @ 2400 rpm	
After injection clean was performed	- 74kw @ 4000 rpm	
	- 181kw @ 2400 rpm	
96 LANDCRUISER REGO: CG4993 ODO: 218520		
Test on vehicle before injector clean	- 95kw @ 4000 rpm	
	- 330kw @ 2000 rpm	
After injection clean was performed	- 99kw @ 4000 rpm	
	- 336kw @ 2000 rpm	

GST:	$65.00
Total Inc GST:	$715.00
Amount Applied:	$0.00
Balance Due:	$715.00

Payment Terms COD.

Complete Industry
OccHealth Services Pty. Ltd.
A.B.N. 70 099 856 167

M R Injector
68 The Strand
Bayswater WA 6053

Invoice Date 8/07/2003
Invoice: 00003834
Order Number: COLIN

TAX INVOICE

QTY	ITEM	DESCRIPTION	AMOUNT
5	Exhaust Gas Monthly Quote	Exhaust Gas Testing completed by Brian Kitson on the 03.07.03	$350.00

GST:	$35.00
Paid Today	$0.00
Total Inc GST:	$385.00

TERMS OF PAYMENT: STRICTLY 30 DAYS FROM DATE OF INVOICE

Moran House, 42 Moran Street, Boulder WA 6432
Telephone: 08 9093 1100 Fax: 08 9093 1199

Complete Industry
OccHealth Services Pty. Ltd.

Exhaust emission results before and after injector cleaning

Method

The vehicles were placed on a dynamometer to simulate road conditions and then tests were carried out under four different conditions. The injectors were then cleaned and the same tests repeated.

The tests carried out were to check for;
CO (carbon monoxide) level
NOX (oxides of nitrogen) levels
Opacity (percent of carbon particles in exhaust plume)

The tests were carried out under the following conditions;
600 RPM (idle)
2600 RPM (unladen revving)
4000 RPM (stall conditions)
3000 RPM (road conditions during economy test)

Results

CG-4993 Toyota HZJ75 218520 Kms Before cleaning

Test Type	RPM	Temp	NOX	CO	Opacity
					Snap idle
Low Idle	600	83	131	76	16.8%
High Idle	2600	94	86	153	
Stall	4000	214	CO	Overload	36.6%
Road Cond	3000	316	565	281	0%

CG-4993 After cleaning

Test Type	RPM	Temp	NOX	CO	Opacity
					Snap idle
Low Idle	600	148	172	61	4.4%
High Idle	2600	166	135	184	
Stall	4000	221	CO	Overload	29.4%
Road Cond	3000	312	564	212	0%

Moran House, Cnr Brookman & Moran Streets, Boulder W.A. 6432
Telephone (08) 9093 1100 • Facsimile (08) 9093 1199 • ABN 70 099 856 167

Results

CG-4667 Toyota Hi-Lux 178821 Kms Before cleaning

Test Type	RPM	Temp	NOX	CO	Opacity
					Snap idle
Low Idle	600	186	287	105	32.2%
High Idle	2600	239	154	551	
Stall	4000	311	441	3000+	1.8%
Road Cond	3000	310	493	114	0%

CG-4667 After cleaning

Test Type	RPM	Temp	NOX	CO	Opacity
					Snap idle
Low Idle	600	127	315	47	8.8%
High Idle	2600	139	140	138	
Stall	4000	298	435	1802	1.5%
Road Cond	3000	294	425	111	0%

Results

CG-479 Toyota Hi-Lux 126010 Kms Before cleaning

Test Type	RPM	Temp	NOX	CO	Opacity
					Snap idle
Low Idle	600	51	158	105	13.5%
High Idle	2600	61	98	152	
Stall	4000	297	422	1000	2.0%
Road Cond	3000		479	135	0%

CG-479 After cleaning

Test Type	RPM	Temp	NOX	CO	Opacity
					Snap idle
Low Idle	600	169	195	66	25.7%
High Idle	2600	186	112	133	
Stall	4000	297	431	1160	4.7%
Road Cond	3000	294	476	110	0%

CG-479 seems to have had a new injector pump fitted recently. However the way the engine runs indicates that the injector timing may need adjusting.

Brian Kitson