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THE UNITED KINGDOM VEHICLE APPROVAL AUTHORITY

COMMUNICATION CONCERNING THE COMPLIANCE OF A COMPRESSION-IGNITION (C.I.) ENGINE TYPE TESTED WITH REGARD TO THE EMISSION OF POLLUTANTS PURSUANT TO ECE REGULATION NO 49.02

1. Trade name or mark of the engine: Dongfeng Cummins Engine Company Limited

2. Engine type: C300 20

3. Combustion type: compression-ignition

3.1 Type of fuel: Diesel

4. Manufacturer's name and address:

Dongfeng Cummins Engine Company Limited
Automobile Industry Development Zone
Xiangfan
Hubei Province
P.R. China 441004

5. If applicable, name and address of manufacturer's representative: not applicable

6. Maximum allowable intake depression: 3.17 kPa

7. Maximum allowable back pressure: 8.14 kPa

8. Maximum permissible power absorbed by the engine-driven equipment:

Intermediate: 1.61 kW; Rated: 2.37 kW

9. Restrictions of use (if any): none

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10. Emission levels - 13 mode emission test values:

CO: 0.378 g/kWh; HC: 0.196 g/kWh; NO_x: 6.44 g/kWh

PT: 0.12 g/kWh determined by a full flow system

11. Engine submitted for tests on: 22 December 2005

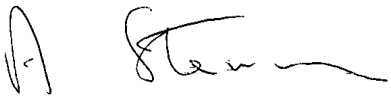
12. Technical service responsible for conducting the test: Vehicle Certification Agency

13. Date of test report issued by that service: 9 January 2005

14. Number of test report issued by that service: CSF070781

15. Place: BRISTOL

16. Date: 28 MARCH 2006

15. Signature: 

A. W. STENNING
Head of Product Certification

16. The following documents are attached

- One copy of annex 1 to this Regulation completed and with the drawings and diagrams referred to attached.
- Test report

CSF070781



a) ESSENTIAL CHARACTERISTICS OF THE ENGINE AND INFORMATION CONCERNING THE CONDUCT OF TEST

1. DESCRIPTION OF ENGINE

1.1	Manufacturer	: Dongfeng Cummins Engine Co.,Ltd
1.2	Manufacturer's Engine Code :	C300 20
1.3	Cycle	: Four stroke
1.4	Bore (mm)	: 114
1.5	Stroke (mm)	:135
1.6	Number and layout of cylinders	:6 in-line, 1-5-3-6-2-4
1.7	Engine capacity (cm^3)	:8.3
1.8	Volumetric compression ratio	:18:1
1.9	Minimum cross-sectional area of inlet and outlet ports (cm^2)	:1860/1662
1.10	Cooling system	
1.11.1	Liquid	
1.11.1.1	Nature of liquid:	:Antifreeze and anticorrosive liquid
1.11.1.2	Circulating pump (s)	:Yes
1.11.1.3	Characteristics or make (s) and type (s)	:Centrifugal
1.11.1.4	Drive ratio (s)	:1.81:1
1.11.2	Air	

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1.11.2.1	Blower	:No
1.11.2.2	Characteristic or make (s) and type (s)	
1.11.2.3	Drive ratio (s)	:N/A
1.12	Temperature permitted by the manufacturer	
1.12.1	Liquid cooling	
	Maximum temperature	
	At outlet (k)	:373
1.12.2	Air cooling	
	Reference point	
	Maximum temperature at	
	Reference point (k)	:N/A
1.12.3	Maximum charge air	
	outlet temperature of	
	the inlet intercooler (k):	:326
1.12.4	Maximum exhaust	
	temperature at the point	
	in the exhaust pipe (s)	
	adjacent to the outer	
	flange (s) of the exhaust	
	manifold (s) (k)	:920
1.12.5	Fuel temperature	

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	min. (k)	:311
	max. (k)	:315
1.12.6	Lubricant temperature	
	min. (k)	:350
	max. (k)	:400
1.13	Pressure charger	
1.13.1	Make	: Wuxi Holset Engineering Co.,Ltd
1.13.2	Type	:HX40W
1.13.3	Intercooler	
1.13.4	Intake system maximum allowable intake depression at rated engine speed and at 100% load (kPa)	: -3.17±1.0
1.15	Exhaust system	
	Maximum allowable exhaust back pressure at rated engine speed and at 100% load (kPa)	: 8.136 ± 0.339
2.	Additional anti-smoke devices (if any, and if not covered by another heading)	
	Description or diagram	:N/A
3.	Fuel feed	

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3.1	Feed pump	
	Pressure (KPa)	
	Or Characteristic diagram	:34.5~48.5
3.2	Injection system	
3.2.1	Pump	
3.2.1.1	Make (s)	:BOSCH
3.2.1.2	Type (s)	:PES6P120ARS7400
3.2.1.3	Delivery (mm^3) per stroke or cycle	
	at engine speed (rpm) at full	
	injection or characteristic diagram	:156.1±8（On pump bench）
	Mention the method used	
3.2.1.4	Injection timing	:N/A
3.2.1.5	Static timing (with tolerance)	:16° CA
3.2.2	Injection piping	
3.2.2.1	Length (mm)	:808
3.2.2.2	Internal diameter (mm)	:1.8
3.2.3	Injector (s)	
3.2.3.1	Make (s)	:BOSCH
3.2.3.2	Type (s)	:KBAL105P51
3.2.3.3	Opening pressure (kPa)	
	or characteristic diagram	:30000-31000

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3.2.4 Governor

3.2.4.1 Make (s) :BOSCH

3.2.4.2 Type (s) :RQV350

3.2.4.3 Speed at which cut-off

starts under full load (rpm) : 2275

3.2.4.4 Maximum no-load speed (rpm) : 2500

3.2.4.5 Idling speed (rpm) : 750

3.3 Cold start system

3.3.1 Make (s) : Not applicable

Type (s) : Not applicable

4. Valve timing

4.1 Maximum lift of valves and angles of opening and closing in relation to dead centers of equivalent data

Maximum lift of valves (mm)

Intake :12.751

Exhaust :12.598

Angles of opening and closing

Intake Valve

Opening (BTDC) :10.0

Closing (ATDC) :34.0

Exhaust Valve

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Opening (BBDC) :45.0

Closing (ATDC) :10.0

4.2 Reference and /or setting range (mm)

Intake (cold) :N/A

Exhaust (cold) :N/A

5. Engine-driven equipment

Maximum permissible power absorbed by the engine-driven equipment as specified in and under the operating conditions of Directive ECE R49/02, Annex I, section 5.1.1. at each engine speed as defined in section 4.1 of Annex III to this Directive.

Idle (kW) :0.3

Intermediate (kW) :1.61

Rated (kW) :2.37

6. Additional information on test conditions

6.1 Lubricant used

6.1.1 Make (s) :Lanzhizun

6.1.2 Type (s) :15W40 CF4/SG

(State percentage of oil in mixture if lubricant and fuel are mixed)

6.2 Engine-driven equipment

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6.2.1 Enumeration and identifying details :Air filter, muffler, fan

6.2.2 Power absorbed (kW) at various :N/A

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Indicated engine speeds

Equipment	Idle	Intermediate	Rated
Total			

6.3 Dynamometer setting (kW)

Per cent load	Idle	Intermediate	Rated
10	—	17.6	23.1
25	—	42.1	55.2
50	—	83.6	111.8
75	—	124.9	164.8
100	—	165.7	210.1

7. Engine performances

7.1 Engine speeds

Idle (rpm) :600~800

Intermediate (rpm) :1400

Rated (rpm) :2200

7.2 Engine power (kW)

(Measured in accordance

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With the provisions of

Directive ECE R49/02)

c= a+b : e= c-d

	Idle	Intermediate	Rated
Maximum power measured on test (kW(a))	—	165.7	210.1
Total power absorbed by engine-driven equipment as per section 6.2.2. (kW(b))	—	0	0
Gross engine power (kW(c))	—	165.7	210.1
Maximum permissible power absorbed as per section (kW(d))	—	1.61	2.37
Maximum net engine power (kW(e))	—	164.1	207.7

a) CHARACTERISTICS OF THE ENGINE-RELATED VEHICLE PARTS

1. Intake system depression : -3.17±1.0

at rated engine rpm and

at 100% load (kPa)

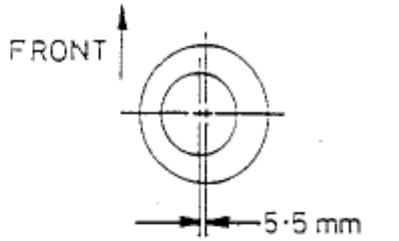
2. Exhaust system back : 8.1

3. Pressure at rated engine

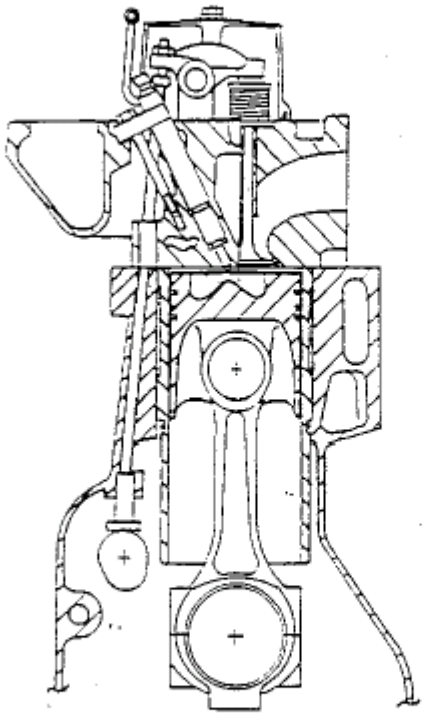
Rpm and at 100% load (kPa)

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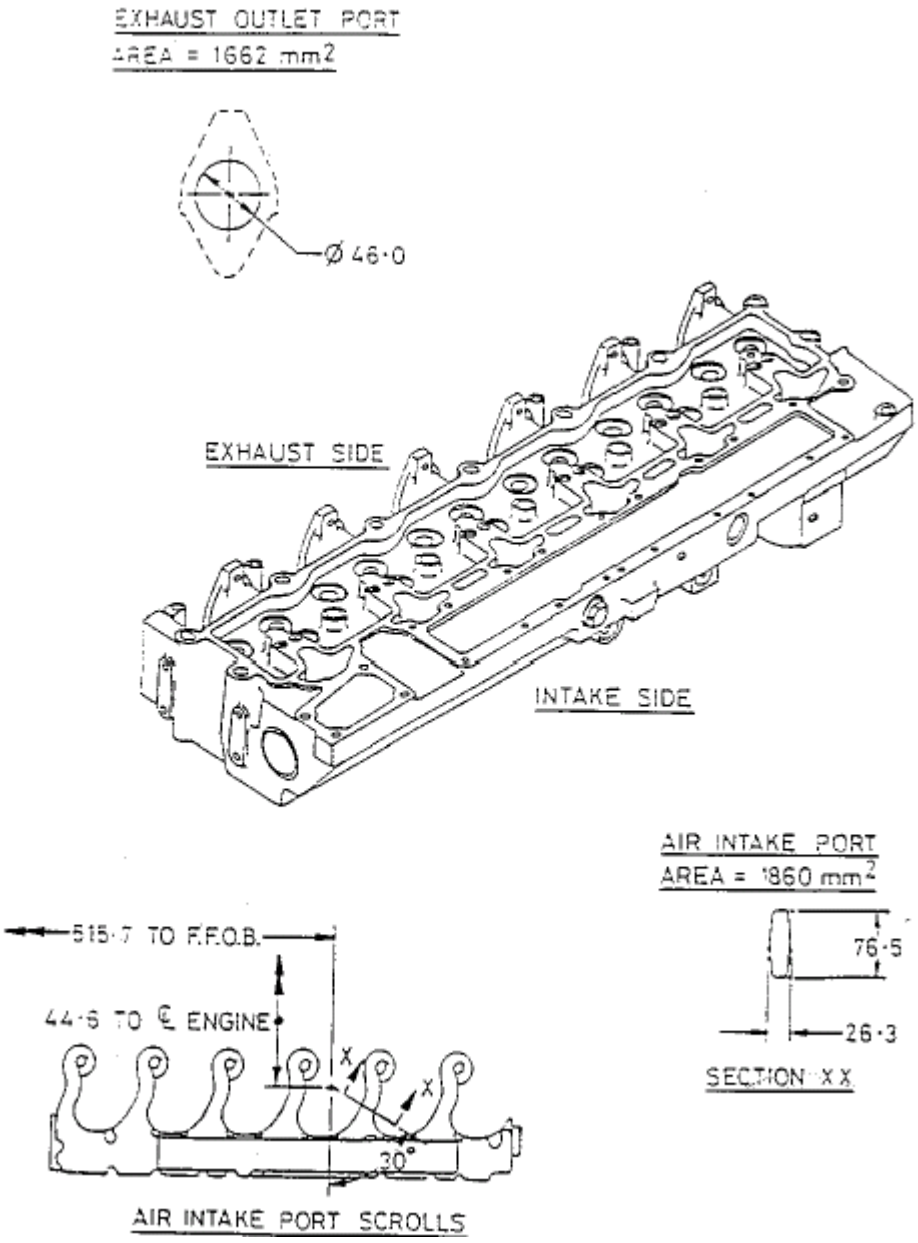
PLAN VIEW OF PISTON



CROSS SECTIONAL VIEW OF CUMMINS "C","CT" AND "CTA" SERIES ENGINES.

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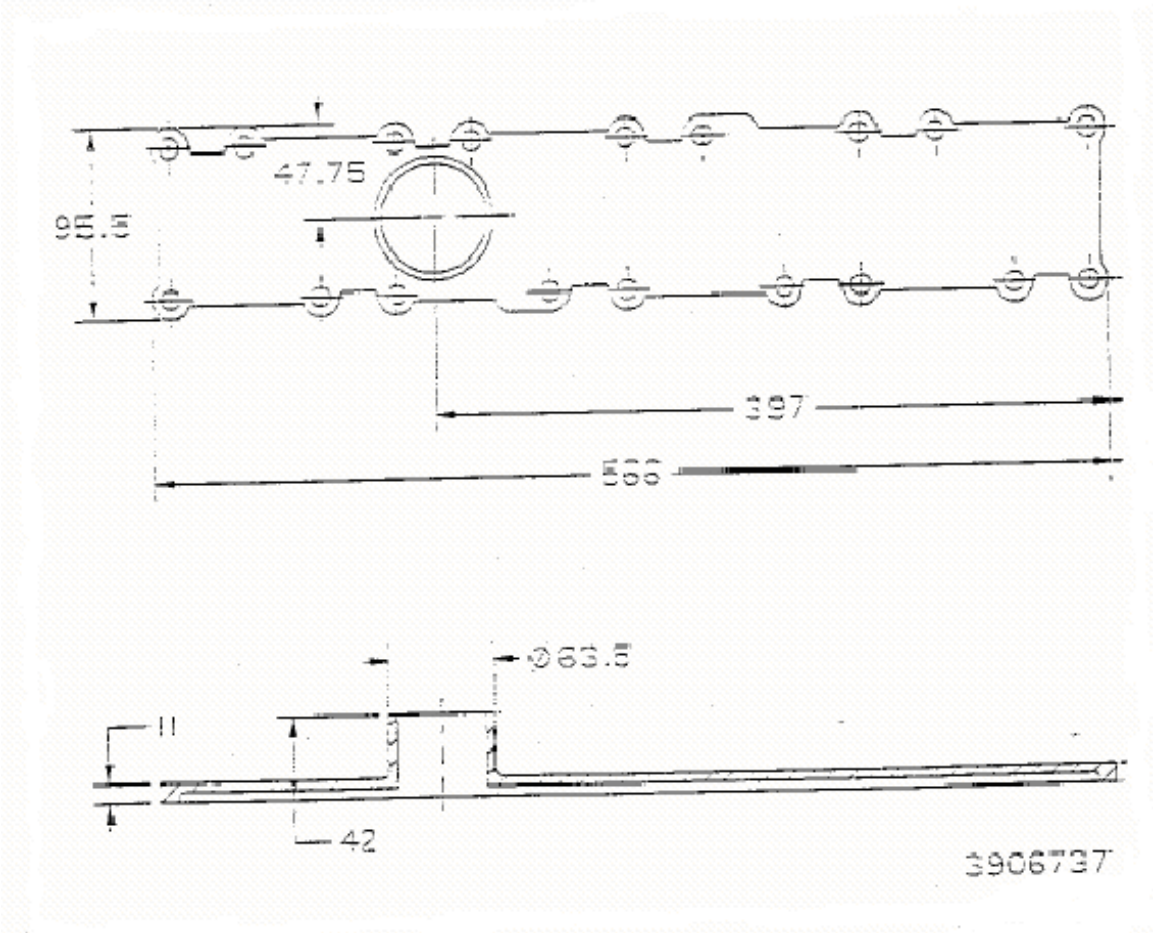
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FAN POWER ABSORPTION

Power absorbed by viscous fan hub
in maximum slip condition is 1.0 kW
over the speed range of the test.

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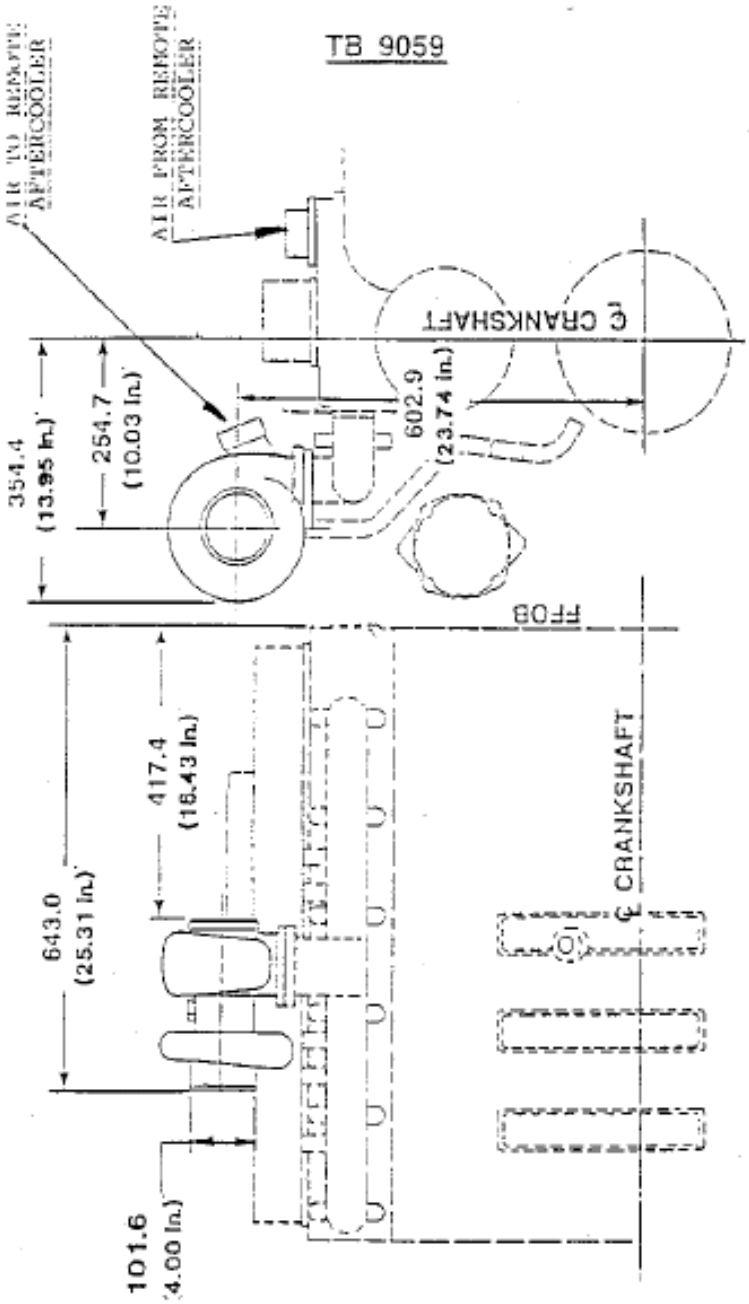
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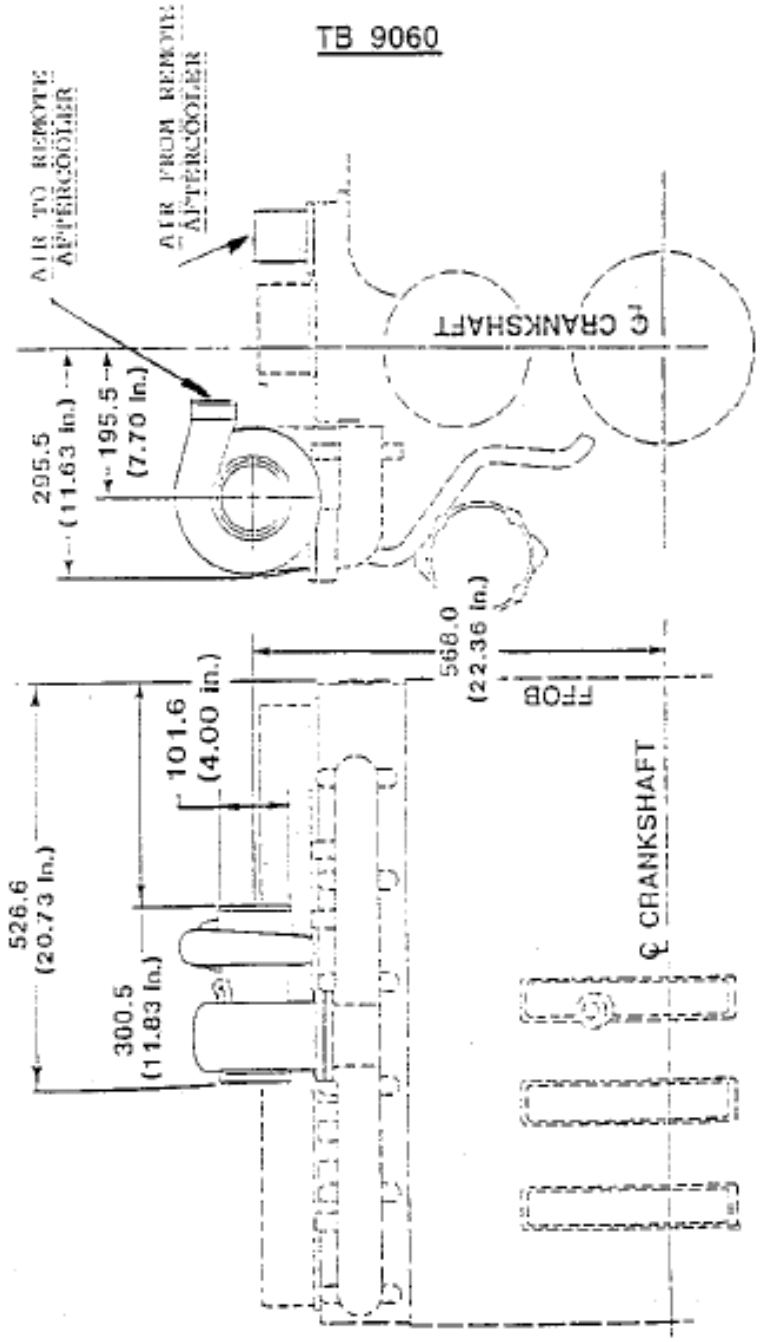
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TURBOCHARGER LOCATION



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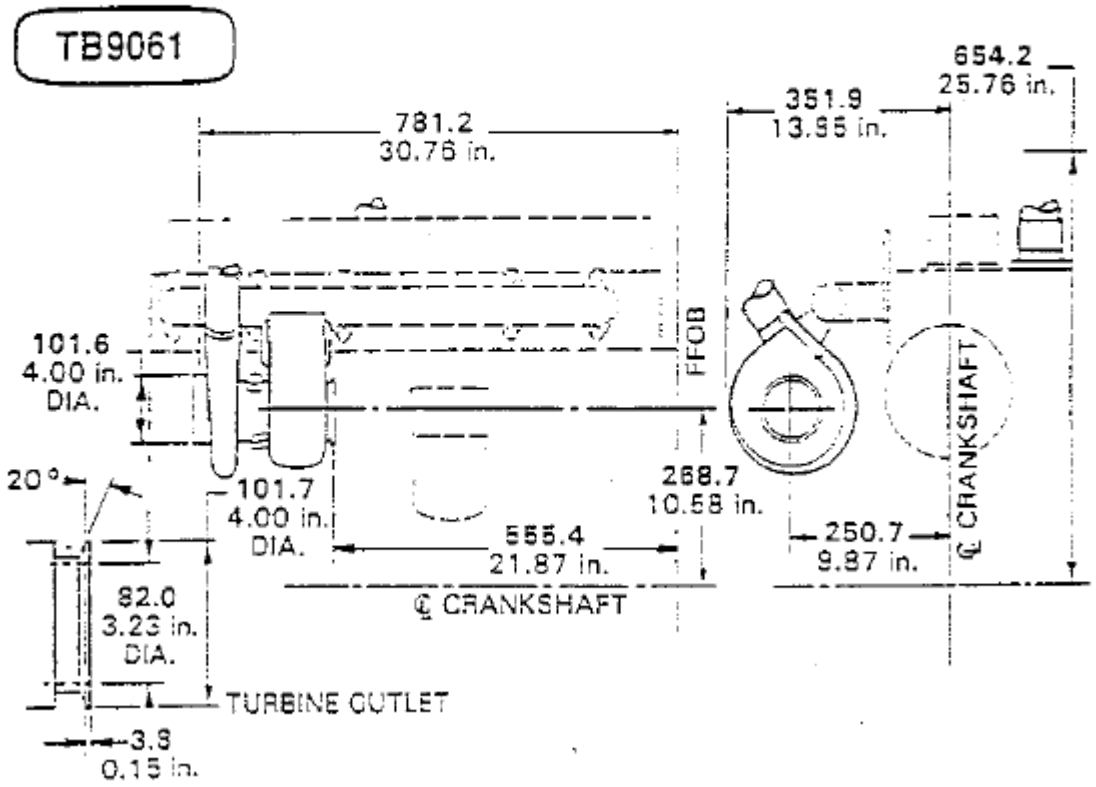
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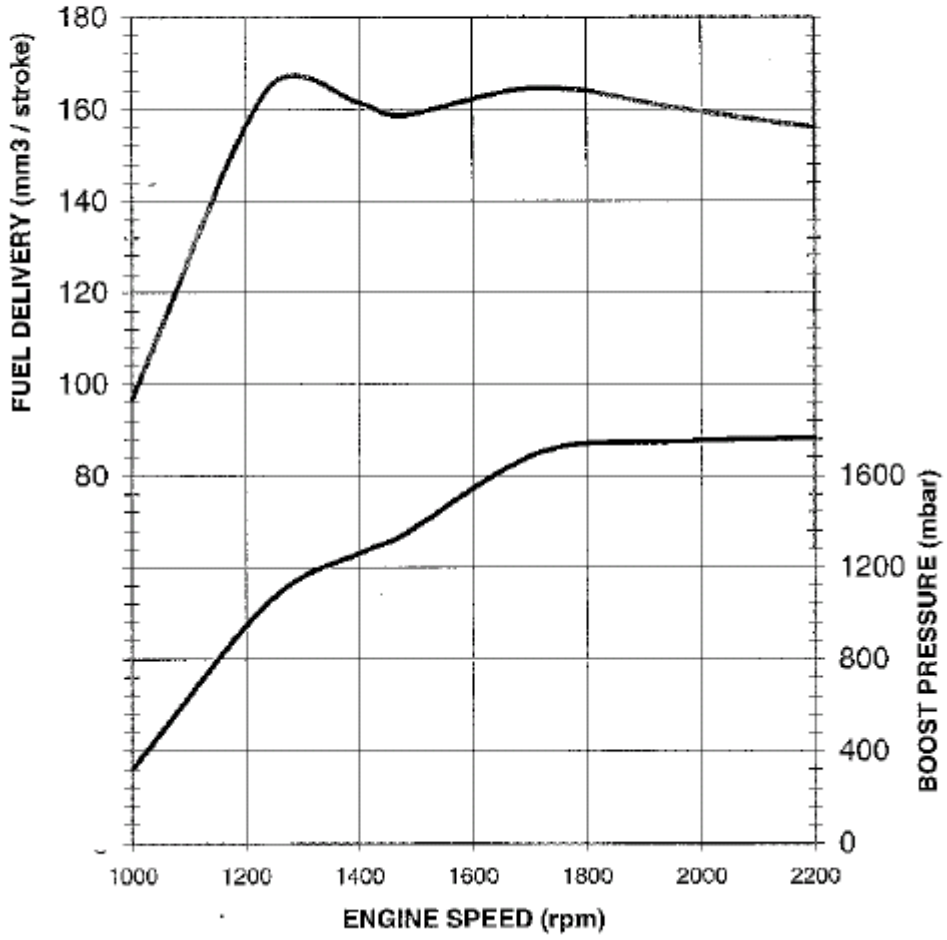
TURBOCHARGER LOCATION



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Boost control & fuel delivery characteristics
Full engine load



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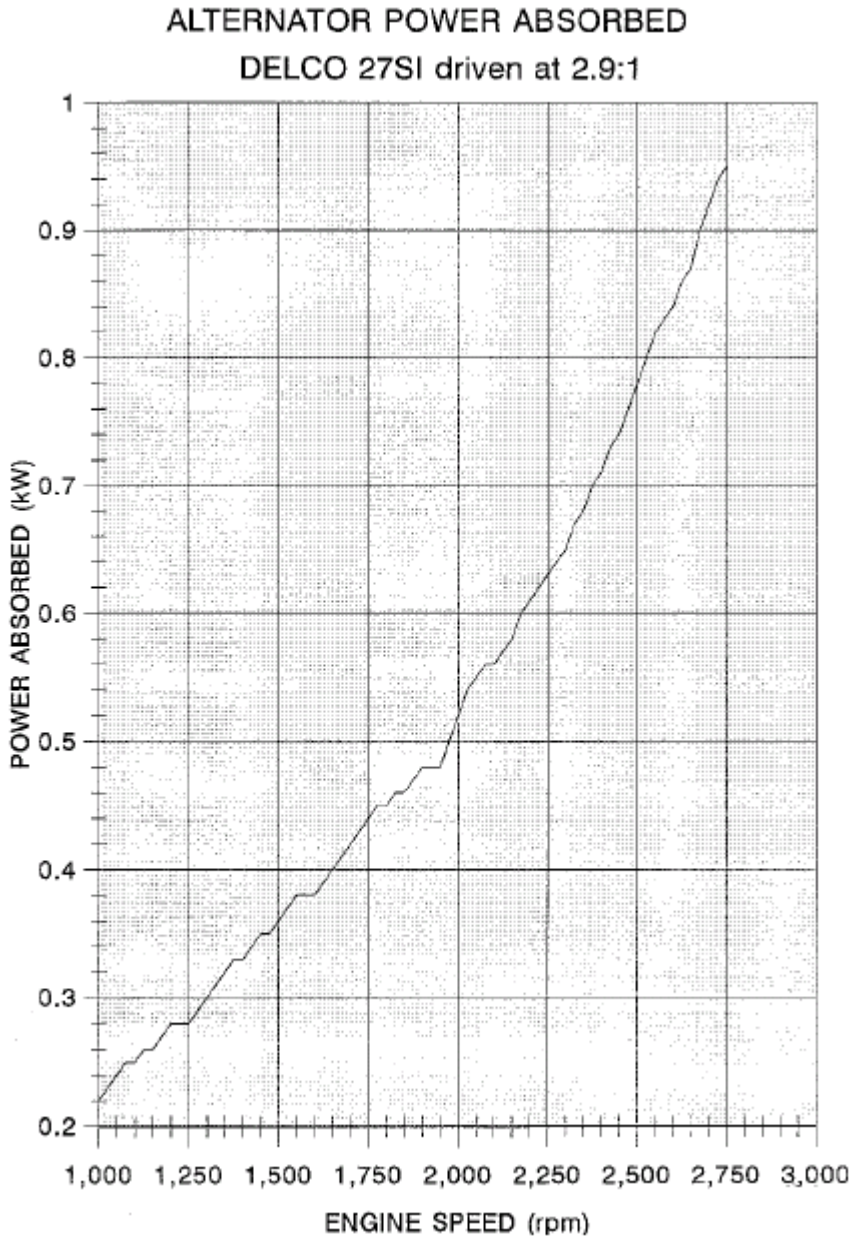
ADDITIONAL ANTI-SMOKE DEVICE

BOOST CONTROL

The Bosch P7100 fuel pump is fitted with a boost control device (Boost Capsule), designed to regulate the fuel delivery output to correspond with the inlet manifold pressure on turbocharged engines during acceleration and lugging. When a turbocharged engine is accelerated, there is sometimes a delay between the throttle lever arriving at full fuel position, and the turbocharger providing it's boost pressure to the combustion chamber. Consequently there is not sufficient air to completely burn the fuel, resulting in excessive smoke during this acceleration. The Boost Control device will sense the air pressure in the manifold during this period and adjust the fuel pressure to limit the amount of fuel injected, thus reducing the smoke produced.

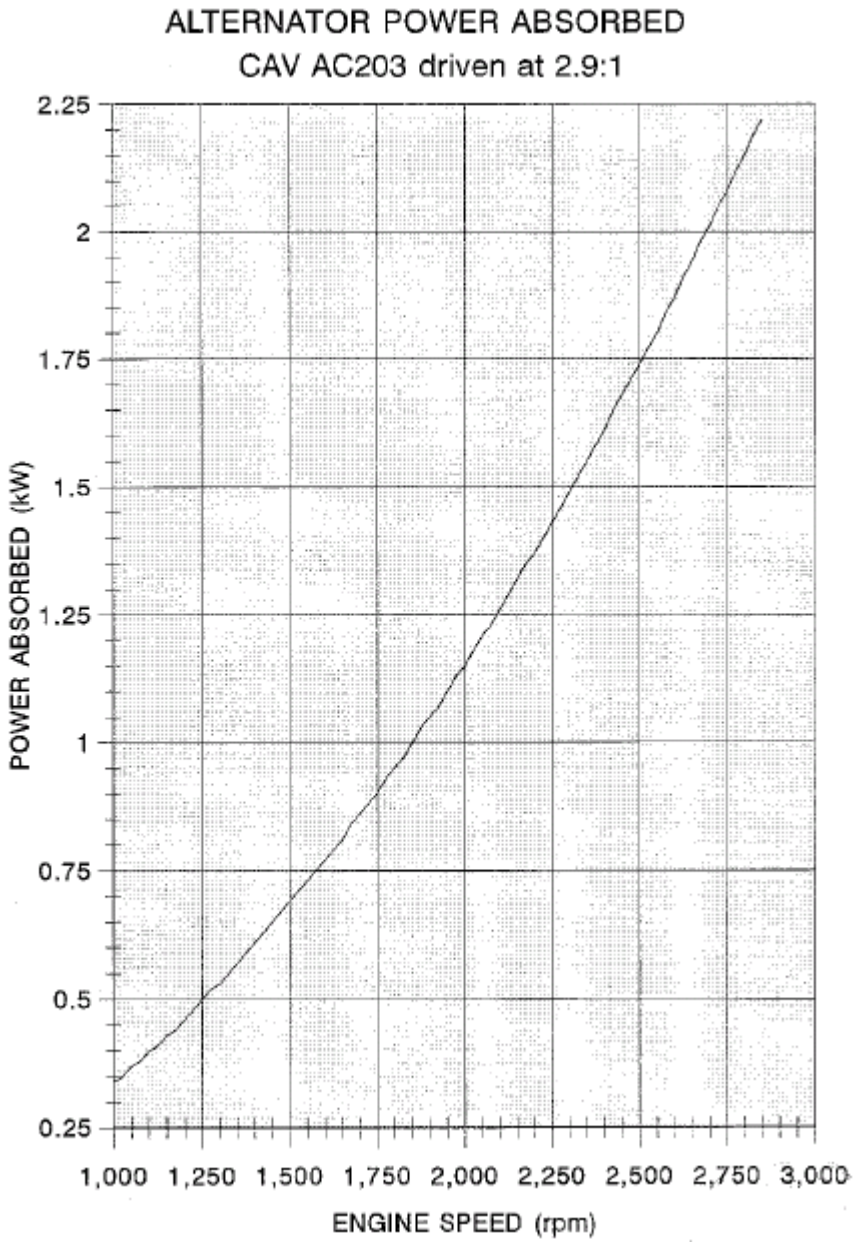
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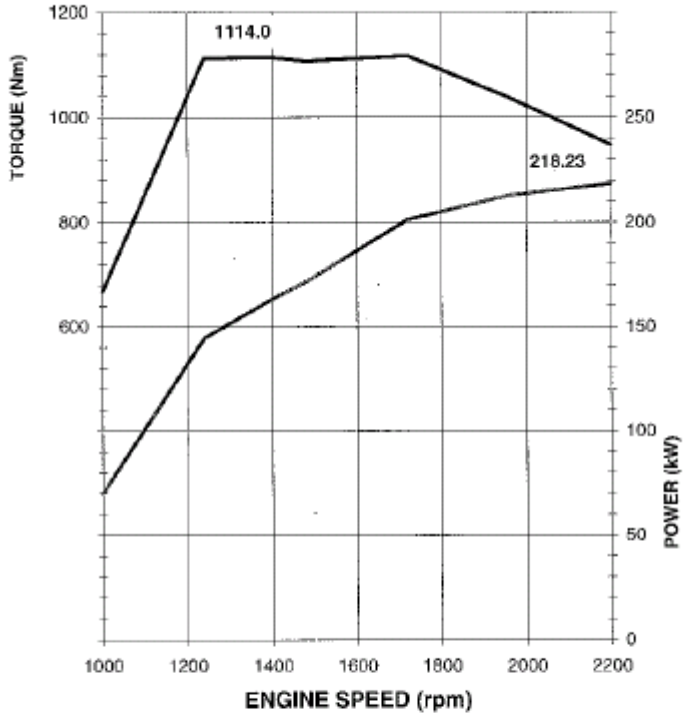
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DECLARED NET ENGINE PERFORMANCE



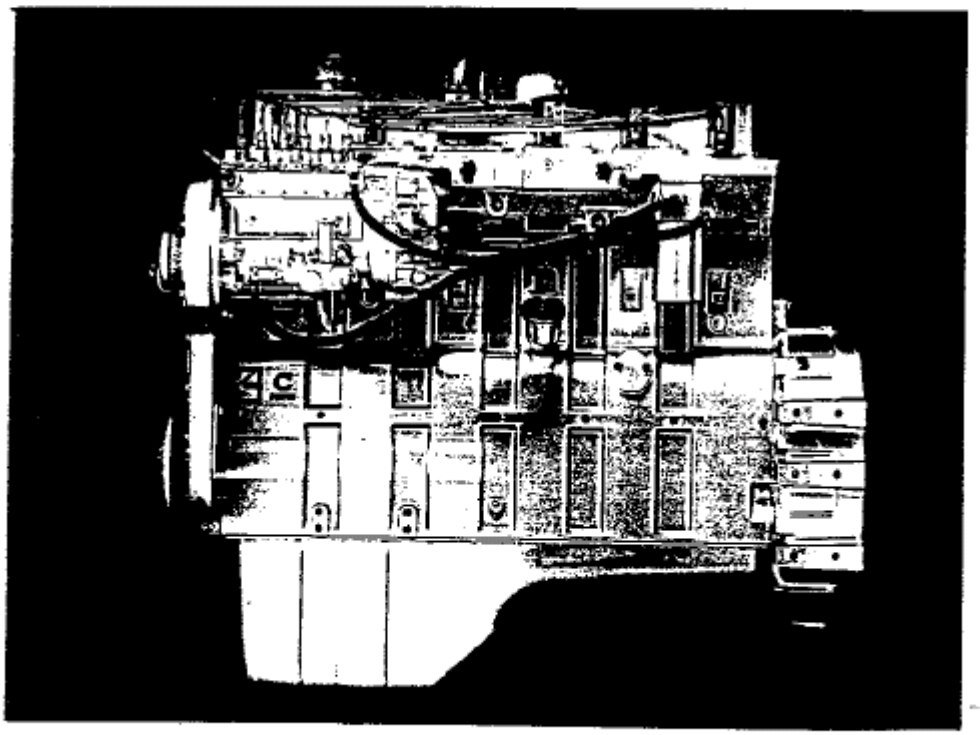
ENGINE (rpm)	1000	1240	1400	1480	1720	1960	2200
NET (Nm)	668.5	1113.0	1114.0	1107.2	1117.6	1036.8	947.2
NET (KW)	70.00	144.53	163.32	171.60	201.30	212.80	218.23
WORST FAN (kW)	1.00	1.00	1.00	1.00	1.00	1.00	1.00
WORST ALT (kW)	0.34	0.50	0.61	0.67	0.88	1.11	1.31

WORST CASE:
FAN: KYSOR 1.0 kW ALT: CAV AC203

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PHOTOGRAPH OF ENGINE



FUEL PUMP SIDE

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PROPRIETARY - Not to be released outside Cummins or its subsidiaries without prior approval, in accordance with CPM 0500-007

DOCUMENT TITLE PAGE

Identification Numbers (If Applicable)		CUMMINS REPORT: 0737-2006-001	Report Distribution
Program Project No: **05070**	Title:	**Performance Documentation Of DCEC Euroll C300 20 Rating**	1. CTC Technical Library 2. Author 3. Darlington Library 4. Ian Watson 5. David W Horner 6. Ian Lowry 7. Claire Redshaw
Engine Family Name: **C**			
Other Reference No.			
Date: **09/January/2006**	Author:	**David Everard**	Title Page Only: 8. Paul Sowerby
Department No: **7808**	Dept. Name:	**Product Development, Darlington**	

SUMMARY

Purpose

The purpose of this report is to document the performance of a 6CTAA C-Series 8.3-litre engine, C300 20 rating, built at Dongfeng Cummins Engine Company Ltd., Xiangfan, China.

Conclusions

None. For documentation purposes only.

Actions

None. For documentation purposes only.

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1. INTRODUCTION

A C300 20 engine, ESN: 69106024, build at the Dongfeng Cummins Engine Company Ltd. engine plant in Xiangfan, China, was tested at Darlington. To allow comparison against data from a Darlington-built engine, the engine speeds chosen replicate those documented during the original R24.03 certification.

2. RESULTS

2.1 Torque Performance

The performance data (gross – observed) recorded at speeds matching those documented in the original R24.03 certification is listed in Attachment 1. The net power/torque data, including the parasitics used in the calculations, are listed in Attachment 2.

2.2 Emissions & Particulates Performance

The engine was tested for emissions and particulates using the same speed/torque points included in the original ECE Regulation 49.02 certification report.

The following table summarises the gaseous emission and particulate results, together with the appropriate limits:

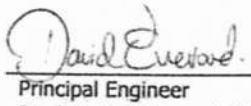
Emission	Limit (g/kW.hr)	Observed (g/kW.hr)
NOx	7.00	6.440
CO	4.00	0.378
HC	1.10	0.196
PM	0.15	0.120

The test data for the emissions/particulate test is listed in Attachment 3.

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SIGNATURES

David Everard



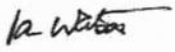
Principal Engineer
Product Development Department
Midrange Technical Operations, DEP, UK

Peter A Williams



New Product Development - Product Manager
Product Development Department
Technical Operations Group, DEP, UK

Ian Watson



Chief Engineer
Product Development Department
Technical Operations Group, DEP, UK

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Metric Log

Date	22-Dec-05
Engine	C300 20 DCEC
Purpose Of Test	Torque Curve
Cell Number	6
Displacement	8.3 litres
Aspiration	Turbo Charged AA
Air Meter Const K0	5230
Number Of Cylinders	6
CPL Number	2368
Fuel Pump Code	3282610

INJECTORS :

Injector Type	BOSCH
Injector Part Number	3283160
Injector Configuration	5-Hole VCO
Exhaust Diameter	85.0 mm

Test Reference	05070.024.tt2a
Engine Serial Number	69106024
Turbo Charger Configuration	HX40W-L8294L/FA19JD8
Camshaft Part Number	3923388
Timing	16
Piston Part Number	3917707
Lubrication Oil Type	Valvoline

REFERENCE INFORMATION :

Rated Power	221.0 kW at : 2200.0 rpm
Fuel Type	Special
Fuel Specific Gravity	0.827 kg/m3

Particulates Calculations

	Prior to Test	Following Test
Sample Filter Weight		
Room Filter Weight		
Max Filter Temp		
Average GEDF		
SumMSAM		
Particulate Mass		
Cycle Result		

Test Type	Cert
Calc Type	Euro 2
Aux Reference	C300_euro2_ax
Emissions Cart	None
Test Schedule	C300_EURO2_TT

Time	Test hrs	Cyc No	Ph No	rpm	Trq Nm	Pwr kW	Fuel Rate kg/hr	Fuel BSFC g/kWh	Fuel Temp °C	Fuel Pr kPa	Fuel Del mm3	Water In Temp °C	Water Out Temp °C	Water Pr kPa	Oil Temp °C	Oil Pr kPa	Oil B-B kPa	Air Intake Int Temp °C	Air Intake Xover Temp °C	Air Intake Xover Pr kPa	Air Intake Manifold Temp °C	Air Intake Manifold Pr kPa	Air Intake Rst kPa	Baro Wet kPa	VP kPa	DP kPa	Rst Fltn kPa	Int Cooler Wat Temp In °C	Int Cooler Wat Temp Out °C	Exhaust TF °C	Exhaust TR °C	Exhaust PF kPa	Exhaust PR kPa	Exhaust Rst kPa	Avl Hsa kPa	Hsp Meas Vppm	MNOx	General Turbo rpm x1000	AFLW m3/hr	AFLW kg/hr	Air Fuel ----	Vol Eff %	Pk Cyl bar	Apk Cyl bar	Dyn Tim Deg	PkL Pr bar	Extra Temps Exhaust TO °C	Exhaust P1 °C	ISO Probe °C	Mini Tun °C	Link Load 1	Link Load 2
21:54	0.061	1	1	2200	929.1	214.1	51.7	242	41	-2	151.8	88	89	265	115	356	0.4	25.0	178	187	49	171	3.68	101.56	1.29	1.668	1.27	1392	1392	1392	1392	172	2	11.02	1.473		0	-1	-0.1	1230.6	1439	27.8	89.0	42.7	45.4	-30.00	70	528	1391	1390	43	-376	0
21:58	0.128	1	2	1960	1021.5	209.7	47.5	227	41	-2	156.7	88	88	229	113	348	0.4	24.8	172	184	46	171	2.99	101.54	1.41	1.385	1.03	1392	1392	1392	1392	172	1	9.14	1.375		0	-1	-0.1	1114.5	1303	27.4	89.8	43.9	46.7	-30.00	70	515	1391	1390	43	-376	0
22:02	0.195	1	3	1720	1124.9	202.6	43.4	214	39	-2	163.2	86	88	197	111	323	0.4	25.1	169	182	43	171	2.22	101.55	1.69	1.065	0.78	1392	1392	1392	1392	172	2	7.27	1.431		0	-1	-0.1	984.9	1151	26.5	89.4	44.8	47.5	-30.00	70	507	1391	1390	42	-376	0
22:06	0.261	1	4	1480	1124.1	174.2	36.0	207	38	-2	157.4	86	87	171	110	292	0.4	24.9	153	163	37	146	1.21	101.56	1.73	0.657	0.46	1392	1392	1392	1392	148	2	4.77	1.033		0	-1	-0.1	774.8	908	25.1	88.3	45.7	48.2	-30.00	71	503	1391	1390	39	-376	0
22:10	0.328	1	5	1400	1125.3	165.4	33.7	204	40	-2	155.4	86	88	162	110	278	0.4	25.1	146	159	34	133	0.85	101.55	1.71	0.530	0.35	1392	1392	1392	1392	133	2	4.12	1.121		0	-1	-0.1	696.0	814	24.2	87.7	45.9	48.3	-30.00	72	520	1391	1390	36	-376	0
22:14	0.395	1	6	1240	1118.0	145.2	30.7	211	41	-2	159.7	86	88	147	109	250	0.4	25.2	132	111	30	107	0.33	101.56	1.80	0.326	0.17	1391	1392	1392	1392	107	2	3.13	1.835		0	-1	-0.1	548.7	639	20.9	86.5	46.4	48.5	-30.00	72	569	1391	1390	36	-376	0
22:18	0.461	1	7	1000	683.7	71.6	15.2	212	40	-2	98.0	85	89	128	106	208	0.4	26.5	72	87	28	35	-0.30	101.55	1.82	0.087	0.00	1391	1391	1391	1392	38	1	1.22	1.650		0	-1	-0.1	262.4	330	21.8	83.9	47.9	49.2	-30.00	72	507	1391	1390	33	-376	0

Attachment 1 – Observed Test Data

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Attachment 2 – Calculated Net Data

Certification Data

Cummins Darlington Mid-Range Tech Ops

Dynamic Parameter Format

Start Date/Time	Serial Number	Engine Model	Test Purpose
22/12/2005	69106024	C300 DCEC-Build	B24.01 Cert Curve

Gross Measured =>>				Parasitics =>>			Certification Parameters =>>					
Phase Number	Speed (rpm)	Torque (Nm)	Power (kW)	Alternator Parasitic (kW)	Compressor Parasitic (kW)	Fan Parasitic (kW)	CertAD	Corrected Fan Power (kW)	Corrected Net Power (Gross + Alternator) (kW)	Final Net Power (kW)	Final Net Torque (Nm)
1	2200.727055	957.071649	214.9692447		0	1	0.997569962	0.997569962	212.1818591	211.1842901	916.5590132
2	1973.954773	1021.478234	209.6543153	1.311945727	0	1	0.99755819	0.99755819	208.6311487	207.6335805	1004.719176
3	1739.616832	1124.93643	202.5761366	0.875693458	0	1	0.998582068	0.998582068	201.4154541	200.4178871	1100.947674
4	1479.815456	1134.115652	174.1094956	0.674851605	0	1	0.998150114	0.998150114	173.4195941	172.2410399	1111.477669
5	1400.077482	1128.251646	165.4180317	0.610057986	0	1	0.998061582	0.998061582	164.5907186	163.5821028	1115.723625
6	1238.67529	1118.047173	145.1783233	0.491980332	0	1	0.998039141	0.998039141	144.5319409	143.539078	1105.981201
7	1000.21879	683.701573	71.84277502	0.340087511	0	1	1.000957313	1.000957313	71.94538198	70.93992447	671.9498708

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Attachment 3 – Emissions & Particulate Data

prodigy 9-Jan-06 17:01

Emissions Log

Date	22-Dec-05	Test Reference	05070.024.pt9965	Rated Power	221.0 kW at : 2200.0 rpm
Engine	C300 20 DCEC	Engine Serial Number	69106024	Fuel Type	Special
Purpose Of Test	Emissions / Particulates			Fuel Specific Gravity	0.827 kg/m3
Cell Number	6	Turbo Charger Configuration	HX40W-L8294L/FA19JD8		
Displacement	8.3 litres	Camshaft Part Number	3923388		
Aspiration	Turbo Charged AA	Timing	16		
Air Meter Const K0	5230	Piston Part Number	3917707		
Number Of Cylinders	6	Lubrication Oil Type	Valvoline		
CPL Number	2368				
Fuel Pump Code	3282610				

INJECTORS :

Injector Type	BOSCH
Injector Part Number	3283160
Injector Configuration	5-Hole VCO
Exhaust Diameter	85.0 mm

REFERENCE INFORMATION :

Test Type	Std Auto
Calc Type	Euro 2
Aux Reference	C300_euro2_ax
Emissions Cart	Cart A
Test Schedule	C300_EURO2_EM

Phase	Rpm	Meas Trq	Meas Pwr kW	Pace Pwr kW	Net Pwr kW	Wtd Net kW	Meas BMEP kPa	Fuel kg/hr	Meas BSFC g/kWh	Pct Load	Ab Hum gr/kg	Wet Baro kPa	Vap Press kPa	Air Temp °C	Int Rest kPa	Exh Press kPa	Wet Air kg/hr	Air m3/hr	Meas A/F	A/F CO2	A/F Comp %	Wtd A/F Comp	A/F O2	Vol Eff	Dry Wet Conv	Nox Hum	Wgt	Wet% CO2	Wet% CO	Wet% NOx	Wet% UHC	Boost kPa	CO gr/hr	NOx gr/hr	UHC gr/hr	WCO	WNOx	WHC	Spec NOx	Int Spec NOx	Comp Spec NOx%	WNOx VP=1 VE=90
1	703	8.5	0.6	1.2	-0.5	0.0	13	1.15	1847	0.0	10.71	101.71	1.73	24.0	-0.50	1.4	160.0	137	138.1	179.9	0.0	0.0	146.0	78.6	0.9866	1.0405	0.083	1.15	0.0089	0.0263	0.0073	1	13.8	67.2	5.66	1.15	5.58	0.47	-126.20			56
2	1400	120.0	17.6	1.6	16.0	1.3	182	5.78	329	9.7	10.46	101.71	1.68	24.8	-0.23	1.1	392.1	335	67.8	72.0	5.6	0.2	66.8	86.5	0.9727	1.0209	0.080	2.85	0.0119	0.0376	0.0094	9	45.7	237.5	17.95	3.66	19.00	1.44	14.85			191
3	1400	287.2	42.1	1.6	40.5	3.2	435	9.83	233	24.7	10.14	101.69	1.63	25.1	-0.18	1.0	425.1	354	43.2	43.7	1.1	0.1	43.0	87.1	0.9572	1.0084	0.083	4.63	0.0054	0.0596	0.0074	17	22.9	411.2	15.47	1.83	32.89	1.24	10.15			332
4	1400	570.6	83.6	1.6	82.0	6.6	864	17.60	210	50.0	10.22	101.70	1.65	25.2	0.04	0.9	521.3	449	29.9	30.1	1.7	0.1	29.8	87.2	0.9375	1.0011	0.080	6.63	0.0027	0.0738	0.0068	45	14.0	631.7	17.59	1.12	50.53	1.41	7.70			514
5	1401	851.8	124.9	1.6	123.3	9.9	1290	25.09	201	75.2	9.31	101.69	1.50	25.5	0.40	0.9	661.5	566	26.4	26.1	-0.9	-0.1	26.0	86.7	0.9298	0.9847	0.080	7.80	0.0026	0.0723	0.0069	87	17.2	788.2	21.51	1.38	63.06	1.72	8.39			642
6	1400	1129.9	165.7	1.6	164.1	41.0	1711	33.97	205	100.0	7.72	101.69	1.25	25.0	0.93	1.2	827.1	707	24.3	24.4	0.2	0.1	24.3	86.3	0.9240	0.9633	0.250	8.10	0.0043	0.0730	0.0053	134	35.9	997.9	21.86	8.98	249.48	5.47	6.08			2537
7	705	5.4	0.4	1.2	-0.8	-0.1	8	1.28	3232	0.0	8.24	101.68	1.33	23.9	-0.48	1.0	163.8	140	127.5	151.3	0.0	0.0	126.4	77.9	0.9855	0.9797	0.083	1.37	0.0096	0.0305	0.0075	1	15.3	80.0	5.94	1.27	6.04	0.49	-104.95			67
8	2200	912.2	210.1	2.4	207.8	20.5	1361	50.58	241	100.0	7.59	101.62	1.23	24.8	3.73	1.0	1448.4	1237	28.6	28.2	-1.4	-0.2	28.0	89.3	0.9353	0.9612	0.100	7.07	0.0058	0.0436	0.0027	172	64.6	1035.0	19.40	8.46	103.50	1.94	4.08			1054
9	2200	715.1	164.8	2.4	162.4	3.2	1083	39.70	241	78.1	8.96	101.67	1.45	24.9	3.38	1.1	1374.4	1176	34.6	34.2	-1.2	0.0	33.8	89.0	0.9456	0.9831	0.020	5.88	0.0042	0.0353	0.0037	157	57.1	792.3	25.19	1.14	16.85	0.50	4.88			161
10	2200	485.4	111.8	2.4	109.5	2.2	735	27.06	242	52.7	10.81	101.67	1.71	24.8	2.03	1.2	1100.2	941	40.7	40.3	-0.9	0.0	39.6	87.1	0.9545	1.0160	0.020	5.02	0.0043	0.0316	0.0066	103	47.1	565.1	35.83	0.94	11.30	0.72	5.18			115
11	2200	239.4	55.2	2.4	52.8	1.1	362	16.08	292	25.4	10.83	101.66	1.71	25.1	0.87	1.2	820.6	702	51.0	51.7	1.2	0.0	50.1	86.7	0.9637	1.0191	0.020	3.94	0.0072	0.0278	0.0069	48	58.2	369.2	35.51	1.15	7.38	0.71	6.99			75
12	2201	100.2	23.1	2.4	20.7	0.4	152	10.19	441	10.0	10.90	101.66	1.75	25.0	0.50	1.2	703.9	602	69.1	72.1	4.1	0.0	68.6	85.7	0.9732	1.0300	0.020	2.85	0.0103	0.0217	0.0118	27	71.2	248.3	39.80	1.42	4.93	0.80	11.88			50
13	706	8.3	0.6	1.2	-0.5	0.0	13	1.09	1778	0.0	10.99	101.66	1.77	24.5	-0.49	1.1	160.7	145	155.7	180.8	0.0	0.0	144.6	80.8	0.9881	1.0442	0.083	1.15	0.0096	0.0257	0.0092	1	15.9	69.7	7.52	1.32	5.78	0.82	-127.36			56
Sum of Net Weighted Power						89.49	kW													Sum of Weighted A/F Comp			0.1 %																		
																																		Wave		33.83	575.93	17.52				585.2
																																		Specific Wave		0.378	6.44	0.196				65

IMPORTANT ! -Check that air to fuel ratio comparisons are satisfactory

IMPORTANT ! -Check that the K0 value in the header file is correct

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Metric Log

Cummins

Date	22-Dec-05
Engine	C300 20 DCEC
Purpose Of Test	Emissions / Particulates
Cell Number	6
Displacement	8.3 litres
Aspiration	Turbo Charged AA
Air Meter Const K0	5230
Number Of Cylinders	6
CPL Number	2368
Fuel Pump Code	3282810

INJECTORS :

Injector Type	BOSCH
Injector Part Number	3283160
Injector Configuration	5-Hole VCO
Exhaust Diameter	85.0 mm

Test Reference	05070.024.pt9965
Engine Serial Number	69106024
Turbo Charger Configuration	HX40W-L8294L/FA19JDS
Camshaft Part Number	3923386
Timing	16
Piston Part Number	3917707
Lubrication Oil Type	Valvoline

REFERENCE INFORMATION :

Rated Power	221.0 kW at :	2200.0 rpm	
Fuel Type	Special		
Fuel Specific Gravity	0.827 kg/m3		
Test Type	Std Auto		
Calc Type	Euro 2		
Aux Reference	C300_euro2_ax		
Emissions Cart	Cart A		
Test Schedule	C300_EURO2_EM		

Particulates Calculations

	Prior to Test	Following Test
Sample Filter Weight	0.2697860	0.2718360
Room Filter Weight	0.2789060	0.2789060

Max Filter Temp	44.930
Average GEDF	8.992
SumMSAM	1.7025
Particulate Mass	0.0020500
Cycle Result	0.1209854

Time	Test hrs	Cyc No	Ph No	rpm	Trq Nm	Pwr kW	Fuel Rate kg/hr	Fuel BSFC g/kWh	Fuel Temp °C	Fuel Pr kPa	Fuel Dil mm3	Water In Temp °C	Water Out Temp °C	Water Pr kPa	Oil Temp °C	Oil Pr kPa	Oil B-B kPa	Air Int Temp °C	Air Xover Temp °C	Air Xover Pr kPa	Air Manifold Temp °C	Air Manifold Pr kPa	Air Rst kPa	Air Baro kPa	Air VP kPa	Air DP kPa	Air Rst Flm kPa	Int Cooler Wat In °C	Int Cooler Wat Out °C	Exhaust TF °C	Exhaust TR °C	Exhaust FF kPa	Exhaust PR kPa	Exhaust Rst kPa	Avl Hsu kPa	Hsp Meas kPa	MNOx Vppm	General Turbo rpm	AFLW x1000	AFLW m3/hr	Air ---- kg/hr	Vol Eff %	Pk Cyl bar	Apk Cyl bar	Dyn Tim Deg	PkL Pr bar	Extra Temps Exhaust TO °C	Exhaust P1 °C	IBO Probe °C	Mini Tun °C	Link Load 1	Link Load 2
16:52	0.097	1	1	703	6.8	0.6	1.2	1847	40	-2	11.1	88	87	109	96	159	0.4	24.0	36	2	28	1	-0.50	101.71	1.73	0.020	0.00	1392	1392	1392	1392	3	1	0.68	0.042	0	-1	-0.1	136.9	160136.1	78.8	44.1	45.2	-30.00	73	162	1391	1390	162	-376	0
16:56	0.197	1	2	1400	120.0	17.6	5.8	329	39	-2	27.7	88	87	165	95	350	0.4	24.8	41	12	24	9	-0.23	101.71	1.68	0.122	0.00	1391	1392	1391	1392	11	1	1.01	0.264	0	-1	-0.1	335.4	392 67.8	86.6	42.6	43.7	-30.00	73	192	1391	1390	136	-376	0
17:04	0.297	1	3	1400	267.2	42.1	9.8	233	40	-2	47.2	89	88	166	101	333	0.4	25.1	50	21	23	17	-0.18	101.69	1.63	0.144	0.00	1391	1392	1391	1392	20	1	1.16	0.293	0	-1	-0.1	383.6	425 43.2	97.1	41.7	42.9	-30.00	73	272	1391	1390	160	-376	0
17:10	0.397	1	4	1400	370.6	53.6	17.6	210	41	-3	84.5	87	87	167	104	314	0.4	25.2	79	50	26	45	0.04	101.70	1.65	0.217	0.07	1392	1392	1392	1392	48	1	1.89	0.352	0	-1	-0.1	445.9	521 39.6	87.2	41.1	42.6	-30.00	72	398	1391	1390	230	-376	0
17:16	0.497	1	5	1401	851.6	124.9	25.1	201	40	-3	120.3	87	88	167	106	297	0.4	25.5	112	93	28	67	0.40	101.69	1.50	0.349	0.19	1392	1392	1392	1392	90	1	2.42	0.505	0	-1	-0.1	565.8	662 35.4	86.7	40.5	42.7	-30.00	72	473	1391	1390	297	-376	0
17:22	0.597	1	6	1400	1129.9	165.7	34.0	205	40	-2	163.0	86	88	166	108	281	0.4	25.0	147	141	33	134	0.93	101.69	1.25	0.545	0.35	1391	1391	1391	1392	137	1	3.55	1.033	0	-1	-0.1	707.4	827 24.3	88.3	41.1	43.5	-30.00	72	512	1391	1390	345	-376	0
17:28	0.697	1	7	706	5.4	0.4	1.3	3232	40	-3	12.2	89	87	112	98	196	0.4	23.9	35	3	27	1	-0.46	101.68	1.33	0.021	0.00	1391	1391	1391	1392	3	1	0.65	0.072	0	-1	-0.1	140.1	164127.5	77.9	42.0	43.1	-30.00	72	171	1391	1390	177	-376	0
17:34	0.797	1	8	2200	912.2	210.1	50.6	241	40	-2	154.5	88	89	269	114	358	0.4	24.8	178	158	49	172	3.73	101.62	1.23	1.683	1.27	1392	1392	1392	1392	174	1	10.07	1.385	0	-1	-0.1	1237.2	1446 28.6	89.3	41.1	43.5	-30.00	72	517	1391	1390	389	-376	0
17:40	0.897	1	9	2200	715.1	164.8	39.7	241	40	-2	121.2	87	88	265	112	356	0.4	24.9	155	172	47	157	3.38	101.67	1.45	1.519	1.15	1392	1392	1392	1392	160	1	8.47	0.000	0	-1	-0.1	1175.6	1374 34.6	89.0	42.8	45.4	-30.00	72	422	1391	1390	937	-376	0
17:46	0.997	1	10	2200	485.4	111.8	27.1	242	40	-3	82.6	89	88	266	110	375	0.4	24.8	124	115	37	103	2.03	101.67	1.71	0.970	0.72	1392	1392	1392	1392	105	1	5.26	0.612	0	-1	-0.1	941.0	1100 40.7	87.1	41.3	43.4	-30.00	72	353	1391	1390	282	-376	0
17:52	1.097	1	11	2200	239.4	55.2	16.1	292	40	-3	49.1	89	88	267	109	385	0.4	25.1	82	56	26	48	0.87	101.66	1.71	0.536	0.34	1392	1392	1392	1392	49	1	2.88	0.555	0	-1	-0.1	701.9	821 51.0	86.7	41.5	43.0	-30.00	72	278	1391	1390	229	-376	0
17:58	1.197	1	12	2201	100.2	23.1	10.2	441	40	-2	31.1	89	88	268	106	392	0.4	25.0	63	34	26	27	0.50	101.66	1.75	0.395	0.23	1391	1392	1392	1392	29	1	2.13	0.553	0	-1	-0.1	602.1	704 69.1	85.7	41.6	42.9	-30.00	72	217	1391	1390	172	-376	0
18:04	1.297	1	13	706	8.3	0.6	1.1	1778	40	-3	10.4	88	87	111	96	160	0.4	24.5	82	2	26	1	-0.49	101.66	1.77	0.023	0.00	1391	1391	1391	1392	3	1	0.59	0.052	0	-1	-0.1	145.1	170155.7	80.8	41.5	42.5	-30.00	72	112	1391	1390	107	-376	0