FEB 2018

XSNano Fuel Trial

1 Introduction

xxxx xxxx aim to save 5% on maintenance and running costs, a significant portion of which is fuel costs.

There is an opportunity to start using the XSNano product to increase fuel efficiency. The supplier reports increase in efficiency of 10% - 28%.

There are two products to Trial:

- NDA which treats the diesel
- NLA which treats the lubricating oil

2 Determining Success

The project will be deemed successful as per the table below.

Fuel Efficiency Gain (%)*	Cost Savings (%)	Project Trial
< 7.41	< 0	Not Successful
10	2.8	Successful
15	8.2	Successful
20	13.6	Successful
28	22.4	Successful

* This is based on an additive cost of 6.4c per litre of diesel

3 Test Methodology

We propose testing the product three groups of prime movers as shown in the table below:

Table 1 Trial Assets

Group	1			2		3	
Make	Freightliner			Western Star		Kenworth	
Model	C120			6964FX		T650	
Name	PRM211BM	PRM213BM	PRM214BM	PRM253BM	PRM252BM	PRM292BM	PRM291BM
Year	2004	2004	2003	2010	2010	2007	2007
Additive	Fuel Only	Fuel / Oil	Control	Fuel Only	Control	Fuel Only	Control
Current Hours	49,517	51,615	6,324	38,799	24,681	60,745	25,393
Engine Make	Caterpillar	Caterpillar	Caterpillar	Cummins	Cummins	Cummins	Cummins
Engine Capacity (L)	16	16	16	15	15	15	15
Gearbox Make	Eaton R/Ranger	Eaton R/Ranger	Eaton R/Ranger	Eaton R/Ranger	Eaton R/Ranger	Eaton R/Ranger	Eaton R/Ranger
Gearbox Model	RTLO20918B	RTLO20918B	RTLO20918B	RTLO22918B	RTLO22918B	RTLO20918B	RTLO20918B
Combination Type	BBAB	BBAB	BBAB	BBAB	BBAB	BBAB	BBAB
GCM	140	140	140	140	140	130	130

Dosing is to be performed by applying the XSNano directly to the fuel tank. A container of XSNano is to be kept at the refueling point.

Each prime mover is to have a sticker on the fuel cover stating that the vehicle is part of the XSNano Additive Trial.

Every time fueling is performed, the number of L added, and additive applied is to be recorded in a logbook (kept with each vehicle) – see Attachment 1.

Each driver is to be briefed on the trial before driving any of the trial vehicles.

0.1ml of XSNano is required per L of fuel added, and the driver can use Attachment 2 to work out how much XSNano to measure.

Procedure for refueling and dosing is as below:

1) Fill tank with diesel – record how much diesel entered the tank
2) Determine quantity of XSNano required (diesel added x 0.1ml), using Attachment 1
3) Measure XSNano (using measuring cylinder) and apply to fuel tank

We will perform a trial, and compare the data for the truck with and without the XSNano added.

3.1 Quantity Required

For the 8 week trial period we will burn ≈ 200,000 L so will require 20 L of XSNano.

3.2 Notes

3.2.1 Fuel Filters

It is not necessary to change fuel filters during or prior to the initial use of XSNano.

However, if there is bacterial growth in fuel tanks or lines the XSNano will kill the infection and clear the system.

This residue would be trapped in the fuel filter and could effect the outcome of fuel economy readings.

The effect of the XSNano should be immediately noticed within the first tank of fuel. If there is no noticeable improvement, the fuel filter on the truck should be replaced. If this occurs we will take a photo of the condition of the filter and any sludge or contamination found.

3.3 Data Integrity

Data integrity will be managed as followed:

- Measurements come directly from the engine management system (through ECM reader) so results cannot be tampered with
- Baseline measurements will be taken over a month period
- A form will be completed each time fuel and additive is added to the prime mover's tank

Key risks to the trial, and control to rectify are shown below:

Risk	Control(s)
Driver forgets to apply additive	Sticker on fuel tank, form to be completed every time refueling, training for drivers prior to starting trial
Accuracy of measurements	Using ECM reader to determine baseline Initial trial results to be taken from bowser and reading and dash hours/kms
Trucks are working on different jobs/routes	Trucks have been grouped according to work

4 Results

Attachment 1 – XSNano Trial Form

Prime Mover _____

Date	Driver	Kms	Fuel (L)	FPC (mL)

Attachment 2 – Reference Table

Fuel Added (L)	XSNano to Add (mL)
200	20
210	21
220	22
230	23
240	24
250	25
260	26
270	27
280	28
290	29
300	30
310	31
320	32
330	33
340	34
350	35
360	36
370	37
380	38
390	39
400	40
410	41
420	42
430	43
440	44
450	45
460	46
470	47
480	48
490	49
500	50
510	51
520	52
530	53
540	54
550	55
560	56
570	57
580	58

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There is usually no need to change fuel filters.

However, If there is no significant response in fuel economy in first tank, the fuel filters may need changing as the XSNano has cleaned the fuel system.

If they do need to change a filter, could they take a photo of the dirty filter and send it to me please.

Also can we possibly get a photo of each truck involved in trials?

Please make sure the person running the tests reads the information below.

Are any of the trucks selected for trial using 'Adblue' or any other Selective Catalytic Reduction (SCR) system?

If so, can the drivers also monitor the fluid levels in SCR fill tank and usage before, during and after trials?

And if possible use at least one truck without SCR unit for comparison.

It is usually not necessary to change fuel filters during or prior to the initial use of XSNano.

However, if there is bacterial growth in fuel tanks or lines the XSNano will kill the infection and clear the system.

This residue would be trapped in the fuel filter and could affect the outcome of fuel economy readings.

The effect of the XSNano should be immediately noticed within the first tank of fuel. If there is no noticeable improvement, the fuel filter on the truck should be replaced. If this occurs please take a photo of the condition of the filter and any sludge or contamination found.

Running just one tank of fuel after replacement of fuel filter is a short time frame to correct and register improvement. And I would suggest running another two tank loads. (One extra litre of NDA)

Results generally show an improvement in economy then a slight downturn followed by a greater improvement which improves with continued use. We don't know why sometimes there is the downturn after initial improvement, but it has been noticed on several trucks (Not All).

Also, most truck drivers are acutely aware of the day to day running of their truck and general well being.

But I would ask them to pay special attention before, during and after the trials the overall performance and "feeling" of the truck they are driving.

Things to take notice of include;

Emissions

Smoke emissions from exhaust on start up, when under load or changing gears, and when using the exhaust brake. Smoke can be black for diesel or blue/grey for engine oil).

Increase in power.

General overall power and less gear changes when traveling up hills or inclines. Not as much pressure on accelerator pedal when cruising etc

And I would ask the drivers to write their comments and observations after the trials and add them to the report.

NB. Bacterial growth (diesel bug) can be present and go undetected until it multiplies and causes damage. There are about 27 different types of 'diesel bug' and typically they grow in moisture and feed on fuel.

Condensation in tanks is an ideal situation for diesel bug growth.

As stated the XSNano will kill and prevent the growth of diesel bug. (Another added benefit from using XSNano is clean trouble free fuel systems).

Regards

Kevin Carpenter - Mobile 0411024117 - email; Kevin@lubricationsolutions.com.au

Attachment 1 – XSNano Trial Form

Prime Mover **PRM213BM**

Date	Driver	Kms	Fuel (L)	FPC (mL)
27-9	Jason	379476	345	35
27.9	TIM	379704	246	25
28-9	Jason	380254	450	45
28/9	ASH	380655	331	33
29/9	BRUCE	381127	450	45
"	BRUCE	381621	450	45
30-09	BRUCE	382.000	346	35
30.9	ASH	382.414	375	37
01-10	BRUCE	382941	510	51
2-10	ASH	385702	370	37
2-10	TREVOR	384120	360	36
3-10	ASH	384543	424	42
4/10/18	ASH	384928	368	36
4-10-18	Tim	385281	319	32
5.10.18	T.m	385561	253	25
6-10-18	TIM	386046	425	43
06-10-18	BRUCE	386495	400	40

642

Attachment 1 – XSNano Trial Form

Prime Mover **PRM213BM**

Date	Driver	Kms	Fuel (L)	FPC (mL)
12/09/18	—	373736	FULL 750	75
~~18-9-18~~ / ~~20-9-18~~	Jas ~ Tim	~~374243~~ 37		
18-9-	JV	374078	304	
20-9	Tim	374223	147	15
20-9	ASH	374489	251	25
21-9	Tim	374842	329	34
21-9	ASH	375051	170	17
22-9	Tim	375491	367	37
22-9	Jason	375919	350	35
23-9	ASH	376301	350	35
23-9	Jason	376854	450	45
24-9	~~ASH~~	377268	365	36
24-9	Jason	377647	300	30
25-9	ASH	377926	292	30
25-9	Tim	378205	279	30
26-9	Jason	378657	350	35
26-9	Tim	379008	337	35

FULL FILLING CHANGE

314

5278 km
4041 L

in tool box

Attachment 1 – XSNano Trial Form

Prime Mover **PRM211BM**

Date	Driver	Kms	Fuel (L)	FPC (mL)
29-9-18	Terry S.	584827	342	34
~~30~~/9/18	Geoff	585317	390	39
30-9-18	Terry S.	586662	346	35
31/9/18	Geoff	586082	320	32
1-10-18	WAL	586428	400	40
2-10-18	WAL	587262	400	40
3-10-18	WAL	587651	350	35
4-10-18	Geoff	587966	270	27
5-10-18	WAL	588277	300	30
6-10-18	WAL	588800	500	50
6/10/18	Geoff	589355	430	43
7-10-18	WAL	589735	400	40
7-10-18	Terry S.	590152	342	34
8/10/18	Geoff	590568	324	32
8-10-18	Terry S.	590847	296	30
9/10/18	Geoff	591200	300	30
9-10-18	Terry S.	591484	272	27

Attachment 1 – XSNano Trial Form

Prime Mover **PRM211BM**

Date	Driver	Kms	Fuel (L)	FPC (mL)	
18/09/18	—	578 311	FULL 750	75	
19/09/18	THARY S.	578 508	218	22	
20-9-18	Terry S.	578 829	299	30	
21-9-18	~~Geoff~~	579244	350	33	
22-9-18	Terry S.	579595	390	39	
23-9-18	WAC KENNEDY	580011	370	37	
24-9-18	Terry S.	580462	379	38	
24-9-18	WAC KENNEDY	580843	345	35	
25-9-18	Terry S.	581264	390	39	FUEL FILTERS CHANGED
25/9/18	Geoff	581714	360	36	
26-9-18	WAC KENNEDY	582097	400	40	
26/9/18	Geoff	582517	340	34	
27-9-18	WAC KENNEDY	582940	400	40	
27/9/18	~~Geoff~~	583250	240	24	
28-9-18	WAC KENNEDY	583701	400	40	
28-9-18	Terry S.	583982	258	26	
29/9/18	Geoff	584473	400	40	

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Prime Mover **PRM213BM**

Date	Driver	Kms	Fuel (L)	FPC (mL)
7-10-18	Heiner.	386910	363	36
8-10-18	Tim	387359	385	40
8-10-18	ASH	387636	230	23
9-10-18	Heiner	387984	335	35
10.10.18	Tim	388227	220	22
11.10.18	Jason	388578	300	30
12/10/18	ASH	388823	272	27
12/10/18	Jason	389208	300	30
13/10/18	ASH	389487	272	37
15/10/18	Jason	389903	350	35
15.10.18	Tim	390219	321	33
16/10/18	ASH	390427	200	20
17.10.18	Tim	390807	329	35
18.10.18	Tim	391372	493	50
18/10/18	ASH	391655	240	24
19/10/18	Jason	392042	300	30
20/10/18	ASH	392460	419	41

548

Attachment 1 – XSNano Trial Form

Prime Mover **PRM211BM**

Date	Driver	Kms	Fuel (L)	FPC (mL)
10-10-18	Terry S.	591856	368	37
11-10-18	Terry S.	592100	197	20
12-10-18	Terry S.	592447	371	37
13/10/18	Geoff	592903	440	44
14-10-18	MAL	593326	450	45
15-10-18	Geoff	593818	440	44
16-10-18	MAL	594233	400	40
16-10-18	Terry S.	594614	296	30
17-10-18	Terry S.	594968	310	31
18-10-18	Geoff	595295	310	31
18-10-18	Terry S.	595709	163	17
19/10/18	Geoff	596092	500	50
19-10-18	MAL	596476	390	39
20-10-18	MAL	596686	201	20
21-10-18	MAL	596897	180	18
22-10-18	Geoff	597352	350	35
23-10-18	Geoff	597599	220	22

Attachment 1 – XSNano Trial Form

Prime Mover 13

Date	Driver	Kms	Fuel (L)	FPC (mL)	
21/02/2018		264 080	Full	70	
22/2/18	Jason	264394	275 L	27 mL	314 Km
22-2-18	Tim	264673	275 L	28	279 Km
23/2/18	Jason	265125	400 L	40 mL	452 Km
23.2.18	Tim	265512	360	36 ml	387 Km
24/2/18	Jason	265928	340	34 mL	416 Km
24/2/18	Chris	266239	251	25 mL	311 Km
25.2.18	Tim	266694	471	0	455 Km
				260	

Attachment 1 – XSNano Trial Form

Prime Mover 53

Date	Driver	Kms	Fuel (L)	FPC (mL)
21-2-18	TIM DINGLE	451 417	FULL	94
22-2-18	T STEPHENS	451 797	340	34
22-2-18	L. WATSON	452 247	500	50
23-2-18	T STEPHENS	452 630	380	38
24-2-18	T. STEPHENS	453 357	670	67
				283

Attachment 1 – XSNano Trial Form

Prime Mover 92

Date	Driver	Kms	Fuel (L)	FPC (mL)
21/02/2018	[illegible]	540 652	Full	90
22-02-2018	Nigel Polen	541123	Full 436	43
23-02-2018	Nigel Polen	541938	400	40
24-02-2018	Nigel Polen	542449	400	40
27-02-2018	Tennessee Jenny	542992	388	38 mL

50440 HRS
214326.4 LTS

1.03
514419 Kms

Attachment 1 – XSNano Trial Form

Prime Mover 11

Date	Driver	Kms	Fuel (L)	FPC (mL)
21/02/2018	MARK [illegible]	511 102	FULL	70
22-2-2018	WAL KENNEDY	511503	300 L FULL	30
22-2-2018	MARK AMBROSE	511968	390L	39
23-2-2018	WAL KENNEDY	512454	350 FULL	35
23-2-18	MARK AMBROSE	512807	300	30
				204

I've done the numbers based on the sheets the drivers have filled in, and we did see some improvement:

Prime Mover	Previous Average (L / 100kms)	XSNano Average (L / 100kms)	Improvement
PRM211BM	95	79	17.11
PRM213BM	103	91	11.91
PRM253BM	87	97	-12.02
PRM292BM	86	69	19.03

Kevin / Dan, do you know any reason why we would see worse results from PRM253?

Fuel Trial - ACLAND

Unit Number	Role	Date	Time	Engine ECM Hours	Fuel Burn Litres	Current Average km/ltr	Odometer
PRM252BM	Control	26-02-18	0752	25313	955228	1.07	722599
PRM253BM	Trial	26-02-18	0745	39579	828957	1.75	454571
PRM291BM	Control	26-02-18	0850	26301	810951	1.17	33618
PRM292BM	Trial	26-02-18	0751	16637	510231	1.26	544443
PRM214BM	Control	26-02-18	0805	6903	218417	1.1	63890
PRM211BM	Trial	26-02-18	0735	50440	2143264	1.03	514419
PRM213BM	Trial	26-02-18	0935	52390	2230671	1.02	266713