



**ISTITUTO MOTORI**

*Consiglio Nazionale delle Ricerche*

CONVENZIONE TRA MINISTERO DELLE INFRASTRUTTURE E DEI TRASPORTI  
ED ISTITUTO MOTORI DEL CNR

***PER LA MISURAZIONE DELLE EMISSIONI INQUINANTI DI VEICOLI DIESEL, L'ANALISI DEI  
RISULTATI DELLE PROVE IN LABORATORIO E SU STRADA  
E LA PRODUZIONE DELLA RELATIVA REPORTISTICA SCIENTIFICA***

# **Report finale**

**PROGRAMMA DI PROVE  
PER LA VALUTAZIONE DEL COMPORTAMENTO EMISSIVO  
DI VETTURE DIESEL EURO 5  
COMMERCIALIZZATE IN ITALIA  
CON PROVE IN LABORATORIO E SU PISTA**

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## 1. Introduzione

Nelle due “NOTICE OF VIOLATION” inviate dall’EPA (Environmental Protection Agency) degli USA il 18/09/2015 e il 02/11/2015 a Volkswagen, Audi e Porsche, l’EPA ha contestato la presenza di DEFEAT DEVICES installati su alcuni modelli di veicoli commercializzati negli USA. In particolare Volkswagen avrebbe prodotto ed installato un software nel Modulo di Controllo Elettronico (ECM/ECU) di ogni veicolo che produce un diverso comportamento del veicolo quando questo viene testato per verificare la rispondenza con gli standard emissivi EPA rispetto all’uso normale. Il software sarebbe in grado di individuare quando il veicolo sta per iniziare un test FTP 75 ed, in tale occasione, attiverebbe un “*temperature conditioning*” mode. In questa modalità di funzionamento, alcuni parametri legati al controllo emissivo dei NOx (ad esempio: tempo di iniezione, EGR, pressione del common rail) consentono di produrre basse emissioni di NOx ed alte temperature dei gas di scarico (per migliorare l’efficienza di riduzione degli NOx dei sistemi catalitici, già presenti sui modelli americani). Alla disattivazione di questa modalità il software attua un “*normal mode*” (sia alla fine del FTP 75 che quando il veicolo parte in condizioni che non sono “riconosciute” quali FTP 75) ed il motore lavora con differenti tempi di iniezione, EGR e pressione del rail che producono più alti livelli di NOx e più basse temperature dei gas di scarico rispetto al “*temperature conditioning*” mode [1].

I due veicoli su cui è stato riscontrato questo comportamento, testati dal centro Centro CAFEE della West Virginia University in USA, erano dotati dello stesso motore Diesel 2.0 litri 104 kW ma con differenti tecnologie di after-treatment installate allo scarico per la riduzione degli NOx: una Lean-NOx Trap (LNT) ed un sistema a Selective Catalyst Reduction (SCR) [2].

L’Autorità di omologazione italiana (Direzione generale per la Motorizzazione del MIT) ha incaricato, nel novembre 2015, l’Istituto Motori del CNR di mettere a punto una metodologia di verifica del comportamento emissivo (in termini di Ossidi di Azoto NOx) di veicoli diesel rispondenti ai limiti Euro 5 commercializzati in Italia e studiarne nel dettaglio il comportamento emissivo al fine di stabilire:

1. la eventuale presenza di dispositivi di manipolazione delle emissioni vietati dalla vigente normativa;
2. la individuazione dei livelli di emissione tipici dell’uso reale dei veicoli confrontati con i livelli emissivi degli stessi veicoli in condizioni standard di test di omologazione.



Per quanto attiene specificamente ai veicoli del Gruppo VW sono state effettuate, in via preliminare e nei primi mesi dell'anno 2016, prove in laboratorio e su pista con connotati più di carattere scientifico vero e proprio che puramente investigativo/funzionale. Questo sia perchè la presenza di dispositivi di manipolazione vietati era già stata formalmente ammessa dai responsabili del Gruppo, sia per le indagini in corso da parte della Procura della Repubblica di Verona che ha sequestrato un campione più numeroso di veicoli da testare, sia in laboratorio che su pista, prima e dopo gli interventi di richiamo e ripristino "a norma". Pertanto ogni riferimento, anche quantitativo, presente in questo report e riferito ai suddetti veicoli è da intendersi come "parziale e provvisorio".

## **2. Veicoli**

La selezione dei veicoli è stata operata dal MIT secondo il criterio della rappresentatività statistica sull'intero universo del parco circolante di veicoli diesel Euro 5b.

Sono stati quindi selezionati 25 modelli di autovetture Diesel rappresentative di oltre il 70% del parco circolante nazionale (diesel Euro 5b). Le vetture (nuove) sono state messe a disposizione per le verifiche in corso da parte dei costruttori tramite la propria rete di concessionari in Italia.

Le configurazioni tipiche degli impianti di after-treatment installati in Europa su vetture Diesel Euro 5 prevedono un sistema composto da Catalizzatore ossidante (OC) + Trappola per il Particolato (DPF). Si evidenzia come il limite Euro 5 per i NOx di 180 mg/km su ciclo NEDC non abbia richiesto l'obbligo di installare un sistema after-treatment per il loro controllo (LNT e/o SCR).

Allo stato sono concluse le prove per 18 veicoli Euro 5 (Tabella 1).

Altri 8 veicoli, tutti facenti capo a marchi del Gruppo VW, sono stati sottoposti a sequestro da parte della Procura di Verona e per sette di questi sono in corso delle prove.

Dei diciotto veicoli, undici veicoli sono stati provati presso la Sala Prova Emissioni E3 dell'Istituto Motori del CNR, e sette presso i laboratori FCA di Torino per conto del CPA Torino.

Tutte le prove sono state condotte alla presenza di Tecnici del MIT e di responsabili individuati dalle case costruttrici dei veicoli di volta in volta soggetti a prova.



<b>Veicolo</b>	<b>Cilindrata [cc]</b>	<b>Potenza [kW]</b>	<b>Inerzia equivalente [kg]</b>	<b>S&amp;S</b>	<b>Odometro (Km)</b>	<b>Trasmissione</b>	<b>Lab</b>
VW Tiguan (2 veicoli)	1968	81	1700	SI	50	Manuale M6	IM-CNR
BMW 118d	1996	105	1470	SI	100	Automatica	IM-CNR
Ford Focus	1596	70	1360	NO	1800	Manuale M6	IM-CNR
Ford S-Max	1999	120	1700	NO	1800	Manuale M6	IM-CNR
Mercedes CLA 200 CDI	1796	100	1470	SI	1300	Automatica	IM-CNR
Mercedes E 220CDI	2143	125	1810	SI	1400	Automatica	IM-CNR
Opel Astra	2000	118	1470	NO	5500	Manuale M6	IM-CNR
Renault Laguna	1461	81	1360	NO	3992	Manuale M6	IM-CNR
Renault Clio	1461	55	1130	NO	3247	Manuale M5	IM-CNR
Dacia Sandero	1461	66	1130	NO	1200	Manuale M5	IM-CNR
Panda 1.3 SDE	1248	55	1130	SI	33132	Manuale M5	FCA
Giulietta 2.0 Mjet	1956	110	1360	SI	25070	Manuale M6	FCA
Doblo 1.3 SDE	1248	66	1360	NO	11195	Manuale M5	FCA
Giulietta 1.6 Mjet	1598	77	1360	SI	27000	Manuale M6	FCA
Cherokee 2.0 MT 4x2	1956	103	1810	SI	16500	Manuale M6	FCA
Lancia Y 1.3 SDE	1248	70	1130	SI	18500	Manuale M5	FCA
500L 1.6 Mjet S&S	1598	77	1470	SI	34522	Manuale M6	FCA

***Tabella 1: Elenco dei veicoli diesel Euro 5***

Per ogni vettura provata in IM-CNR è stata preparata una scheda con le principali caratteristiche (Allegato A, Tabelle da A1 a A10). Le informazioni per i veicoli provati dal CPA Torino sono riportate nell'Allegato E.

### **3. Protocollo di prova**

Il protocollo di prova è stato definito al fine di poter riuscire a discriminare comportamenti emissivi anomali di autovetture Diesel rispondenti agli standard emissivi europei Euro 5; i cicli individuati per il test delle vetture sono in linea con quelli previsti dal protocollo di prova definito dal Centro di ricerca JRC della Commissione UE.



Fino a quando non entrerà in vigore la procedura RDE (definita dal Regolamento EU 427/2016 e con integrazione 646 del 20/04/2016 [3]), le emissioni degli inquinanti vengono verificate in omologazione tramite la procedura di Tipo I, come prevista dalla direttiva EU 715/2007.

E' utile precisare che TUTTI i veicoli sottoposti a prova secondo l'originaria procedura di omologazione (dir. EU 715/2007 – NEDC Cold Lab) hanno fatto registrare livelli di emissione compatibili con i dati di omologazione e quindi "in regola" con l'allora vigente normativa di riferimento.

*Il protocollo prevede una prima serie di test con la vettura installata sul banco a rulli ed una successiva serie di test con la vettura guidata su pista.*

### **3.1 Prove sul banco a rulli**

Il protocollo ha previsto l'esecuzione del ciclo di guida di omologazione standard europeo (NEDC, in condizioni di partenza a freddo e a caldo) e di un ciclo modificato (NEDC REVERSE, in condizioni di partenza a freddo) con il veicolo installato sul banco a rulli.

Inoltre sono state effettuate anche altre tipologie di prova come il ciclo reale URBAN, test a velocità costante ed il ciclo NEDC Reverse con partenza a caldo.

I cicli:

- CICLO NEDC A FREDDO;
- CICLO NEDC A CALDO;
- CICLO NEDC REVERSE A FREDDO

sono stati eseguiti con tutti i veicoli, sia quelli provati presso il laboratorio di CNR-IM che quelli provati presso i laboratori FCA di Torino per conto del CPA Torino.

Gli altri cicli non sono stati eseguiti con tutte le vetture ed hanno avuto lo scopo di valutare il comportamento emissivo in condizioni o piu' rappresentative della guida reale (Urban) o di confronto in funzione delle condizioni di partenza (ciclo NEDC Reverse):

- CICLO ARTEMIS URBAN (solo CNR-IM);
- PROVE A VELOCITA' COSTANTE (solo CNR-IM);
- CICLO NEDC REVERSE A CALDO (solo CPA Torino).



Per ogni vettura è stata seguita la seguente tempistica di prova nel laboratorio di CNR-IM:

**1° Giorno.**

Installazione della vettura sul banco a rulli;  
Settaggio del banco;  
Effettuazione coast-down con parametri di frenatura ed Inerzia equivalente forniti dal costruttore;  
Riempimento serbatoio con circa  $\frac{3}{4}$  di gasolio commerciale;  
Gonfiaggio pneumatici a pressione indicata dal costruttore;  
Collegamento centralina per diagnosi vettura;  
Controllo eventuale necessità di rigenerazione DPF;  
Installazione sensore NOx/O<sub>2</sub> sulla linea di scarico;  
Collegamento dello scarico della vettura al tunnel di diluizione per effettuazione ciclo NEDC secondo direttiva EU 715/2007.

*Effettuazione di 3 cicli EUDC di condizionamento;*

*Messa in carica della batteria.*

*Condizionamento del veicolo per almeno 8 ore a  $20 \leq T \leq 30^\circ\text{C}$ .*

**2° Giorno.**

CICLO NEDC A FREDDO ( $T=20 \div 30^\circ\text{C}$ );

CICLO NEDC A CALDO ( $T_{olio} > 80^\circ\text{C}$ );

CICLO ARTEMIS URBAN;

PROVE A VELOCITA' COSTANTE (da 10 a 130 km/h a step di 10 km/h).

*Effettuazione di 3 cicli EUDC di condizionamento;*

*Messa in carica della batteria.*

*Condizionamento del veicolo per almeno 8 ore a  $20 \leq T \leq 30^\circ\text{C}$ .*

**3° Giorno.**

CICLO NEDC REVERSE (prima fase EUDC e poi UDC) A FREDDO ( $T=20 \div 30^\circ\text{C}$ );

CICLO NEDC A CALDO ( $T_{olio} > 80^\circ\text{C}$ ).

*Effettuazione di 3 cicli EUDC di condizionamento;*

*Messa in carica della batteria.*

*Condizionamento del veicolo per almeno 8 ore a  $20 \leq T \leq 30^\circ\text{C}$ .*

**4° Giorno**

CICLO NEDC A FREDDO ( $T=20 \div 30^\circ\text{C}$ ).

*Controllo eventuale necessità di rigenerazione DPF.*



Lo stesso combustibile (un gasolio commerciale) è stato utilizzato per tutte le prove in laboratorio e su pista con tutti i veicoli.

Durante l'effettuazione dei cicli di prova sul banco a rulli il cofano e le portiere della vettura sono stati mantenuti chiusi.

L'impianto di condizionamento e le luci notturne sono stati sempre spenti. La strumentazione utilizzata in IM-CNR è descritta nell'Allegato B.

Per tutte le prove è stato redatto un report con i valori degli inquinanti espressi per singola fase del ciclo e sul ciclo combinato in g/km (o mg/km per gli inquinanti gassosi e particolato in massa, o #/km per il numero di particelle) (riportati negli Allegati D ed E).

Inoltre, per ogni prova è stato redatto un file contenente i valori istantanei (ad 1 Hz) della velocità reale, degli inquinanti gassosi CO, HC, NO<sub>x</sub>, CO<sub>2</sub> (espressi in g/s e misurati nella corrente diluita), dei parametri motoristici acquisiti tramite tool di diagnosi, del numero di particelle misurate (in #/s).

Per i test in IM-CNR sono stati elaborati i dati acquisiti con il sensore NO<sub>x</sub> installato sullo scarico del veicolo e confrontati con i valori di NO<sub>x</sub> acquisiti secondo procedura di normativa (da lettura dei sacchi). La lettura del sensore NO<sub>x</sub> è stata, altresì, verificata in laboratorio tramite comparazione con la lettura di un analizzatore a chemiluminescenza, anch'esso posto sullo scarico grezzo.

Gli 8 parametri motoristici acquisiti via EOBD (nei test eseguiti solo in IM-CNR) non sono esattamente gli stessi per tutti i veicoli (per disponibilità diverse da ECU). I parametri comuni acquisiti nella maggior parte dei casi sono: velocità del veicolo (km/h), numero di giri del motore (rpm), temperatura dell'aria aspirata (°C), temperatura del combustibile (°C), temperatura del fluido di raffreddamento (°C), valore della valvola EGR (%), portata d'aria aspirata (in kg/h o mg/ciclo). Si riporta nell'Allegato C (Tabella C) l'elenco dei parametri acquisiti da centralina per ogni veicolo provato in IM-CNR (sia nelle prove in laboratorio che su pista).

Il segnale di velocità da utilizzare per il driver-aid a bordo è stato verificato per ogni veicolo con prove dedicate, a velocità costante, sul banco a rulli.

Le prove in laboratorio, in particolare il secondo ed il terzo giorno della tempistica descritta a pagina 9, sono state effettuate in presenza di rappresentanti delle case costruttrici (sia italiani che della casa madre) e di funzionari del MIT.

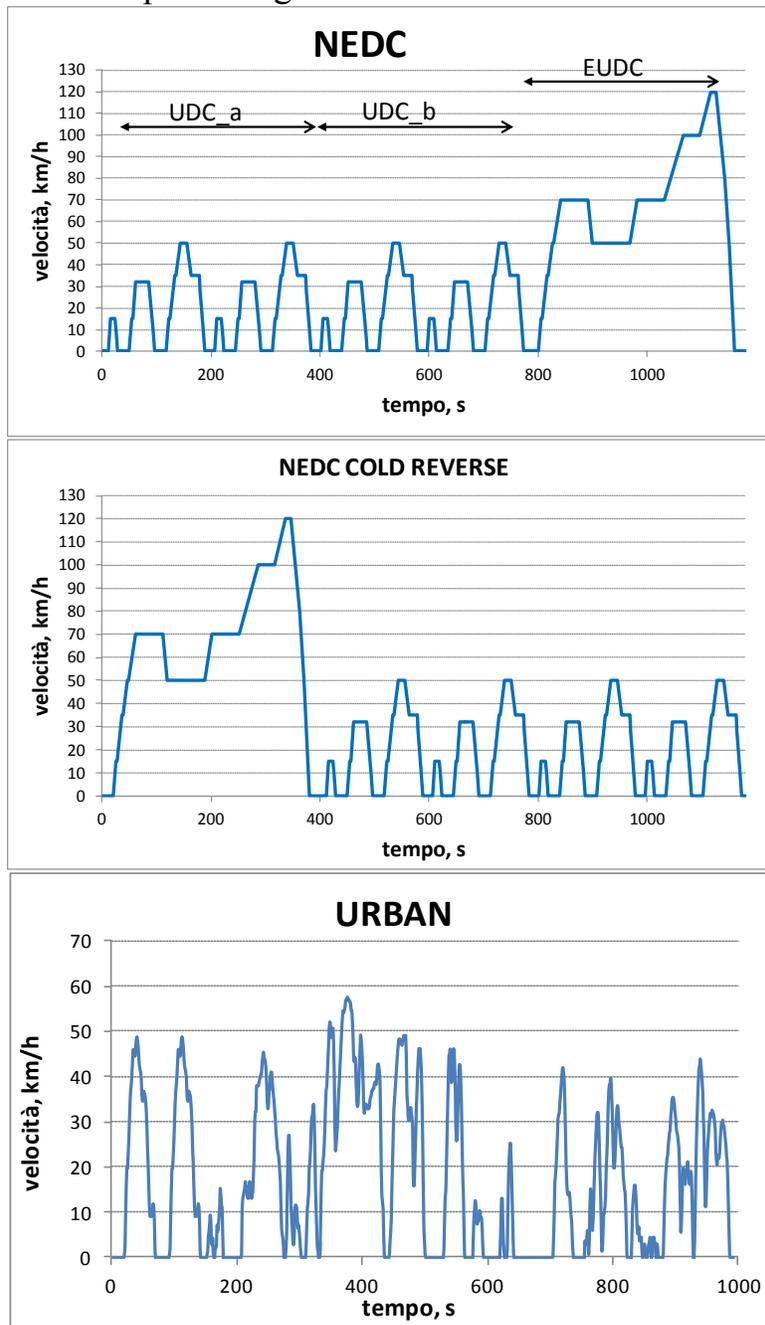
### **3.2 Cicli di guida**

In Figura 1 sono riportati i profili di velocità dei singoli cicli di guida realizzati:

- **CICLO NEDC**, ciclo per l'omologazione europea, diviso in 3 fasi (UDC\_A, UDC\_B, EUDC). La fase UDC\_A rappresenta i primi due moduli urbani di durata 390 secondi e 2 km di percorrenza (con velocità media 18.5 km/h), la fase UDC\_B i successivi due



moduli urbani di durata sempre 390 secondi e 2 km di percorrenza, la fase EUDC rappresenta la fase extra-urbana di durata 400 secondi e 7 km circa di percorrenza (con velocità media 63.2 km/h). Il ciclo NEDC è stato effettuato con partenza a freddo (NEDC COLD) e con partenza a caldo (NEDC WARM), cioè partendo con temperatura dell'olio superiore agli 80°C.



**Figura 1: Cicli di guida effettuati (NEDC a freddo/caldo, NEDC Reverse, Urban)**



- **CICLO NEDC REVERSE (o anche Invertito)**. Questo è il ciclo NEDC modificato, realizzato guidando prima la fase extra-urbana (EUDC) e poi quelle urbane (UDC\_A, UDC\_B). Il ciclo NEDC Invertito è stato effettuato con partenza a freddo (NEDC COLD Reverse) e solo nei test effettuati sui veicoli del gruppo FCA, anche con partenza a caldo (NEDC WARM REVERSE), cioè con la temperatura dell'olio superiore agli 80°C.
- **CICLO URBAN**. Ciclo reale sviluppato nell'ambito del progetto EU Artemis, a cui ha partecipato IM-CNR. Durata 921 secondi (+72 s di preconditionamento), 4,5 km di percorrenza e 17,5 km/h di velocità media. E' un ciclo effettuato a caldo dopo l'esecuzione di uno o più cicli NEDC. Presenta un'accelerazione media positiva di 0,53 m/s<sup>2</sup> contro i 0,35 m/s<sup>2</sup> della parte urbana del ciclo NEDC.

### 3.3 Prove su pista

La misura degli NOx su pista condotta sui veicoli testati da IM-CNR è stata realizzata tramite l'utilizzo di una strumentazione "leggera" (non PEMS standard); essa include:

- ✓ Sensore NOx/O<sub>2</sub> (Continental, UniNOx);
- ✓ Interfaccia tramite EOBD con centralina per acquisizione otto (8) parametri motoristici ad 1 Hz (Texa, IDC4);
- ✓ Scheda per acquisizione segnale velocità (direttamente da CAN bus tramite una CAN Bus Speed Interface, Raceologic) per il Driver-aid installato a bordo, da usare per le prove su pista, (National Instruments, LabVIEW RIO Evaluation Kit);
- ✓ GPS (Garmin, Montana 600) per acquisire le coordinate della locazione della sperimentazione e poter ricavare il valore della velocità istantanea del veicolo;
- ✓ Video camera per riprendere le immagini dei test su pista;
- ✓ Batteria 12V 230 Ah;
- ✓ Inverter 12V/220 V da 1200W;
- ✓ Due PC, uno per l'acquisizione dei parametri da centralina ed un altro da usare per la visualizzazione del profilo di velocità da seguire (driver-aid).

Questa strumentazione ha un peso complessivo di circa 35 kg.



Per ogni vettura provata da IM-CNR si è effettuata la seguente tempistica di prova su pista:

**1° Giorno.**

- Controllo eventuale necessità di rigenerazione DPF;
- Verifica del livello di gasolio a circa ½ del serbatoio.
- Installazione sensore NO<sub>x</sub>/O<sub>2</sub> sulla linea di scarico;
- Messa in carica della batteria.
- Allestimento della vettura;
- Vettura lasciata in sosta sulla pista.

**2° Giorno.**

CICLO NEDC A FREDDO (T=non programmabile): le due fasi UDC\_A, UDC\_B e la fase EUDC fino alla fine del secondo tratto a 70 km/h cioè al secondo 1030, con una percorrenza di circa 4 km (per un totale di circa 8 km);

CICLO NEDC A CALDO (T<sub>olio</sub>>80°C): le due fasi UDC\_A, UDC\_B e la fase EUDC fino alla fine del secondo tratto a 70 km/h cioè al secondo 1030, con una percorrenza di circa 4 km (per un totale di circa 8 km);

PROVE A VELOCITA' COSTANTE (da 10 a 70 km/h a step di 10 km/h)

Lo stesso combustibile è stato utilizzato per ogni vettura sia nelle prove di laboratorio che su pista.

Le prove su pista sono state eseguite da parte dell'Istituto Motori sui veicoli già testati sul banco a rulli, trasportandoli sulla pista N. 20 del CENTRO POLIFUNZIONALE DI SPERIMENTAZIONE (CEPOLISPE) dell'Esercito a Montelibretti (Roma).

Grazie all'uso di questa pista è stato possibile superare alcune problematiche legate all'uso di piste quali:

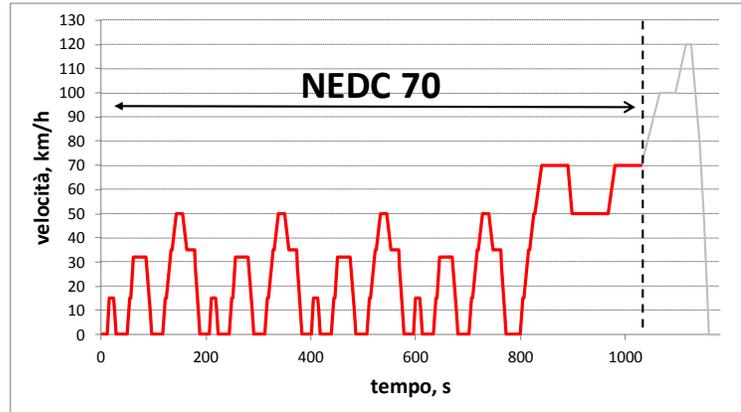
- la possibilità di avere la pista in esclusiva e quindi la possibilità di fermarsi per effettuare le soste previste dal ciclo NEDC;
- la possibilità di poter lasciare il veicolo parcheggiato su pista la sera per poter effettuare la mattina i cicli con partenza a freddo (anche se ovviamente non a temperature prestabilite e controllate).

La lunghezza del rettilineo della pista del Cepolispe di circa 1.6 km e la curvatura degli anelli terminali non ha consentito la possibilità di effettuare la parte extra-urbana del ciclo NEDC fino a 120 km/h ma ci si è limitati ai 70 km/h (Figura 2). Quindi il ciclo NEDC realizzato (denominato NEDC 70) ha una durata di 1030 secondi contro i 1180 s del ciclo eseguito sul banco a rulli ed una distanza totale percorsa di circa 8 km contro gli 11 km del ciclo NEDC di omologazione.



**ISTITUTO MOTORI**

*Consiglio Nazionale delle Ricerche*



*Figura 2: Profilo di velocità del ciclo NEDC cold e warm 70 effettuato su pista*

Le prove su pista eseguite da IM-CNR, in particolare il secondo giorno della tempistica descritta a pagina 13, sono state effettuate in presenza di rappresentanti delle case costruttrici (sia italiani che della casa madre) e di funzionari del MIT.

I test sono stati effettuati da IM-CNR nei mesi di giugno e luglio 2016.

Le prove effettuate sui veicoli FCA per conto del CPA di Torino sono state effettuate sulla pista Balocco di FCA (luglio 2016) e sulla pista di Nardò (gennaio e primi di febbraio 2017) utilizzando una strumentazione PEMS convenzionale.

Quindi sulle diverse piste sono stati eseguiti i seguenti test:

CICLO NEDC A FREDDO ( $T=20\div 30^{\circ}\text{C}$ ) fino a 70 km/h, sia CNR-IM che CPA Torino;

CICLO NEDC A CALDO ( $T_{olio}>80^{\circ}\text{C}$ ) fino a 70 km/h, sia CNR-IM che CPA Torino;

PROVE A VELOCITA' COSTANTE (da 10 a 130 km/h a step di 10 km/h), solo CNR-IM.



## 4. Risultati

### 4.1 Valutazione dei risultati dei test in laboratorio.

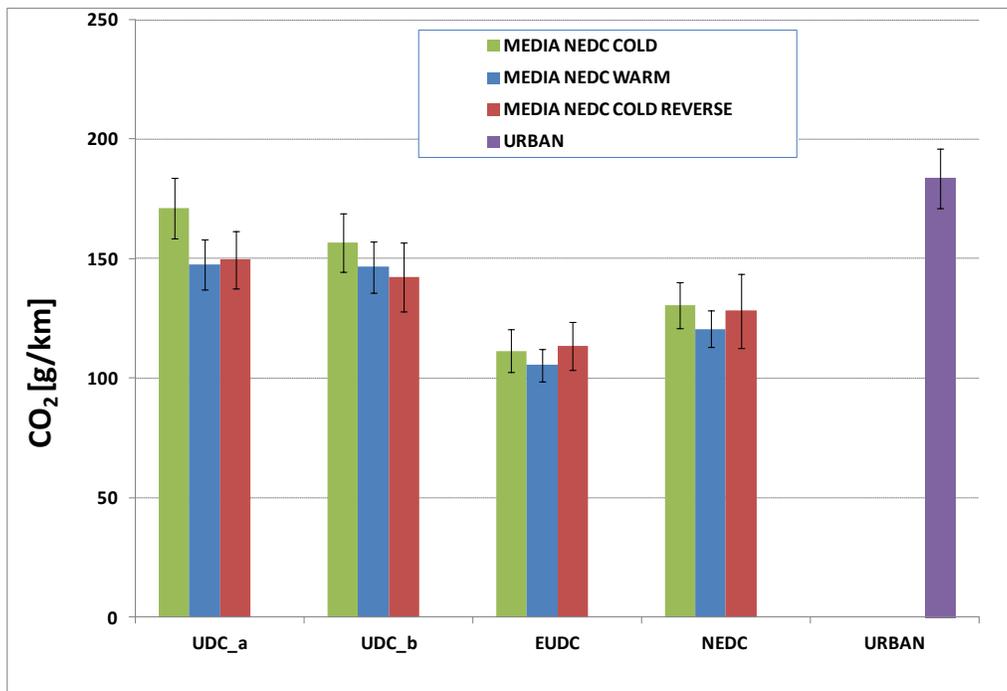
Si riportano nelle Figure 3-7 i valori medi per CO<sub>2</sub>, CO, HC, PN e NO<sub>x</sub> ottenuti con le 11 vetture provate in Istituto Motori sul banco a rulli con i diversi cicli di guida previsti dal protocollo.

I valori medi riportati nelle figure hanno un'elevata variabilità poiché sono stati calcolati da misure eseguite su differenti veicoli (11) con differenti inerzie e cilindrata.

Il ciclo complessivo NEDC a freddo (cold) è caratterizzato da maggiori emissioni di CO<sub>2</sub> rispetto al NEDC a caldo (warm) ed al NEDC cold invertito (reverse) (Figura 3). La partenza a freddo porta un sovraconsumo rispetto al NEDC warm di circa il 9%.

Il ciclo NEDC cold reverse presenta un valore medio di CO<sub>2</sub> confrontabile con quello del ciclo convenzionale NEDC cold.

Dall'analisi di tutti i cicli di guida le emissioni maggiori di CO<sub>2</sub> sono state misurate sul ciclo reale URBAN: 180 g/km contro i 150 g/km della fase urbana regimata (UDC\_B) ed i 125 g/km del ciclo globale NEDC.

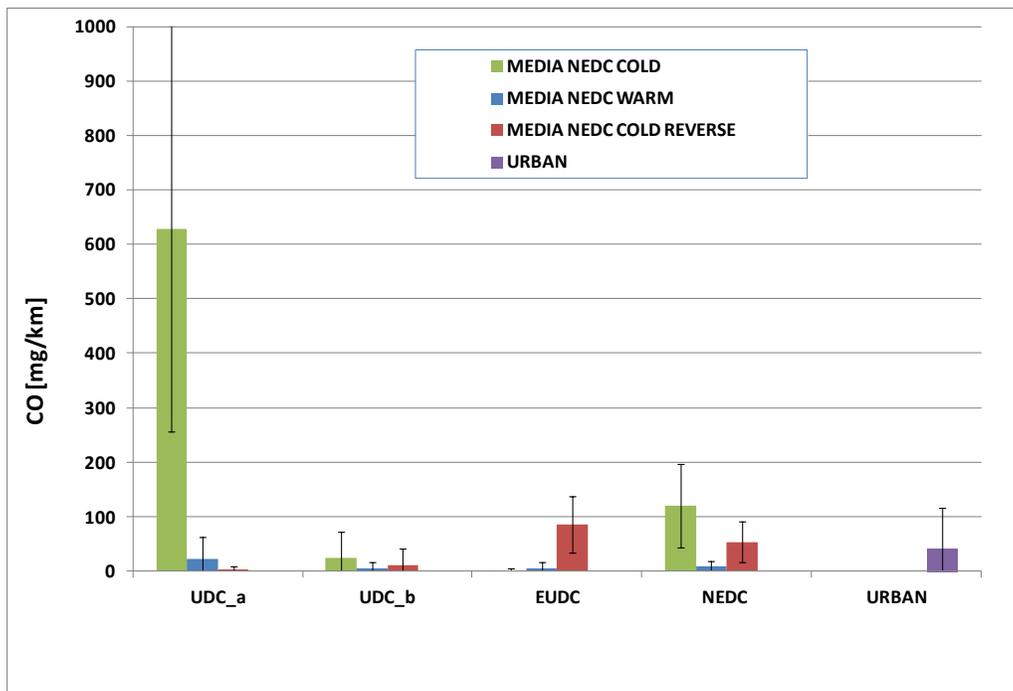


**Figura 3: Valori medi di CO<sub>2</sub> ottenuti nelle prove in Istituto Motori (ciclo NEDC a freddo e a caldo, NEDC invertito a freddo, Urban)**



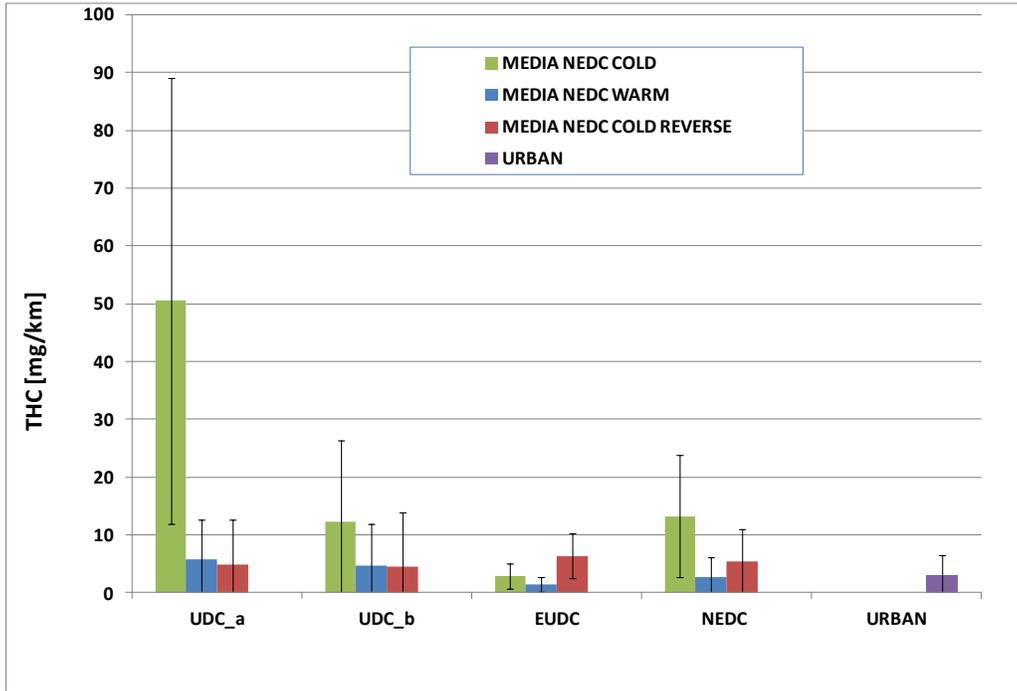
Dalla Figura 4 e Figura 5 si nota come le maggiori emissioni di CO e THC si abbiano durante le fasi del ciclo NEDC con partenza a freddo (UDC\_A). Durante questa fase avviene l'attivazione del catalizzatore ossidante che riesce ad abbattere il CO per oltre il 90% e gli idrocarburi incombusti per oltre il 70%.

Tutti i veicoli presentano sul ciclo NEDC cold emissioni di CO molto più basse del limite Euro 5 per veicoli Diesel (pari a 0.5 g/km).

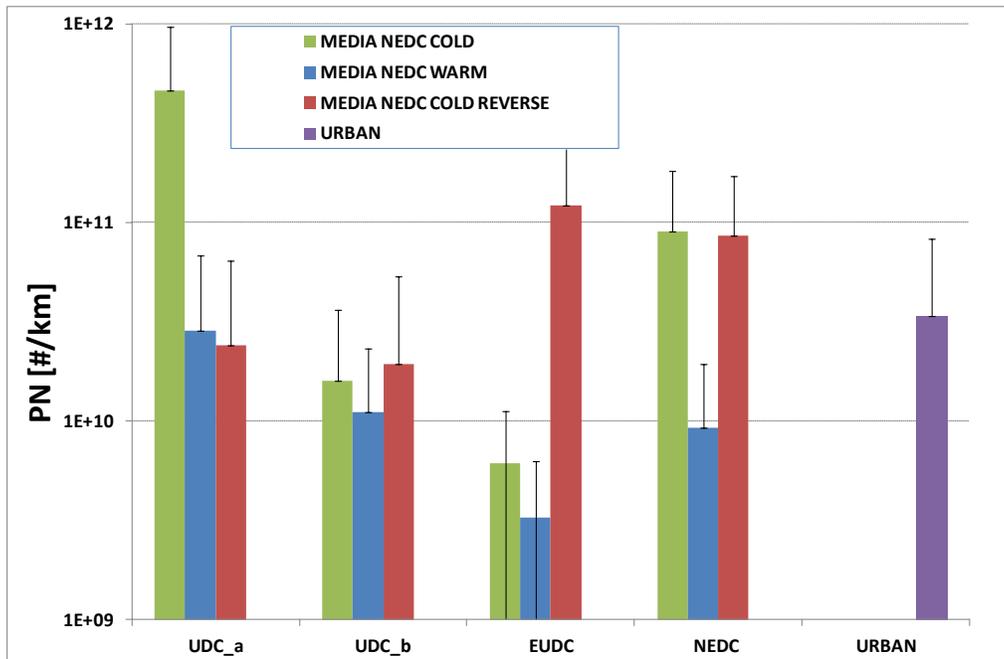


**Figura 4: Valori medi di CO ottenuti nelle prove in Istituto Motori (ciclo NEDC a freddo e a caldo, NEDC invertito a freddo, Urban)**

Dalla Figura 6, appare evidente che il numero di particelle (PN) risulta sempre inferiore al limite di omologazione pari a  $6 \cdot 10^{11}$  #/km. Bisogna precisare, però, che le misure effettuate in IM-CNR non sono conformi alle prescrizione del Regolamento UNECE n.83.



**Figura 5: Valori medi di THC ottenuti nelle prove in Istituto Motori (ciclo NEDC a freddo e a caldo, NEDC invertito a freddo, Urban)**

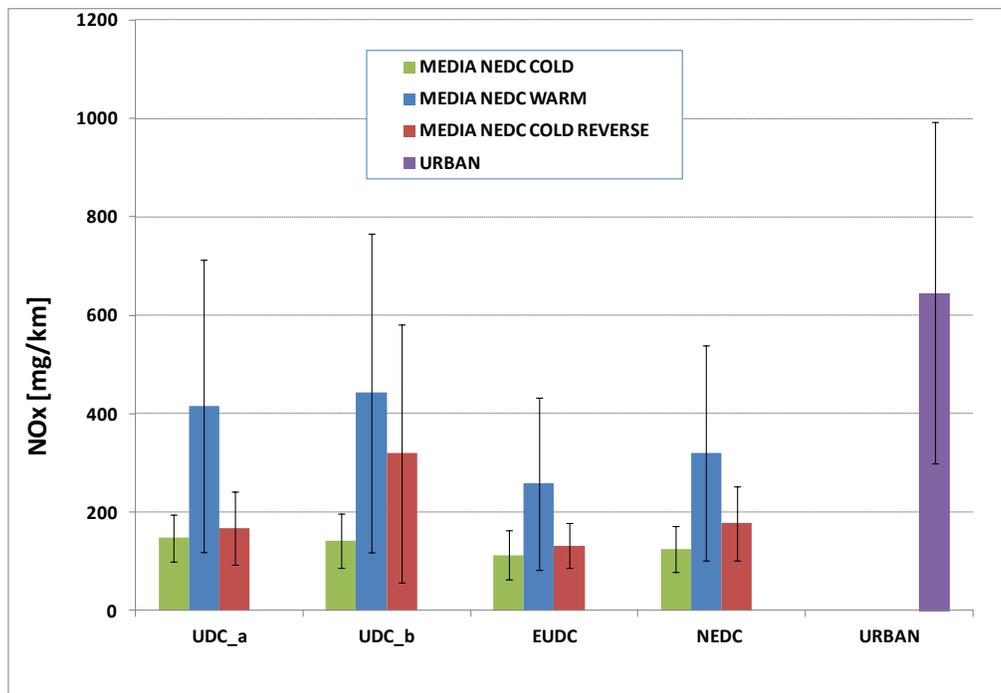


**Figura 6: Valori medi di PN ottenuti nelle prove in Istituto Motori (ciclo NEDC a freddo e a caldo, NEDC invertito a freddo, Urban)**



E' possibile osservare che tra le tre varianti del ciclo NEDC sperimentate in laboratorio, le maggiori emissioni di NOx sono state misurate sul NEDC warm (Figura 7). Esse sono maggiori di quelle relative allo stesso ciclo con partenza a freddo ed al ciclo invertito. In sostanza, l'incremento delle emissioni di NOx è dovuto all'aumento delle temperature di funzionamento del motore. Questo aspetto può essere, altresì, evidenziato dal confronto tra il ciclo NEDC cold ed il ciclo NEDC cold invertito. In particolare, osservando le emissioni misurate nella fase urbana UDC\_b si evidenzia che nel caso in cui questa sia successiva alla fase EUDC ed UDC\_a (NEDC cold invertito) le emissioni di NOx risultano essere più del doppio rispetto a quelle registrate nello stesso modulo effettuato solamente dopo l'UDC\_a (NEDC cold).

Il ciclo reale URBAN è caratterizzato dalle emissioni più alte di NOx per tutti i veicoli testati in Istituto Motori: 630 mg/km. In tal caso, alle temperature regimate del motore si aggiunge l'utilizzo parziale dell'EGR nelle condizioni di elevato carico imposte dal ciclo stesso. Si ricorda, infatti, che il ciclo URBAN, utilizzato esclusivamente a fini scientifici di confronto, è caratterizzato da elevate accelerazioni e dunque notevoli richieste di carico.



**Figura 7: Valori medi di NOx ottenuti nelle prove in Istituto Motori (ciclo NEDC a freddo e a caldo, NEDC invertito a freddo, Urban)**



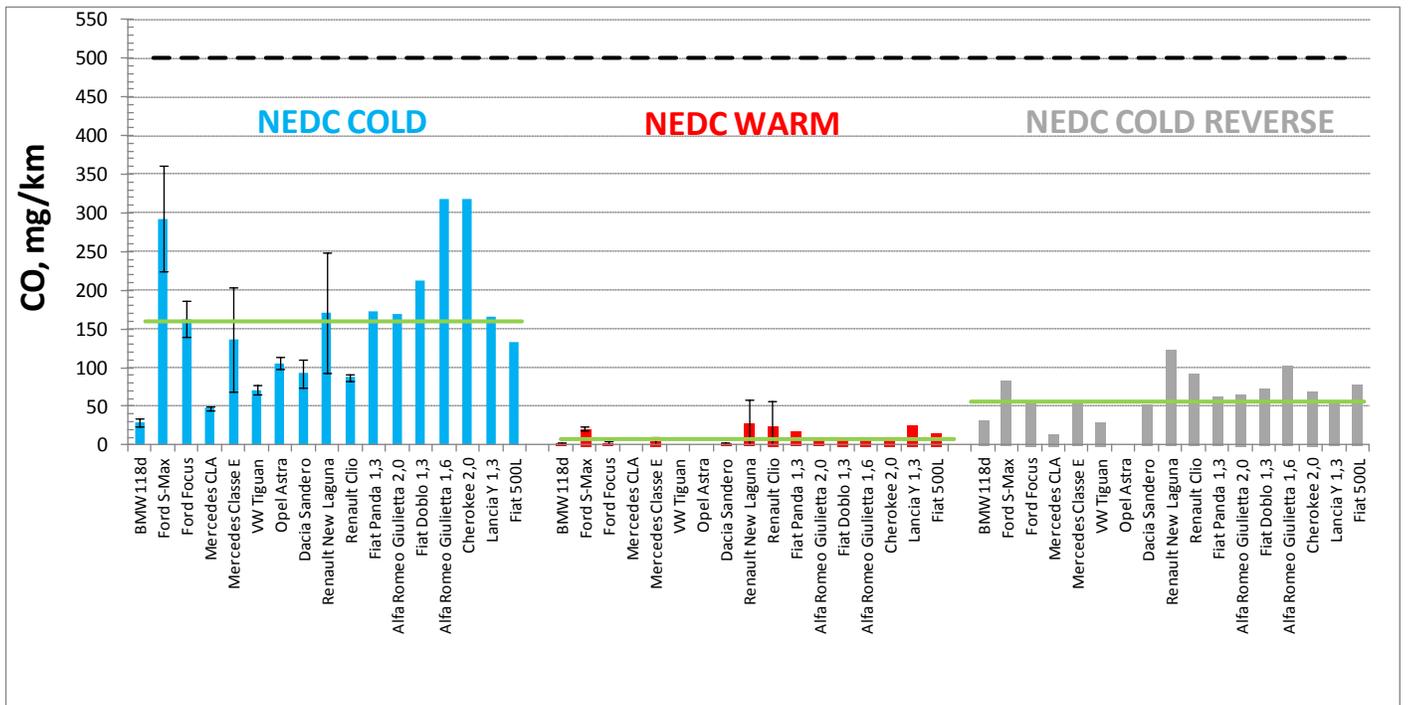
Nei seguenti grafici (da Figura 8 a Figura 13), sono riportate le emissioni di CO, THC, THC+NO<sub>x</sub>, CO<sub>2</sub>, PM e PN misurate in laboratorio per tutti i veicoli analizzati dall'IM-CNR e presso FCA.

Sono presentati i dati medi dei cicli NEDC cold, NEDC warm e NEDC cold reverse. I grafici riportano con la linea nera tratteggiata il valore limite Euro 5, dove previsto, e con la linea verde il valore medio di tutti i veicoli sui tre diversi cicli.

I valori delle emissioni di CO sono ben al di sotto del limite di 0.5 g/km per tutti i veicoli nel ciclo NEDC con partenza a freddo e sempre molto basse negli altri cicli (<100 mg/km).

Per le emissioni di HC non è previsto un limite (se non come valore combinato della somma di HC+NO<sub>x</sub> pari a 230 mg/km) e risultano nei cicli a caldo inferiori ai 20 mg/km.

Le emissioni di particolato in massa PM sono sempre ben al di sotto del limite di 4.5 mg/km in tutti i cicli per tutte le vetture; si ricorda che tutte le vetture sono equipaggiate con un DPF (Diesel Particulate Filter). Valori più bassi del limite di 6\*10<sup>11</sup>#/km previsto per il numero di particelle (PN) sono riscontrati su tutti i cicli per tutte le vetture.



**Figura 8: Emissioni di CO misurate in laboratorio per ciascun veicolo**

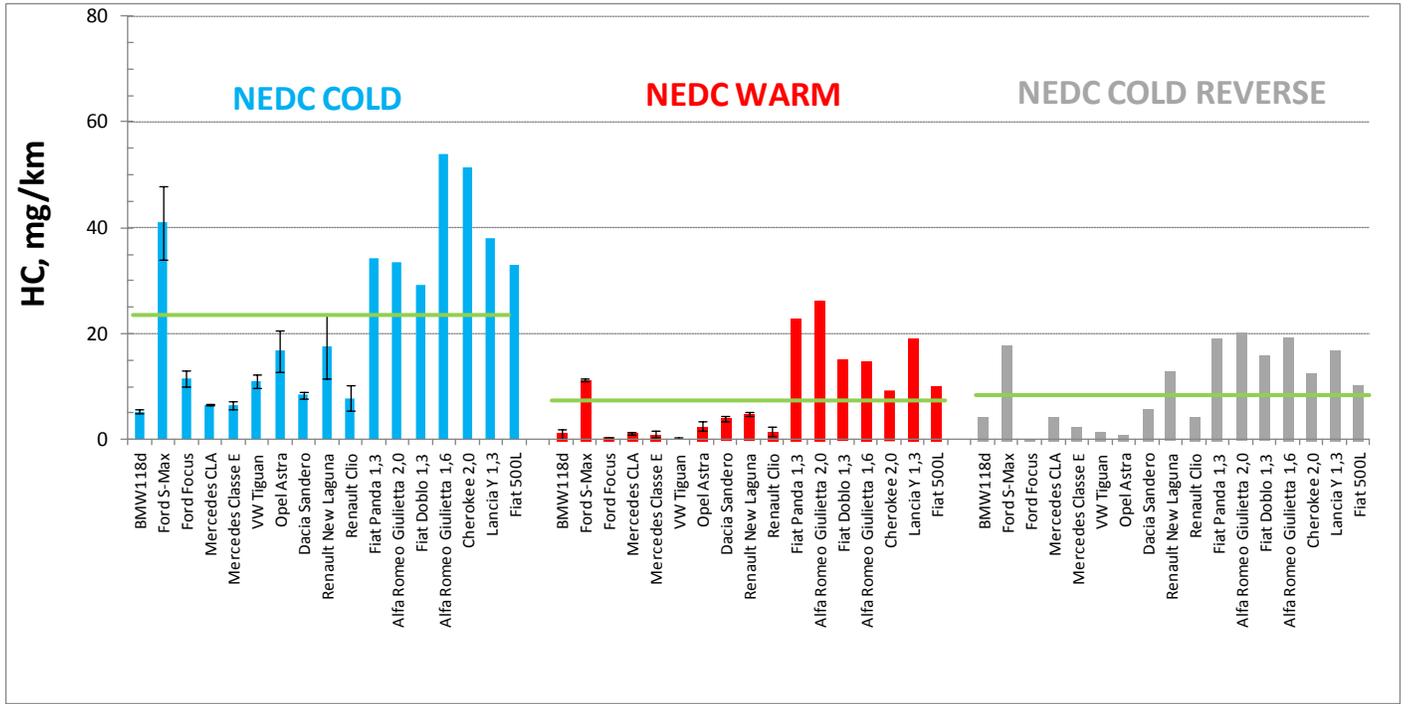


Figura 9: Emissioni di THC misurate in laboratorio per ciascun veicolo

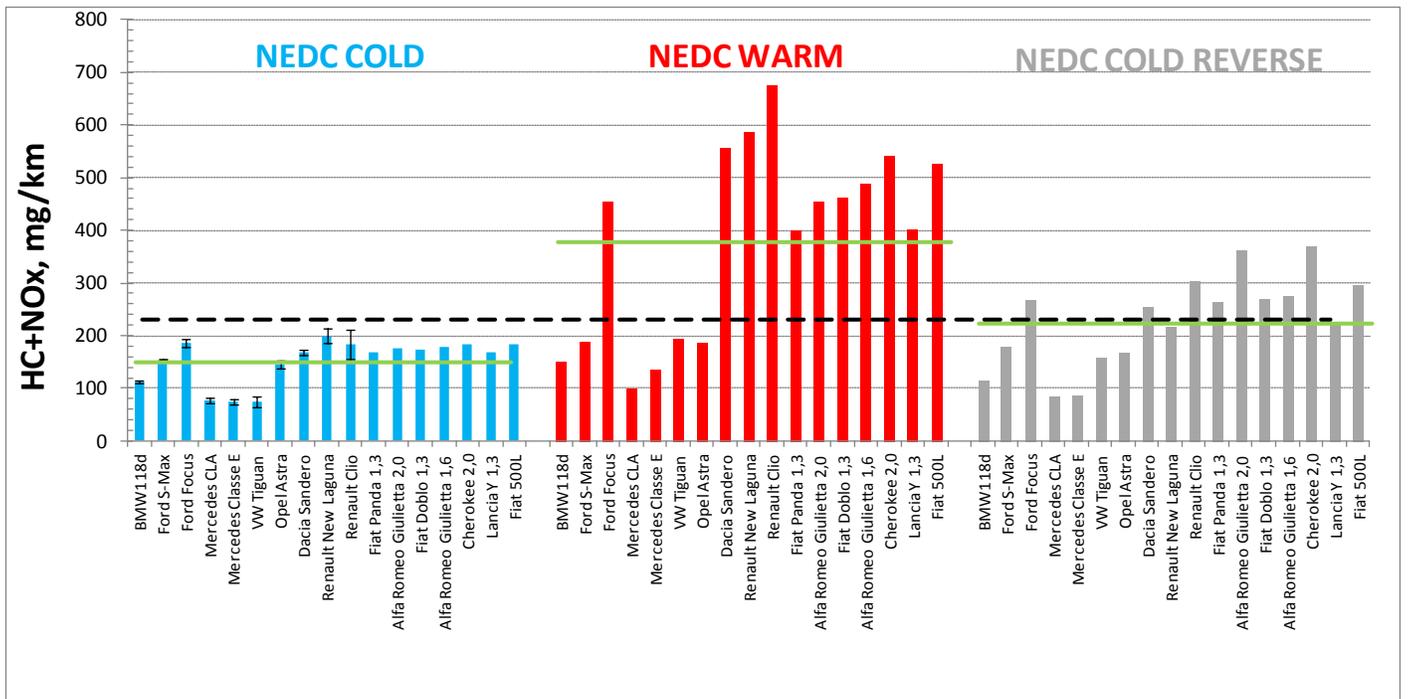


Figura 10: Emissioni di THC+NOx misurate in laboratorio per ciascun veicolo

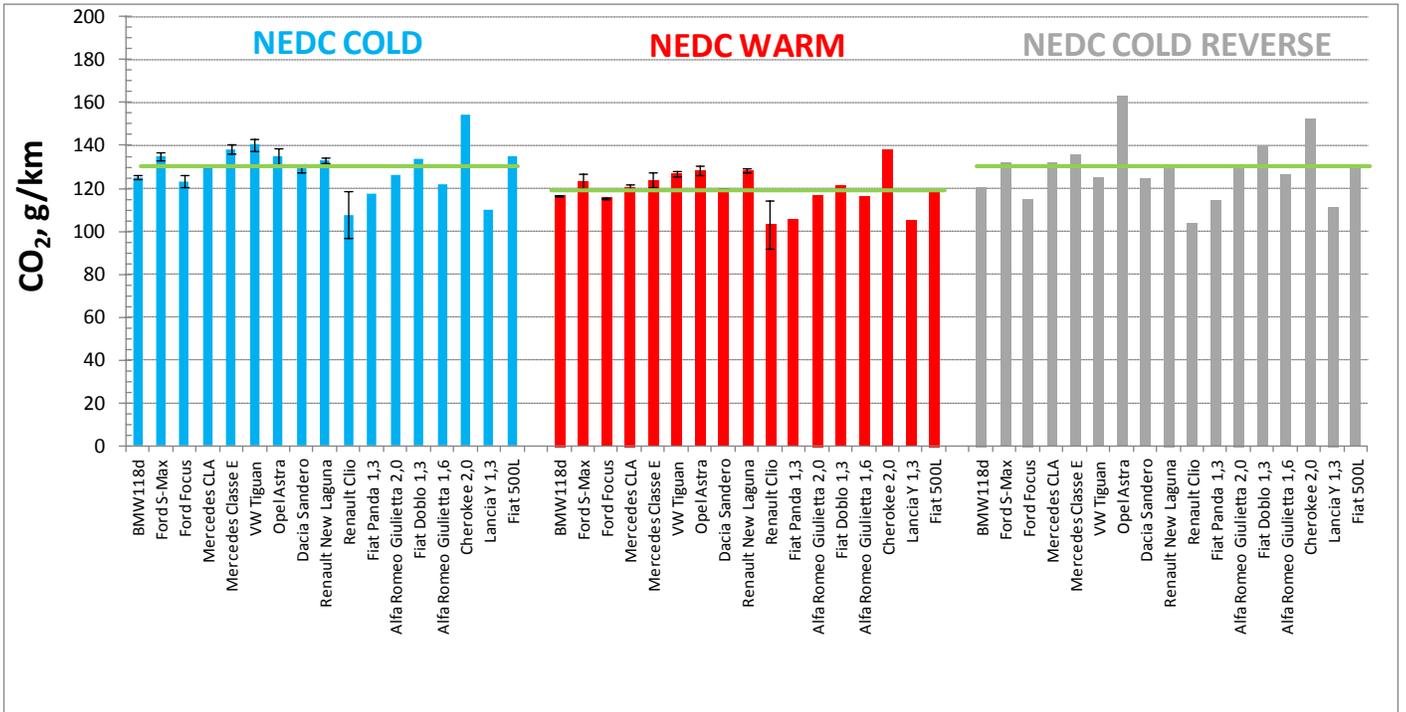


Figura 11: Emissioni di CO<sub>2</sub> misurate in laboratorio per ciascun veicolo

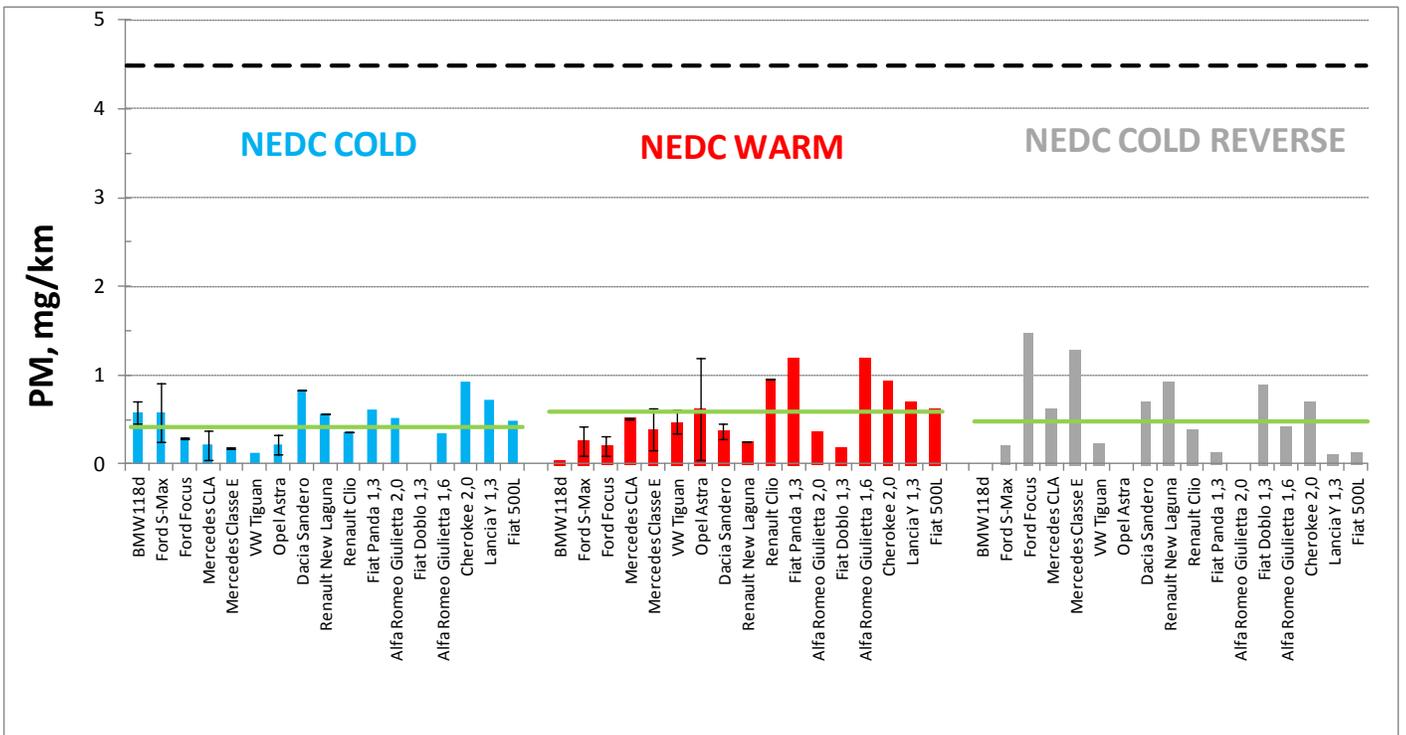
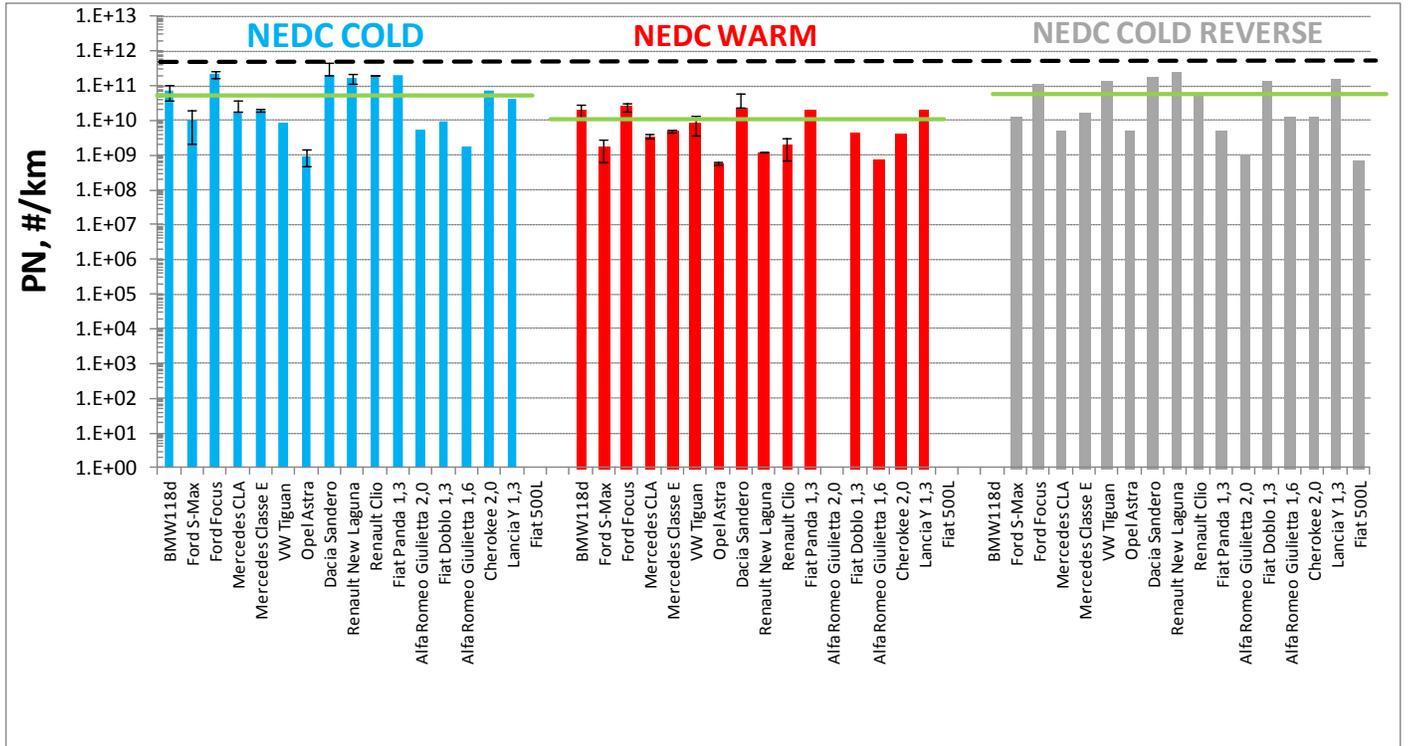


Figura 12: Emissioni di PM misurate in laboratorio per ciascun veicolo



**Figura 13: Emissioni di PN misurate in laboratorio per ciascun veicolo**

## 4.2 Emissioni di NOx misurate in laboratorio

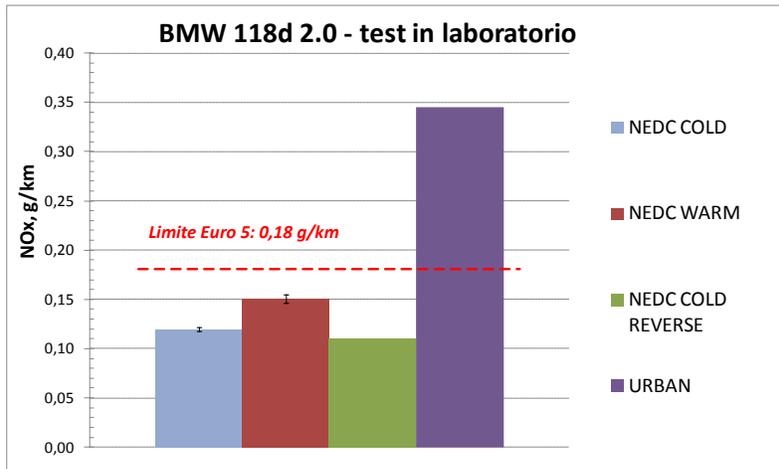
Nel seguito (da Figura 14 a Figura 23) sono riportati i valori medi di NOx misurati (dai sacchi) ottenuti con i diversi veicoli durante le prove sul banco a rulli nei cicli NEDC cold, NEDC warm, NEDC cold reverse e Urban dei test effettuati in IM-CNR.

In Figura 14 ed in Figura 15 sono riportate i diagrammi relativi alla BMW 118d ed alla Opel Astra. Osserviamo andamenti simili tra le due vetture con valori al di sotto del limite Euro 5b, oltre che nel ciclo di omologazione, anche nei cicli NEDC warm e NEDC cold reverse. Nel ciclo Urban le vetture emettono tra 350-450 mg/km di NOx. Anche la Mercedes CLA, la Ford S-Max e la Mercedes E220 mostrano lo stesso comportamento (Figura 16, Figura 17 e Figura 18). Maggiori differenze nelle emissioni di NOx sono riscontrabili sul ciclo NEDC warm con la VW Tiguan e la Ford Focus (Figura 19 e Figura 20, rispettivamente) che emettono piu' di 180 mg/km. La Focus sul ciclo Urban ha mostrato emissioni di circa 1100 mg/km di NOx.

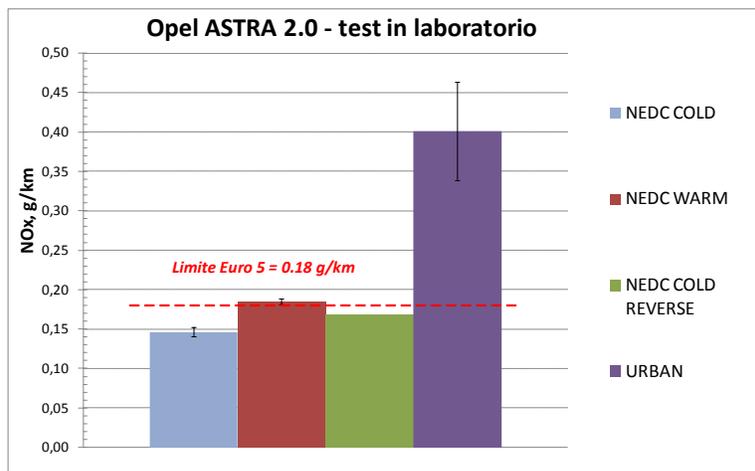


Le Figure 21, 22 e 23 riportano le emissioni di NOx misurate in laboratorio con la Dacia Sandero, Renault Laguna e Renault Clio. Il comportamento emissivo di questi tre veicoli risulta molto simile a quello descritto per la Ford Focus.

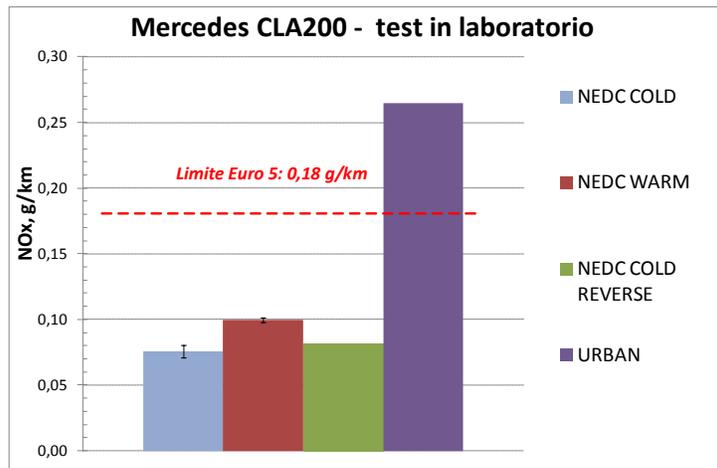
Le tre vetture del gruppo Renault presentano emissioni di NOx sul ciclo NEDC COLD molto prossime al limite di omologazione. Talvolta in alcuni test di laboratorio tale limite è stato leggermente superato. Le emissioni durante il ciclo NEDC WARM sono notevolmente maggiori rispetto a quelle misurate nel ciclo COLD e pari mediamente a circa 0,6 g/km. Questo aspetto evidenzia una forte influenza delle condizioni termiche del motore per quanto riguarda l'intervento dell'EGR per la riduzione delle emissioni di NOx. Le emissioni peggiori sono state misurate anche per questi tre veicoli durante il ciclo Artemis URBAN (emissioni prossime ad 1 g/km).



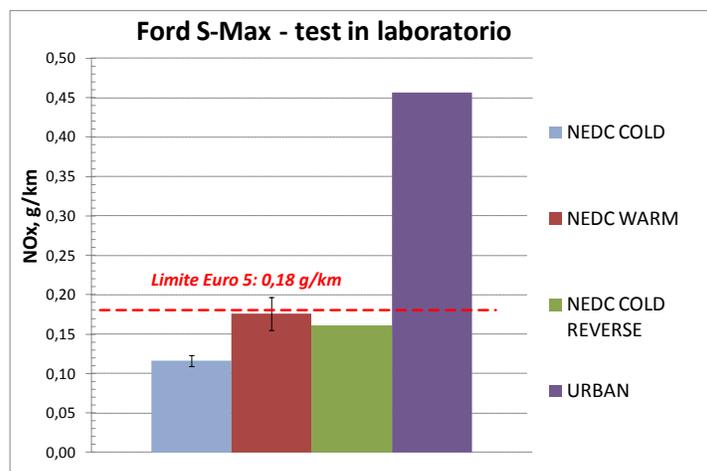
**Figura 14:** Valori medi di NOx sui diversi cicli ottenuti con BMW 118



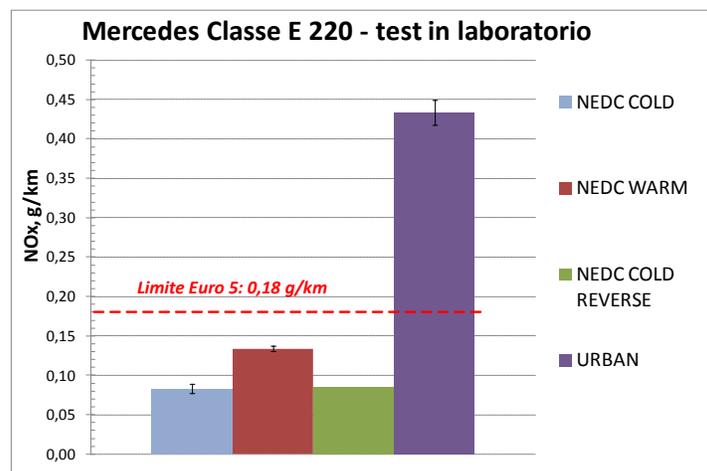
**Figura 15:** Valori medi di NOx sui diversi cicli ottenuti con Opel Astra



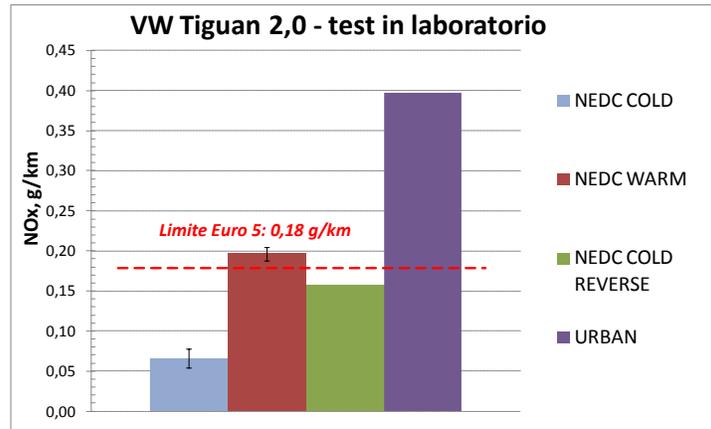
**Figura 16:** Valori medi di NOx sui diversi cicli ottenuti con Mercedes CLA



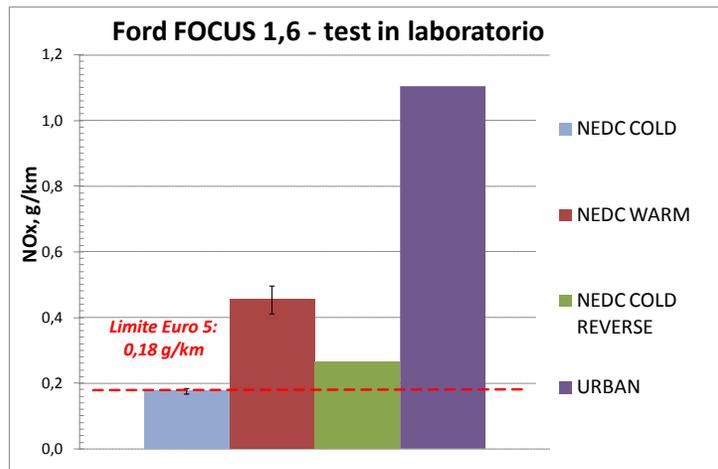
**Figura 17:** Valori medi di NOx sui diversi cicli ottenuti con Ford S-Max



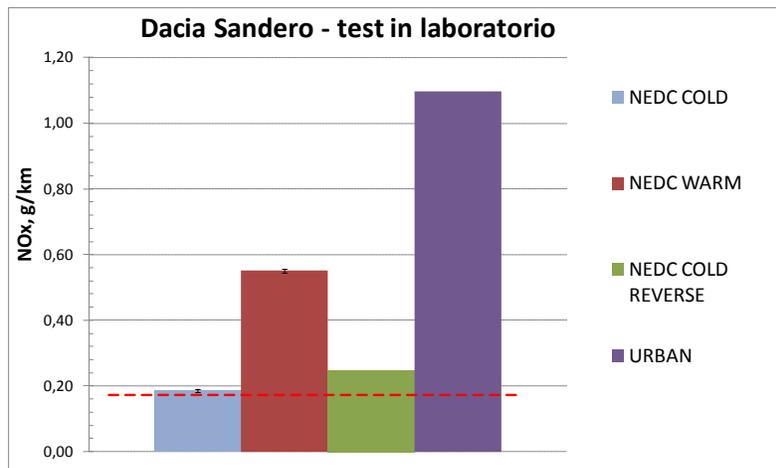
**Figura 18:** Valori medi di NOx sui diversi cicli ottenuti con Mercedes E220



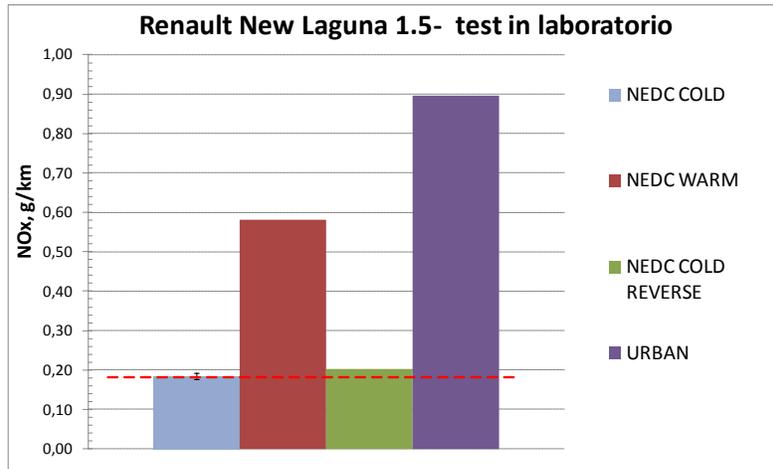
**Figura 19:** Valori medi di NOx sui diversi cicli ottenuti con VW Tiguan



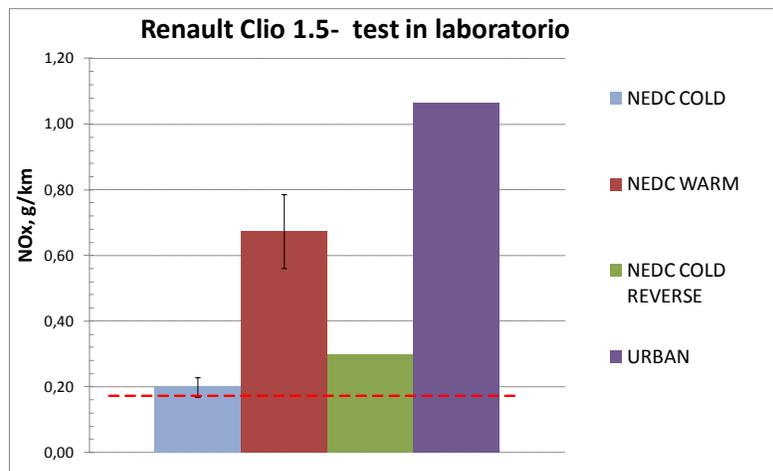
**Figura 20:** Valori medi di NOx sui diversi cicli ottenuti con Ford Focus



**Figura 21:** Valori medi di NOx sui diversi cicli ottenuti con Dacia Sandero

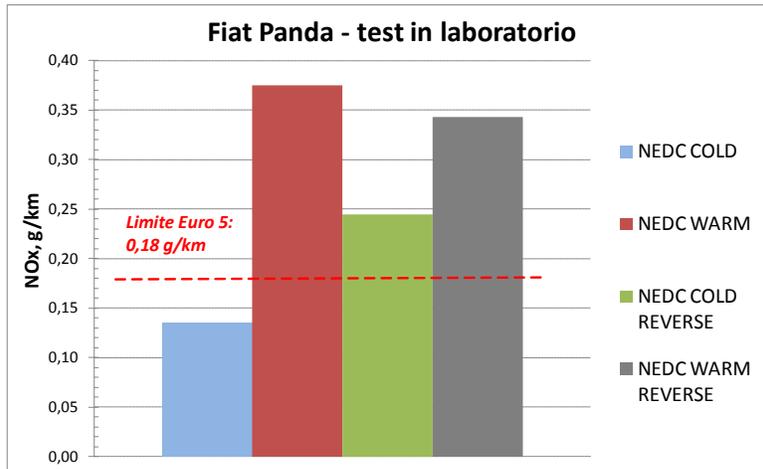


**Figura 22: Valori medi di NOx sui diversi cicli ottenuti con Renault Laguna**

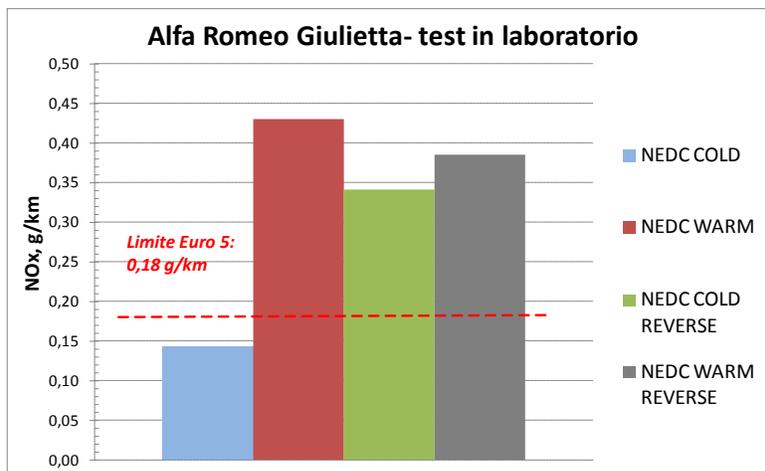


**Figura 23: Valori medi di NOx sui diversi cicli ottenuti con Renault Clio**

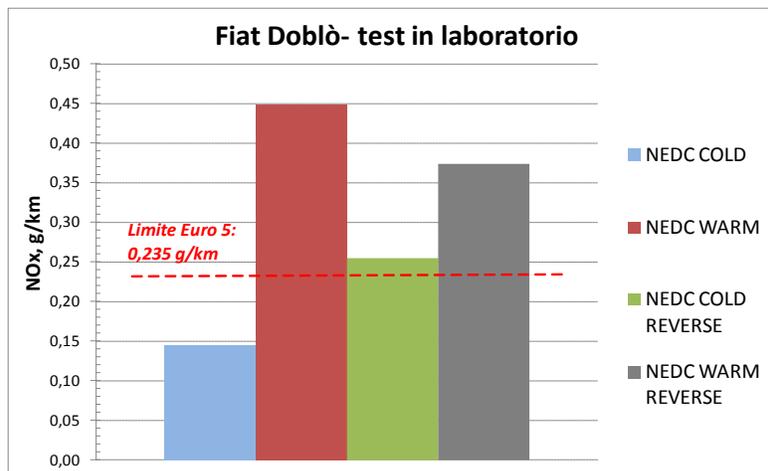
Nelle Figure da 24 a 30 sono riportati i valori misurati (dai sacchi) nei vari cicli effettuati (NEDC cold, NEDC hot, NEDC cold reverse ed anche NEDC hot reverse) presso i laboratori FCA. Per tutti questi veicoli, si evidenziano forti incrementi delle emissioni di NOx nei cicli con partenza a caldo e nel ciclo NEDC COLD REVERSE rispetto al NEDC COLD. In particolare le emissioni del ciclo NEDC WARM sono piu' elevate del limite Euro 5, di un fattore variabile tra 2 e 3 (e comprese tra 260-530 mg/km). Nei due cicli condotti in condizioni WARM, per tutti i 7 veicoli si riscontrano valori di emissioni di NOx paragonabili ad evidenziare una simile strategia di controllo NOx in condizioni regimate ( $T_{olio} > 80^{\circ}C$ ) in condizioni simili di guida.



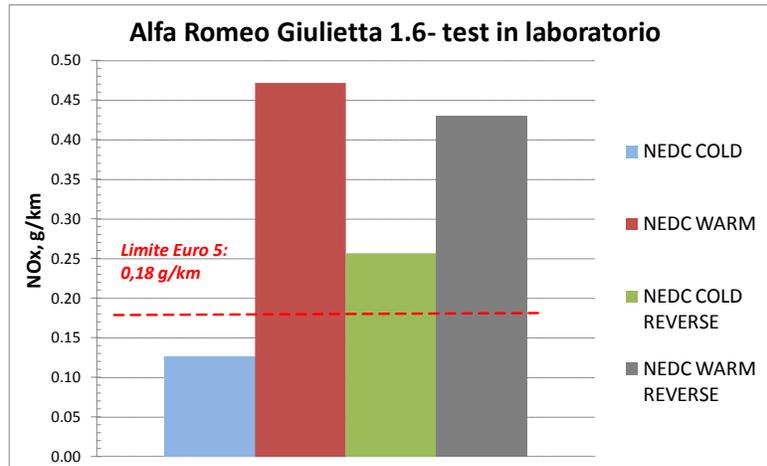
**Figura 24: Valori medi di NOx sui diversi cicli ottenuti con Fiat Panda**



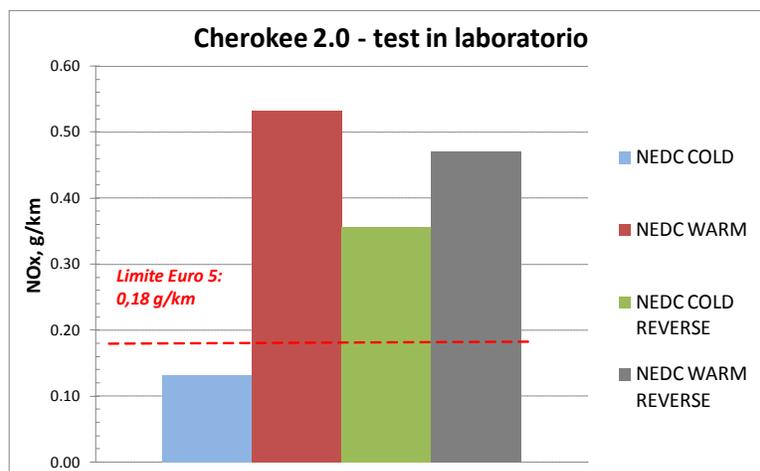
**Figura 25: Valori medi di NOx sui diversi cicli ottenuti con AR Giulietta 2.0**



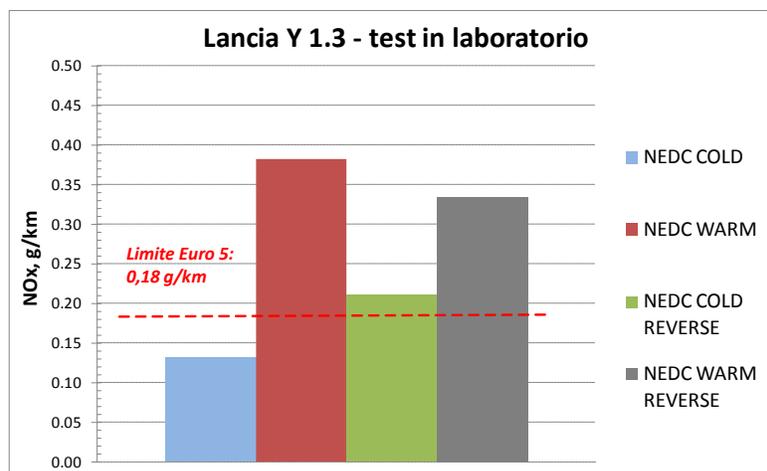
**Figura 26: Valori medi di NOx sui diversi cicli ottenuti con Fiat Doblò**



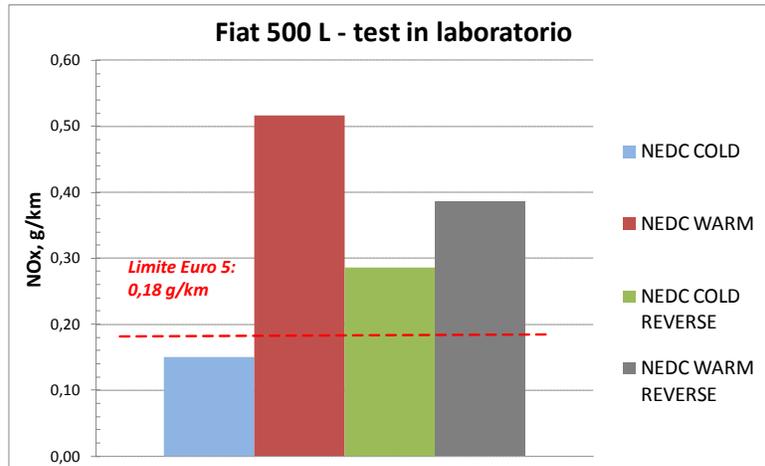
**Figura 27: Valori medi di NOx sui diversi cicli ottenuti con Alfa Romeo Giulietta 1.6**



**Figura 28: Valori medi di NOx sui diversi cicli ottenuti con Cherokee 2.0**



**Figura 29: Valori medi di NOx sui diversi cicli ottenuti con Lancia Y 1.3**



**Figura 30: Valori medi di NOx sui diversi cicli ottenuti con Fiat 500L**

La Figura 31 riporta in dettaglio le emissioni di NOx valutate sul ciclo NEDC cold, NEDC warm e NEDC invertito cold per tutti i veicoli analizzati dall'IM-CNR e da FCA. La linea tratteggiata nera mostra il limite Euro 5 di 180 mg/km mentre le linee continue verdi indicano il valore medio di tutte le autovetture su ciascuno dei tre cicli.

Questo grafico conferma quanto già evidenziato. Le condizioni termiche del motore giocano un ruolo determinante nella produzione di NOx nei motori diesel, infatti si passa da 130 mg/km come valore medio per i NOx emessi durante il ciclo NEDC con partenza a freddo a 360 mg/km emessi di media durante il ciclo NEDC in condizioni warm: ciò evidenzia un rapporto medio di circa 2.8 tra emissioni del ciclo a caldo e quelle del ciclo a freddo nelle prove condotte sul banco a rulli. Il ciclo NEDC invertito con partenza a freddo mostra valori intermedi prossimi a 220 mg/km di valore medio.

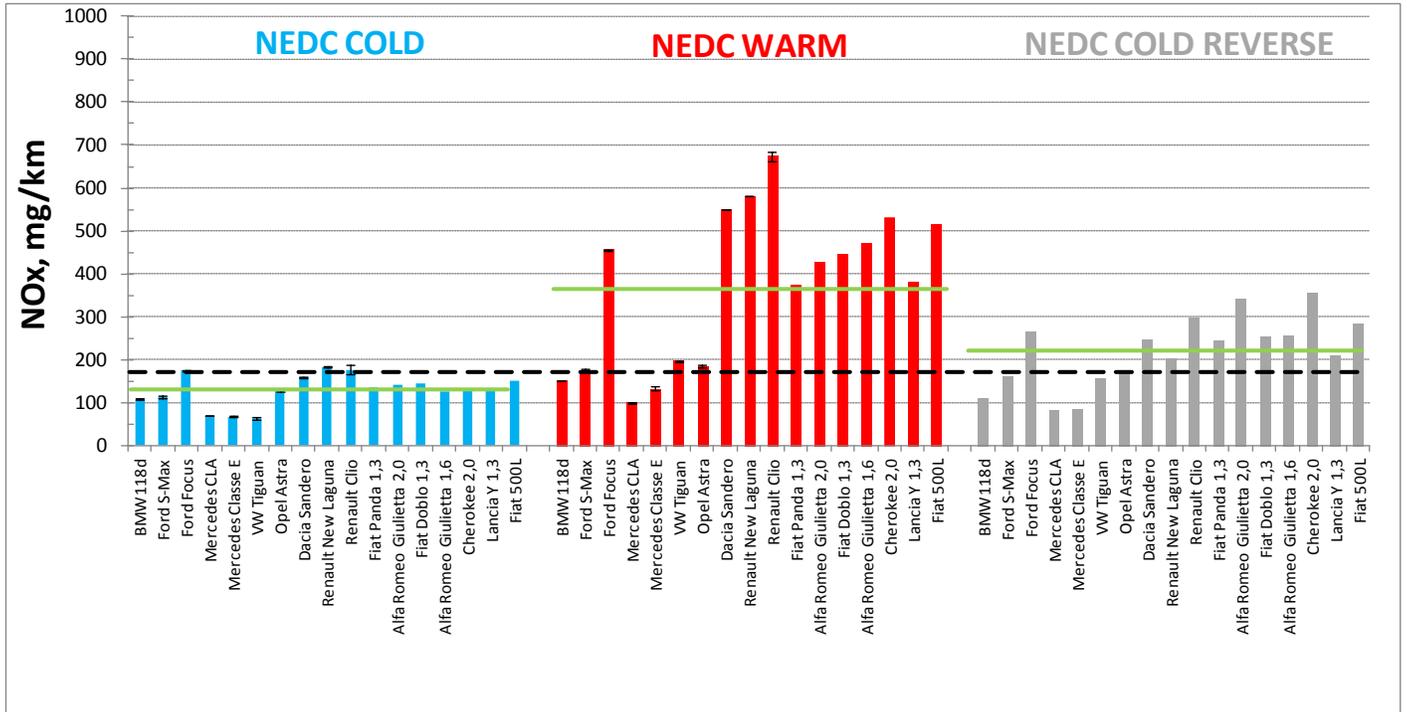


Figura 31: Emissioni di NOx misurate per ogni veicolo in laboratorio

Gli incrementi misurati per ciascun veicolo sul ciclo NEDC warm e NEDC invertito, rispetto al ciclo NEDC con partenza a freddo, sono riportati in Tabella 2.

Il rapporto tra le emissioni di NOx misurate durante il NEDC warm ed il NEDC cold varia tra 1.4 a 4.0. Il rapporto tra le emissioni del NEDC cold Reverse e NEDC cold varia tra 1 e 2.7.

Si evidenziano quindi due tipologie di comportamenti:

- Veicoli con differenze basse tra emissioni di NOx nel ciclo a caldo rispetto a quello a freddo (rapporti <1.5) ed anche differenze basse tra emissioni di NOx nel ciclo NEDC Reverse rispetto a quello a freddo. Manifestano questo comportamento la BMW 118d, la Mercedes CLA 200 e l'Opel Astra.
- Veicoli con differenze più elevate tra emissioni di NOx nel ciclo a caldo rispetto a quello a freddo ed anche differenze tra emissioni di NOx nel ciclo NEDC reverse rispetto a quello a freddo maggiori di 2.0. Manifestano questo comportamento le vetture del gruppo FCA, la Ford Focus, la VW Tiguan ed i veicoli Renault.

La Ford S-Max e la Mercedes E220 mostrano un comportamento intermedio.



<b>Rapporto delle emissioni di NOx</b>		
	<b>NEDC warm/ NEDC cold</b>	<b>NEDC invertito/ NEDC cold</b>
BMW118d	1.4	1.0
Ford S-Max	1.6	1.4
Ford Focus	2.6	1.5
Mercedes CLA	1.4	1.2
Mercedes Classe E	2.0	1.3
VW Tiguan	3.1	2.5
Opel Astra	1.4	1.3
Dacia Sandero	3.5	1.6
Renault New Laguna	3.2	1.1
Renault Clio	3.8	1.7
Fiat Panda 1,3	2.8	1.8
Alfa Romeo Giulietta 2,0	3.0	2.4
Fiat Doblo 1,3	3.1	1.8
Alfa Romeo Giulietta 1,6	3.8	2.0
Cherokee 2,0	4.0	2.7
Lancia Y 1,3	2.9	1.6
Fiat 500L	3.4	1.9

***Tabella 2: Rapporto tra emissioni di NOx nel ciclo NEDC WARM rispetto al NEDC COLD e tra ciclo NEDC reverse COLD e ciclo NEDC COLD***

*Dall'analisi di questi dati non si evince un comportamento diverso della VW Tiguan da quello di altre autovetture.*



### **4.3 Emissioni di NO<sub>x</sub> misurate su pista.**

Nelle pagine successive sono riportati dei confronti dei risultati ottenuti nelle prove in laboratorio con quelle su pista per alcuni dei veicoli.

Per le prove effettuate da IM-CNR sono stati confrontati i valori medi degli NO<sub>x</sub> misurati con il sensore NO<sub>x</sub> durante i cicli condotti su pista, NEDC COLD 70 e NEDC WARM 70 (limite di 70 km/h come max velocità), con i corrispondenti valori ottenuti in laboratorio sul banco a rulli. I dati dei cicli NEDC di confronto riferiti ai test in laboratorio sono stati anche essi valutati sui cicli NEDC COLD 70 e NEDC WARM 70 (cioè non considerando nella fase extra-urbana le emissioni istantanee degli ultimi 3 km quando la velocità supera i 70 km/h) a partire dalle misure del sensore di NO<sub>x</sub> installato sullo scarico grezzo durante tutti i test in laboratorio.

E' stata verificata la risposta di questo sensore confrontando i valori misurati contemporaneamente con un analizzatore a chemiluminescenza (Horiba Mexa 7200) con sonda di campionamento posta in prossimità del sensore.

In condizioni stazionarie la differenza dei valori misurati dal sensore rispetto a quelli misurati con il detector a chemiluminescenza è risultata nell'ordine del  $\pm 5.0\%$  mentre durante un ciclo NEDC del  $\pm 9.0\%$ . Questi scostamenti sono in linea con quanto verificato dal TNO [4].

Per le vetture testate dal CPA di Torino sono stati confrontati i valori medi degli NO<sub>x</sub> misurati con sistema PEMS convenzionale durante i cicli condotti su pista, NEDC COLD 70 (poichè limitato a 70 km/h come max velocità) e NEDC WARM 70 (poichè limitato a 70 km/h come max velocità), con i valori misurati (dai sacchi) durante le prove in laboratorio sul banco a rulli, considerando i dati dell'intero ciclo NEDC.

Prima di passare ad un'analisi dei dati ottenuti per ogni veicolo vengono rappresentati i risultati delle prove su pista nel loro insieme.

La Figura 32 riporta in dettaglio le emissioni di NO<sub>x</sub> ottenute durante i test su pista e valutate sul ciclo NEDC cold 70 e NEDC warm 70 per tutti i veicoli analizzati dall'IM-CNR e da FCA. La linea tratteggiata mostra il limite Euro 5 di 180 mg/km mentre le linee continue indicano il valore medio di tutte le autovetture su ciascuno dei due cicli.

Anche su pista in media i cicli guidati in condizioni di partenza termicamente regimate conducono a maggiori emissioni di NO<sub>x</sub>. Si passa da 225 mg/km come valore medio per i NO<sub>x</sub> emessi durante il ciclo NEDC cold 70 a 380 mg/km emessi di media durante il ciclo NEDC warm 70: ciò evidenzia un rapporto medio di circa 1.7 tra emissioni del ciclo a caldo rispetto quello a freddo nelle prove condotte su pista.

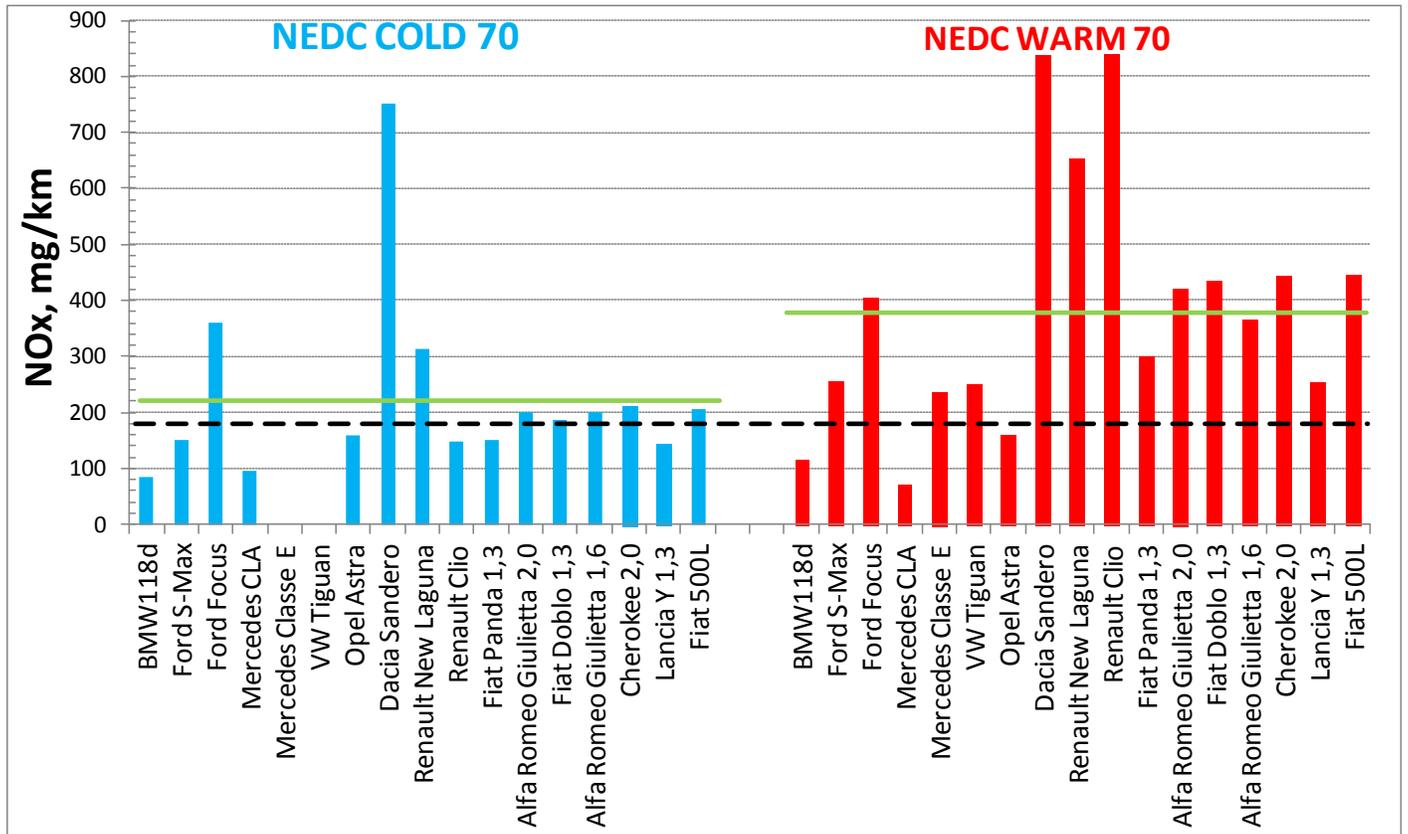


Figura 32: Valori medi di NOx sul ciclo NEDC cold 70 e NEDC warm 70 su pista

Bisogna evidenziare come però questi valori medi derivino da comportamenti molto diversi. Innanzitutto va evidenziato che le vetture Renault e FCA raddoppiano le emissioni durante il ciclo warm mentre le altre vetture mostrano incrementi più contenuti. Inoltre per il veicolo Dacia Sandero le emissioni sul ciclo NEDC cold 70 risultano molto superiori sia al limite Euro 5 e sia al valore medio dei test effettuati. Va precisato che i test su pista con questo veicolo sono stati condotti il giorno 28 luglio 2016 tra le ore 11.00 e le ore 14.00 con temperatura ambiente superiore a 30degC.

I cicli su pista sono ben riprodotti dai drivers (meno di 5 errori sul ciclo NEDC 70). L'analisi dei parametri motoristici mostra una buona riproducibilità in termini di numero di giri, portata d'aria, posizione pedale dell'acceleratore e portata combustibile delle prove su pista rispetto a quelle di laboratorio. Sono i parametri ambientali a divergere talvolta (T e umidità ambiente) ed è diversa l'azione di raffreddamento sul motore dovuta al moto su pista del veicolo o al ventilatore posizionato in laboratorio di fronte alla vettura. Il parametro più variabile tra prove in laboratorio e su pista è stato la temperatura dell'aria di aspirazione che può influenzare notevolmente il funzionamento dell'EGR per il controllo degli NOx.



#### 4.4 Confrontazioni tra le emissioni di NOx misurate su pista e quelle in laboratorio

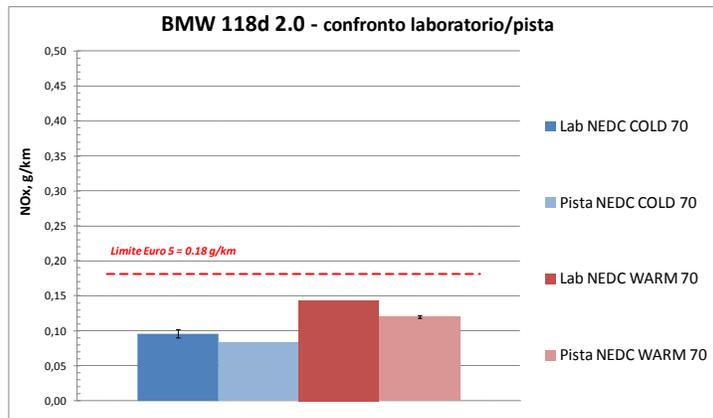
Di seguito sono riportati i confronti tra le emissioni di NOx valutate su pista ed in laboratorio per ognuna delle vetture analizzate sia in IM-CNR che dal CPA di Torino.

Veicolo: BMW 118d 2.0

La Figura 33 mostra il confronto tra le emissioni misurate su pista ed in laboratorio sui cicli NEDC cold e warm 70. La BMW118d mostra lo stesso comportamento in laboratorio e su pista: emissioni a caldo del 30-40% piu' elevate rispetto a quelle a freddo.

I fattori di conformità (CF) riportati in Tabella 3 risultano tutti minori di 1, tranne che per il ciclo Urban (dove è circa 2).

Non si evidenzia una correlazione tra la variazione della temperatura dell'aria di aspirazione (tra 25 e 37°C) ed il tasso di EGR (espresso come % di apertura della valvola EGR) utilizzato. Il valore medio di EGR% nelle prove su pista sembra leggermente piu' basso di quello utilizzato nelle prove in laboratorio (Figura 34).



**Figura 33: Confronto pista/laboratorio per BMW 118d**

	Laboratorio				Pista	
	NEDC COLD	NEDC WARM	NEDC COLD REV	URBAN	NEDC COLD_70	NEDC WARM_70
<b>CF</b>	0,67	0,84	0,61	1,92	0,46	0,67

**Tabella 3: Fattori di conformità per la BMW 118d**

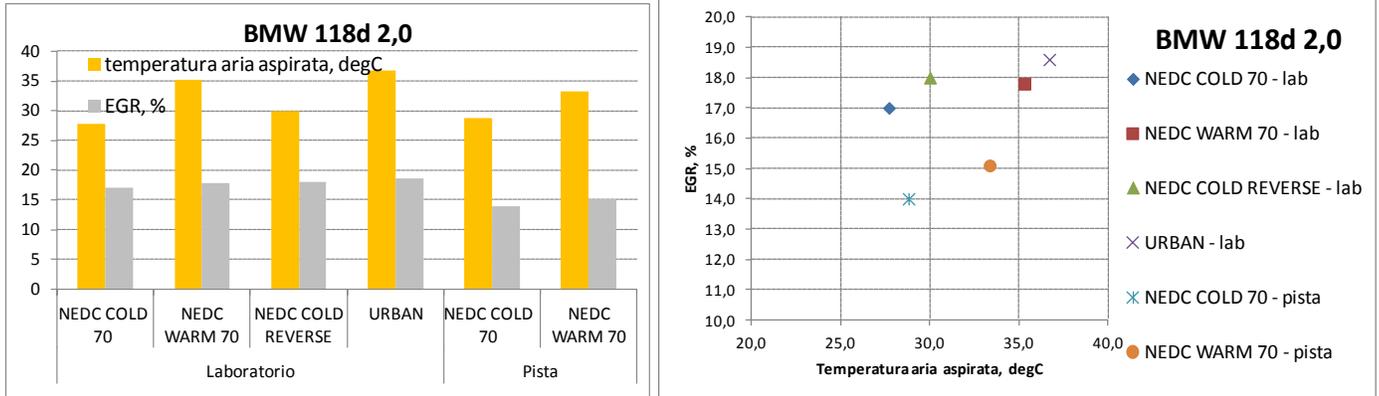


Figura 34: EGR e temperatura di aspirazione nelle prove svolte con la BMW 118d

Veicolo: OPEL ASTRA 2.0

L'Opel Astra mostra lo stesso comportamento in laboratorio e su pista sul ciclo con partenza a freddo, mentre nel ciclo a caldo emette piu' NOx nella prova di laboratorio (Figura 35).

I fattori di conformità (CF) riportati in tabella risultano tutti minori di 1 o prossimi ad 1, tranne che per il ciclo Urban (dove è circa 2,2) (Tabella 4).

Su questa vettura si evidenzia una correlazione tra la variazione della temperatura dell'aria di aspirazione (tra 25 e 45°C) ed il tasso di EGR (espresso come % di apertura della valvola EGR) utilizzato: all'aumentare della temperatura dell'aria aspirata viene utilizzata una percentuale di apertura valvola EGR minore (Figura 36). La prova a caldo in laboratorio presenta una temperatura media dell'aria aspirata di 6°C piu' bassa di quella misurata nella analoga prova su pista: ciò potrebbe spiegare il valore di NOx piu' alto misurato.

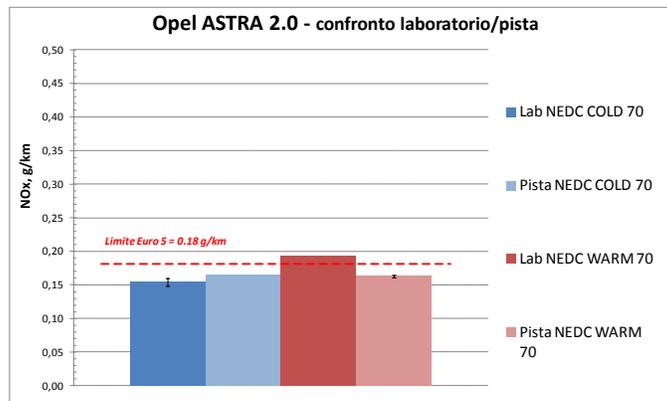


Figura 35: Confronto pista/laboratorio per Opel Astra



	Laboratorio				Pista	
	NEDC COLD	NEDC WARM	NEDC COLD REV	URBAN	NEDC COLD_70	NEDC WARM_70
CF	0,81	1,03	0,93	2,23	0,92	0,90

Tabella 4: Fattori di conformità per la Opel Astra

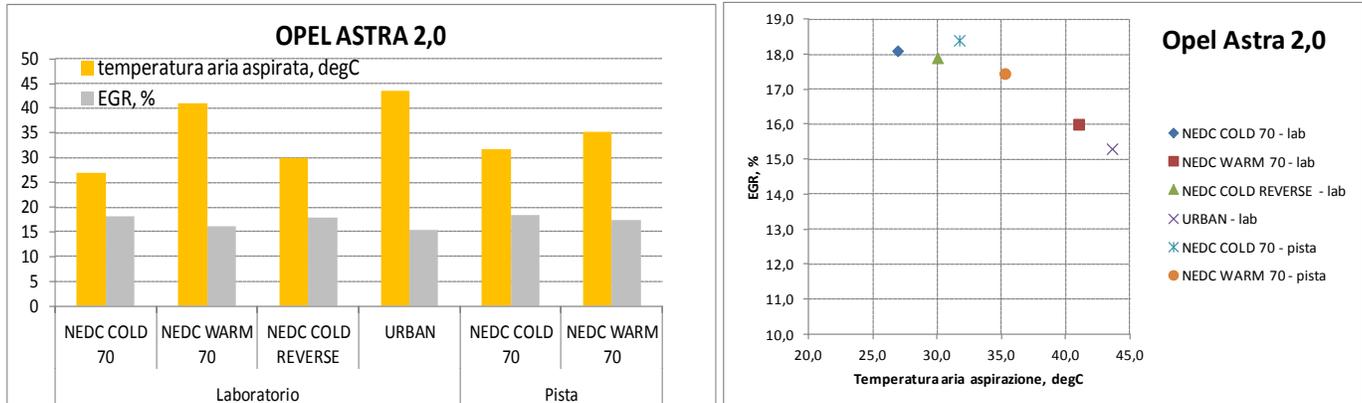


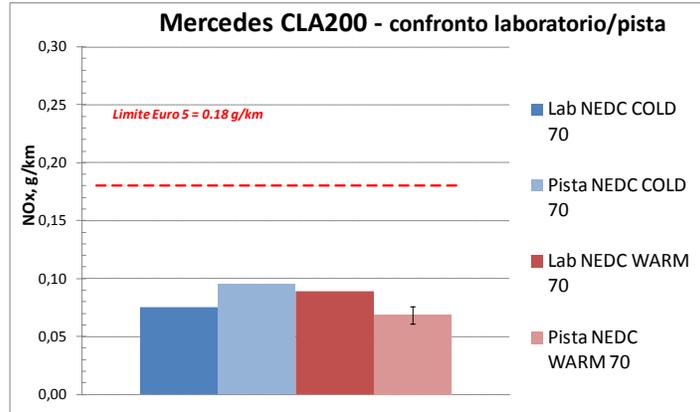
Figura 36: EGR e temperatura di aspirazione nelle prove svolte con la Opel Astra

Veicolo: Mercedes CLA200

La Mercedes CLA emette basse quantità di NOx sia nelle prove in laboratorio che su pista con un diverso comportamento tra prove con partenza a freddo e a caldo (Figura 37).

I fattori di conformità (CF) riportati in Tabella 5 risultano tutti minori di 1, tranne che per il ciclo Urban (dove è circa 1,5).

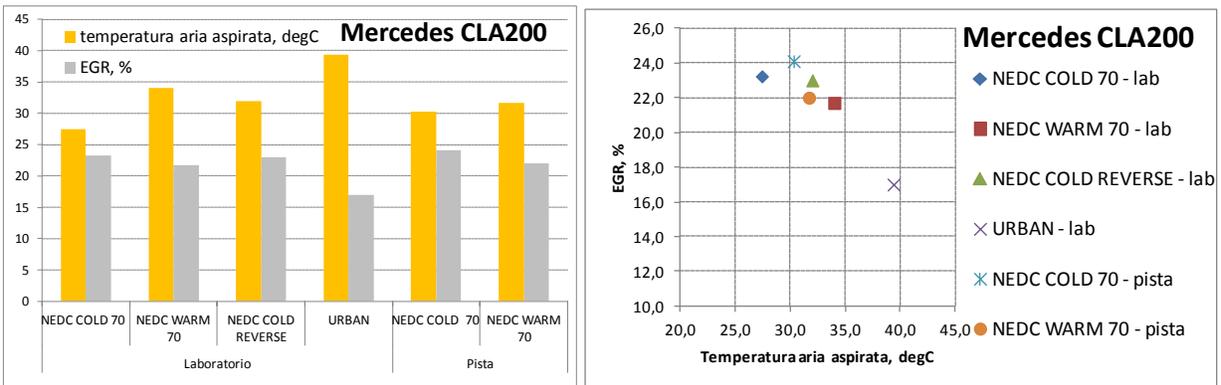
Su questa vettura si evidenzia una correlazione tra la variazione della temperatura dell'aria di aspirazione (tra 25 e 40°C) ed il tasso di EGR (espresso come % di apertura della valvola EGR) utilizzato: all'aumentare della temperatura dell'aria aspirata viene utilizzata una percentuale di apertura valvola EGR minore (Figura 38). Il ciclo Urban è quello con la minore percentuale di EGR.



**Figura 37: Confronto pista/laboratorio per Mercedes CLA 200**

	Laboratorio				Pista	
	NEDC COLD	NEDC WARM	NEDC COLD REVERSE	URBAN	NEDC COLD_70	NEDC WARM_70
<b>CF</b>	0,42	0,55	0,45	1,47	0,53	0,38

**Tabella 5: Fattori di conformità per la Mercedes CLA 200**



**Figura 38: EGR e temperatura di aspirazione nelle prove svolte con la Mercedes CLA 200**

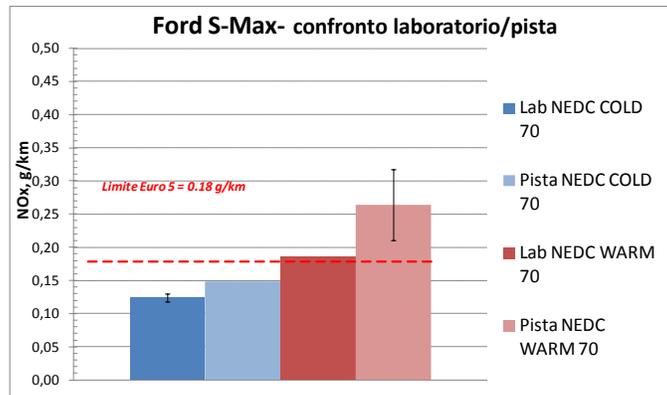


Veicolo: Ford S-Max

La Ford S-Max mostra lo stesso comportamento in laboratorio e su pista: emissioni a caldo del 50% piu' elevate rispetto a quelle a freddo (Figura 39).

I fattori di conformità (CF) riportati in Tabella 6 risultano tutti minori di 1, tranne che per il ciclo a caldo su pista (CF=1,5) e per il ciclo Urban (dove è circa 2,5).

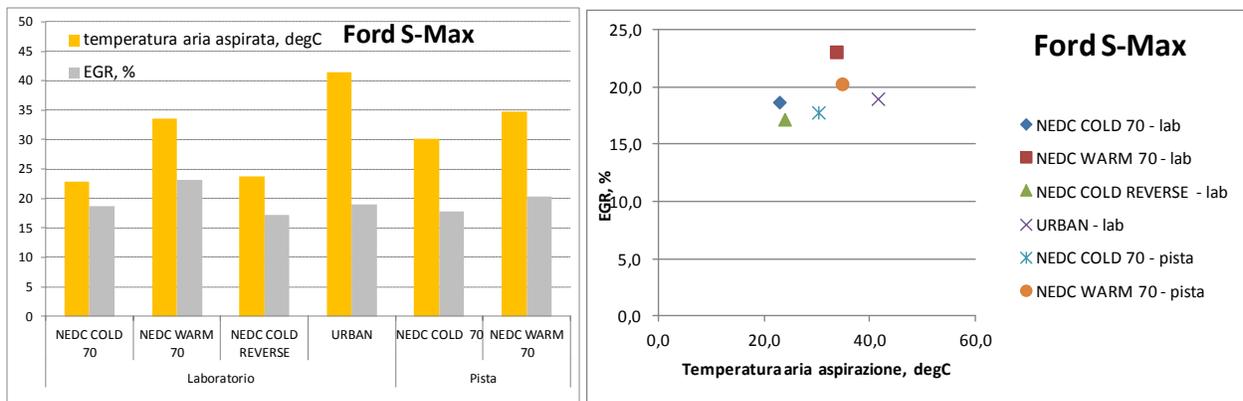
Su questa vettura non si evidenzia una dipendenza tra la variazione della temperatura dell'aria di aspirazione (tra 25 e 45°C) ed il tasso di EGR (espresso come % di apertura della valvola EGR) utilizzato (Figura 40). La percentuale della valvola di EGR è sempre compresa tra il 17 ed il 22 % in ogni test esguito sia in pista che in laboratorio.



**Figura 39: Confronto pista/laboratorio per Ford S-Max**

	Laboratorio				Pista	
	NEDC COLD	NEDC WARM	NEDC COLD REVERSE	URBAN	NEDC COLD	NEDC WARM
<b>CF</b>	0,65	0,98	0,89	2,53	0,82	1,47

**Tabella 6: Fattori di conformità per la Ford S-Max**



**Figura 40: EGR e temperatura di aspirazione nelle prove svolte con la Ford S-Max**

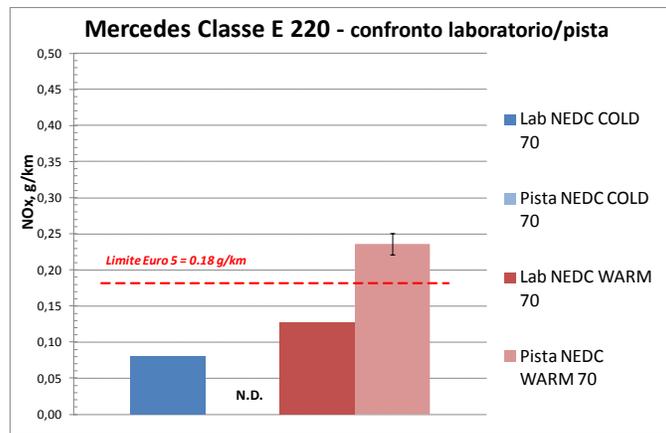


Veicolo: Mercedes Classe E 220

La Mercedes Classe E mostra su pista delle emissioni a caldo molto piu' elevate rispetto a quelle a misurate in laboratorio (Figura 41).

I fattori di conformità (CF) riportati in Tabella 7 risultano tutti minori di 1, tranne che per il ciclo a caldo su pista (CF=1,3) e per il ciclo Urban (dove è circa 2,4).

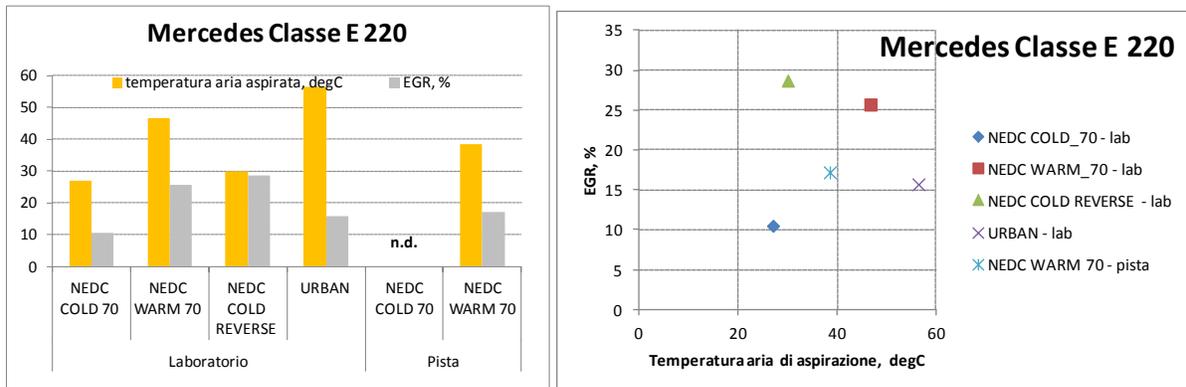
Non si evidenzia una correlazione tra la variazione della temperatura dell'aria di aspirazione (tra 25 e 60°C) ed il tasso di EGR (espresso come % di apertura della valvola EGR) utilizzato (Figura 42).



**Figura 41: Confronto pista/laboratorio per Mercedes Classe E 220**

	Laboratorio				Pista	
	NEDC COLD	NEDC WARM	NEDC COLD REVERSE	URBAN	NEDC COLD	NEDC WARM
<b>CF</b>	0,46	0,74	0,47	2,41	n.d.	1,31

**Tabella 7: Fattori di conformità per Mercedes Classe E 220**



**Figura 42: EGR e temperatura di aspirazione nelle prove svolte con la Mercedes Classe E**

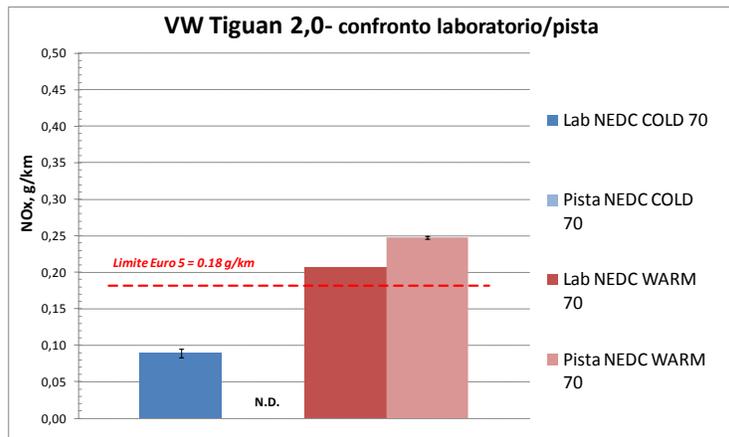


Veicolo: Volkswagen Tiguan 2.0

La VW Tiguan mostra su pista delle emissioni a caldo poco piu' elevate rispetto a quelle misurate in laboratorio (Figura 43). Come già visto precedentemente le emissioni a caldo ottenute in laboratorio sono circa il doppio di quelle emesse con partenza a freddo.

I fattori di conformità (CF) riportati in Tabella 8 risultano minori di 1 o vicino ad 1, tranne che per il ciclo a caldo su pista (CF=1,4) e per il ciclo Urban (dove è circa 2,2).

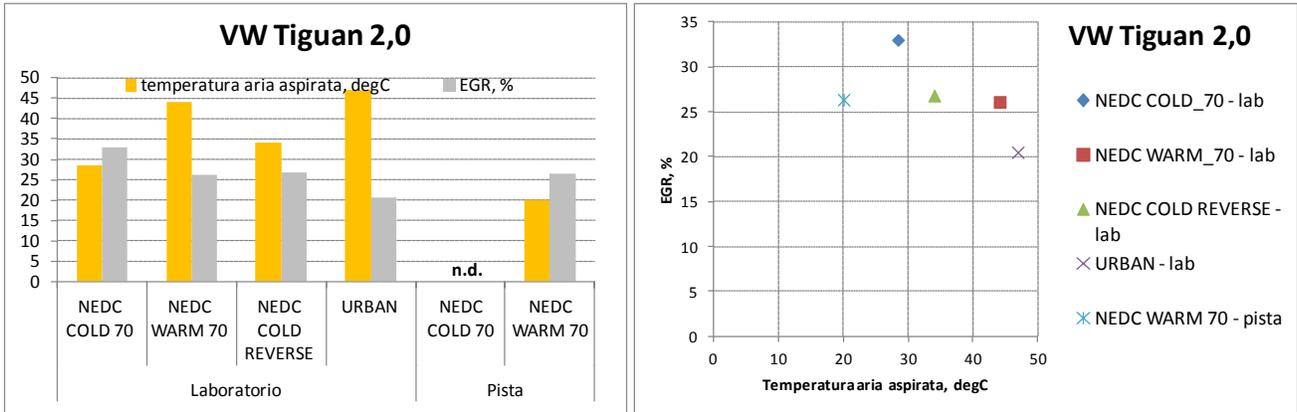
Su questa vettura si evidenzia una correlazione tra la variazione della temperatura dell'aria di aspirazione (tra 20 e 50°C) ed il tasso di EGR utilizzato: all'aumentare della temperatura dell'aria aspirata viene utilizzata una percentuale di apertura valvola EGR minore. Il ciclo Urban è quello con la minore percentuale di EGR (Figura 44).



**Figura 43: Confronto pista/laboratorio per VW Tiguan**

	Laboratorio				Pista	
	NEDC COLD	NEDC WARM	NEDC COLD REVERSE	URBAN	NEDC COLD_70	NEDC WARM_70
<b>CF</b>	0,37	1,09	0,87	2,21	n.d.	1,38

**Tabella 8: Fattori di conformità per VW Tiguan**



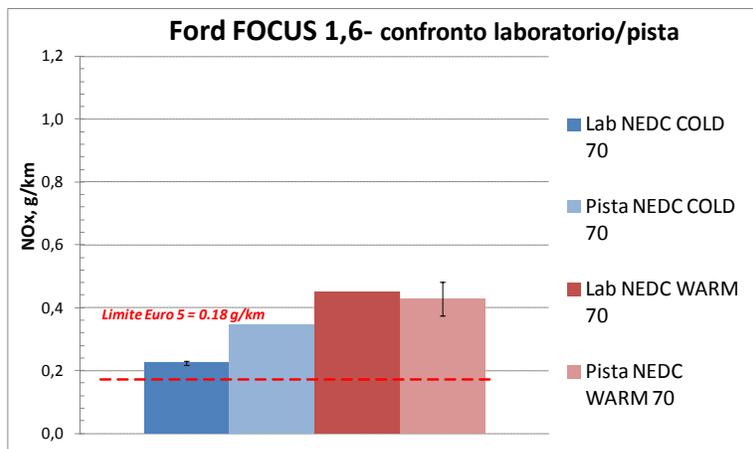
**Figura 44: EGR e temperatura di aspirazione nelle prove svolte con la VW Tiguan**

Veicolo: Ford FOCUS 1.6

La Ford Focus mostra su pista delle emissioni a caldo confrontabili a quelle a misurate in laboratorio. Come già visto le emissioni a caldo ottenute in laboratorio sono circa il doppio di quelle emesse con partenza a freddo (Figura 45).

I fattori di conformità (CF) riportati in Tabella 9 risultano tutti maggiori di 1 (prossimo ad 1 è solo il ciclo NEDC cold in laboratorio) e per il ciclo Urban arriva addirittura a 6.

Su questa vettura si evidenzia una correlazione tra la variazione della temperatura dell'aria di aspirazione (tra 30 e 70°C) ed il tasso di EGR utilizzato: all'aumentare della temperatura dell'aria aspirata viene utilizzata una percentuale di apertura valvola EGR fortemente ridotta (Figura 46). Durante il ciclo Urban il valore medio della % di EGR è prossimo allo zero e risulta molto basso anche durante i cicli a caldo (sia in laboratorio che su pista).

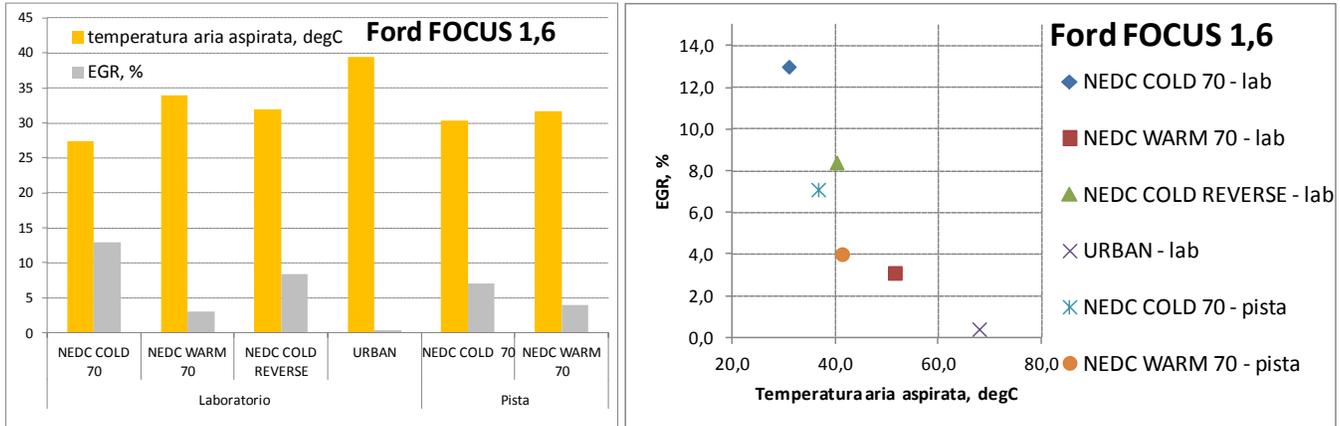


**Figura 45: Confronto pista/laboratorio per Ford Focus**



	Laboratorio				Pista	
	NEDC COLD	NEDC WARM	NEDC COLD REVERSE	URBAN	NEDC COLD_70	NEDC WARM_70
<b>CF</b>	0,98	2,53	1,48	6,13	1,93	2,38

**Tabella 9: Fattori di conformità per Ford Focus**

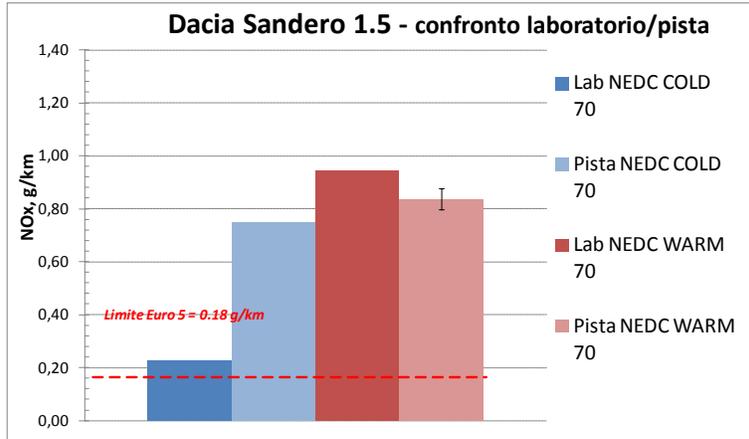


**Figura 46: EGR e temperatura di aspirazione nelle prove svolte con la Ford Focus**

Veicolo: Dacia Sandero

Le prove su pista con la Dacia Sandero sono state condotte in condizioni molto calde (temperatura ambiente > 30degC). Ciò giustifica la marcata differenza tra le emissioni su pista e le emissioni in laboratorio sul ciclo NEDC cold. Il ciclo NEDC warm, invece evidenzia emissioni confrontabili su pista ed in laboratorio (Figura 47).I fattori di conformità (CF) riportati in Tabella 10 risultano tutti ben superiori ad 1 in tutti i cicli in laboratorio con partenza a caldo e su pista. Sul ciclo NEDC cold il coefficiente di conformità risulta prossimo ad 1.

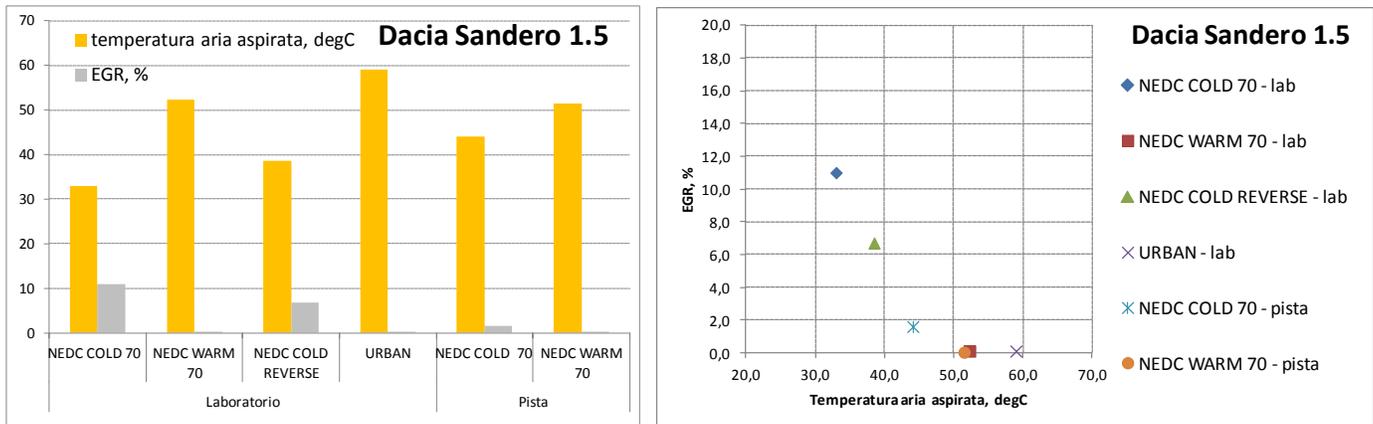
Le condizioni termiche del motore influenzano significativamente il funzionamento dell'EGR. In Figura 48, si osserva che per temperature dell'aria di aspirazione a monte del parzializzatore superiori a 45 degC (condizione raggiunta in tutti i cicli warm), la centralina motore comanda la chiusura totale della valvola EGR.



**Figura 47: Confronto pista/laboratorio per Dacia Sandero**

	Laboratorio				Pista	
	NEDC COLD	NEDC WARM	NEDC COLD REVERSE	URBAN	NEDC COLD_70	NEDC WARM_70
<b>CF</b>	1,03	3,06	1,38	6,10	4,18	4,65

**Tabella 10: Fattori di conformità per Dacia Sandero**



**Figura 48: EGR e temperatura di aspirazione nelle prove svolte con la Dacia Sandero**

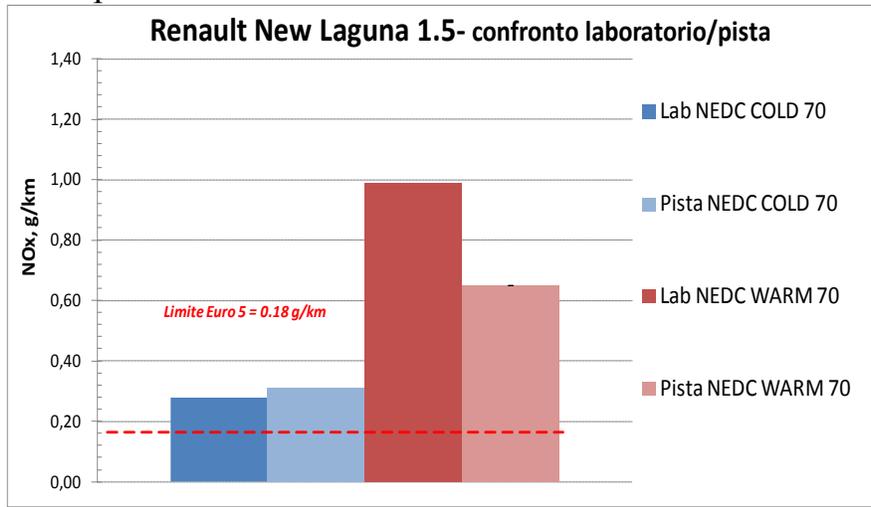
Veicolo: Renault New Laguna

I dati relativi alla Renault New Laguna evidenziano un accordo tra le prove in pista ed in laboratorio per il ciclo NEDC cold, mentre le emissioni di NOx del laboratorio sul ciclo NEDC warm risultano notevolmente maggiori delle rispettive misurate su pista (Figura 49). Ancora una volta, quindi, si osserva come le modalità del raffreddamento del veicolo giocano un ruolo fondamentale per la produzione di NOx.



I fattori di conformità sono riportati in Tabella 11. Nei cicli cold variano tra 1 ed 1.7, mentre nei cicli warm variano tra 3.2 e 5.

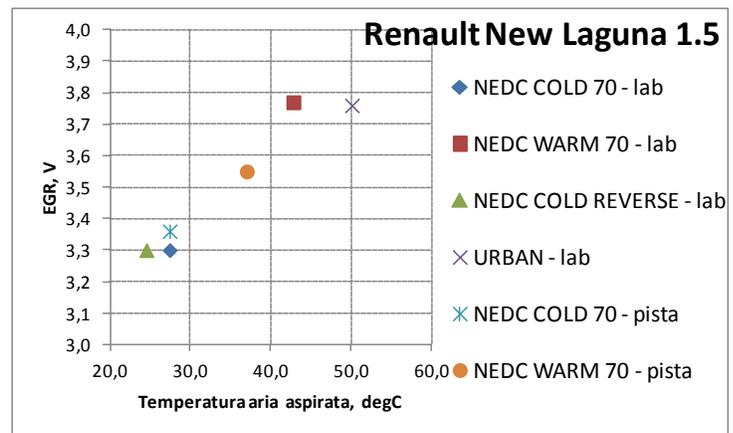
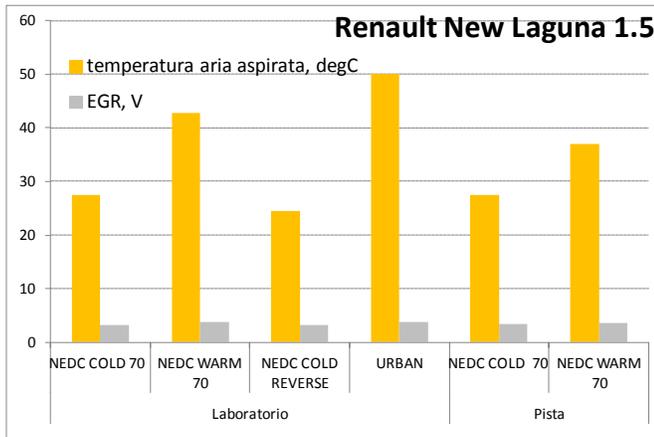
Tra i parametri centralina messi a disposizione dall'OBD figura il valore del potenziometro EGRespresso in Volt. Tale valore è inversamente proporzionale alla percentuale di EGR finora esaminata per gli altri veicoli. In Figura 50, viene mostrata la relazione esistente tra la temperatura dell'aria aspirata e l'EGR.



**Figura 49: Confronto pista/laboratorio per Renault New Laguna**

	Laboratorio				Pista	
	NEDC COLD	NEDC WARM	NEDC COLD REVERSE	URBAN	NEDC COLD_70	NEDC WARM_70
<b>CF</b>	1,02	3,23	1,13	4,98	1,73	3,62

**Tabella 11: Fattori di conformità per Renault New Laguna**

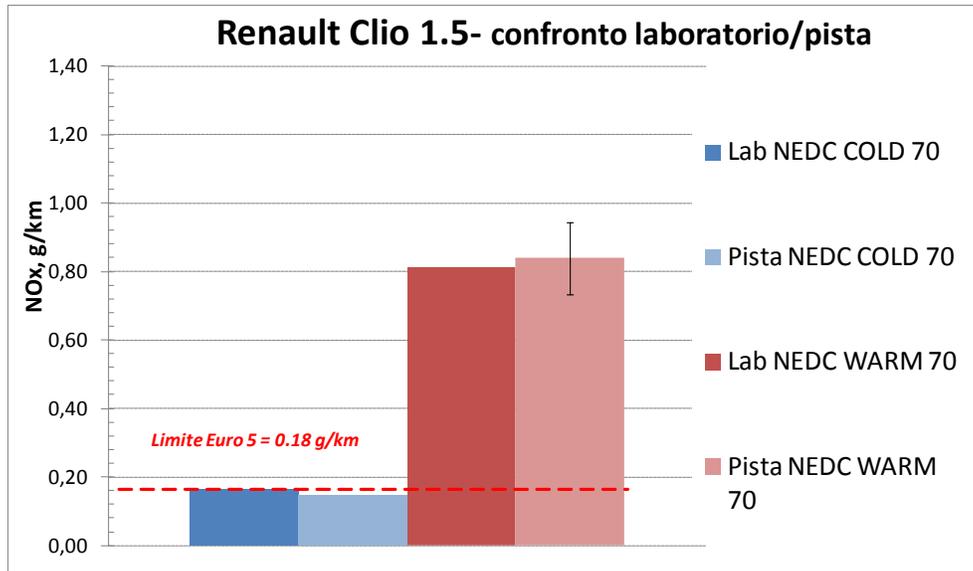


**Figura 50: EGR e temperatura di aspirazione nelle prove svolte con la Renault New Laguna**



Veicolo: Renault Clio

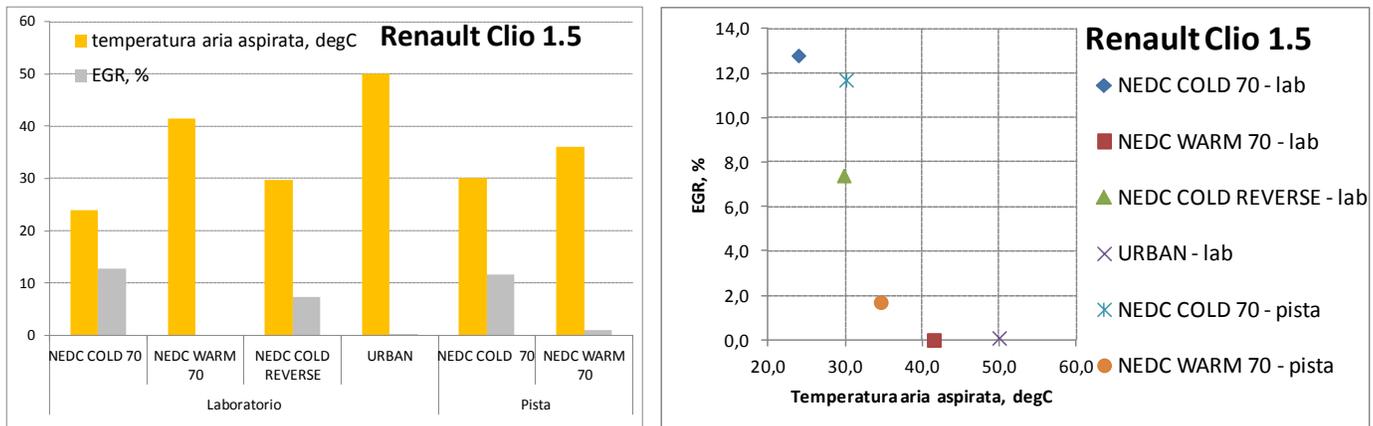
I dati relativi alla Renault Clio evidenziano un buon accordo tra le prove in pista ed in laboratorio (Figura 51). Al di sopra della temperatura di 40 degC dell'aria di aspirazione, il ricircolo dei gas di scarico viene totalmente disattivato (Figura 52). I fattori di conformità sono riportati in Tabella 12. Nei cicli cold variano tra 0.8 ed 1.7, mentre nei cicli warm variano tra 3.3 e 4.7.



**Figura 51: Confronto pista/laboratorio per Renault Clio**

	Laboratorio				Pista	
	NEDC COLD	NEDC WARM	NEDC COLD REVERSE	URBAN	NEDC COLD_70	NEDC WARM_70
<b>CF</b>	1,11	3,30	1,66	5,91	0,82	4,66

**Tabella 12: Fattori di conformità per Renault Clio**



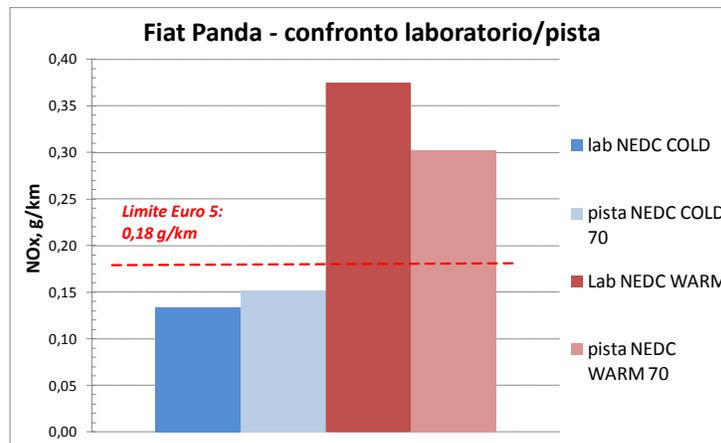
**Figura 52: EGR e temperatura di aspirazione nelle prove svolte con la Renault Clio**



Veicolo: FIAT Nuova PANDA 1.3L sde

La Fiat Panda mostra emissioni a freddo e a caldo confrontabili tra pista e laboratorio anche se in questo caso i cicli non sono gli stessi nella fase extra-urbana (fino a 120 km/h in laboratorio e fino a 70 km/h su pista). Come già evidenziato in precedenza le emissioni a caldo ottenute sia in laboratorio che su pista sono circa il doppio di quelle emesse con partenza a freddo (Figura 53).

I fattori di conformità (CF) riportati in Tabella 13 risultano tutti maggiori di 1 tranne per i NEDC cold.



**Figura 53: Confronto pista/laboratorio per Fiat Panda**

	Laboratorio				Pista	
	NEDC COLD	NEDC WARM	NEDC COLD REVERSE	NEDC WARM REVERSE	NEDC COLD_70	NEDC WARM_70
<b>CF</b>	0,75	2,08	1,36	1,91	0,85	1,68

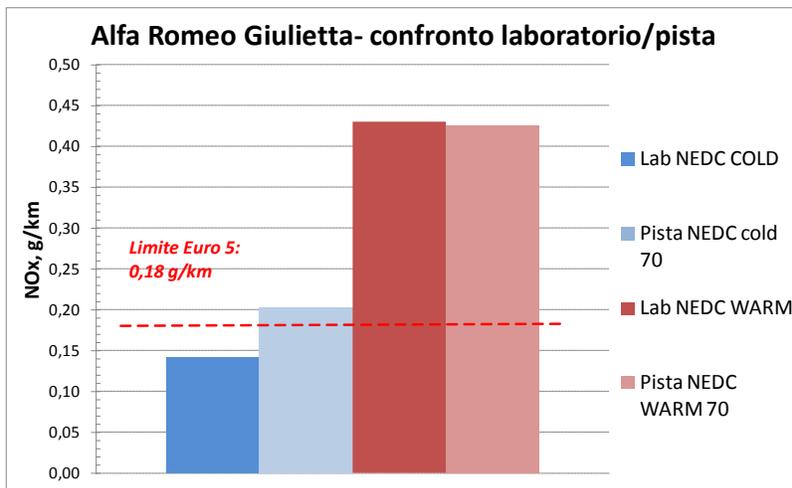
**Tabella 13: Fattori di conformità per Fiat Panda**



Veicolo: ALFA ROMEO GIULIETTA 2.0 MULTIJET

La Alfa Romeo Giulietta mostra emissioni a freddo e a caldo confrontabili tra pista e laboratorio anche se in questo caso i cicli non sono gli stessi nella fase extra-urbana (fino a 120 km/h in laboratorio e fino a 70 km/h su pista). Anche per questa vettura le emissioni a caldo ottenute sia in laboratorio che su pista sono circa il doppio di quelle emesse con partenza a freddo (Figura 54).

I fattori di conformità (CF) riportati in Tabella 14 risultano tutti maggiori di 1 tranne il NEDC cold eseguito in laboratorio.



**Figura 54: Confronto pista/laboratorio per Alfa Romeo Giulietta 2.0**

	Laboratorio				Pista	
	NEDC COLD	NEDC WARM	NEDC COLD REVERSE	NEDC WARM REVERSE	NEDC COLD_70	NEDC WARM_70
<b>CF</b>	0,79	2,39	1,90	2,14	1,13	2,37

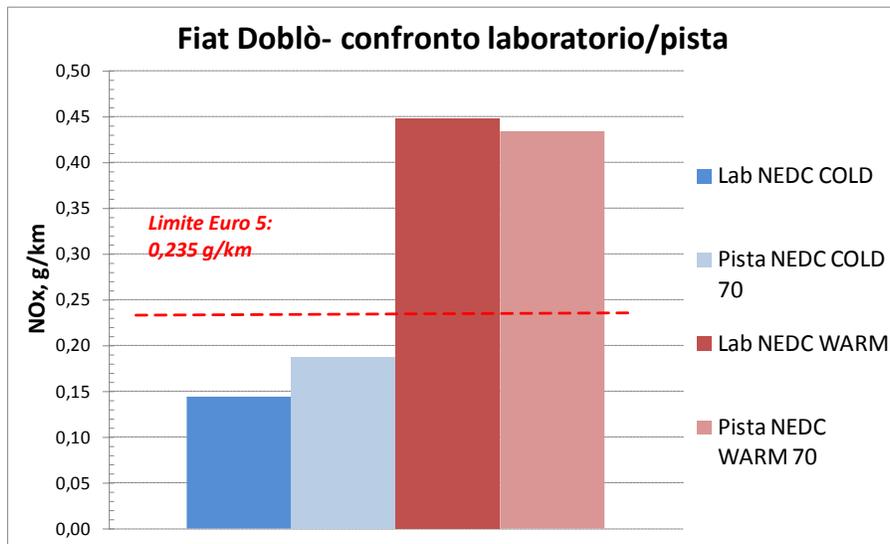
**Tabella 14: Fattori di conformità per Alfa Romeo Giulietta 2.0**



Veicolo: FIAT DOBLO'

Il Fiat Doblò, che è un veicolo commerciale con limite Euro 5 per i NOx di 235 mg/km, mostra emissioni a freddo e a caldo confrontabili tra pista e laboratorio anche se in questo caso i cicli non sono gli stessi nella fase extra-urbana (fino a 120 km/h in laboratorio e fino a 70 km/h su pista). Anche per questa vettura le emissioni a caldo ottenute sia in laboratorio che su pista sono circa il doppio di quelle emesse con partenza a freddo (Figura 55).

I fattori di conformità (CF) riportati in Tabella 15 risultano minori di 1 o prossimi ad 1 quelli eseguiti in condizioni a freddo e pari a circa a 2 se condotti in condizioni warm.



**Figura 55: Confronto pista/laboratorio per Fiat Doblò**

	Laboratorio				Pista	
	NEDC COLD	NEDC WARM	NEDC COLD REVERSE	NEDC WARM REVERSE	NEDC COLD_70	NEDC WARM_70
<b>CF</b>	0,61	1,91	1,08	1,59	0,80	1,85

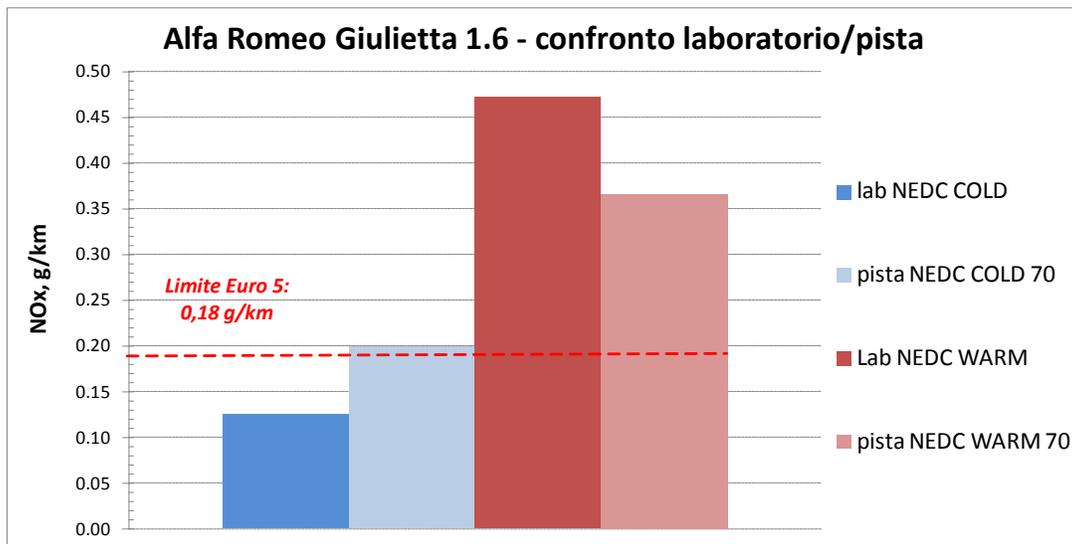
**Tabella 15: Fattori di conformità per Fiat Doblò**



Veicolo: Alfa Romeo Giulietta 1.6 Multijet

L'Alfa Romeo Giulietta 1.6 mostra emissioni a freddo e a caldo confrontabili tra pista e laboratorio anche se in questo caso i cicli non sono gli stessi nella fase extra-urbana (fino a 120 km/h in laboratorio e fino a 70 km/h su pista). Anche per questa vettura le emissioni a caldo ottenute sia in laboratorio che su pista sono circa il doppio di quelle emesse con partenza a freddo (Figura 56).

I fattori di conformità (CF) riportati in Tabella 16 risultano minori di 1 o prossimi ad 1 quelli eseguiti in condizioni a freddo (max 1.4) e tra 2 e 2.6 se condotti in condizioni warm.



**Figure 56: Confronto pista/laboratorio per Alfa Romeo Giulietta 1.6**

	Laboratorio				Pista	
	NEDC COLD	NEDC WARM	NEDC COLD REVERSE	NEDC WARM REVERSE	NEDC COLD_70	NEDC WARM_70
<b>CF</b>	0.70	2.62	1.42	2.39	1.11	2.03

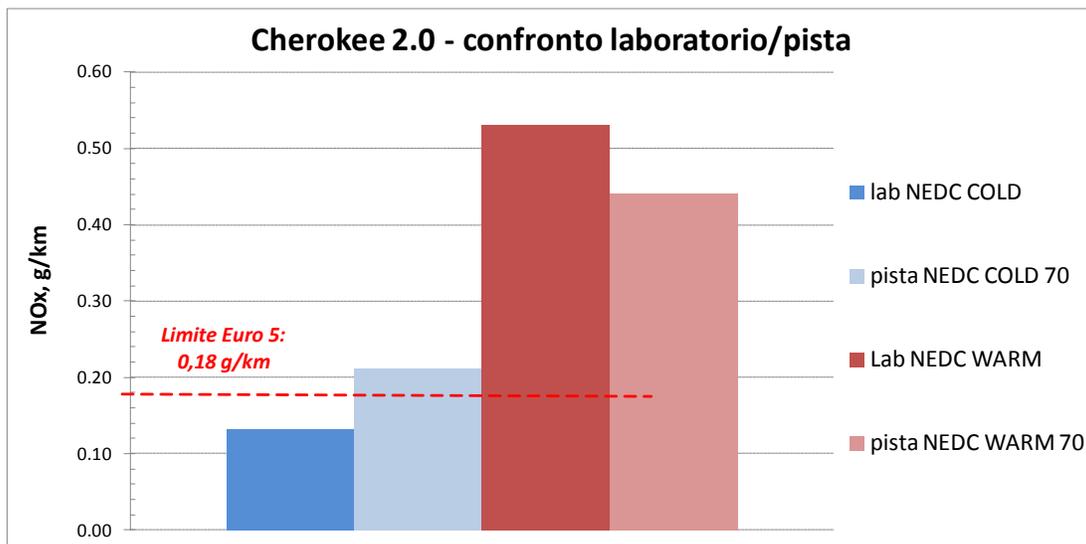
**Tabella 16: Fattori di conformità per Alfa Romeo Giulietta 1.6**



Veicolo: Cherokee 2.0

Il Cherokee 2.0 mostra emissioni a freddo e a caldo abbastanza confrontabili tra pista e laboratorio anche se in questo caso i cicli non sono gli stessi nella fase extra-urbana (fino a 120 km/h in laboratorio e fino a 70 km/h su pista). Anche per questa vettura le emissioni a caldo ottenute sia in laboratorio che su pista sono circa il doppio di quelle emesse con partenza a freddo (Figura 57).

I fattori di conformità (CF) riportati in Tabella 17 risultano minori di 1 o prossimi ad 1 quelli eseguiti in condizioni a freddo per il ciclo NEDC e pari a circa a 2.5-3.0 se condotti in condizioni warm.



**Figura 57: Confronto pista/laboratorio per Cherokee 2.0**

	Laboratorio				Pista	
	NEDC COLD	NEDC WARM	NEDC COLD REVERSE	NEDC WARM REVERSE	NEDC COLD_70	NEDC WARM_70
<b>CF</b>	0.73	2.95	1.98	2.61	1.17	2.45

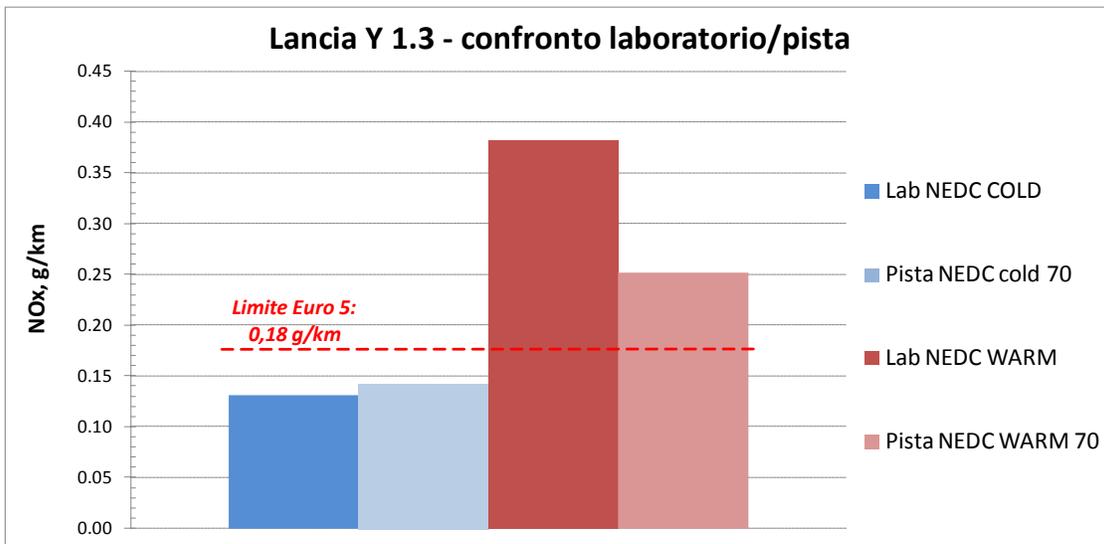
**Tabella 17: Fattori di conformità per Cherokee 2.0**



Veicolo: Lancia Y

La Lancia Y 1.3 mostra emissioni a freddo confrontabili tra pista e laboratorio anche se in questo caso i cicli non sono gli stessi nella fase extra-urbana (fino a 120 km/h in laboratorio e fino a 70 km/h su pista); a caldo si sono riscontrate emissioni piu' elevate nella prova in laboratorio. Anche per questa vettura le emissioni a caldo ottenute sia in laboratorio che su pista sono circa il doppio di quelle emesse con partenza a freddo (Figura 58).

I fattori di conformità (CF) riportati in Tabella 18 risultano minori di 1 o prossimi ad 1 quelli eseguiti in condizioni a freddo e tra 1.4 e 2.1 se condotti in condizioni warm.



**Figura 58: Confronto pista/laboratorio per Lancia Y 1.3**

	Laboratorio				Pista	
	NEDC COLD	NEDC WARM	NEDC COLD REVERSE	NEDC WARM REVERSE	NEDC COLD_70	NEDC WARM_70
<b>CF</b>	0.73	2.12	1.17	1.86	0.79	1.40

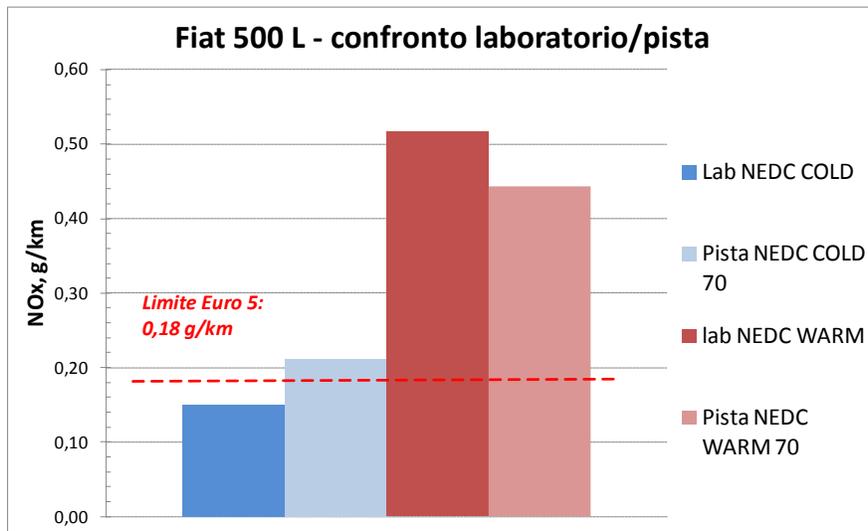
**Tabella 18: Fattori di conformità per Lancia Y 1.3**



Veicolo: FIAT 500 L 1.6 Multijet

La Fiat 500L mostra emissioni a freddo e a caldo abbastanza confrontabili tra pista e laboratorio anche se in questo caso i cicli non sono gli stessi nella fase extra-urbana (fino a 120 km/h in laboratorio e fino a 70 km/h su pista). Anche per questa vettura le emissioni a caldo ottenute sia in laboratorio che su pista sono circa il doppio di quelle emesse con partenza a freddo (Figura 59).

I fattori di conformità (CF) riportati in Tabella 19 risultano tutti maggiori di 1 tranne il NEDC cold eseguito in laboratorio.



**Figura 59: Confronto pista/laboratorio per la Fiat 500L**

	Laboratorio				Pista	
	NEDC COLD	NEDC WARM	NEDC COLD REVERSE	NEDC WARM REVERSE	NEDC COLD_70	NEDC WARM_70
<b>CF</b>	0,84	2,87	1,59	2,14	1,18	2,46

**Tabella 19: Fattori di conformità per Fiat 500L**



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## **Conclusioni**

Il protocollo sviluppato ed adottato al fine di verificare il comportamento emissivo di veicoli Diesel rispondenti allo standard Euro 5, e per cercare di evidenziare comportamenti emissivi anomali per quanto riguarda gli Ossidi di Azoto (NOx), ha previsto l'esecuzione del ciclo di guida di omologazione standard (NEDC, in condizioni di partenza a freddo e a caldo) e di un ciclo modificato (ciclo NEDC reverse) con partenza a freddo, con il veicolo installato sul banco a rulli. Questi cicli sono stati eseguiti con tutti i veicoli, sia quelli provati presso il laboratorio di CNR-IM che quelli provati presso i laboratori FCA di Torino per conto del CPA Torino.

Inoltre sono state effettuate anche altre tipologie di prova come il ciclo reale URBAN, test a velocità costante ed il ciclo NEDC Reverse con partenza a caldo con lo scopo di valutare il comportamento emissivo in condizioni o più rappresentative della guida reale (Urban) o di confronto in funzione delle condizioni di partenza (ciclo NEDC Reverse warm).

Questi cicli non sono stati eseguiti con tutte le vetture.

Riassumendo le prove effettuate:

CICLO NEDC A FREDDO ( $T=20\div 30^{\circ}\text{C}$ ), sia CNR-IM che CPA Torino;  
CICLO NEDC A CALDO ( $T_{\text{olio}} > 80^{\circ}\text{C}$ ), sia CNR-IM che CPA Torino;  
CICLO NEDC REVERSE A FREDDO ( $T=20\div 30^{\circ}\text{C}$ ), sia CNR-IM che CPA Torino;

CICLO ARTEMIS URBAN, solo CNR-IM;  
PROVE A VELOCITA' COSTANTE (da 10 a 130 km/h), solo CNR-IM;  
CICLO NEDC REVERSE A CALDO ( $T_{\text{olio}} > 80^{\circ}\text{C}$ ), solo CPA Torino.

Al fine poi di valutare un'eventuale differenza di comportamento della gestione motore tra prove effettuate sul banco a rulli e normale uso del veicolo su strada, i veicoli sono stati strumentati ed alcuni dei test eseguiti sul banco a rulli sono stati ripetuti su pista (anche se con qualche modifica).

CICLO NEDC A FREDDO ( $T=20\div 30^{\circ}\text{C}$ ) fino a 70 km/h, sia CNR-IM che CPA Torino;  
CICLO NEDC A CALDO ( $T_{\text{olio}} > 80^{\circ}\text{C}$ ) fino a 70 km/h, sia CNR-IM che CPA Torino;

PROVE A VELOCITA' COSTANTE (da 10 a 70 km/h), solo CNR-IM.



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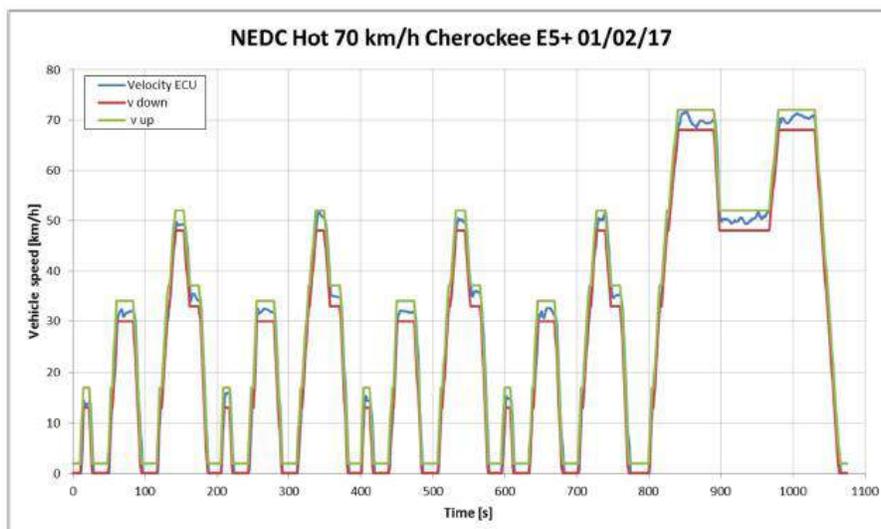
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Le prove su pista sono state eseguite da parte dell'Istituto Motori sulla pista N. 20 del CENTRO POLIFUNZIONALE DI SPERIMENTAZIONE (CEPOLISPE) dell'Esercito a Montelibretti (Roma) nei mesi di giugno e luglio 2016.

Le prove effettuate sui veicoli FCA per conto del CPA di Torino sono state eseguite sulla pista Balocco di FCA (luglio 2016) e sulla pista di Nardò (gennaio e primi di febbraio 2017) utilizzando una strumentazione PEMS convenzionale.

In particolare, la ripetizione del ciclo di prova di omologazione (NEDC Cold) su pista e i conseguenti risultati paragonati con quelli ottenuti in laboratorio in condizioni simili, si è rivelato uno dei test più significativi per verificare la presenza o meno sul veicolo di dispositivi (vietati) in condizione di “abbassare il livello emissivo” soltanto nel corso delle prove di omologazione (circostanza che si realizza, secondo le ammissioni dei responsabili, nel caso dei veicoli del Gruppo VW).

Il primo risultato è che i cicli su pista sono ben riprodotti dai drivers (meno di 5 errori sul ciclo NEDC 70, cioè fino al secondo tratto della fase extra-urbana EUDC con velocità massima di 70 km/h e quindi senza raggiungere i 120 km/h). Si riporta in Figura 60 un profilo di velocità seguito sulla pista di Nardò durante un test con il Cherokee 2.0.



**Figura 60: Profilo di velocità realizzato durante una prova su pista con Cherokee 2.0**

L'analisi dei parametri motoristici mostra una buona riproducibilità in termini di numero di giri, portata d'aria, posizione pedale dell'acceleratore e portata combustibile delle prove su pista rispetto a quelle di laboratorio, a parità di ciclo di guida.



Sono i parametri ambientali a divergere talvolta (T e umidità ambiente) ed è diversa l'azione di raffreddamento sul motore dovuta al moto su pista del veicolo rispetto al ventilatore posizionato in laboratorio di fronte alla vettura.

Il parametro più variabile tra prove in laboratorio e su pista è stato la temperatura dell'aria di aspirazione che può influenzare notevolmente il funzionamento dell'EGR per il controllo degli NOx. Molte volte la temperatura dell'aria di aspirazione in laboratorio è risultata essere maggiore di quella misurata su pista, specialmente quando si effettuano più cicli consecutivamente.

Il secondo aspetto da evidenziare è che mediamente il comportamento del veicolo in termini di emissioni di NOx durante le prove di laboratorio viene rispettato su pista. Un veicolo con basse emissioni di NOx durante un ciclo a freddo in laboratorio rimane un veicolo basso emissivo se guidato ovviamente in condizioni simili (carico simile, assenza di salite/discese etc.) su strada.

La strumentazione non convenzionale utilizzata nei test su pista ha dato i risultati attesi: facilità di installazione, scarsi consumi energetici, basso contributo al peso del veicolo (circa 35 kg), e buona rispondenza con strumentazione convenzionale da laboratorio. Può essere utilizzata per uno screening sulle emissioni di NOx senza dovere installare una strumentazione standard PEMS. Risulta fondamentale però acquisire una serie di parametri motoristici per poter effettuare confronti, correlazioni e valutazioni rispetto ai valori emissivi misurati.

Sono state evidenziate due tipologie di comportamento per quanto concerne le emissioni di NOx:

1. Veicoli che nei cicli con partenza a caldo (nel nostro caso  $T_{olio} > 80^{\circ}\text{C}$ ) mostrano emissioni di NOx molto più alte (2-4 volte) di quelle rilasciate nello stesso ciclo con partenza a freddo. Probabilmente in condizioni di partenza a freddo (previste dall'attuale ciclo di omologazione NEDC) viene utilizzata una differente calibrazione motore [5]. Il comportamento rimane lo stesso sia se il veicolo viene provato sul banco a rulli che su pista.
2. Veicoli particolarmente sensibili alle condizioni di temperatura dell'aria di aspirazione. Nel corso di questa sperimentazione, in particolare condotta su pista nella stagione estiva, si sono osservati alcuni comportamenti alto emissivi per  $T > 30^{\circ}\text{C}$  [6, 7]. Non si è riusciti invece a condurre test con  $T < 18^{\circ}\text{C}$ . Diversi studi hanno evidenziato un funzionamento limitato o una chiusura dell'EGR in corrispondenza di basse temperature ambiente ( $< 15^{\circ}\text{C}$ ) [8,9].



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Sulla base dei risultati di prova ad oggi disponibili non siamo in grado di determinare la presenza di un dispositivo defeat device vietato [10, 11].

I due veicoli VW provati si comportano secondo la tipologia N. 1 e sono risultati in linea con le emissioni di altri costruttori [12].

Tutti i veicoli provati sul ciclo di guida reale Urban molto dinamico, caratterizzato da elevate accelerazioni e dunque notevoli richieste di carico, hanno mostrato elevate emissioni di NOx. Infatti durante questo ciclo, alle temperature regimate del motore si aggiunge l'utilizzo parziale dell'EGR nelle condizioni di elevato carico imposte dal ciclo stesso.



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**Allegato A – Caratteristiche tecniche dei veicoli testati**

<b>SCHEDA DEL VEICOLO MIT- 01 e 02</b>	
<b>Data ricevimento veicolo in IM-CNR</b>	23/11/2015
<b>Codice Identificativo Interno IM-CNR</b>	MIT-01 e MIT-02
<b>Costruttore del veicolo</b>	Volkswagen
<b>Categoria del veicolo</b>	M1
<b>Modello del veicolo (nome commerciale)</b>	Tiguan
<b>Tipo/Variante/Versione</b>	
<b>VIN (Vehicle Identification Number)</b>	WVGZZZ5NZFW614662
<b>Codice motore</b>	CFFD
<b>Chilometraggio alla consegna [km]</b>	45
<b>Cilindrata [cc]</b>	1968
<b>Max potenza [kW]</b>	81
<b>Massima coppia [Nm]</b>	280
<b>Massima velocità [km/h]</b>	175
<b>Tipo di trasmissione</b>	Manuale
<b>Tipo di trazione</b>	Anteriore
<b>Start&amp;Stop</b>	SI
<b>Sistema after-treatment</b>	BLOCCO DOC+cDPF
<b>Sistema EGR</b>	SI
<b>Massa di riferimento [kg]</b>	1511
<b>Standard emissivo</b>	Euro 5b
<b>Inerzia equivalente [kg]</b>	1700
<b>Parametri stradali da simulare [N, N/(km/h), N/(km/h)^2]</b>	F0= 7.9, F2=0.0536N/(km/h)^2
<b>Ciclo di omologazione</b>	NEDC
<b>Valore di omologazione CO [g/km]</b>	
<b>Valore di omologazione NOx [g/km]</b>	
<b>Valore di omologazione HC+NOx [g/km]</b>	
<b>Valore di omologazione PM [mg/km]</b>	
<b>Valore di omologazione PN [# /km]</b>	
<b>Valore di omologazione CO<sub>2</sub> UDC/EUDC/NEDC[g/km]</b>	165/126/139
<b>Valore di omologazione consumi UDC/EUDC/NEDC[g/km]</b>	6,8/4,8/5,3

**Tabella A1: Scheda con le caratteristiche dei veicoli VW Tiguan**

**SCHEDA DEL VEICOLO MIT-03**

<b>Data ricevimento veicolo in IM-CNR</b>	22/03/2016
<b>Codice Identificativo Interno IM-CNR</b>	MIT-03
<b>Costruttore del veicolo</b>	BMW
<b>Categoria del veicolo</b>	M1/ Station vagon
<b>Modello del veicolo (nome commerciale)</b>	1 serie - 118d
<b>Tipo/Variante/Versione</b>	1K4/1C11/5A250000
<b>VIN (Vehicle Identification Number)</b>	WBA1C11020J835721
<b>Codice motore</b>	N47D20C
<b>Chilometraggio alla consegna [km]</b>	97
<b>Cilindrata [cc]</b>	1995
<b>Max potenza [kW]</b>	105 a 4000 rpm
<b>Massima velocità [km/h]</b>	212
<b>Tipo di trasmissione</b>	Automatica
<b>Tipo di trazione</b>	Posteriore
<b>Start&amp;Stop</b>	SI
<b>Sistema after-treatment</b>	BLOCCO DOC+cDPF
<b>Sistema EGR</b>	SI fino al max 50%
<b>Massa di riferimento [kg]</b>	1530
<b>Standard emissivo</b>	Euro 5b
<b>Inerzia equivalente [kg]</b>	1470
<b>Parametri stradali da simulare [N, N/(km/h), N/(km/h)^2]</b>	168,5/-0,528/0,0357
<b>Ciclo di omologazione</b>	NEDC
<b>Valore di omologazione CO [g/km]</b>	0,2583
<b>Valore di omologazione NOx [g/km]</b>	0,1315
<b>Valore di omologazione HC+NOx [g/km]</b>	0,1536
<b>Valore di omologazione PM [mg/km]</b>	0,06
<b>Valore di omologazione PN [# /km]</b>	0.01*10 <sup>11</sup>
<b>Valore di omologazione CO<sub>2</sub> UDC/EUDC/NEDC[g/km]</b>	140/102/116
<b>Valore di omologazione consumi UDC/EUDC/NEDC[g/km]</b>	5,3/3,9/4,4

**Tabella A2: Scheda con le caratteristiche del veicolo BMW 118d**

**SCHEDA DEL VEICOLO MIT-04**

<b>Data ricevimento veicolo in IM-CNR</b>	31/03/2016
<b>Codice Identificativo Interno IM-CNR</b>	MIT-04
<b>Costruttore del veicolo</b>	Ford
<b>Categoria del veicolo</b>	M1/ BERLINA
<b>Modello del veicolo (nome commerciale)</b>	Focus
<b>Tipo/Variante/Versione</b>	DYB/T3DA15/5DAAMC
<b>VIN (Vehicle Identification Number)</b>	WF05XXGCC5EA26317
<b>Codice motore</b>	T3DA
<b>Chilometraggio alla consegna [km]</b>	1800
<b>Cilindrata [cc]</b>	1596
<b>Max potenza [kW]</b>	70 a 3600 rpm
<b>Massima velocità [km/h]</b>	180
<b>Tipo di trasmissione</b>	Manuale
<b>Tipo di trazione</b>	Anteriore
<b>Start&amp;Stop</b>	NO
<b>Sistema after-treatment</b>	BLOCCO DOC+cDPF
<b>Sistema EGR</b>	SI
<b>Massa di riferimento [kg]</b>	1360
<b>Standard emissivo</b>	Euro 5b
<b>Inerzia equivalente [kg]</b>	1360
<b>Parametri stradali da simulare [N, N/(km/h), N/(km/h)^2]</b>	33/0.8094/0.0297
<b>Ciclo di omologazione</b>	NEDC
<b>Valore di omologazione CO [g/km]</b>	0.189
<b>Valore di omologazione NOx [g/km]</b>	0.1653
<b>Valore di omologazione HC+NOx [g/km]</b>	0.1848
<b>Valore di omologazione PM [mg/km]</b>	0.55
<b>Valore di omologazione PN [# /km]</b>	3.090e+11
<b>Valore di omologazione CO<sub>2</sub> UDC/EUDC/NEDC [g/km]</b>	150/98/117
<b>Valore di omologazione consumi UDC/EUDC/NEDC [g/km]</b>	5.7/3.7/4.5

**Tabella A3: Scheda con le caratteristiche del veicolo Ford Focus**

**SCHEDA DEL VEICOLO MIT-05**

<b>Data ricevimento veicolo in IM-CNR</b>	31/03/2016
<b>Codice Identificativo Interno IM-CNR</b>	MIT-05
<b>Costruttore del veicolo</b>	Ford
<b>Categoria del veicolo</b>	M1
<b>Modello del veicolo (nome commerciale)</b>	S-Max
<b>Tipo/Variante/Versione</b>	WA6/TXWA1S/7HEAQG
<b>VIN (Vehicle Identification Number)</b>	WF0SXXGBWSEG20090
<b>Codice motore</b>	TXWA
<b>Chilometraggio alla consegna [km]</b>	1800
<b>Cilindrata [cc]</b>	1999
<b>Max potenza [kW]</b>	120 a 3750 rpm
<b>Massima velocità [km/h]</b>	194
<b>Tipo di trasmissione</b>	Manuale
<b>Tipo di trazione</b>	Anteriore
<b>Start&amp;Stop</b>	NO
<b>Sistema after-treatment</b>	BLOCCO DOC+cDPF
<b>Sistema EGR</b>	SI
<b>Massa di riferimento [kg]</b>	1700
<b>Standard emissivo</b>	Euro 5b
<b>Inerzia equivalente [kg]</b>	1700
<b>Parametri stradali da simulare [N, N/(km/h), N/(km/h)^2]</b>	102.49/1.3922/0.0267
<b>Ciclo di omologazione</b>	NEDC
<b>Valore di omologazione CO [g/km]</b>	0.3565
<b>Valore di omologazione NOx [g/km]</b>	0.1722
<b>Valore di omologazione HC+NOx [g/km]</b>	0.2273
<b>Valore di omologazione PM [mg/km]</b>	0.15
<b>Valore di omologazione PN [# /km]</b>	3.090e+11
<b>Valore di omologazione CO<sub>2</sub> UDC/EUDC/NEDC [g/km]</b>	170/122/139
<b>Valore di omologazione consumi UDC/EUDC/NEDC [g/km]</b>	6.5/4.7/5.3

**Tabella A4: Scheda con le caratteristiche del veicolo Ford S-Max**

**SCHEDA DEL VEICOLO MIT-06**

<b>Data ricevimento veicolo in IM-CNR</b>	02/05/2016
<b>Codice Identificativo Interno IM-CNR</b>	MIT-06
<b>Costruttore del veicolo</b>	Mercedes
<b>Categoria del veicolo</b>	M1
<b>Modello del veicolo (nome commerciale)</b>	CLA 200 CDI
<b>Tipo/Variante/Versione</b>	245G/2308M2/MZAAB543
<b>VIN (Vehicle Identification Number)</b>	WDD1173011N119033
<b>Codice motore</b>	651901
<b>Chilometraggio alla consegna [km]</b>	1296
<b>Cilindrata [cc]</b>	1796
<b>Max potenza [kW]</b>	100 a 4400 rpm
<b>Massima velocità [km/h]</b>	220
<b>Tipo di trasmissione</b>	Automatica
<b>Tipo di trazione</b>	Posteriore
<b>Start&amp;Stop</b>	SI
<b>Sistema after-treatment</b>	BLOCCO DOC+cDPF
<b>Sistema EGR</b>	SI
<b>Massa di riferimento [kg]</b>	1530
<b>Standard emissivo</b>	Euro 5b
<b>Inerzia equivalente [kg]</b>	1470
<b>Parametri stradali da simulare [N, N/(km/h), N/(km/h)^2]</b>	F0=113 N, F1=0N/(km/h), F2=0,034 N/(km/h) <sup>2</sup>
<b>Ciclo di omologazione</b>	NEDC
<b>Valore di omologazione CO [g/km]</b>	0.226
<b>Valore di omologazione NOx [g/km]</b>	0.159
<b>Valore di omologazione HC+NOx [g/km]</b>	0.178
<b>Valore di omologazione PM [mg/km]</b>	0.45
<b>Valore di omologazione PN [# /km]</b>	1,580E+09
<b>Valore di omologazione CO<sub>2</sub> UDC/EUDC/NEDC[g/km]</b>	137,0/111,0/118,0
<b>Valore di omologazione consumi UDC/EUDC/NEDC[g/km]</b>	5,2/4,2/4,5

**Tabella A5: Scheda con le caratteristiche del veicolo Mercedes CLA200**

**SCHEDA DEL VEICOLO MIT-07**

<b>Data ricevimento veicolo in IM-CNR</b>	02/05/2016
<b>Codice Identificativo Interno IM-CNR</b>	MIT-07
<b>Costruttore del veicolo</b>	Mercedes
<b>Categoria del veicolo</b>	M1
<b>Modello del veicolo (nome commerciale)</b>	Classe E 220 CDI
<b>Tipo/Variante/Versione</b>	212K/J2S2M0/NZC B501
<b>VIN (Vehicle Identification Number)</b>	WDD2122021A808470
<b>Codice motore</b>	651924
<b>Chilometraggio alla consegna [km]</b>	1420
<b>Cilindrata [cc]</b>	2143
<b>Max potenza [kW]</b>	125 a 4200 rpm
<b>Massima velocità [km/h]</b>	216
<b>Tipo di trasmissione</b>	Automatica
<b>Tipo di trazione</b>	Posteriore
<b>Start&amp;Stop</b>	SI
<b>Sistema after-treatment</b>	BLOCCO DOC+cDPF
<b>Sistema EGR</b>	SI
<b>Massa di riferimento [kg]</b>	1820
<b>Standard emissivo</b>	Euro 5b
<b>Inerzia equivalente [kg]</b>	1810
<b>Parametri stradali da simulare [N, N/(km/h), N/(km/h)^2]</b>	107N/1,68N/(km/h)/0,0253N/(km/h)^2
<b>Ciclo di omologazione</b>	NEDC
<b>Valore di omologazione CO [g/km]</b>	0.935
<b>Valore di omologazione NOx [g/km]</b>	0.148
<b>Valore di omologazione HC+NOx [g/km]</b>	0.160
<b>Valore di omologazione PM [mg/km]</b>	0.23
<b>Valore di omologazione PN [# /km]</b>	2,420E+10
<b>Valore di omologazione CO<sub>2</sub> UDC/EUDC/NEDC[g/km]</b>	169,0/124,0/141,0
<b>Valore di omologazione consumi UDC/EUDC/NEDC[g/km]</b>	6,4/4,7/5,4

**Tabella A6: Scheda con le caratteristiche del veicolo Mercedes E220**

**SCHEDA DEL VEICOLO MIT-08**

<b>Data ricevimento veicolo in IM-CNR</b>	30/05/2016
<b>Codice Identificativo Interno IM-CNR</b>	MIT-08
<b>Costruttore del veicolo</b>	Opel
<b>Categoria del veicolo</b>	M1
<b>Modello del veicolo (nome commerciale)</b>	Astra
<b>Tipo/Variante/Versione</b>	SEDAN
<b>VIN (Vehicle Identification Number)</b>	W0LPE6ENXFG151062
<b>Codice motore</b>	A20DTH
<b>Chilometraggio alla consegna [km]</b>	5500
<b>Cilindrata [cc]</b>	1956
<b>Max potenza [kW]</b>	118 a 4000 rpm
<b>Massima velocità [km/h]</b>	209
<b>Tipo di trasmissione</b>	Manuale
<b>Tipo di trazione</b>	Anteriore
<b>Start&amp;Stop</b>	NO
<b>Sistema after-treatment</b>	BLOCCO DOC+cDPF
<b>Sistema EGR</b>	SI
<b>Massa di riferimento [kg]</b>	
<b>Standard emissivo</b>	Euro 5b
<b>Inerzia equivalente [kg]</b>	1470
<b>Parametri stradali da simulare [N, N/(km/h), N/(km/h)^2]</b>	F0= 78,9 N, F1=0,383N/(km/h), F2= 0,03297 N/(km/h)^2
<b>Ciclo di omologazione</b>	NEDC
<b>Valore di omologazione CO [g/km]</b>	0.353
<b>Valore di omologazione NOx [g/km]</b>	0.120
<b>Valore di omologazione HC+NOx [g/km]</b>	0.153
<b>Valore di omologazione PM [mg/km]</b>	0.18
<b>Valore di omologazione PN [# /km]</b>	1,210E+09
<b>Valore di omologazione CO<sub>2</sub> UDC/EUDC/NEDC[g/km]</b>	157,0/105,0/124,0
<b>Valore di omologazione consumi UDC/EUDC/NEDC[g/km]</b>	5,9/4,0/4,7

**Tabella A7: Scheda con le caratteristiche del veicolo Opel Astra**

**SCHEDA DEL VEICOLO MIT-09**

<b>Data ricevimento veicolo in IM-CNR</b>	22/06/2016
<b>Codice Identificativo Interno IM-CNR</b>	MIT-09
<b>Costruttore del veicolo</b>	Dacia
<b>Categoria del veicolo</b>	M1
<b>Modello del veicolo (nome commerciale)</b>	Sandero
<b>Tipo/Variante/Versione</b>	Stepway//5SDCLC
<b>VIN (Vehicle Identification Number)</b>	UU15SDCLC49639484
<b>Codice motore</b>	K9KC6
<b>Chilometraggio alla consegna [km]</b>	1200
<b>Cilindrata [cc]</b>	1500
<b>Max potenza [kW]</b>	66
<b>Massima velocità [km/h]</b>	160
<b>Tipo di trasmissione</b>	Manuale
<b>Tipo di trazione</b>	Anteriore
<b>Start&amp;Stop</b>	NO
<b>Sistema after-treatment</b>	BLOCCO DOC+cDPF
<b>Sistema EGR</b>	SI
<b>Massa di riferimento [kg]</b>	1123
<b>Standard emissivo</b>	Euro 5b
<b>Inerzia equivalente [kg]</b>	1130
<b>Parametri stradali da simulare [N, N/(km/h), N/(km/h)^2]</b>	60.239/0.6118/0.0406
<b>Ciclo di omologazione</b>	NEDC
<b>Valore di omologazione CO [g/km]</b>	0.1559
<b>Valore di omologazione NOx [g/km]</b>	0.1193
<b>Valore di omologazione HC+NOx [g/km]</b>	0.1349
<b>Valore di omologazione PM [mg/km]</b>	0.02
<b>Valore di omologazione PN [# /km]</b>	7.4e+10
<b>Valore di omologazione CO<sub>2</sub> UDC/EUDC/NEDC[g/km]</b>	120/98/105
<b>Valore di omologazione consumi UDC/EUDC/NEDC[g/km]</b>	4.6/3.7/4.0

**Tabella A8: Scheda con le caratteristiche del veicolo Dacia Sandero**

**SCHEDA DEL VEICOLO MIT-10**

<b>Data ricevimento veicolo in IM-CNR</b>	04/07/2016
<b>Codice Identificativo Interno IM-CNR</b>	MIT-10
<b>Costruttore del veicolo</b>	Renault
<b>Categoria del veicolo</b>	M1
<b>Modello del veicolo (nome commerciale)</b>	New Laguna
<b>Tipo/Variante/Versione</b>	Berlina/BT12C6
<b>VIN (Vehicle Identification Number)</b>	VF1BT12C652776749
<b>Codice motore</b>	K9K R8
<b>Chilometraggio alla consegna [km]</b>	4000
<b>Cilindrata [cc]</b>	1461
<b>Max potenza [kW]</b>	81 @4000rpm
<b>Massima velocità [km/h]</b>	192
<b>Tipo di trasmissione</b>	Manuale/6M
<b>Tipo di trazione</b>	Anteriore
<b>Start&amp;Stop</b>	SI
<b>Sistema after-treatment</b>	BLOCCO DOC+cDPF
<b>Sistema EGR</b>	SI
<b>Massa di riferimento [kg]</b>	1485
<b>Standard emissivo</b>	Euro 5b
<b>Inerzia equivalente [kg]</b>	1470
<b>Parametri stradali da simulare [N, N/(km/h), N/(km/h)^2]</b>	F0=85,797; F1=0.8713; F2=0.0315
<b>Ciclo di omologazione</b>	NEDC
<b>Valore di omologazione CO [g/km]</b>	0,1766
<b>Valore di omologazione NOx [g/km]</b>	0,1119
<b>Valore di omologazione HC+NOx [g/km]</b>	0,128
<b>Valore di omologazione PM [mg/km]</b>	0,83
<b>Valore di omologazione PN [# /km]</b>	0,01*10 <sup>11</sup>
<b>Valore di omologazione CO<sub>2</sub> UDC/EUDC/NEDC[g/km]</b>	132/104/114
<b>Valore di omologazione consumi UDC/EUDC/NEDC[g/km]</b>	5/3.9/4.3

**Tabella A9: Scheda con le caratteristiche del veicolo Renault Laguna**

**SCHEDA DEL VEICOLO MIT-011**

<b>Data ricevimento veicolo in IM-CNR</b>	04/07/2016
<b>Codice Identificativo Interno IM-CNR</b>	MIT-011
<b>Costruttore del veicolo</b>	Renault
<b>Categoria del veicolo</b>	M1
<b>Modello del veicolo (nome commerciale)</b>	Clio
<b>Tipo/Variante/Versione</b>	
<b>VIN (Vehicle Identification Number)</b>	VF15R040H55223300
<b>Codice motore</b>	K9KC6
<b>Chilometraggio alla consegna [km]</b>	3247
<b>Cilindrata [cc]</b>	1461
<b>Max potenza [kW]</b>	55
<b>Massima velocità [km/h]</b>	170
<b>Tipo di trasmissione</b>	Manuale
<b>Tipo di trazione</b>	Anteriore
<b>Start&amp;Stop</b>	NO
<b>Tipologia di pneumatici</b>	Bridgestone, Ecopia, 185/65R15
<b>Sistema after-treatment</b>	BLOCCO DOC+cDPF
<b>Sistema EGR</b>	SI
<b>Massa di riferimento [kg]</b>	<1280
<b>Standard emissivo</b>	Euro 5b
<b>Inerzia equivalente [kg]</b>	1130
<b>Parametri stradali da simulare [N, N/(km/h), N/(km/h)^2]</b>	F0= 57.128, F1=0.5287N/(km/h), F2= 0,0289 N/(km/h)^2
<b>Ciclo di omologazione</b>	NEDC
<b>Valore di omologazione CO [g/km]</b>	0,0711
<b>Valore di omologazione NOx [g/km]</b>	0,1427
<b>Valore di omologazione HC+NOx [g/km]</b>	0,1525
<b>Valore di omologazione PM [mg/km]</b>	0,02
<b>Valore di omologazione PN [# /km]</b>	0,01*10 <sup>11</sup>
<b>Valore di omologazione CO<sub>2</sub> UDC/EUDC/NEDC[g/km]</b>	113/85/95
<b>Valore di omologazione consumi UDC/EUDC/NEDC[g/km]</b>	4.3/3.2/3.6

**Tabella A10: Scheda con le caratteristiche del veicolo Renault Clio**



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**Allegato B – Test report – Prova di Tipo 1**

*TEST REPORT: Valutazioni emissioni e consumi (Euro 5)  
Regolamento (EC) N° 692/2008*

**TEST REQUIREMENTS**

**PROVA DI TIPO 1 (Emissioni allo scarico dopo una partenza a freddo)**

**Equipaggiamento laboratorio Emissioni Istituto Motori CNR**

<b>Sala Emissioni E3</b>	<b>Costruttore</b>	<b>Tipo</b>
<b>Banco a rulli</b>	Schenk	Monorullo 62” - freno a c.c.
<b>CVS</b>	NOVA-MMB Messtechnik	PDP
<b>Blower</b>		Velocità variabile
<b>Analizzatore di gas</b>	Horiba	Mexa 7200H
<b>Campionatore PM</b>	TCR Tecora	Bravo M Plus
<b>Analizzatore PN</b>	TSI	CPC

**Metodo per settare il carico:**

Annex 4, Appendice 3	Simulazione del carico stradale tramite coast-down		<b>SI</b>	



**Allegato C – Parametri centralina motore**

VW Tiguan	BMW 118d	Ford Focus	Ford Smax	Mercedes CLA	Mercedes E	Opel Astra	Dacia Sandero	Renault Clio	Renaul Laguna
Consumo di carburante [l/h]	Flusso massa d'aria effettiva [mg/ciclo]	Coppia del motore calcolata [Nm]	Coppia del motore calcolata [Nm]	Attuatore del ricircolo dei gas di scarico [%]	Attuatore del ricircolo dei gas di scarico [%]	posizione pedale acceleratore [%]	Coppia motrice [N/m]	Coppia motrice [N/m]	Portata d'aria calcolata [kg/h]
Posizione della valvola a farfalla assoluta [%]	Regime motore [rpm]	EGR comandato [%]	EGR comandato [%]	Massa aria [mg/ciclo]	Massa aria [mg/ciclo]	pressione di combustione massima nel cilindro 4 [bar]	portata linea di scarico [g/s]	Portata d'aria calcolata [kg/h]	portata linea di scarico [g/s]
Regime motore [rpm]	Segnale attuatore EGR per funzionamento ad alta pressione [%]	Flusso massa aria [g/s]	Flusso aria misurato dal sensore MAF [g/s]	Quantità iniettata [mg/ciclo]	Quantità iniettata [mg/ciclo]	pressione differenziale FAP [mbar]	Posizione EGR [%]	Posizione EGR [%]	potenziometro EGR [V]
Temperatura aria aspirata [°C]	Segnale attuatore EGR per funzionamento a bassa pressione [%]	Numero di giri motore [rpm]	Giro Motore al Minuto [rpm]	regime motore [rpm]	regime motore [rpm]	regime motore [rpm]	posizione pedale acceleratore [%]	Portata d'aria nominale [mg/ciclo]	Regime Motore [rpm]
Temperatura dell'olio motore [°C]	Temperatura dell'aria aspirata [°C]	Pressione differenziale gas di scarico [mbar]	Posizione pedale acceleratore D [%]	sensore pedale acceleratore [%]	sensore pedale acceleratore [%]	sensore 1 temperatura aria di aspirazione [°C]	sensore temperatura aria di aspirazione [V]	Temperatura acqua [°C]	Temperatura carburante [°C]
Valore effettivo massa d'aria [g/s]	Temperatura del carburante [°C]	Temperatura aria aspirata 2 [°C]	Temperatura dell'aria aspirata [°C]	sensore temperatura aria di aspirazione [°C]	sensore temperatura aria di aspirazione [°C]	sensore flusso massa d'aria [g/s]	Temperatura a monte catalizzatore [°C]	Temperatura a monte catalizzatore [°C]	Temperatura liquido di raffreddamento motore [°C]
Valore effettivo valvola di ricircolo gas di scarico [%]	Temperatura del liquido di raffreddamento [°C]	Temperatura refrigerante motore [°C]	Temperatura refrigerante motore [°C]	Temperatura olio [°C]	Temperatura olio [°C]	sensore posizione EGR [%]	Temperatura a monte del parzializzatore di aspirazione [°C]	Temperatura a monte del parzializzatore di aspirazione [°C]	Temperatura aria aspirata [°C]
velocità del veicolo [km/h]	Temperatura gas di scarico a monte del catalizzatore [°C]	Velocità veicolo - Alta risoluzione [miglia/h]	Velocità veicolo - Alta risoluzione [km/h]	Velocità veicolo [km/h]	Velocità veicolo [km/h]	velocità veicolo [km/h]	velocità veicolo [km/h]	velocità veicolo [km/h]	velocità veicolo [km/h]

**Tabella C: Parametri acquisiti da centralina per ogni veicolo provato in IM-CNR**



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## **Allegato D – Test report di tutte le prove sperimentali svolte nel laboratorio IM-CNR**

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# ISTITUTO MOTORI

Consiglio Nazionale delle Ricerche

## 1. BMW 118d

ISTITUTO MOTORI		Consiglio Nazionale delle Ricerche		
Vehicle Emission Laboratory E3 - Istituto Motori CNR				
Project: MIT_2016				
Test: NEDC cold				
Vehicle	<b>BMW 118d</b>	Date [dd/mm/yy]	08/04/16	
VIN	WBA1C11020J835721	Test n.	1	
Engine type	2000cm3-105 kW	Driver	A.S.	
Engine code	N47D20C	Odometer [km]	132	
Gear shift	automatic			
Start&Stop	YES		Testcarried out in	
Tyres	195/55 R16 87W	Notes	"Dyno Mode" ON	
Inerzia [kg]	1470			
<b>ROAD SETTINGS</b>				
f0 [N]	168,5			
f1 [N/km/h]	-0,528			
f2 [N/(km/h) <sup>2</sup> ]	0,0357			
Weather data		Phase 1: UDC	Phase 2: EUDC	
Temperature [°C]		23,1	23,6	
Pressure [kPa]		102,1	102,1	
Humidity [%]		37	36,00	
kh		0,890	0,877	
Dati del test		Phase 1: UDC	Phase 2: EUDC	
Toil start engine [°C]		21,0		
V mix Nm3		67,2	38,8	
Distance [km]		4,000	7,023	
HC gas dil. [ppmC]		5,20	4,30	
HC air dil. [ppmC]		4,15	4,20	
CO gas dil. [ppm]		3,41	0,20	
CO air dil. [ppm]		0,15	0,20	
NOx gas dil. [ppm]		3,05	12,60	
NOx air dil. [ppm]		0,50	0,30	
CO2 gas dil. [%]		0,540	1,028	
CO2 air dil. [%]		0,060	0,060	
Test results		Phase 1: UDC	Phase 2: EUDC	
Dilution Factor (DF)		24,78	13,03	
HC [g/phase]		0,051	0,010	
CO [g/phase]		0,274	0,001	
NOx [g/phase]		0,315	0,860	
CO2 [g/phase]		641,7	746,4	
HC [mg/km]		12,75	1,45	
CO [mg/km]		68,61	0,11	
NOx [mg/km]		78,80	122,47	
CO2 [g/km]		160,4	106,3	
Fuel economy [l/100km]		6,06	4,01	
NEDC cold results				
HC	CO	NOx	CO2	Fuel economy
[mg/km]	[mg/km]	[mg/km]	[g/km]	[l/100km]
<b>5,55</b>	<b>24,97</b>	<b>106,62</b>	<b>125,9</b>	<b>4,8</b>
PM	PN			
[mg/km]	[pt/km]			
<b>0,67</b>	<b>4,71E+10</b>			





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**Vehicle Emission Laboratory E3 - Istituto Motori CNR**

**Project: MIT\_2016**

**Test: NEDC warm**

Vehicle	<b>BMW 118d</b>	Date [dd/mm/yy]	08/04/16
VIN	WBA1C11020J835721	Test n.	2
Engine type	2000cm3-105 kW	Driver	A.S.
Engine code	N47D20C	Odometer [km]	143
Gear shift	automatic		
Start&Stop	YES	Notes	Testcarried out in
Tyres	195/55 R16 87W		"Dyno Mode" ON

Inerzia [kg] 1470

**ROAD SETTINGS**

f0 [N] 168,5  
f1 [N/km/h] -0,528  
f2 [N/(km/h)<sup>2</sup>] 0,0357

Weather data	Phase 1: UDC	Phase 2: EUDC
Temperature [°C]	25,5	25,9
Pressure [kPa]	102,3	102,3
Humidity [%]	34	33,00
kh	0,890	0,891

Dati del test	Phase 1: UDC	Phase 2: EUDC
Toil start engine [°C]	85,0	
V mix Nm3	66,7	38,4
Distance [km]	4,000	7,023
HC gas dil. [ppmC]	4,20	3,90
HC air dil. [ppmC]	4,10	3,80
CO gas dil. [ppm]	0,72	0,87
CO air dil. [ppm]	0,38	0,84
NOx gas dil. [ppm]	5,60	13,80
NOx air dil. [ppm]	0,10	0,10
CO2 gas dil. [%]	0,473	1,001
CO2 air dil. [%]	0,049	0,047

Test results	Phase 1: UDC	Phase 2: EUDC
Dilution Factor (DF)	28,33	13,38
HC [g/phase]	0,010	0,009
CO [g/phase]	0,029	0,004
NOx [g/phase]	0,670	0,962
CO2 [g/phase]	561,5	727,0
HC [mg/km]	2,54	1,31
CO [mg/km]	7,26	0,63
NOx [mg/km]	167,46	136,95
CO2 [g/km]	140,4	103,5
Fuel economy [l/100km]	5,30	3,91

**NEDC warm results**

HC	CO	NOx	CO2	Fuel economy
[mg/km]	[mg/km]	[mg/km]	[g/km]	[l/100km]
<b>1,76</b>	<b>3,04</b>	<b>148,02</b>	<b>116,9</b>	<b>4,4</b>

PM	PN
[mg/km]	[pt/km]
<b>2,28</b>	<b>2,57E+10</b>





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**Vehicle Emission Laboratory E3 - Istituto Motori CNR**

**Project: MIT\_2016**

**Test: Artemis Urban**

Vehicle	<b>BMW 118d</b>	Date [dd/mm/yy]	08/04/16
VIN	WBA1C11020J835721	Test n.	3
Engine type	2000cm3-105 kW	Driver	A.S.
Engine code	N47D20C	Odometer [km]	154
Gear shift	automatic		
Start&Stop	YES	Notes	Testcarried out in
Tyres	195/55 R16 87W		"Dyno Mode" ON

Inerzia [kg] 1470

**ROAD SETTINGS**

f0 [N] 168,5  
f1 [N/km/h] -0,528  
f2 [N/(km/h)<sup>2</sup>] 0,0357

Weather data		Phase 1: URBAN	
Temperature [°C]		25,5	
Pressure [kPa]		101,1	
Humidity [%]		29	
kh		0,863	

Dati del test		Phase 1: URBAN	
Toil start engine [°C]		90,0	
V mix Nm3		77,9	
Distance [km]		4,480	
HC gas dil. [ppmC]		2,90	
HC air dil. [ppmC]		2,90	
CO gas dil. [ppm]		0,00	
CO air dil. [ppm]		0,00	
NOx gas dil. [ppm]		11,80	
NOx air dil. [ppm]		0,60	
CO2 gas dil. [%]		0,570	
CO2 air dil. [%]		0,059	

Test results		Phase 1: URBAN	
Dilution Factor (DF)		23,50	
HC [g/phase]		0,006	
CO [g/phase]		0,000	
NOx [g/phase]		1,547	
CO2 [g/phase]		791,2	
HC [mg/km]		1,34	
CO [mg/km]		0,00	
NOx [mg/km]		345,39	
CO2 [g/km]		176,6	
Fuel economy [l/100km]		6,66	

**Artemis URBAN results**

HC	CO	NOx	CO2	Fuel economy
[mg/km]	[mg/km]	[mg/km]	[g/km]	[l/100km]
<b>1,34</b>	<b>0,00</b>	<b>345,39</b>	<b>176,6</b>	<b>6,7</b>

PM	PN
[mg/km]	[pt/km]
<b>0,36</b>	<b>1,58E+11</b>





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**Project: MIT\_2016**

**Test: NEDC cold REVERSE**

Vehicle	<b>BMW 118d</b>	Date [dd/mm/yy]	11/04/16
VIN	WBA1C11020J835721	Test n.	4
Engine type	2000cm3-105 kW	Driver	A.S.
Engine code	N47D20C	Odometer [km]	215
Gear shift	automatic		
Start&Stop	YES		Testcarried out in
Tyres	195/55 R16 87W	Notes	"Dyno Mode" ON

Inerzia [kg] 1470  
**ROAD SETTINGS**  
 f0 [N] 168,5  
 f1 [N/km/h] -0,528  
 f2 [N/(km/h)<sup>2</sup>] 0,0357

Weather data	Phase 1: EUDC	Phase 2: UDC
Temperature [°C]	27,0	27,1
Pressure [kPa]	101,7	101,7
Humidity [%]	28	28,00
kh	0,870	0,870

Dati del test	Phase 1: EUDC	Phase 2: UDC
Toil start engine [°C]	21,0	
V mix Nm3	38,5	66,1
Distance [km]	7,020	4,020
HC gas dil. [ppmC]	4,70	3,65
HC air dil. [ppmC]	3,50	3,50
CO gas dil. [ppm]	7,00	0,00
CO air dil. [ppm]	0,00	0,00
NOx gas dil. [ppm]	12,60	3,25
NOx air dil. [ppm]	0,30	0,15
CO2 gas dil. [%]	1,082	0,468
CO2 air dil. [%]	0,055	0,054

Test results	Phase 1: EUDC	Phase 2: UDC
Dilution Factor (DF)	12,37	28,61
HC [g/phase]	0,036	0,011
CO [g/phase]	0,337	0,000
NOx [g/phase]	0,846	0,366
CO2 [g/phase]	785,2	543,5
HC [mg/km]	5,07	2,79
CO [mg/km]	48,00	0,00
NOx [mg/km]	120,54	91,10
CO2 [g/km]	111,9	135,2
Fuel economy [l/100km]	4,22	5,10

**NEDC cold REVERSE results**

HC	CO	NOx	CO2	Fuel economy
[mg/km]	[mg/km]	[mg/km]	[g/km]	[l/100km]
<b>4,24</b>	<b>30,52</b>	<b>109,82</b>	<b>120,4</b>	<b>4,5</b>

PM	PN
[mg/km]	[pt/km]
<b>n.a.</b>	<b>n.a.</b>





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**Project: MIT\_2016**

**Test: NEDC warm**

Vehicle	<b>BMW 118d</b>	Date [dd/mm/yy]	11/04/16
VIN	WBA1C11020J835721	Test n.	5
Engine type	2000cm3-105 kW	Driver	A.S.
Engine code	N47D20C	Odometer [km]	226
Gear shift	automatic		
Start&Stop	YES	Notes	Testcarried out in
Tyres	195/55 R16 87W		"Dyno Mode" ON

Inerzia [kg] 1470

**ROAD SETTINGS**

f0 [N] 168,5  
f1 [N/km/h] -0,528  
f2 [N/(km/h)<sup>2</sup>] 0,0357

Weather data		Phase 1: UDC	Phase 2: EUDC
Temperature	[°C]	25,3	25,7
Pressure	[kPa]	102,0	102,0
Humidity	[%]	35	35,00
kh		0,890	0,894

Dati del test		Phase 1: UDC	Phase 2: EUDC
Toil start engine	[°C]	85,0	
V mix	Nm3	66,6	38,4
Distance	[km]	4,000	7,023
HC gas dil.	[ppmC]	4,25	4,40
HC air dil.	[ppmC]	4,55	4,30
CO gas dil.	[ppm]	0,00	0,00
CO air dil.	[ppm]	0,00	0,00
NOx gas dil.	[ppm]	6,30	14,10
NOx air dil.	[ppm]	0,35	0,30
CO2 gas dil.	[%]	0,486	1,008
CO2 air dil.	[%]	0,063	0,061

Test results		Phase 1: UDC	Phase 2: EUDC
Dilution Factor (DF)		27,55	13,29
HC	[g/phase]	-0,006	0,010
CO	[g/phase]	0,000	0,000
NOx	[g/phase]	0,725	0,973
CO2	[g/phase]	560,7	722,5
HC	[mg/km]	-1,40	1,44
CO	[mg/km]	0,00	0,00
NOx	[mg/km]	181,16	138,58
CO2	[g/km]	140,2	102,9
Fuel economy	[l/100km]	5,29	3,88

**NEDC warm results**

HC	CO	NOx	CO2	Fuel economy
[mg/km]	[mg/km]	[mg/km]	[g/km]	[l/100km]
<b>0,41</b>	<b>0,00</b>	<b>154,03</b>	<b>116,4</b>	<b>4,4</b>

PM	PN
[mg/km]	[pt/km]
<b>0,04</b>	<b>1,35E+10</b>





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**Vehicle Emission Laboratory E3 - Istituto Motori CNR**

**Project: MIT\_2016**

**Test: NEDC cold**

Vehicle	<b>BMW 118d</b>	Date [dd/mm/yy]	12/04/16
VIN	WBA1C11020J835721	Test n.	6
Engine type	2000cm3-105 kW	Driver	A.S.
Engine code	N47D20C	Odometer [km]	258
Gear shift	automatic		
Start&Stop	YES		Testcarried out in
Tyres	195/55 R16 87W	Notes	"Dyno Mode" ON

Inerzia [kg] 1470  
**ROAD SETTINGS**  
 f0 [N] 168,5  
 f1 [N/km/h] -0,528  
 f2 [N/(km/h)<sup>2</sup>] 0,0357

Weather data	Phase 1: UDC	Phase 2: EUDC
Temperature [°C]	24,7	24,9
Pressure [kPa]	101,2	101,2
Humidity [%]	29	29,00
kh	0,856	0,857

Dati del test	Phase 1: UDC	Phase 2: EUDC
Toil start engine [°C]	21,0	
V mix Nm3	66,4	38,5
Distance [km]	4,000	7,023
HC gas dil. [ppmC]	3,90	3,10
HC air dil. [ppmC]	2,95	2,80
CO gas dil. [ppm]	4,25	0,00
CO air dil. [ppm]	0,00	0,00
NOx gas dil. [ppm]	3,65	12,50
NOx air dil. [ppm]	0,35	0,40
CO2 gas dil. [%]	0,527	1,038
CO2 air dil. [%]	0,056	0,055

Test results	Phase 1: UDC	Phase 2: EUDC
Dilution Factor (DF)	25,39	12,91
HC [g/phase]	0,044	0,012
CO [g/phase]	0,353	0,000
NOx [g/phase]	0,386	0,821
CO2 [g/phase]	621,9	751,6
HC [mg/km]	11,03	1,77
CO [mg/km]	88,21	0,00
NOx [mg/km]	96,54	116,94
CO2 [g/km]	155,5	107,0
Fuel economy [l/100km]	5,87	4,04

**NEDC cold results**

HC	CO	NOx	CO2	Fuel economy
[mg/km]	[mg/km]	[mg/km]	[g/km]	[l/100km]
<b>5,13</b>	<b>32,01</b>	<b>109,54</b>	<b>124,6</b>	<b>4,7</b>

PM	PN
[mg/km]	[pt/km]
<b>0,49</b>	<b>9,46E+10</b>





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## 2. Ford FOCUS

 <b>ISTITUTO MOTORI</b> <i>Consiglio Nazionale delle Ricerche</i>				
<b>Vehicle Emission Laboratory E3 - Istituto Motori CNR</b>				
<b>Project: MIT_2016</b>				
<b>Test: NEDC cold</b>				
Vehicle	<b>Ford FOCUS</b>	Date [dd/mm/yy]	19/04/16	
VIN	WF05XXGCC5EA26317	Test n.	1	
Engine type	1596cm3-70 kW	Driver	A.S.	
Engine code	T3DA	Odometer [km]	1842	
Gear shift	manual, 6 gears			
Start&Stop	NO			
Tyres		Notes		
Inerzia [kg]	1360			
<b>ROAD SETTINGS</b>				
f0 [N]	33			
f1 [N/km/h]	0,8094			
f2 [N/(km/h) <sup>2</sup> ]	0,0297			
<b>Weather data</b>		<b>Phase 1: UDC</b>	<b>Phase 2: EUDC</b>	
Temperature [°C]		25,6	25,8	
Pressure [kPa]		102,9	102,9	
Humidity [%]		36	36,00	
kh		0,897	0,899	
<b>Dati del test</b>		<b>Phase 1: UDC</b>	<b>Phase 2: EUDC</b>	
Toil start engine [°C]		23,0		
V mix Nm3		67,2	38,7	
Distance [km]		4,000	7,023	
HC gas dil. [ppmC]		6,25	3,70	
HC air dil. [ppmC]		3,35	3,20	
CO gas dil. [ppm]		20,24	0,00	
CO air dil. [ppm]		0,00	0,00	
NOx gas dil. [ppm]		6,90	14,00	
NOx air dil. [ppm]		0,10	0,20	
CO2 gas dil. [%]		0,503	1,020	
CO2 air dil. [%]		0,054	0,055	
<b>Test results</b>		<b>Phase 1: UDC</b>	<b>Phase 2: EUDC</b>	
Dilution Factor (DF)		26,50	13,13	
HC [g/phase]		0,127	0,018	
CO [g/phase]		1,700	0,000	
NOx [g/phase]		0,841	0,986	
CO2 [g/phase]		600,0	741,8	
HC [mg/km]		31,69	2,55	
CO [mg/km]		425,09	0,00	
NOx [mg/km]		210,28	140,42	
CO2 [g/km]		150,0	105,6	
Fuel economy [l/100km]		5,69	3,99	
<b>NEDC cold results</b>				
<b>HC</b>	<b>CO</b>	<b>NOx</b>	<b>CO2</b>	<b>Fuel economy</b>
[mg/km]	[mg/km]	[mg/km]	[g/km]	[l/100km]
<b>13,13</b>	<b>154,26</b>	<b>165,77</b>	<b>121,7</b>	<b>4,6</b>
<b>PM</b>	<b>PN</b>			
[mg/km]	[pt/km]			
<b>0,30</b>	<b>2,64E+11</b>			
 <small>           P.le. ex. 34 00174 Roma - Tel. 06/4972101 - Fax 06/4972102            00120 Roma - Via Marconi, 1         </small>				



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**Vehicle Emission Laboratory E3 - Istituto Motori CNR**

**Project: MIT\_2016**

**Test: NEDC warm**

Vehicle	<b>Ford FOCUS</b>	Date [dd/mm/yy]	19/04/16
VIN	WF05XXGCC5EA26317	Test n.	2
Engine type	1596cm3-70 kW	Driver	A.S.
Engine code	T3DA	Odometer [km]	1853
Gear shift	manual, 6 gears		
Start&Stop	NO		
Tyres		Notes	

Inerzia [kg] 1360  
**ROAD SETTINGS**  
 f0 [N] 33  
 f1 [N/km/h] 0,8094  
 f2 [N/(km/h)<sup>2</sup>] 0,0297

Weather data		Phase 1: UDC	Phase 2: EUDC
Temperature	[°C]	26,3	26,6
Pressure	[kPa]	102,9	102,9
Humidity	[%]	35	34,00
kh		0,897	0,897

Dati del test		Phase 1: UDC	Phase 2: EUDC
Toil start engine	[°C]	90,0	
V mix	Nm3	66,6	38,4
Distance	[km]	4,000	7,023
HC gas dil.	[ppmC]	3,55	3,40
HC air dil.	[ppmC]	3,65	3,50
CO gas dil.	[ppm]	0,00	0,00
CO air dil.	[ppm]	0,00	0,00
NOx gas dil.	[ppm]	25,90	31,10
NOx air dil.	[ppm]	0,10	0,10
CO2 gas dil.	[%]	0,481	1,002
CO2 air dil.	[%]	0,060	0,058

Test results		Phase 1: UDC	Phase 2: EUDC
Dilution Factor (DF)		27,87	13,37
HC	[g/phase]	0,001	0,004
CO	[g/phase]	0,000	0,000
NOx	[g/phase]	3,160	2,191
CO2	[g/phase]	557,2	720,0
HC	[mg/km]	0,32	0,55
CO	[mg/km]	0,00	0,00
NOx	[mg/km]	790,06	311,96
CO2	[g/km]	139,3	102,5
Fuel economy	[l/100km]	5,26	3,87

**NEDC warm results**

HC	CO	NOx	CO2	Fuel economy
[mg/km]	[mg/km]	[mg/km]	[g/km]	[l/100km]
<b>0,47</b>	<b>0,00</b>	<b>485,45</b>	<b>115,9</b>	<b>4,4</b>

PM	PN
[mg/km]	[pt/km]
<b>0,28</b>	<b>2,08E+10</b>





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**Vehicle Emission Laboratory E3 - Istituto Motori CNR**  
**Project: MIT\_2016**  
**Test: Artemis Urban**

Vehicle	<b>Ford FOCUS</b>	Date [dd/mm/yy]	19/04/16
VIN	WF05XXGCC5EA26317	Test n.	3
Engine type	1596cm3-70 kW	Driver	A.S.
Engine code	T3DA	Odometer [km]	1864
Gear shift	manual, 6 gears		
Start&Stop	NO		
Tyres		Notes	

Inerzia [kg] 1360  
**ROAD SETTINGS**  
f0 [N] 33  
f1 [N/km/h] 0,8094  
f2 [N/(km/h)<sup>2</sup>] 0,0297

Weather data		Phase 1: URBAN	
Temperature [°C]		27,0	
Pressure [kPa]		102,9	
Humidity [%]		32	
kh		0,690	

Dati del test		Phase 1: URBAN	
Toil start engine [°C]		n.a.	
V mix Nm3		78,4	
Distance [km]		4,480	
HC gas dil. [ppmC]		3,60	
HC air dil. [ppmC]		3,60	
CO gas dil. [ppm]		10,50	
CO air dil. [ppm]		0,00	
NOx gas dil. [ppm]		35,30	
NOx air dil. [ppm]		0,80	
CO2 gas dil. [%]		0,565	
CO2 air dil. [%]		0,056	

Test results		Phase 1: URBAN	
Dilution Factor (DF)		23,66	
HC [g/phase]		0,007	
CO [g/phase]		1,029	
NOx [g/phase]		4,943	
CO2 [g/phase]		792,8	
HC [mg/km]		1,66	
CO [mg/km]		229,76	
NOx [mg/km]		1103,41	
CO2 [g/km]		177,0	
Fuel economy [l/100km]		6,69	

Artemis URBAN results				
HC	CO	NOx	CO2	Fuel economy
[mg/km]	[mg/km]	[mg/km]	[g/km]	[l/100km]
<b>1,66</b>	<b>229,76</b>	<b>1103,41</b>	<b>177,0</b>	<b>6,7</b>

PM	PN
[mg/km]	[pt/km]
<b>1,18</b>	<b>7,10E+10</b>





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**Vehicle Emission Laboratory E3 - Istituto Motori CNR**

**Project: MIT\_2016**

**Test: NEDC cold REVERSE**

Vehicle	<b>Ford FOCUS</b>	Date [dd/mm/yy]	20/04/16
VIN	WF05XXGCC5EA26317	Test n.	4
Engine type	1596cm3-70 kW	Driver	A.S.
Engine code	T3DA	Odometer [km]	1925
Gear shift	manual, 6 gears		
Start&Stop	NO		
Tyres		Notes	

Inerzia [kg] 1360  
**ROAD SETTINGS**  
 f0 [N] 33  
 f1 [N/km/h] 0,8094  
 f2 [N/(km/h)<sup>2</sup>] 0,0297

Weather data		Phase 1: EUDC	Phase 2: UDC
Temperature	[°C]	26,5	27,1
Pressure	[kPa]	103,4	103,4
Humidity	[%]	28	28,00
kh		0,863	0,868

Dati del test		Phase 1: EUDC	Phase 2: UDC
Toil start engine	[°C]	21,0	
V mix	Nm3	38,5	66,9
Distance	[km]	7,020	4,020
HC gas dil.	[ppmC]	4,20	3,45
HC air dil.	[ppmC]	3,60	3,45
CO gas dil.	[ppm]	8,40	2,54
CO air dil.	[ppm]	0,00	0,00
NOx gas dil.	[ppm]	19,40	13,85
NOx air dil.	[ppm]	0,30	0,15
CO2 gas dil.	[%]	1,012	0,445
CO2 air dil.	[%]	0,047	0,045

Test results		Phase 1: EUDC	Phase 2: UDC
Dilution Factor (DF)		13,22	30,11
HC	[g/phase]	0,021	0,005
CO	[g/phase]	0,404	0,212
NOx	[g/phase]	1,303	1,632
CO2	[g/phase]	737,4	530,5
HC	[mg/km]	2,98	1,19
CO	[mg/km]	57,60	52,86
NOx	[mg/km]	185,59	406,07
CO2	[g/km]	105,0	132,0
Fuel economy	[l/100km]	3,97	4,98

**NEDC cold REVERSE results**

HC	CO	NOx	CO2	Fuel economy
[mg/km]	[mg/km]	[mg/km]	[g/km]	[l/100km]
<b>2,33</b>	<b>55,87</b>	<b>265,87</b>	<b>114,8</b>	<b>4,3</b>

PM	PN
[mg/km]	[pt/km]
<b>1,47</b>	<b>1,18E+11</b>





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**Vehicle Emission Laboratory E3 - Istituto Motori CNR**

**Project: MIT\_2016**

**Test: NEDC warm**

Vehicle	<b>Ford FOCUS</b>	Date [dd/mm/yy]	20/04/16
VIN	WF05XXGCC5EA26317	Test n.	5
Engine type	1596cm3-70 kW	Driver	A.S.
Engine code	T3DA	Odometer [km]	1936
Gear shift	manual, 6 gears		
Start&Stop	NO		
Tyres		Notes	

Inerzia [kg] 1360

**ROAD SETTINGS**

f0 [N] 33  
f1 [N/km/h] 0,8094  
f2 [N/(km/h)<sup>2</sup>] 0,0297

Weather data	Phase 1: UDC	Phase 2: EUDC
Temperature [°C]	25,2	25,5
Pressure [kPa]	103,3	103,3
Humidity [%]	28	28,00
kh	0,852	0,855

Dati del test	Phase 1: UDC	Phase 2: EUDC
Toil start engine [°C]	90,0	
V mix Nm3	67,2	38,7
Distance [km]	4,000	7,023
HC gas dil. [ppmC]	2,60	2,60
HC air dil. [ppmC]	2,75	2,60
CO gas dil. [ppm]	0,52	0,00
CO air dil. [ppm]	0,00	0,00
NOx gas dil. [ppm]	24,75	26,90
NOx air dil. [ppm]	0,25	0,30
CO2 gas dil. [%]	0,473	0,978
CO2 air dil. [%]	0,053	0,052

Test results	Phase 1: UDC	Phase 2: EUDC
Dilution Factor (DF)	28,34	13,70
HC [g/phase]	-0,002	0,005
CO [g/phase]	0,044	0,000
NOx [g/phase]	2,878	1,806
CO2 [g/phase]	560,6	711,7
HC [mg/km]	-0,55	0,65
CO [mg/km]	10,92	0,00
NOx [mg/km]	719,51	257,20
CO2 [g/km]	140,2	101,3
Fuel economy [l/100km]	5,29	3,82

**NEDC warm results**

HC	CO	NOx	CO2	Fuel economy
[mg/km]	[mg/km]	[mg/km]	[g/km]	[l/100km]
<b>0,21</b>	<b>3,96</b>	<b>424,97</b>	<b>115,4</b>	<b>4,4</b>

PM	PN
[mg/km]	[pt/km]
<b>0,13</b>	<b>2,98E+10</b>





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**Project: MIT\_2016**

**Test: NEDC cold**

Vehicle	<b>Ford FOCUS</b>	Date [dd/mm/yy]	21/04/16
VIN	WF05XXGCC5EA26317	Test n.	6
Engine type	1596cm3-70 kW	Driver	A.S.
Engine code	T3DA	Odometer [km]	1968
Gear shift	manual, 6 gears		
Start&Stop	NO		
Tyres		Notes	

Inerzia [kg] 1360  
**ROAD SETTINGS**  
 f0 [N] 33  
 f1 [N/km/h] 0,8094  
 f2 [N/(km/h)<sup>2</sup>] 0,0297

Weather data		Phase 1: UDC	Phase 2: EUDC
Temperature	[°C]	24,2	24,5
Pressure	[kPa]	103,4	103,4
Humidity	[%]	28	28,00
kh		0,845	0,847

Dati del test		Phase 1: UDC	Phase 2: EUDC
Toil start engine	[°C]	23,0	
V mix	Nm3	67,5	38,7
Distance	[km]	4,000	7,023
HC gas dil.	[ppmC]	5,40	2,80
HC air dil.	[ppmC]	3,10	2,60
CO gas dil.	[ppm]	24,69	0,00
CO air dil.	[ppm]	0,00	0,00
NOx gas dil.	[ppm]	8,10	15,40
NOx air dil.	[ppm]	0,25	0,10
CO2 gas dil.	[%]	0,500	1,010
CO2 air dil.	[%]	0,049	0,049

Test results		Phase 1: UDC	Phase 2: EUDC
Dilution Factor (DF)		26,64	13,26
HC	[g/phase]	0,102	0,010
CO	[g/phase]	2,084	0,000
NOx	[g/phase]	0,919	1,029
CO2	[g/phase]	605,1	738,4
HC	[mg/km]	25,41	1,36
CO	[mg/km]	521,02	0,00
NOx	[mg/km]	229,80	146,55
CO2	[g/km]	151,3	105,1
Fuel economy	[l/100km]	5,74	3,97

**NEDC cold results**

HC	CO	NOx	CO2	Fuel economy
[mg/km]	[mg/km]	[mg/km]	[g/km]	[l/100km]
<b>10,09</b>	<b>189,07</b>	<b>176,76</b>	<b>121,9</b>	<b>4,6</b>

PM	PN
[mg/km]	[pt/km]
<b>0,28</b>	<b>2,07E+11</b>





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### 3. Ford S-MAX

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Vehicle Emission Laboratory E3 - Istituto Motori CNR				
Project: MIT_2016				
Test: NEDC cold				
Vehicle	<b>Ford S-Max</b>	Date [dd/mm/yy]	28/04/16	
VIN	WF0SXXGBWSEG20090	Test n.	1	
Engine type	1999cm3-120 kW	Driver	A.S.	
Engine code	TXWA	Odometer [km]	1832	
Gear shift	manual, 6 gears			
Start&Stop	NO			
Tyres		Notes		
Inerzia [kg]	1700			
<b>ROAD SETTINGS</b>				
f0 [N]	102,49			
f1 [N/km/h]	1,3922			
f2 [N/(km/h) <sup>2</sup> ]	0,0267			
<b>Weather data</b>				
		<b>Phase 1: UDC</b>	<b>Phase 2: EUDC</b>	
Temperature [°C]		21,3	21,6	
Pressure [kPa]		102,8	102,8	
Humidity [%]		45	45,00	
kh		0,891	0,894	
<b>Dati del test</b>				
		<b>Phase 1: UDC</b>	<b>Phase 2: EUDC</b>	
Toil start engine [°C]		20,0		
V mix Nm3		68,1	39,1	
Distance [km]		4,000	7,023	
HC gas dil. [ppmC]		14,90	6,10	
HC air dil. [ppmC]		3,95	3,70	
CO gas dil. [ppm]		42,15	1,30	
CO air dil. [ppm]		0,00	0,00	
NOx gas dil. [ppm]		4,70	9,00	
NOx air dil. [ppm]		0,30	0,40	
CO2 gas dil. [%]		0,545	1,108	
CO2 air dil. [%]		0,055	0,056	
<b>Test results</b>				
		<b>Phase 1: UDC</b>	<b>Phase 2: EUDC</b>	
Dilution Factor (DF)		24,35	12,09	
HC [g/phase]		0,472	0,066	
CO [g/phase]		3,590	0,064	
NOx [g/phase]		0,549	0,619	
CO2 [g/phase]		662,3	817,4	
HC [mg/km]		117,92	9,39	
CO [mg/km]		897,45	9,05	
NOx [mg/km]		137,20	88,16	
CO2 [g/km]		165,6	116,4	
Fuel economy [l/100km]		6,31	4,39	
<b>NEDC cold results</b>				
<b>HC</b>	<b>CO</b>	<b>NOx</b>	<b>CO2</b>	<b>Fuel economy</b>
[mg/km]	[mg/km]	[mg/km]	[g/km]	[l/100km]
<b>48,78</b>	<b>331,43</b>	<b>105,96</b>	<b>134,2</b>	<b>5,1</b>
<b>PM</b>	<b>PN</b>			
[mg/km]	[pt/km]			
<b>0,92</b>	<b>4,67E+09</b>			
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**Project: MIT\_2016**

**Test: NEDC warm**

Vehicle	<b>Ford S-Max</b>	Date [dd/mm/yy]	28/04/16
VIN	WF0SXXGBWSEG20090	Test n.	2
Engine type	1999cm3-120 kW	Driver	A.S.
Engine code	TXWA	Odometer [km]	1843
Gear shift	manual, 6 gears		
Start&Stop	NO		
Tyres		Notes	

Inerzia [kg] 1700

**ROAD SETTINGS**

f0 [N] 102,49  
f1 [N/km/h] 1,3922  
f2 [N/(km/h)<sup>2</sup>] 0,0267

Weather data	Phase 1: UDC	Phase 2: EUDC
Temperature [°C]	22,2	22,6
Pressure [kPa]	102,9	102,9
Humidity [%]	43	42,00
kh	0,890	0,892

Dati del test	Phase 1: UDC	Phase 2: EUDC
Toil start engine [°C]	90,0	
V mix Nm3	67,4	39,0
Distance [km]	4,000	7,023
HC gas dil. [ppmC]	6,20	5,20
HC air dil. [ppmC]	4,20	4,20
CO gas dil. [ppm]	2,35	0,25
CO air dil. [ppm]	0,00	0,00
NOx gas dil. [ppm]	8,25	11,50
NOx air dil. [ppm]	0,30	0,30
CO2 gas dil. [%]	0,495	1,027
CO2 air dil. [%]	0,059	0,059

Test results	Phase 1: UDC	Phase 2: EUDC
Dilution Factor (DF)	27,05	13,04
HC [g/phase]	0,091	0,032
CO [g/phase]	0,198	0,012
NOx [g/phase]	0,979	0,801
CO2 [g/phase]	583,4	750,3
HC [mg/km]	22,63	4,58
CO [mg/km]	49,52	1,74
NOx [mg/km]	244,81	114,08
CO2 [g/km]	145,8	106,8
Fuel economy [l/100km]	5,51	4,03

**NEDC warm results**

HC	CO	NOx	CO2	Fuel economy
[mg/km]	[mg/km]	[mg/km]	[g/km]	[l/100km]
<b>11,13</b>	<b>19,07</b>	<b>161,52</b>	<b>121,0</b>	<b>4,6</b>

PM	PN
[mg/km]	[pt/km]
<b>0,38</b>	<b>2,59E+09</b>





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**Vehicle Emission Laboratory E3 - Istituto Motori CNR**  
**Project: MIT\_2016**  
**Test: Artemis Urban**

Vehicle	<b>Ford S-Max</b>	Date [dd/mm/yy]	28/04/16
VIN	WF0SXXGBWSEG20090	Test n.	3
Engine type	1999cm3-120 kW	Driver	A.S.
Engine code	TXWA	Odometer [km]	1854
Gear shift	manual, 6 gears		
Start&Stop	NO		
Tyres		Notes	

Inerzia [kg] 1700  
**ROAD SETTINGS**  
f0 [N] 102,49  
f1 [N/km/h] 1,3922  
f2 [N/(km/h)<sup>2</sup>] 0,0267

Weather data		Phase 1: URBAN	
Temperature [°C]		23,2	
Pressure [kPa]		102,8	
Humidity [%]		40	
kh		0,890	

Dati del test		Phase 1: URBAN	
Toil start engine [°C]		n.a.	
V mix Nm3		79,4	
Distance [km]		4,480	
HC gas dil. [ppmC]		5,10	
HC air dil. [ppmC]		4,20	
CO gas dil. [ppm]		3,34	
CO air dil. [ppm]		0,00	
NOx gas dil. [ppm]		14,40	
NOx air dil. [ppm]		0,30	
CO2 gas dil. [%]		0,556	
CO2 air dil. [%]		0,060	

Test results		Phase 1: URBAN	
Dilution Factor (DF)		24,06	
HC [g/phase]		0,053	
CO [g/phase]		0,331	
NOx [g/phase]		2,044	
CO2 [g/phase]		782,2	
HC [mg/km]		11,86	
CO [mg/km]		73,97	
NOx [mg/km]		456,25	
CO2 [g/km]		174,6	
Fuel economy [l/100km]		6,59	

Artemis URBAN results				
HC	CO	NOx	CO2	Fuel economy
[mg/km]	[mg/km]	[mg/km]	[g/km]	[l/100km]
<b>11,86</b>	<b>73,97</b>	<b>456,25</b>	<b>174,6</b>	<b>6,6</b>

PM	PN
[mg/km]	[pt/km]
<b>0,86</b>	<b>8,42E+09</b>





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**Vehicle Emission Laboratory E3 - Istituto Motori CNR**

**Project: MIT\_2016**

**Test: NEDC cold REVERSE**

Vehicle	<b>Ford S-Max</b>	Date [dd/mm/yy]	29/04/16
VIN	WF0SXXGBWSEG20090	Test n.	4
Engine type	1999cm3-120 kW	Driver	A.S.
Engine code	TXWA	Odometer [km]	1915
Gear shift	manual, 6 gears		
Start&Stop	NO		
Tyres		Notes	

Inerzia [kg] 1700  
**ROAD SETTINGS**  
 f0 [N] 102,49  
 f1 [N/km/h] 1,3922  
 f2 [N/(km/h)<sup>2</sup>] 0,0267

Weather data	Phase 1: EUDC	Phase 2: UDC
Temperature [°C]	20,4	20,7
Pressure [kPa]	102,2	102,2
Humidity [%]	40	40,00
kh	0,863	0,866

Dati del test	Phase 1: EUDC	Phase 2: UDC
Toil start engine [°C]	20,0	
V mix Nm3	39,5	67,4
Distance [km]	7,020	4,020
HC gas dil. [ppmC]	6,80	5,65
HC air dil. [ppmC]	3,20	3,35
CO gas dil. [ppm]	17,80	0,30
CO air dil. [ppm]	0,00	0,00
NOx gas dil. [ppm]	12,10	8,50
NOx air dil. [ppm]	0,50	0,50
CO2 gas dil. [%]	1,116	0,515
CO2 air dil. [%]	0,048	0,053

Test results	Phase 1: EUDC	Phase 2: UDC
Dilution Factor (DF)	11,98	26,01
HC [g/phase]	0,095	0,102
CO [g/phase]	0,880	0,025
NOx [g/phase]	0,815	0,960
CO2 [g/phase]	838,1	618,5
HC [mg/km]	13,57	25,38
CO [mg/km]	125,35	6,29
NOx [mg/km]	116,03	238,72
CO2 [g/km]	119,4	153,9
Fuel economy [l/100km]	4,51	5,81

**NEDC cold REVERSE results**

HC	CO	NOx	CO2	Fuel economy
[mg/km]	[mg/km]	[mg/km]	[g/km]	[l/100km]
<b>17,87</b>	<b>81,99</b>	<b>160,70</b>	<b>131,9</b>	<b>5,0</b>

PM	PN
[mg/km]	[pt/km]
<b>0,21</b>	<b>1,24E+10</b>





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**Project: MIT\_2016**

**Test: NEDC warm**

Vehicle	<b>Ford S-Max</b>	Date [dd/mm/yy]	29/04/16
VIN	WF0SXXGBWSEG20090	Test n.	5
Engine type	1999cm3-120 kW	Driver	A.S.
Engine code	TXWA	Odometer [km]	1926
Gear shift	manual, 6 gears		
Start&Stop	NO		
Tyres		Notes	

Inerzia [kg] 1700

**ROAD SETTINGS**

f0 [N] 102,49  
f1 [N/km/h] 1,3922  
f2 [N/(km/h)<sup>2</sup>] 0,0267

Weather data		Phase 1: UDC	Phase 2: EUDC
Temperature	[°C]	23,1	23,4
Pressure	[kPa]	102,1	102,1
Humidity	[%]	36	35,00
kh		0,870	0,871

Dati del test		Phase 1: UDC	Phase 2: EUDC
Toil start engine	[°C]	90,0	
V mix	Nm3	66,8	38,6
Distance	[km]	4,000	7,023
HC gas dil.	[ppmC]	5,60	4,60
HC air dil.	[ppmC]	3,55	3,40
CO gas dil.	[ppm]	2,87	0,20
CO air dil.	[ppm]	0,00	0,00
NOx gas dil.	[ppm]	10,50	15,00
NOx air dil.	[ppm]	1,00	1,00
CO2 gas dil.	[%]	0,509	1,075
CO2 air dil.	[%]	0,053	0,055

Test results		Phase 1: UDC	Phase 2: EUDC
Dilution Factor (DF)		26,28	12,46
HC	[g/phase]	0,091	0,035
CO	[g/phase]	0,240	0,010
NOx	[g/phase]	1,137	0,970
CO2	[g/phase]	605,0	782,0
HC	[mg/km]	22,74	5,05
CO	[mg/km]	59,93	1,37
NOx	[mg/km]	284,16	138,17
CO2	[g/km]	151,3	111,3
Fuel economy	[l/100km]	5,71	4,20

**NEDC warm results**

HC	CO	NOx	CO2	Fuel economy
[mg/km]	[mg/km]	[mg/km]	[g/km]	[l/100km]
<b>11,47</b>	<b>22,62</b>	<b>191,14</b>	<b>125,8</b>	<b>4,8</b>

PM	PN
[mg/km]	[pt/km]
<b>0,14</b>	<b>9,68E+08</b>





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**Vehicle Emission Laboratory E3 - Istituto Motori CNR**

**Project: MIT\_2016**

**Test: NEDC cold**

Vehicle	<b>Ford S-Max</b>	Date [dd/mm/yy]	02/05/16
VIN	WF0SXXGBWSEG20090	Test n.	6
Engine type	1999cm3-120 kW	Driver	A.S.
Engine code	TXWA	Odometer [km]	1958
Gear shift	manual, 6 gears		
Start&Stop	NO		
Tyres		Notes	

Inerzia [kg] 1700

**ROAD SETTINGS**

f0 [N] 102,49  
f1 [N/km/h] 1,3922  
f2 [N/(km/h)<sup>2</sup>] 0,0267

Weather data	Phase 1: UDC	Phase 2: EUDC
Temperature [°C]	22,3	22,6
Pressure [kPa]	102,8	102,8
Humidity [%]	44	44,00
kh	0,898	0,901

Dati del test	Phase 1: UDC	Phase 2: EUDC
Toil start engine [°C]	20,0	
V mix Nm3	67,9	39,1
Distance [km]	4,000	7,023
HC gas dil. [ppmC]	12,40	5,90
HC air dil. [ppmC]	3,95	3,70
CO gas dil. [ppm]	41,80	2,20
CO air dil. [ppm]	0,00	0,00
NOx gas dil. [ppm]	5,15	9,60
NOx air dil. [ppm]	0,40	0,50
CO2 gas dil. [%]	0,532	1,109
CO2 air dil. [%]	0,048	0,048

Test results	Phase 1: UDC	Phase 2: EUDC
Dilution Factor (DF)	24,93	12,07
HC [g/phase]	0,364	0,061
CO [g/phase]	3,549	0,108
NOx [g/phase]	0,596	0,661
CO2 [g/phase]	653,2	823,8
HC [mg/km]	91,08	8,70
CO [mg/km]	887,36	15,32
NOx [mg/km]	148,97	94,12
CO2 [g/km]	163,3	117,3
Fuel economy [l/100km]	6,22	4,43

**NEDC cold results**

HC	CO	NOx	CO2	Fuel economy
[mg/km]	[mg/km]	[mg/km]	[g/km]	[l/100km]
<b>38,59</b>	<b>331,76</b>	<b>114,02</b>	<b>134,0</b>	<b>5,1</b>

PM	PN
[mg/km]	[pt/km]
<b>0,43</b>	<b>n.a.</b>





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## 4. Mercedes CLA 200

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<b>Vehicle Emission Laboratory E3 - Istituto Motori CNR</b> <b>Project: MIT_2016</b> <b>Test: NEDC cold</b>				
Vehicle	<b>Mercedes CLA 200</b>	Date [dd/mm/yy]	11/05/16	
VIN	WDD1173011N119033	Test n.	1	
Engine type	1796 cm3 - 100 kW	Driver	A.S.	
Engine code	651901	Odometer [km]	1328	
Gear shift	automatic			
Start&Stop	YES			
Tyres	225/40 R18 92W XL	Notes	DYNO MODE ON	
Inerzia [kg]	1470			
<b>ROAD SETTINGS</b>				
f0 [N]	113			
f1 [N/km/h]	0,87			
f2 [N/(km/h) <sup>2</sup> ]	0,0246			
<b>Weather data</b>				
		<b>Phase 1: UDC</b>	<b>Phase 2: EUDC</b>	
Temperature [°C]		25,6	25,7	
Pressure [kPa]		102,2	102,2	
Humidity [%]		43	43,00	
kh		0,938	0,939	
<b>Dati del test</b>				
		<b>Phase 1: UDC</b>	<b>Phase 2: EUDC</b>	
Toil start engine [°C]		24,0		
V mix Nm3		66,6	38,5	
Distance [km]		4,000	7,023	
HC gas dil. [ppmC]		5,30	4,10	
HC air dil. [ppmC]		4,00	3,90	
CO gas dil. [ppm]		6,55	0,00	
CO air dil. [ppm]		0,00	0,00	
NOx gas dil. [ppm]		3,10	6,10	
NOx air dil. [ppm]		0,20	0,20	
CO2 gas dil. [%]		0,520	1,112	
CO2 air dil. [%]		0,048	0,048	
<b>Test results</b>				
		<b>Phase 1: UDC</b>	<b>Phase 2: EUDC</b>	
Dilution Factor (DF)		25,70	12,04	
HC [g/phase]		0,060	0,013	
CO [g/phase]		0,545	0,000	
NOx [g/phase]		0,372	0,439	
CO2 [g/phase]		624,8	813,8	
HC [mg/km]		15,10	1,79	
CO [mg/km]		136,36	0,00	
NOx [mg/km]		93,11	62,47	
CO2 [g/km]		156,2	115,9	
Fuel economy [l/100km]		5,90	4,37	
<b>NEDC cold results</b>				
<b>HC</b>	<b>CO</b>	<b>NOx</b>	<b>CO2</b>	<b>Fuel economy</b>
[mg/km]	[mg/km]	[mg/km]	[g/km]	[l/100km]
<b>6,62</b>	<b>49,48</b>	<b>73,59</b>	<b>130,5</b>	<b>4,9</b>
<b>PM</b>	<b>PN</b>			
[mg/km]	[µt/km]			
<b>0,33</b>	<b>4,92E+09</b>			
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**Vehicle Emission Laboratory E3 - Istituto Motori CNR**

**Project: MIT\_2016**

**Test: NEDC warm**

Vehicle	<b>Mercedes CLA 200</b>	Date [dd/mm/yy]	11/05/16
VIN	WDD1173011N119033	Test n.	2
Engine type	1796 cm3 - 100 kW	Driver	A.S.
Engine code	651901	Odometer [km]	1339
Gear shift	automatic		
Start&Stop	YES		
Tyres	225/40 R18 92W XL	Notes	DYNO MODE ON

Inerzia [kg] 1470  
**ROAD SETTINGS**  
 f0 [N] 113  
 f1 [N/km/h] 0,87  
 f2 [N/(km/h)<sup>2</sup>] 0,0246

Weather data	Phase 1: UDC	Phase 2: EUDC
Temperature [°C]	26,1	26,2
Pressure [kPa]	101,9	101,9
Humidity [%]	42	41,00
kh	0,939	0,935

Dati del test	Phase 1: UDC	Phase 2: EUDC
Toil start engine [°C]	n.a.	
V mix Nm3	66,0	38,3
Distance [km]	4,000	7,023
HC gas dil. [ppmC]	4,05	3,90
HC air dil. [ppmC]	4,10	3,90
CO gas dil. [ppm]	0,00	0,00
CO air dil. [ppm]	0,00	0,00
NOx gas dil. [ppm]	2,85	10,50
NOx air dil. [ppm]	0,10	0,10
CO2 gas dil. [%]	0,484	1,062
CO2 air dil. [%]	0,050	0,050

Test results	Phase 1: UDC	Phase 2: EUDC
Dilution Factor (DF)	27,69	12,61
HC [g/phase]	0,004	0,007
CO [g/phase]	0,000	0,000
NOx [g/phase]	0,350	0,765
CO2 [g/phase]	568,1	769,3
HC [mg/km]	1,01	1,05
CO [mg/km]	0,00	0,00
NOx [mg/km]	87,51	108,86
CO2 [g/km]	142,0	109,5
Fuel economy [l/100km]	5,36	4,13

**NEDC warm results**

HC	CO	NOx	CO2	Fuel economy
[mg/km]	[mg/km]	[mg/km]	[g/km]	[l/100km]
<b>1,04</b>	<b>0,00</b>	<b>101,11</b>	<b>121,3</b>	<b>4,6</b>

PM	PN
[mg/km]	[pt/km]
<b>0,51</b>	<b>3,84E+09</b>





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**Vehicle Emission Laboratory E3 - Istituto Motori CNR**  
**Project: MIT\_2016**  
**Test: Artemis Urban**

Vehicle	<b>Mercedes CLA 200</b>	Date [dd/mm/yy]	11/05/16
VIN	WDD1173011N119033	Test n.	3
Engine type	1796 cm3 - 100 kW	Driver	A.S.
Engine code	651901	Odometer [km]	1350
Gear shift	automatic		
Start&Stop	YES		
Tyres	225/40 R18 92W XL	Notes	DYNO MODE ON

Inerzia [kg] 1470  
**ROAD SETTINGS**  
f0 [N] 113  
f1 [N/km/h] 0,87  
f2 [N/(km/h)<sup>2</sup>] 0,0246

Weather data		Phase 1: URBAN	
Temperature	[°C]	26,8	
Pressure	[kPa]	101,8	
Humidity	[%]	40	
kh		0,938	

Dati del test		Phase 1: URBAN	
Toil start engine	[°C]	n.a.	
V mix	Nm3	77,9	
Distance	[km]	4,480	
HC gas dil.	[ppmC]	3,90	
HC air dil.	[ppmC]	3,90	
CO gas dil.	[ppm]	0,00	
CO air dil.	[ppm]	0,00	
NOx gas dil.	[ppm]	8,00	
NOx air dil.	[ppm]	0,10	
CO2 gas dil.	[%]	0,554	
CO2 air dil.	[%]	0,050	

Test results		Phase 1: URBAN	
Dilution Factor (DF)		24,17	
HC	[g/phase]	0,008	
CO	[g/phase]	0,000	
NOx	[g/phase]	1,185	
CO2	[g/phase]	779,8	
HC	[mg/km]	1,75	
CO	[mg/km]	0,00	
NOx	[mg/km]	264,56	
CO2	[g/km]	174,1	
Fuel economy	[l/100km]	6,57	

Artemis URBAN results				
HC	CO	NOx	CO2	Fuel economy
[mg/km]	[mg/km]	[mg/km]	[g/km]	[l/100km]
<b>1,75</b>	<b>0,00</b>	<b>264,56</b>	<b>174,1</b>	<b>6,6</b>

PM	PN
[mg/km]	[pt/km]
<b>1,61</b>	<b>8,16E+09</b>





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**Project: MIT\_2016**

**Test: NEDC cold REVERSE**

Vehicle	<b>Mercedes CLA 200</b>	Date [dd/mm/yy]	12/05/16
VIN	WDD1173011N119033	Test n.	4
Engine type	1796 cm3 - 100 kW	Driver	A.S.
Engine code	651901	Odometer [km]	1411
Gear shift	automatic		
Start&Stop	YES		
Tyres	225/40 R18 92W XL	Notes	DYNO MODE ON

Inerzia [kg] 1470  
**ROAD SETTINGS**  
 f0 [N] 113  
 f1 [N/km/h] 0,87  
 f2 [N/(km/h)<sup>2</sup>] 0,0246

Weather data	Phase 1: EUDC	Phase 2: UDC
Temperature [°C]	28,2	28,3
Pressure [kPa]	101,6	101,7
Humidity [%]	36	35,50
kh	0,849	0,850

Dati del test	Phase 1: EUDC	Phase 2: UDC
Toil start engine [°C]	20,0	
V mix Nm3	38,3	65,7
Distance [km]	7,020	4,020
HC gas dil. [ppmC]	4,60	4,20
HC air dil. [ppmC]	3,80	3,90
CO gas dil. [ppm]	3,17	0,00
CO air dil. [ppm]	0,00	0,00
NOx gas dil. [ppm]	9,60	2,60
NOx air dil. [ppm]	0,30	0,15
CO2 gas dil. [%]	1,214	0,488
CO2 air dil. [%]	0,050	0,050

Test results	Phase 1: EUDC	Phase 2: UDC
Dilution Factor (DF)	11,03	27,46
HC [g/phase]	0,027	0,018
CO [g/phase]	0,152	0,000
NOx [g/phase]	0,622	0,281
CO2 [g/phase]	884,8	570,7
HC [mg/km]	3,89	4,50
CO [mg/km]	21,62	0,00
NOx [mg/km]	88,63	69,94
CO2 [g/km]	126,0	142,0
Fuel economy [l/100km]	4,76	5,36

**NEDC cold REVERSE results**

HC	CO	NOx	CO2	Fuel economy
[mg/km]	[mg/km]	[mg/km]	[g/km]	[l/100km]
<b>4,11</b>	<b>13,75</b>	<b>81,82</b>	<b>131,8</b>	<b>5,0</b>

PM	PN
[mg/km]	[pt/km]
<b>0,63</b>	<b>4,81E+09</b>





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**Project: MIT\_2016**

**Test: NEDC warm**

Vehicle	<b>Mercedes CLA 200</b>	Date [dd/mm/yy]	12/05/16
VIN	WDD1173011N119033	Test n.	5
Engine type	1796 cm3 - 100 kW	Driver	A.S.
Engine code	651901	Odometer [km]	1422
Gear shift	automatic		
Start&Stop	YES		
Tyres	225/40 R18 92W XL	Notes	DYNO MODE ON

Inerzia [kg] 1470  
**ROAD SETTINGS**  
 f0 [N] 113  
 f1 [N/km/h] 0,87  
 f2 [N/(km/h)<sup>2</sup>] 0,0246

Weather data	Phase 1: UDC	Phase 2: EUDC
Temperature [°C]	26,0	26,0
Pressure [kPa]	101,7	101,7
Humidity [%]	48	48,00
kh	0,977	0,977

Dati del test	Phase 1: UDC	Phase 2: EUDC
Toil start engine [°C]	90,0	
V mix Nm3	65,9	38,2
Distance [km]	4,000	7,023
HC gas dil. [ppmC]	4,35	4,30
HC air dil. [ppmC]	4,25	4,40
CO gas dil. [ppm]	0,00	0,00
CO air dil. [ppm]	0,00	0,00
NOx gas dil. [ppm]	2,65	10,20
NOx air dil. [ppm]	0,20	0,30
CO2 gas dil. [%]	0,474	1,057
CO2 air dil. [%]	0,050	0,050

Test results	Phase 1: UDC	Phase 2: EUDC
Dilution Factor (DF)	28,27	12,67
HC [g/phase]	0,010	0,006
CO [g/phase]	0,000	0,000
NOx [g/phase]	0,324	0,760
CO2 [g/phase]	554,1	763,4
HC [mg/km]	2,57	0,84
CO [mg/km]	0,00	0,00
NOx [mg/km]	81,12	108,15
CO2 [g/km]	138,5	108,7
Fuel economy [l/100km]	5,23	4,10

**NEDC warm results**

HC	CO	NOx	CO2	Fuel economy
[mg/km]	[mg/km]	[mg/km]	[g/km]	[l/100km]
<b>1,47</b>	<b>0,00</b>	<b>98,34</b>	<b>119,5</b>	<b>4,5</b>

PM	PN
[mg/km]	[pt/km]
<b>0,52</b>	<b>3,20E+09</b>





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**Vehicle Emission Laboratory E3 - Istituto Motori CNR**

**Project: MIT\_2016**

**Test: NEDC cold**

Vehicle	<b>Mercedes CLA 200</b>	Date [dd/mm/yy]	13/05/16
VIN	WDD1173011N119033	Test n.	6
Engine type	1796 cm3 - 100 kW	Driver	A.S.
Engine code	651901	Odometer [km]	1454
Gear shift	automatic		
Start&Stop	YES		
Tyres	225/40 R18 92W XL	Notes	DYNO MODE ON

Inerzia [kg] 1470  
**ROAD SETTINGS**  
 f0 [N] 113  
 f1 [N/km/h] 0,87  
 f2 [N/(km/h)<sup>2</sup>] 0,0246

Weather data	Phase 1: UDC	Phase 2: EUDC
Temperature [°C]	25,9	26,0
Pressure [kPa]	101,7	101,7
Humidity [%]	49	49,00
kh	0,981	0,984

Dati del test	Phase 1: UDC	Phase 2: EUDC
Toil start engine [°C]	24,0	
V mix Nm3	66,2	38,4
Distance [km]	4,000	7,023
HC gas dil. [ppmC]	5,80	4,70
HC air dil. [ppmC]	4,60	4,50
CO gas dil. [ppm]	6,06	0,00
CO air dil. [ppm]	0,00	0,00
NOx gas dil. [ppm]	2,75	5,20
NOx air dil. [ppm]	0,20	0,10
CO2 gas dil. [%]	0,533	1,099
CO2 air dil. [%]	0,048	0,048

Test results	Phase 1: UDC	Phase 2: EUDC
Dilution Factor (DF)	25,09	12,19
HC [g/phase]	0,057	0,014
CO [g/phase]	0,502	0,000
NOx [g/phase]	0,341	0,396
CO2 [g/phase]	637,9	801,4
HC [mg/km]	14,27	1,94
CO [mg/km]	125,40	0,00
NOx [mg/km]	85,17	56,35
CO2 [g/km]	159,5	114,1
Fuel economy [l/100km]	6,03	4,31

**NEDC cold results**

HC	CO	NOx	CO2	Fuel economy
[mg/km]	[mg/km]	[mg/km]	[g/km]	[l/100km]
<b>6,41</b>	<b>45,50</b>	<b>66,81</b>	<b>130,6</b>	<b>4,9</b>

PM	PN
[mg/km]	[pt/km]
<b>0,10</b>	<b>3,18E+10</b>





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## 5. Mercedes Classe E

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Vehicle Emission Laboratory E3 - Istituto Motori CNR				
Project: MIT_2016				
Test: NEDC cold				
Vehicle	<b>Mercedes Classe E</b>	Date [dd/mm/yy]	20/05/16	
VIN	WDD2122021A808470	Test n.	1	
Engine type	2143 cm3 - 125 kW	Driver	A.S.	
Engine code	651924	Odometer [km]	1452	
Gear shift	automatic			
Start&Stop	YES			
Tyres	245/45 R17 99Y XL	Notes	DYNO MODE ON	
Inerzia [kg]	1810			
<b>ROAD SETTINGS</b>				
f0 [N]	113			
f1 [N/km/h]	1,97			
f2 [N/(km/h) <sup>2</sup> ]	0,0252			
<b>Weather data</b>				
		<b>Phase 1: UDC</b>	<b>Phase 2: EUDC</b>	
Temperature [°C]		23,7	23,9	
Pressure [kPa]		102,3	102,3	
Humidity [%]		40	40,00	
kh		0,896	0,899	
<b>Dati del test</b>				
		<b>Phase 1: UDC</b>	<b>Phase 2: EUDC</b>	
Toil start engine [°C]		25,0		
V mix Nm3		67,5	38,8	
Distance [km]		4,000	7,023	
HC gas dil. [ppmC]		5,60	3,90	
HC air dil. [ppmC]		4,10	3,90	
CO gas dil. [ppm]		24,10	0,00	
CO air dil. [ppm]		0,00	0,00	
NOx gas dil. [ppm]		3,05	4,50	
NOx air dil. [ppm]		0,00	0,00	
CO2 gas dil. [%]		0,579	1,138	
CO2 air dil. [%]		0,053	0,052	
<b>Test results</b>				
		<b>Phase 1: UDC</b>	<b>Phase 2: EUDC</b>	
Dilution Factor (DF)		23,05	11,77	
HC [g/phase]		0,071	0,008	
CO [g/phase]		2,034	0,000	
NOx [g/phase]		0,378	0,322	
CO2 [g/phase]		704,6	836,8	
HC [mg/km]		17,65	1,14	
CO [mg/km]		508,57	0,00	
NOx [mg/km]		94,57	45,83	
CO2 [g/km]		176,1	119,2	
Fuel economy [l/100km]		6,68	4,50	
<b>NEDC cold results</b>				
<b>HC</b>	<b>CO</b>	<b>NOx</b>	<b>CO2</b>	<b>Fuel economy</b>
[mg/km]	[mg/km]	[mg/km]	[g/km]	[l/100km]
<b>7,13</b>	<b>184,55</b>	<b>63,52</b>	<b>139,8</b>	<b>5,3</b>
<b>PM</b>	<b>PN</b>			
[mg/km]	[pt/km]			
<b>0,18</b>	<b>2,07E+10</b>			



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**Vehicle Emission Laboratory E3 - Istituto Motori CNR**

**Project: MIT\_2016**

**Test: NEDC warm**

Vehicle	<b>Mercedes Classe E</b>	Date [dd/mm/yy]	20/05/16
VIN	WDD2122021A808470	Test n.	2
Engine type	2143 cm3 - 125 kW	Driver	A.S.
Engine code	651924	Odometer [km]	1463
Gear shift	automatic		
Start&Stop	YES		
Tyres	245/45 R17 99Y XL	Notes	DYNO MODE ON

Inerzia [kg] 1810

**ROAD SETTINGS**

F0 [N] 113

F1 [N/km/h] 1,97

F2 [N/(km/h)<sup>2</sup>] 0,0252

Weather data	Phase 1: UDC	Phase 2: EUDC
Temperature [°C]	24,5	24,7
Pressure [kPa]	102,3	102,3
Humidity [%]	39	39,00
kh	0,900	0,903

Dati del test	Phase 1: UDC	Phase 2: EUDC
Toil start engine [°C]	90,0	
V mix Nm3	67,2	38,8
Distance [km]	4,000	7,023
HC gas dil. [ppmC]	4,05	3,90
HC air dil. [ppmC]	4,00	3,90
CO gas dil. [ppm]	0,00	0,00
CO air dil. [ppm]	0,00	0,00
NOx gas dil. [ppm]	4,15	13,90
NOx air dil. [ppm]	0,05	0,10
CO2 gas dil. [%]	0,500	1,089
CO2 air dil. [%]	0,055	0,055

Test results	Phase 1: UDC	Phase 2: EUDC
Dilution Factor (DF)	26,78	12,30
HC [g/phase]	0,008	0,008
CO [g/phase]	0,000	0,000
NOx [g/phase]	0,509	0,993
CO2 [g/phase]	594,7	797,0
HC [mg/km]	2,09	1,09
CO [mg/km]	0,00	0,00
NOx [mg/km]	127,24	141,35
CO2 [g/km]	148,7	113,5
Fuel economy [l/100km]	5,61	4,28

NEDC warm results				
HC	CO	NOx	CO2	Fuel economy
[mg/km]	[mg/km]	[mg/km]	[g/km]	[l/100km]
<b>1,45</b>	<b>0,00</b>	<b>136,23</b>	<b>126,3</b>	<b>4,8</b>

PM	PN
[mg/km]	[pt/km]
<b>0,22</b>	<b>5,49E+09</b>





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**Project: MIT\_2016**

**Test: Artemis Urban**

Vehicle	<b>Mercedes Classe E</b>	Date [dd/mm/yy]	20/05/16
VIN	WDD2122021A808470	Test n.	3
Engine type	2143 cm3 - 125 kW	Driver	A.S.
Engine code	651924	Odometer [km]	1474
Gear shift	automatic		
Start&Stop	YES		
Tyres	245/45 R17 99Y XL	Notes	DYNO MODE ON

Inerzia [kg] 1810

**ROAD SETTINGS**

f0 [N] 113  
f1 [N/km/h] 1,97  
f2 [N/(km/h)<sup>2</sup>] 0,0252

Weather data		Phase 1: URBAN	
Temperature [°C]		25,3	
Pressure [kPa]		102,3	
Humidity [%]		38	
kh		0,905	

Dati del test		Phase 1: URBAN	
Toil start engine [°C]		96,0	
V mix Nm3		78,9	
Distance [km]		4,480	
HC gas dil. [ppmC]		4,00	
HC air dil. [ppmC]		4,00	
CO gas dil. [ppm]		0,50	
CO air dil. [ppm]		0,50	
NOx gas dil. [ppm]		13,80	
NOx air dil. [ppm]		0,20	
CO2 gas dil. [%]		0,596	
CO2 air dil. [%]		0,060	

Test results		Phase 1: URBAN	
Dilution Factor (DF)		22,47	
HC [g/phase]		0,009	
CO [g/phase]		0,002	
NOx [g/phase]		1,993	
CO2 [g/phase]		840,2	
HC [mg/km]		1,95	
CO [mg/km]		0,49	
NOx [mg/km]		444,76	
CO2 [g/km]		187,5	
Fuel economy [l/100km]		7,08	

**Artemis URBAN results**

HC	CO	NOx	CO2	Fuel economy
[mg/km]	[mg/km]	[mg/km]	[g/km]	[l/100km]
<b>1,95</b>	<b>0,49</b>	<b>444,76</b>	<b>187,5</b>	<b>7,1</b>

PM	PN
[mg/km]	[pt/km]
<b>5,94</b>	<b>7,85E+09</b>





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**Vehicle Emission Laboratory E3 - Istituto Motori CNR**

**Project: MIT\_2016**

**Test: NEDC cold REVERSE**

Vehicle	<b>Mercedes Classe E</b>	Date [dd/mm/yy]	23/05/16
VIN	WDD2122021A808470	Test n.	4
Engine type	2143 cm3 - 125 kW	Driver	A.S.
Engine code	651924	Odometer [km]	1535
Gear shift	automatic		
Start&Stop	YES		
Tyres	245/45 R17 99Y XL	Notes	DYNO MODE ON

Inerzia [kg] 1810  
**ROAD SETTINGS**  
 f0 [N] 113  
 f1 [N/km/h] 1,97  
 f2 [N/(km/h)<sup>2</sup>] 0,0252

Weather data	Phase 1: EUDC	Phase 2: UDC
Temperature [°C]	24,7	25,1
Pressure [kPa]	103,0	103,0
Humidity [%]	42	41,00
kh	0,918	0,905

Dati del test	Phase 1: EUDC	Phase 2: UDC
Toil start engine [°C]	23,0	
V mix Nm3	39,2	67,5
Distance [km]	7,020	4,020
HC gas dil. [ppmC]	5,00	4,55
HC air dil. [ppmC]	4,10	4,55
CO gas dil. [ppm]	12,64	0,00
CO air dil. [ppm]	0,00	0,00
NOx gas dil. [ppm]	7,40	3,55
NOx air dil. [ppm]	0,30	0,25
CO2 gas dil. [%]	1,169	0,518
CO2 air dil. [%]	0,050	0,052

Test results	Phase 1: EUDC	Phase 2: UDC
Dilution Factor (DF)	11,45	25,87
HC [g/phase]	0,031	0,007
CO [g/phase]	0,620	0,000
NOx [g/phase]	0,526	0,415
CO2 [g/phase]	871,3	624,7
HC [mg/km]	4,38	1,84
CO [mg/km]	88,31	0,00
NOx [mg/km]	74,94	103,14
CO2 [g/km]	124,1	155,4
Fuel economy [l/100km]	4,69	5,86

**NEDC cold REVERSE results**

HC	CO	NOx	CO2	Fuel economy
[mg/km]	[mg/km]	[mg/km]	[g/km]	[l/100km]
<b>3,46</b>	<b>56,15</b>	<b>85,21</b>	<b>135,5</b>	<b>5,1</b>

PM	PN
[mg/km]	[pt/km]
<b>1,28</b>	<b>1,59E+10</b>





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**Vehicle Emission Laboratory E3 - Istituto Motori CNR**

**Project: MIT\_2016**

**Test: NEDC warm**

Vehicle	<b>Mercedes Classe E</b>	Date [dd/mm/yy]	23/05/16
VIN	WDD2122021A808470	Test n.	5
Engine type	2143 cm3 - 125 kW	Driver	A.S.
Engine code	651924	Odometer [km]	1546
Gear shift	automatic		
Start&Stop	YES		
Tyres	245/45 R17 99Y XL	Notes	DYNO MODE ON

Inerzia [kg] 1810

**ROAD SETTINGS**

f0 [N]	113
f1 [N/km/h]	1,97
f2 [N/(km/h) <sup>2</sup> ]	0,0252

Weather data	Phase 1: UDC	Phase 2: EUDC
Temperature [°C]	26,0	26,0
Pressure [kPa]	102,9	102,9
Humidity [%]	38	38,00
kh	0,910	0,913

Dati del test	Phase 1: UDC	Phase 2: EUDC
Toil start engine [°C]	90,0	
V mix Nm3	67,2	38,8
Distance [km]	4,000	7,023
HC gas dil. [ppmC]	4,30	3,80
HC air dil. [ppmC]	4,35	4,00
CO gas dil. [ppm]	1,12	0,00
CO air dil. [ppm]	0,00	0,00
NOx gas dil. [ppm]	4,15	12,90
NOx air dil. [ppm]	0,10	0,00
CO2 gas dil. [%]	0,500	1,003
CO2 air dil. [%]	0,048	0,048

Test results	Phase 1: UDC	Phase 2: EUDC
Dilution Factor (DF)	26,77	13,35
HC [g/phase]	0,005	0,002
CO [g/phase]	0,094	0,000
NOx [g/phase]	0,508	0,937
CO2 [g/phase]	603,0	735,7
HC [mg/km]	1,18	0,34
CO [mg/km]	23,53	0,00
NOx [mg/km]	127,10	133,45
CO2 [g/km]	150,8	104,8
Fuel economy [l/100km]	5,69	3,95

**NEDC warm results**

HC	CO	NOx	CO2	Fuel economy
[mg/km]	[mg/km]	[mg/km]	[g/km]	[l/100km]
<b>0,65</b>	<b>8,54</b>	<b>131,15</b>	<b>121,4</b>	<b>4,6</b>

PM	PN
[mg/km]	[pt/km]
<b>0,56</b>	<b>4,77E+09</b>





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**Vehicle Emission Laboratory E3 - Istituto Motori CNR**

**Project: MIT\_2016**

**Test: NEDC cold**

Vehicle	<b>Mercedes Classe E</b>	Date [dd/mm/yy]	24/05/16
VIN	WDD2122021A808470	Test n.	6
Engine type	2143 cm3 - 125 kW	Driver	A.S.
Engine code	651924	Odometer [km]	1578
Gear shift	automatic		
Start&Stop	YES		
Tyres	245/45 R17 99Y XL	Notes	DYNO MODE ON

Inerzia [kg] 1810

**ROAD SETTINGS**

f0 [N] 113  
f1 [N/km/h] 1,97  
f2 [N/(km/h)<sup>2</sup>] 0,0252

Weather data		Phase 1: UDC	Phase 2: EUDC
Temperature	[°C]	24,0	24,1
Pressure	[kPa]	102,6	102,6
Humidity	[%]	37	36,00
kh		0,882	0,881

Dati del test		Phase 1: UDC	Phase 2: EUDC
Toil start engine	[°C]	28,0	
V mix	Nm3	67,4	38,9
Distance	[km]	4,000	7,023
HC gas dil.	[ppmC]	4,90	4,10
HC air dil.	[ppmC]	3,90	3,70
CO gas dil.	[ppm]	11,57	0,00
CO air dil.	[ppm]	0,00	0,00
NOx gas dil.	[ppm]	3,85	4,90
NOx air dil.	[ppm]	0,10	0,10
CO2 gas dil.	[%]	0,559	1,086
CO2 air dil.	[%]	0,037	0,038

Test results		Phase 1: UDC	Phase 2: EUDC
Dilution Factor (DF)		23,90	12,33
HC	[g/phase]	0,049	0,017
CO	[g/phase]	0,975	0,000
NOx	[g/phase]	0,458	0,338
CO2	[g/phase]	697,8	808,8
HC	[mg/km]	12,22	2,42
CO	[mg/km]	243,69	0,00
NOx	[mg/km]	114,42	48,11
CO2	[g/km]	174,5	115,2
Fuel economy	[l/100km]	6,60	4,35

**NEDC cold results**

HC	CO	NOx	CO2	Fuel economy
[mg/km]	[mg/km]	[mg/km]	[g/km]	[l/100km]
<b>5,97</b>	<b>88,43</b>	<b>72,17</b>	<b>136,7</b>	<b>5,2</b>

PM	PN
[mg/km]	[pt/km]
<b>0,17</b>	<b>1,91E+10</b>





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## 6. Volkswagen TIGUAN

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<b>Vehicle Emission Laboratory E3 - Istituto Motori CNR</b>				
<b>Project: MIT_2016</b>				
<b>Test: NEDC cold</b>				
Vehicle	<b>Volkswagen Tiguan</b>	Date [dd/mm/yy]	26/05/16	
VIN	WVGZZZ5N2FW614662	Test n.	1	
Engine type	2000 cm3 - 81 kW	Driver	A.S.	
Engine code	CFFD	Odometer [km]	1232	
Gear shift	manual			
Start&Stop	YES		Start&Stop partially working	
Tyres		Notes		
Inerzia [kg]	1700			
<b>ROAD SETTINGS</b>				
f0 [N]	7,9			
f1 [N/km/h]	0			
f2 [N/(km/h) <sup>2</sup> ]	0,0536			
<b>Weather data</b>		<b>Phase 1: UDC</b>	<b>Phase 2: EUDC</b>	
Temperature [°C]		25,0	25,3	
Pressure [kPa]		103,1	103,1	
Humidity [%]		41	40,00	
kh		0,916	0,915	
<b>Dati del test</b>		<b>Phase 1: UDC</b>	<b>Phase 2: EUDC</b>	
Toil start engine [°C]		23,0		
V mix Nm3		67,5	39,0	
Distance [km]		4,000	7,023	
HC gas dil. [ppmC]		6,15	4,90	
HC air dil. [ppmC]		4,35	4,10	
CO gas dil. [ppm]		8,67	0,00	
CO air dil. [ppm]		0,00	0,00	
NOx gas dil. [ppm]		4,25	5,70	
NOx air dil. [ppm]		0,75	1,00	
CO2 gas dil. [%]		0,586	1,153	
CO2 air dil. [%]		0,051	0,053	
<b>Test results</b>		<b>Phase 1: UDC</b>	<b>Phase 2: EUDC</b>	
Dilution Factor (DF)		22,83	11,62	
HC [g/phase]		0,084	0,028	
CO [g/phase]		0,732	0,000	
NOx [g/phase]		0,448	0,350	
CO2 [g/phase]		716,5	852,2	
HC [mg/km]		20,94	3,99	
CO [mg/km]		182,96	0,00	
NOx [mg/km]		112,02	49,87	
CO2 [g/km]		179,1	121,3	
Fuel economy [l/100km]		6,77	4,58	
<b>NEDC cold results</b>				
<b>HC</b>	<b>CO</b>	<b>NOx</b>	<b>CO2</b>	<b>Fuel economy</b>
[mg/km]	[mg/km]	[mg/km]	[g/km]	[l/100km]
<b>10,14</b>	<b>66,39</b>	<b>72,42</b>	<b>142,3</b>	<b>5,4</b>
<b>PM</b>	<b>PN</b>			
[mg/km]	[pt/km]			
<b>n.a.</b>	<b>n.a.</b>			
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**Project: MIT\_2016**

**Test: NEDC warm**

Vehicle	<b>Volkswagen Tiguan</b>	Date [dd/mm/yy]	26/05/16
VIN	WVGZZZ5N2FW614662	Test n.	2
Engine type	2000 cm3 - 81 kW	Driver	A.S.
Engine code	CFFD	Odometer [km]	1243
Gear shift	manual		
Start&Stop	YES		Start&Stop partially working
Tyres		Notes	

Inerzia [kg] 1700  
**ROAD SETTINGS**  
 f0 [N] 7,9  
 f1 [N/km/h] 0  
 f2 [N/(km/h)<sup>2</sup>] 0,0536

Weather data		Phase 1: UDC	Phase 2: EUDC
Temperature	[°C]	26,2	26,5
Pressure	[kPa]	103,0	103,0
Humidity	[%]	36	36,00
kh		0,904	0,907

Dati del test		Phase 1: UDC	Phase 2: EUDC
Toil start engine	[°C]	79,0	
V mix	Nm3	67,2	38,7
Distance	[km]	4,000	7,023
HC gas dil.	[ppmC]	5,00	4,60
HC air dil.	[ppmC]	4,60	4,60
CO gas dil.	[ppm]	0,00	0,00
CO air dil.	[ppm]	0,00	0,00
NOx gas dil.	[ppm]	8,20	15,60
NOx air dil.	[ppm]	0,25	0,20
CO2 gas dil.	[%]	0,510	1,084
CO2 air dil.	[%]	0,060	0,060

Test results		Phase 1: UDC	Phase 2: EUDC
Dilution Factor (DF)		26,27	12,36
HC	[g/phase]	0,024	0,009
CO	[g/phase]	0,000	0,000
NOx	[g/phase]	0,991	1,110
CO2	[g/phase]	600,4	787,5
HC	[mg/km]	6,02	1,28
CO	[mg/km]	0,00	0,00
NOx	[mg/km]	247,85	158,12
CO2	[g/km]	150,1	112,1
Fuel economy	[l/100km]	5,66	4,23

**NEDC warm results**

HC	CO	NOx	CO2	Fuel economy
[mg/km]	[mg/km]	[mg/km]	[g/km]	[l/100km]
<b>3,00</b>	<b>0,00</b>	<b>190,68</b>	<b>125,9</b>	<b>4,8</b>

PM	PN
[mg/km]	[pt/km]
<b>0,38</b>	<b>5,14E+09</b>





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**Project: MIT\_2016**

**Test: Artemis Urban**

Vehicle	<b>Volkswagen Tiguan</b>	Date [dd/mm/yy]	26/05/16
VIN	WVGZZZ5NZFW614662	Test n.	1
Engine type	2000 cm3 - 81 kW	Driver	A.S.
Engine code	CFFD	Odometer [km]	1254
Gear shift	manual		
Start&Stop	YES	Notes	Start&Stop partially working
Tyres			

Inerzia [kg] 1700  
**ROAD SETTINGS**  
 f0 [N] 7,9  
 f1 [N/km/h] 0  
 f2 [N/(km/h)<sup>2</sup>] 0,0536

Weather data		Phase 1: URBAN	
Temperature [°C]		28,3	
Pressure [kPa]		102,8	
Humidity [%]		40	
kh		0,960	

Dati del test		Phase 1: URBAN	
Toil start engine [°C]		90,0	
V mix Nm3		78,7	
Distance [km]		4,480	
HC gas dil. [ppmC]		3,90	
HC air dil. [ppmC]		3,90	
CO gas dil. [ppm]		0,00	
CO air dil. [ppm]		0,00	
NOx gas dil. [ppm]		11,50	
NOx air dil. [ppm]		0,00	
CO2 gas dil. [%]		0,572	
CO2 air dil. [%]		0,057	

Test results		Phase 1: URBAN	
Dilution Factor (DF)		23,41	
HC [g/phase]		0,008	
CO [g/phase]		0,000	
NOx [g/phase]		1,780	
CO2 [g/phase]		804,6	
HC [mg/km]		1,82	
CO [mg/km]		0,00	
NOx [mg/km]		397,33	
CO2 [g/km]		179,6	
Fuel economy [l/100km]		6,78	

**Artemis URBAN results**

HC	CO	NOx	CO2	Fuel economy
[mg/km]	[mg/km]	[mg/km]	[g/km]	[l/100km]
<b>1,82</b>	<b>0,00</b>	<b>397,33</b>	<b>179,6</b>	<b>6,8</b>

PM	PN
[mg/km]	[pt/km]
<b>3,09</b>	<b>5,36E+10</b>





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**Project: MIT\_2016**

**Test: NEDC cold REVERSE**

Vehicle	<b>Volkswagen Tiguan</b>	Date [dd/mm/yy]	27/05/16
VIN	WVGZZZ5NZFW614662	Test n.	4
Engine type	2000 cm3 - 81 kW	Driver	A.S.
Engine code	CFFD	Odometer [km]	1315
Gear shift	manual		
Start&Stop	YES		
Tyres		Notes	

Inerzia [kg] 1700  
**ROAD SETTINGS**  
 f0 [N] 7,9  
 f1 [N/km/h] 0  
 f2 [N/(km/h)<sup>2</sup>] 0,0536

Weather data		Phase 1: EUDC	Phase 2: UDC
Temperature [°C]		24,8	25,2
Pressure [kPa]		103,0	103,0
Humidity [%]		38	37,00
kh		0,898	0,898

Dati del test		Phase 1: EUDC	Phase 2: UDC
Toil start engine [°C]		25,0	
V mix Nm3		38,3	68,1
Distance [km]		7,020	4,000
HC gas dil. [ppmC]		5,40	4,65
HC air dil. [ppmC]		4,90	4,60
CO gas dil. [ppm]		6,80	0,00
CO air dil. [ppm]		0,00	0,00
NOx gas dil. [ppm]		12,40	7,15
NOx air dil. [ppm]		0,20	0,20
CO2 gas dil. [%]		1,123	0,483
CO2 air dil. [%]		0,058	0,062

Test results		Phase 1: EUDC	Phase 2: UDC
Dilution Factor (DF)		11,92	27,75
HC [g/phase]		0,022	0,009
CO [g/phase]		0,325	0,000
NOx [g/phase]		0,861	0,872
CO2 [g/phase]		809,1	569,6
HC [mg/km]		3,09	2,29
CO [mg/km]		46,32	0,00
NOx [mg/km]		122,58	217,90
CO2 [g/km]		115,3	142,4
Fuel economy [l/100km]		4,35	5,37

NEDC cold REVERSE results				
HC	CO	NOx	CO2	Fuel economy
[mg/km]	[mg/km]	[mg/km]	[g/km]	[l/100km]
<b>2,80</b>	<b>29,51</b>	<b>157,18</b>	<b>125,1</b>	<b>4,7</b>

PM	PN
[mg/km]	[pt/km]
<b>0,24</b>	<b>1,40E+11</b>





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**Project: MIT\_2016**

**Test: NEDC warm**

Vehicle	<b>Volkswagen Tiguan</b>	Date [dd/mm/yy]	27/05/16
VIN	WVGZZZ5N2FW614662	Test n.	5
Engine type	2000 cm3 - 81 kW	Driver	M.C.
Engine code	CFFD	Odometer [km]	1326
Gear shift	manual		
Start&Stop	YES		
Tyres		Notes	

Inerzia [kg] 1700  
**ROAD SETTINGS**  
 f0 [N] 7,9  
 f1 [N/km/h] 0  
 f2 [N/(km/h)<sup>2</sup>] 0,0536

Weather data	Phase 1: UDC	Phase 2: EUDC
Temperature [°C]	27,1	27,3
Pressure [kPa]	102,8	102,8
Humidity [%]	44	43,00
kh	0,963	0,964

Dati del test	Phase 1: UDC	Phase 2: EUDC
Toil start engine [°C]	82,0	
V mix Nm3	66,8	38,7
Distance [km]	4,000	7,023
HC gas dil. [ppmC]	3,75	3,70
HC air dil. [ppmC]	3,75	3,70
CO gas dil. [ppm]	0,00	0,00
CO air dil. [ppm]	0,00	0,00
NOx gas dil. [ppm]	8,60	14,80
NOx air dil. [ppm]	0,20	0,20
CO2 gas dil. [%]	0,527	1,081
CO2 air dil. [%]	0,059	0,058

Test results	Phase 1: UDC	Phase 2: EUDC
Dilution Factor (DF)	25,41	12,39
HC [g/phase]	0,006	0,007
CO [g/phase]	0,000	0,000
NOx [g/phase]	1,109	1,118
CO2 [g/phase]	621,3	786,6
HC [mg/km]	1,54	1,03
CO [mg/km]	0,00	0,00
NOx [mg/km]	277,30	159,25
CO2 [g/km]	155,3	112,0
Fuel economy [l/100km]	5,86	4,23

**NEDC warm results**

HC	CO	NOx	CO2	Fuel economy
[mg/km]	[mg/km]	[mg/km]	[g/km]	[l/100km]
<b>1,21</b>	<b>0,00</b>	<b>202,09</b>	<b>127,7</b>	<b>4,8</b>

PM	PN
[mg/km]	[pt/km]
<b>0,57</b>	<b>1,20E+10</b>





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**Vehicle Emission Laboratory E3 - Istituto Motori CNR**

**Project: MIT\_2016**

**Test: NEDC cold**

Vehicle	<b>Volkswagen Tiguan</b>	Date [dd/mm/yy]	30/05/16
VIN	WVGZZZ5NZFW614662	Test n.	6
Engine type	2000 cm3 - 81 kW	Driver	A.S.
Engine code	CFFD	Odometer [km]	1358
Gear shift	manual		
Start&Stop	YES		
Tyres		Notes	

Inerzia [kg] 1700  
**ROAD SETTINGS**  
 f0 [N] 7,9  
 f1 [N/km/h] 0  
 f2 [N/(km/h)<sup>2</sup>] 0,0536

Weather data	Phase 1: UDC	Phase 2: EUDC
Temperature [°C]	25,5	25,8
Pressure [kPa]	102,8	102,8
Humidity [%]	47	46,00
kh	0,959	0,958

Dati del test	Phase 1: UDC	Phase 2: EUDC
Toil start engine [°C]	25,0	
V mix Nm3	67,4	38,8
Distance [km]	4,000	7,023
HC gas dil. [ppmC]	6,55	5,50
HC air dil. [ppmC]	4,50	4,30
CO gas dil. [ppm]	9,80	0,00
CO air dil. [ppm]	0,00	0,00
NOx gas dil. [ppm]	2,55	3,90
NOx air dil. [ppm]	0,15	0,00
CO2 gas dil. [%]	0,562	1,143
CO2 air dil. [%]	0,051	0,052

Test results	Phase 1: UDC	Phase 2: EUDC
Dilution Factor (DF)	23,77	11,72
HC [g/phase]	0,094	0,038
CO [g/phase]	0,826	0,000
NOx [g/phase]	0,319	0,297
CO2 [g/phase]	684,6	840,7
HC [mg/km]	23,52	5,40
CO [mg/km]	206,50	0,00
NOx [mg/km]	79,75	42,34
CO2 [g/km]	171,2	119,7
Fuel economy [l/100km]	6,47	4,52

**NEDC cold results**

HC	CO	NOx	CO2	Fuel economy
[mg/km]	[mg/km]	[mg/km]	[g/km]	[l/100km]
<b>11,97</b>	<b>74,93</b>	<b>55,91</b>	<b>138,4</b>	<b>5,2</b>

PM	PN
[mg/km]	[pt/km]
<b>0,13</b>	<b>8,54E+09</b>





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## 7. Opel ASTRA

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<b>Vehicle Emission Laboratory E3 - Istituto Motori CNR</b>				
<b>Project: MIT_2016</b>				
<b>Test: NEDC cold</b>				
Vehicle	<b>Opel Astra</b>	Date [dd/mm/yy]	14/06/16	
VIN	W0LPE6ENXFG151062	Test n.	1	
Engine type	2000 cm3 - 118 kW	Driver	A.S.	
Engine code	A20DTH	Odometer [km]	5532	
Gear shift	manual			
Start&Stop	NO			
Tyres	225/50 R17	Notes		
Inerzia [kg]	1470			
<b>ROAD SETTINGS</b>				
f0 [N]	78,9			
f1 [N/km/h]	0,383			
f2 [N/(km/h) <sup>2</sup> ]	0,03297			
<b>Weather data</b>		<b>Phase 1: UDC</b>	<b>Phase 2: EUDC</b>	
Temperature [°C]		24,2	24,3	
Pressure [kPa]		101,7	101,7	
Humidity [%]		46	46,00	
kh		0,934	0,937	
<b>Dati del test</b>		<b>Phase 1: UDC</b>	<b>Phase 2: EUDC</b>	
Toil start engine [°C]		23,0		
V mix Nm3		66,8	38,5	
Distance [km]		4,000	7,023	
HC gas dil. [ppmC]		7,50	4,10	
HC air dil. [ppmC]		4,55	4,10	
CO gas dil. [ppm]		12,70	0,00	
CO air dil. [ppm]		0,00	0,00	
NOx gas dil. [ppm]		5,10	11,60	
NOx air dil. [ppm]		0,30	0,20	
CO2 gas dil. [%]		0,609	1,090	
CO2 air dil. [%]		0,058	0,056	
<b>Test results</b>		<b>Phase 1: UDC</b>	<b>Phase 2: EUDC</b>	
Dilution Factor (DF)		21,93	12,29	
HC [g/phase]		0,131	0,008	
CO [g/phase]		1,061	0,000	
NOx [g/phase]		0,616	0,844	
CO2 [g/phase]		731,3	790,7	
HC [mg/km]		32,86	1,14	
CO [mg/km]		265,20	0,00	
NOx [mg/km]		154,02	120,20	
CO2 [g/km]		182,8	112,6	
Fuel economy [l/100km]		6,92	4,25	
<b>NEDC cold results</b>				
<b>HC</b>	<b>CO</b>	<b>NOx</b>	<b>CO2</b>	<b>Fuel economy</b>
[mg/km]	[mg/km]	[mg/km]	[g/km]	[l/100km]
<b>12,65</b>	<b>96,23</b>	<b>132,47</b>	<b>138,1</b>	<b>5,2</b>
<b>PM</b>	<b>PN</b>			
[mg/km]	[pt/km]			
<b>0,29</b>	<b>n.a.</b>			
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**Vehicle Emission Laboratory E3 - Istituto Motori CNR**

**Project: MIT\_2016**

**Test: NEDC warm**

Vehicle	<b>Opel Astra</b>	Date [dd/mm/yy]	14/06/16
VIN	W0LPE6ENXFG151062	Test n.	2
Engine type	2000 cm3 - 118 kW	Driver	A.S.
Engine code	A20DTH	Odometer [km]	5543
Gear shift	manual		
Start&Stop	NO		
Tyres	225/50 R17	Notes	

Inerzia [kg] 1470

**ROAD SETTINGS**

f0 [N] 78,9  
f1 [N/km/h] 0,383  
f2 [N/(km/h)<sup>2</sup>] 0,03297

Weather data	Phase 1: UDC	Phase 2: EUDC
Temperature [°C]	25,2	25,3
Pressure [kPa]	101,6	101,6
Humidity [%]	45	45,00
kh	0,944	0,947

Dati del test	Phase 1: UDC	Phase 2: EUDC
Toil start engine [°C]	97,0	
V mix Nm3	66,5	38,4
Distance [km]	4,000	7,023
HC gas dil. [ppmC]	3,80	3,50
HC air dil. [ppmC]	3,60	3,50
CO gas dil. [ppm]	0,00	0,00
CO air dil. [ppm]	0,00	0,00
NOx gas dil. [ppm]	8,60	13,50
NOx air dil. [ppm]	0,30	0,20
CO2 gas dil. [%]	0,550	1,034
CO2 air dil. [%]	0,058	0,056

Test results	Phase 1: UDC	Phase 2: EUDC
Dilution Factor (DF)	24,35	12,95
HC [g/phase]	0,014	0,006
CO [g/phase]	0,000	0,000
NOx [g/phase]	1,070	0,992
CO2 [g/phase]	650,1	745,8
HC [mg/km]	3,60	0,92
CO [mg/km]	0,00	0,00
NOx [mg/km]	267,58	141,31
CO2 [g/km]	162,5	106,2
Fuel economy [l/100km]	6,13	4,01

**NEDC warm results**

HC	CO	NOx	CO2	Fuel economy
[mg/km]	[mg/km]	[mg/km]	[g/km]	[l/100km]
<b>1,89</b>	<b>0,00</b>	<b>187,13</b>	<b>126,6</b>	<b>4,8</b>

PM	PN
[mg/km]	[pt/km]
<b>1,03</b>	<b>6,28E+08</b>





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**Vehicle Emission Laboratory E3 - Istituto Motori CNR**  
**Project: MIT\_2016**  
**Test: Artemis Urban**

Vehicle	<b>Opel Astra</b>	Date [dd/mm/yy]	14/06/16
VIN	W0LPE6ENXFG151062	Test n.	3
Engine type	2000 cm3 - 118 kW	Driver	A.S.
Engine code	A20DTH	Odometer [km]	5554
Gear shift	manual		
Start&Stop	NO		
Tyres	225/50 R17	Notes	

Inerzia [kg] 1470  
**ROAD SETTINGS**  
f0 [N] 78,9  
f1 [N/km/h] 0,383  
f2 [N/(km/h)<sup>2</sup>] 0,03297

Weather data		Phase 1: URBAN	
Temperature	[°C]	25,8	
Pressure	[kPa]	101,7	
Humidity	[%]	44	
kh		0,948	

Dati del test		Phase 1: URBAN	
Toil start engine	[°C]	100,0	
V mix	Nm3	78,2	
Distance	[km]	4,480	
HC gas dil.	[ppmC]	4,90	
HC air dil.	[ppmC]	4,80	
CO gas dil.	[ppm]	0,13	
CO air dil.	[ppm]	0,00	
NOx gas dil.	[ppm]	13,50	
NOx air dil.	[ppm]	0,40	
CO2 gas dil.	[%]	0,646	
CO2 air dil.	[%]	0,056	

Test results		Phase 1: URBAN	
Dilution Factor (DF)		20,73	
HC	[g/phase]	0,016	
CO	[g/phase]	0,013	
NOx	[g/phase]	1,994	
CO2	[g/phase]	916,1	
HC	[mg/km]	3,61	
CO	[mg/km]	2,84	
NOx	[mg/km]	445,09	
CO2	[g/km]	204,5	
Fuel economy	[l/100km]	7,72	

**Artemis URBAN results**

HC	CO	NOx	CO2	Fuel economy
[mg/km]	[mg/km]	[mg/km]	[g/km]	[l/100km]
<b>3,61</b>	<b>2,84</b>	<b>445,09</b>	<b>204,5</b>	<b>7,7</b>

PM	PN
[mg/km]	[pt/km]
<b>1,06</b>	<b>1,39E+09</b>





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**Project: MIT\_2016**

**Test: NEDC cold REVERSE**

Vehicle	<b>Opel Astra</b>	Date [dd/mm/yy]	15/06/16
VIN	W0LPE6ENXFG151062	Test n.	4
Engine type	2000 cm3 - 118 kW	Driver	A.S.
Engine code	A20DTH	Odometer [km]	5615
Gear shift	manual		
Start&Stop	NO		
Tyres	225/50 R17	Notes	

Inerzia [kg] 1470

**ROAD SETTINGS**

f0 [N] 78,9  
f1 [N/km/h] 0,383  
f2 [N/(km/h)<sup>2</sup>] 0,03297

Weather data		Phase 1: EUDC	Phase 2: UDC
Temperature	[°C]	25,8	26,1
Pressure	[kPa]	102,1	102,1
Humidity	[%]	41	40,00
kh		0,929	0,927

Dati del test		Phase 1: EUDC	Phase 2: UDC
Toil start engine	[°C]	25,0	
V mix	Nm3	38,7	66,6
Distance	[km]	7,023	4,000
HC gas dil.	[ppmC]	6,00	4,85
HC air dil.	[ppmC]	4,50	4,95
CO gas dil.	[ppm]	8,10	0,00
CO air dil.	[ppm]	0,00	0,00
NOx gas dil.	[ppm]	9,20	4,85
NOx air dil.	[ppm]	0,30	0,05
CO2 gas dil.	[%]	1,111	0,542
CO2 air dil.	[%]	0,044	0,045

Test results		Phase 1: EUDC	Phase 2: UDC
Dilution Factor (DF)		12,05	24,72
HC	[g/phase]	0,045	0,004
CO	[g/phase]	0,392	0,000
NOx	[g/phase]	0,658	0,608
CO2	[g/phase]	819,5	656,3
HC	[mg/km]	6,44	1,04
CO	[mg/km]	55,82	0,00
NOx	[mg/km]	93,73	152,06
CO2	[g/km]	116,7	164,1
Fuel economy	[l/100km]	4,41	6,19

**NEDC cold REVERSE results**

HC	CO	NOx	CO2	Fuel economy
[mg/km]	[mg/km]	[mg/km]	[g/km]	[l/100km]
<b>4,48</b>	<b>35,56</b>	<b>114,89</b>	<b>133,9</b>	<b>5,1</b>

PM	PN
[mg/km]	[pt/km]
n.a.	5,07E+09





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**Project: MIT\_2016**

**Test: NEDC warm**

Vehicle	<b>Opel Astra</b>	Date [dd/mm/yy]	15/06/16
VIN	W0LPE6ENXFG151062	Test n.	5
Engine type	2000 cm3 - 118 kW	Driver	A.S.
Engine code	A20DTH	Odometer [km]	5626
Gear shift	manual		
Start&Stop	NO		
Tyres	225/50 R17	Notes	

Inerzia [kg] 1470

**ROAD SETTINGS**

f0 [N] 78,9  
f1 [N/km/h] 0,383  
f2 [N/(km/h)<sup>2</sup>] 0,03297

Weather data	Phase 1: UDC	Phase 2: EUDC
Temperature [°C]	25,6	25,6
Pressure [kPa]	101,6	101,6
Humidity [%]	48	47,00
kh	0,969	0,964

Dati del test	Phase 1: UDC	Phase 2: EUDC
Toil start engine [°C]	89,0	
V mix Nm3	66,5	38,4
Distance [km]	4,000	7,023
HC gas dil. [ppmC]	4,95	4,70
HC air dil. [ppmC]	4,60	4,50
CO gas dil. [ppm]	0,00	0,00
CO air dil. [ppm]	0,00	0,00
NOx gas dil. [ppm]	7,90	13,40
NOx air dil. [ppm]	0,25	0,30
CO2 gas dil. [%]	0,549	1,071
CO2 air dil. [%]	0,053	0,052

Test results	Phase 1: UDC	Phase 2: EUDC
Dilution Factor (DF)	24,41	12,51
HC [g/phase]	0,022	0,013
CO [g/phase]	0,000	0,000
NOx [g/phase]	1,013	0,996
CO2 [g/phase]	654,4	776,8
HC [mg/km]	5,58	1,91
CO [mg/km]	0,00	0,00
NOx [mg/km]	253,15	141,84
CO2 [g/km]	163,6	110,6
Fuel economy [l/100km]	6,17	4,17

**NEDC warm results**

HC	CO	NOx	CO2	Fuel economy
[mg/km]	[mg/km]	[mg/km]	[g/km]	[l/100km]
<b>3,24</b>	<b>0,00</b>	<b>182,23</b>	<b>129,8</b>	<b>4,9</b>

PM	PN
[mg/km]	[pt/km]
<b>0,22</b>	<b>5,41E+08</b>





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**Project: MIT\_2016**

**Test: NEDC cold**

Vehicle	<b>Opel Astra</b>	Date [dd/mm/yy]	16/06/16
VIN	W0LPE6ENXFG151062	Test n.	6
Engine type	2000 cm3 - 118 kW	Driver	A.S.
Engine code	A20DTH	Odometer [km]	5658
Gear shift	manual, 6th gears		
Start&Stop	NO		
Tyres	225/50 R17	Notes	

Inerzia [kg] 1470

**ROAD SETTINGS**

f0 [N] 78,9  
f1 [N/km/h] 0,383  
f2 [N/(km/h)<sup>2</sup>] 0,03297

Weather data	Phase 1: UDC	Phase 2: EUDC
Temperature [°C]	25,9	26,1
Pressure [kPa]	102,2	102,2
Humidity [%]	48	47,00
kh	0,970	0,971

Dati del test	Phase 1: UDC	Phase 2: EUDC
Toil start engine [°C]	26,0	
V mix Nm3	67,1	38,7
Distance [km]	4,000	7,023
HC gas dil. [ppmC]	7,65	3,30
HC air dil. [ppmC]	2,75	2,80
CO gas dil. [ppm]	14,60	0,00
CO air dil. [ppm]	0,00	0,00
NOx gas dil. [ppm]	4,65	11,40
NOx air dil. [ppm]	0,25	0,10
CO2 gas dil. [%]	0,567	1,058
CO2 air dil. [%]	0,032	0,031

Test results	Phase 1: UDC	Phase 2: EUDC
Dilution Factor (DF)	23,54	12,66
HC [g/phase]	0,210	0,017
CO [g/phase]	1,225	0,000
NOx [g/phase]	0,589	0,872
CO2 [g/phase]	711,7	787,9
HC [mg/km]	52,45	2,48
CO [mg/km]	306,25	0,00
NOx [mg/km]	147,14	124,10
CO2 [g/km]	177,9	112,2
Fuel economy [l/100km]	6,74	4,23

**NEDC cold results**

HC	CO	NOx	CO2	Fuel economy
[mg/km]	[mg/km]	[mg/km]	[g/km]	[l/100km]
<b>20,61</b>	<b>111,13</b>	<b>132,46</b>	<b>136,0</b>	<b>5,1</b>

PM	PN
[mg/km]	[pt/km]
n.a.	<b>6,13E+08</b>





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**8. Dacia SANDERO**

Weather data		Phase 1: UDC	Phase 2: EUDC	
Temperature	[°C]	20,1	20,2	
Pressure	[kPa]	102,4	102,4	
Humidity	[%]	54	54,00	
kh		0,907	0,907	

Dati del test		Phase 1: UDC	Phase 2: EUDC	
Toil start engine	[°C]	20,0		
V mix	Nm3	68,2	39,4	
Distance	[km]	4,000	7,023	
HC gas dil.	[ppmC]	5,55	3,80	
HC air dil.	[ppmC]	3,90	3,60	
CO gas dil.	[ppm]	13,54	0,00	
CO air dil.	[ppm]	0,00	0,00	
NOx gas dil.	[ppm]	5,84	14,96	
NOx air dil.	[ppm]	0,24	0,16	
CO2 gas dil.	[%]	0,540	1,039	
CO2 air dil.	[%]	0,047	0,047	

Test results		Phase 1: UDC	Phase 2: EUDC	
Dilution Factor (DF)		24,75	12,89	
HC	[g/phase]	0,077	0,012	
CO	[g/phase]	1,155	0,000	
NOx	[g/phase]	0,712	1,086	
CO2	[g/phase]	666,9	776,3	
HC	[mg/km]	19,21	1,68	
CO	[mg/km]	288,72	0,00	
NOx	[mg/km]	177,93	154,64	
CO2	[g/km]	166,7	110,5	
Fuel economy	[l/100km]	6,31	4,17	

NEDC cold results				
HC	CO	NOx	CO2	Fuel economy
[mg/km]	[mg/km]	[mg/km]	[g/km]	[l/100km]
<b>8,04</b>	<b>104,77</b>	<b>163,09</b>	<b>130,9</b>	<b>4,9</b>

PM	PN
[mg/km]	[pt/km]
<b>n.a.</b>	<b>2,85E+10</b>



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Weather data		Phase 1: UDC	Phase 2: EUDC	
Temperature	[°C]	20,8	20,8	
Pressure	[kPa]	102,6	102,6	
Humidity	[%]	55	53,00	
kh		0,924	0,918	

Dati del test		Phase 1: UDC	Phase 2: EUDC	
Toil start engine	[°C]	83,0		
V mix	Nm3	67,9	39,2	
Distance	[km]	4,000	7,023	
HC gas dil.	[ppmC]	3,85	3,30	
HC air dil.	[ppmC]	3,20	3,20	
CO gas dil.	[ppm]	0,00	0,50	
CO air dil.	[ppm]	0,00	0,00	
NOx gas dil.	[ppm]	24,68	40,72	
NOx air dil.	[ppm]	0,32	0,16	
CO2 gas dil.	[%]	0,492	0,995	
CO2 air dil.	[%]	0,056	0,055	

Test results		Phase 1: UDC	Phase 2: EUDC	
Dilution Factor (DF)		27,24	13,46	
HC	[g/phase]	0,032	0,008	
CO	[g/phase]	0,000	0,025	
NOx	[g/phase]	3,136	2,995	
CO2	[g/phase]	587,6	732,3	
HC	[mg/km]	8,12	1,18	
CO	[mg/km]	0,00	3,49	
NOx	[mg/km]	784,07	426,42	
CO2	[g/km]	146,9	104,3	
Fuel economy	[l/100km]	5,54	3,93	

NEDC warm results				
HC	CO	NOx	CO2	Fuel economy
[mg/km]	[mg/km]	[mg/km]	[g/km]	[l/100km]
<b>3,70</b>	<b>2,22</b>	<b>556,21</b>	<b>119,7</b>	<b>4,5</b>

PM	PN
[mg/km]	[pt/km]
n.a.	4,91E+10



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**Vehicle Emission Laboratory E3 - Istituto Motori CNR**  
**Project: MIT\_2016**  
**Test: Artemis Urban**

Vehicle	<b>Dacia Sandero Stepway</b>	Date [dd/mm/yy]	08/09/16
VIN	UU15SDCLC49639484	Test n.	3
Engine type	1500cm3 - 66kW	Driver	M.C.
Engine code	K9KC6	Odometer [km]	1254
Gear shift	manual		
Start&Stop	NO		
Tyres		Notes	

Inerzia [kg] 1130  
**ROAD SETTINGS**  
f0 [N] 60,239  
f1 [N/km/h] 0,6118  
f2 [N/(km/h)<sup>2</sup>] 0,0406

Weather data		Phase 1: URBAN	
Temperature	[°C]	21,4	
Pressure	[kPa]	102,3	
Humidity	[%]	57	
kh		0,945	

Dati del test		Phase 1: URBAN	
Toil start engine	[°C]	91,0	
V mix	Nm3	78,2	
Distance	[km]	4,480	
HC gas dil.	[ppmC]	2,80	
HC air dil.	[ppmC]	2,50	
CO gas dil.	[ppm]	0,00	
CO air dil.	[ppm]	0,00	
NOx gas dil.	[ppm]	30,72	
NOx air dil.	[ppm]	1,44	
CO2 gas dil.	[%]	0,619	
CO2 air dil.	[%]	0,060	

Test results		Phase 1: URBAN	
Dilution Factor (DF)		21,64	
HC	[g/phase]	0,020	
CO	[g/phase]	0,000	
NOx	[g/phase]	4,446	
CO2	[g/phase]	868,3	
HC	[mg/km]	4,52	
CO	[mg/km]	0,00	
NOx	[mg/km]	992,35	
CO2	[g/km]	193,8	
Fuel economy	[l/100km]	7,31	

**Artemis URBAN results**

HC	CO	NOx	CO2	Fuel economy
[mg/km]	[mg/km]	[mg/km]	[g/km]	[l/100km]
<b>4,52</b>	<b>0,00</b>	<b>992,35</b>	<b>193,8</b>	<b>7,3</b>

PM	PN
[mg/km]	[pt/km]
<b>0,75</b>	<b>6,09E+09</b>





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**Project: MIT\_2016**

**Test: NEDC cold REVERSE**

Vehicle	<b>Dacia Sandero Stepway</b>	Date [dd/mm/yy]	09/09/16
VIN	UU15SDCLC49639484	Test n.	4
Engine type	1500cm3 - 66kW	Driver	M.C.
Engine code	K9KC6	Odometer [km]	1315
Gear shift	manual		
Start&Stop	NO		
Tyres		Notes	

Inerzia [kg] 1130  
**ROAD SETTINGS**  
 f0 [N] 60,239  
 f1 [N/km/h] 0,6118  
 f2 [N/(km/h)<sup>2</sup>] 0,0406

Weather data	Phase 1: EUDC	Phase 2: UDC
Temperature [°C]	20,7	20,7
Pressure [kPa]	102,3	102,3
Humidity [%]	60	59,50
kh	0,947	0,945

Dati del test	Phase 1: EUDC	Phase 2: UDC
Toil start engine [°C]	24,0	
V mix Nm3	38,9	66,6
Distance [km]	7,020	4,020
HC gas dil. [ppmC]	4,40	3,45
HC air dil. [ppmC]	3,00	3,00
CO gas dil. [ppm]	11,70	0,02
CO air dil. [ppm]	0,00	0,00
NOx gas dil. [ppm]	11,68	14,64
NOx air dil. [ppm]	0,24	0,28
CO2 gas dil. [%]	1,050	0,517
CO2 air dil. [%]	0,057	0,060

Test results	Phase 1: EUDC	Phase 2: UDC
Dilution Factor (DF)	12,74	25,90
HC [g/phase]	0,040	0,023
CO [g/phase]	0,569	0,002
NOx [g/phase]	0,866	1,854
CO2 [g/phase]	767,5	604,9
HC [mg/km]	5,65	5,84
CO [mg/km]	81,10	0,41
NOx [mg/km]	123,41	461,29
CO2 [g/km]	109,3	150,5
Fuel economy [l/100km]	4,13	5,68

**NEDC cold REVERSE results**

HC	CO	NOx	CO2	Fuel economy
[mg/km]	[mg/km]	[mg/km]	[g/km]	[l/100km]
<b>5,72</b>	<b>51,72</b>	<b>246,44</b>	<b>124,3</b>	<b>4,7</b>

PM	PN
[mg/km]	[pt/km]
<b>0,71</b>	<b>1,83E+11</b>





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**Project: MIT\_2016**

**Test: NEDC warm**

Vehicle	<b>Dacia Sandero Stepway</b>	Date [dd/mm/yy]	09/09/16
VIN	UU15SDCLC49639484	Test n.	5
Engine type	1500cm3 - 66kW	Driver	M.C.
Engine code	K9KC6	Odometer [km]	1326
Gear shift	manual		
Start&Stop	NO		
Tyres		Notes	

Inerzia [kg] 1130

**ROAD SETTINGS**

f0 [N] 60,239  
f1 [N/km/h] 0,6118  
f2 [N/(km/h)<sup>2</sup>] 0,0406

Weather data	Phase 1: UDC	Phase 2: EUDC
Temperature [°C]	21,0	21,1
Pressure [kPa]	102,3	102,3
Humidity [%]	58	57,00
kh	0,941	0,940

Dati del test	Phase 1: UDC	Phase 2: EUDC
Toil start engine [°C]	87,0	
V mix Nm3	66,6	38,5
Distance [km]	4,000	7,023
HC gas dil. [ppmC]	3,75	3,30
HC air dil. [ppmC]	3,00	3,00
CO gas dil. [ppm]	0,00	0,00
CO air dil. [ppm]	0,00	0,00
NOx gas dil. [ppm]	26,36	37,20
NOx air dil. [ppm]	0,64	0,64
CO2 gas dil. [%]	0,517	0,991
CO2 air dil. [%]	0,058	0,058

Test results	Phase 1: UDC	Phase 2: EUDC
Dilution Factor (DF)	25,93	13,52
HC [g/phase]	0,036	0,013
CO [g/phase]	0,000	0,000
NOx [g/phase]	3,309	2,718
CO2 [g/phase]	606,8	713,6
HC [mg/km]	8,98	1,78
CO [mg/km]	0,00	0,00
NOx [mg/km]	827,14	386,96
CO2 [g/km]	151,7	101,6
Fuel economy [l/100km]	5,72	3,83

**NEDC warm results**

HC	CO	NOx	CO2	Fuel economy
[mg/km]	[mg/km]	[mg/km]	[g/km]	[l/100km]
<b>4,40</b>	<b>0,00</b>	<b>546,69</b>	<b>119,8</b>	<b>4,5</b>

PM	PN
[mg/km]	[pt/km]
<b>0,31</b>	<b>1,11E+09</b>





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**Vehicle Emission Laboratory E3 - Istituto Motori CNR**

**Project: MIT\_2016**

**Test: NEDC cold**

Vehicle	<b>Dacia Sandero Stepway</b>	Date [dd/mm/yy]	12/09/16
VIN	UU15SDCLC49639484	Test n.	6
Engine type	1500cm3 - 66kW	Driver	M.C.
Engine code	K9KC6	Odometer [km]	1358
Gear shift	manual		
Start&Stop	NO		
Tyres		Notes	

Inerzia [kg] 1130  
**ROAD SETTINGS**  
f0 [N] 60,239  
f1 [N/km/h] 0,6118  
f2 [N/(km/h)<sup>2</sup>] 0,0406

Weather data	Phase 1: UDC	Phase 2: EUDC
Temperature [°C]	20,2	20,4
Pressure [kPa]	102,6	102,5
Humidity [%]	56	57,00
kh	0,920	0,929

Dati del test	Phase 1: UDC	Phase 2: EUDC
Toil start engine [°C]	21,0	
V mix Nm3	68,3	39,5
Distance [km]	4,000	7,023
HC gas dil. [ppmC]	5,20	3,50
HC air dil. [ppmC]	3,35	3,20
CO gas dil. [ppm]	10,35	0,00
CO air dil. [ppm]	0,05	0,00
NOx gas dil. [ppm]	5,96	12,88
NOx air dil. [ppm]	0,16	0,08
CO2 gas dil. [%]	0,522	1,036
CO2 air dil. [%]	0,050	0,050

Test results	Phase 1: UDC	Phase 2: EUDC
Dilution Factor (DF)	25,62	12,93
HC [g/phase]	0,084	0,013
CO [g/phase]	0,880	0,000
NOx [g/phase]	0,748	0,965
CO2 [g/phase]	639,6	773,8
HC [mg/km]	21,08	1,92
CO [mg/km]	220,00	0,00
NOx [mg/km]	187,05	137,35
CO2 [g/km]	159,9	110,2
Fuel economy [l/100km]	6,05	4,16

**NEDC cold results**

HC	CO	NOx	CO2	Fuel economy
[mg/km]	[mg/km]	[mg/km]	[g/km]	[l/100km]
<b>8,87</b>	<b>79,83</b>	<b>155,38</b>	<b>128,2</b>	<b>4,8</b>

PM	PN
[mg/km]	[pt/km]
<b>n.a.</b>	<b>3,75E+11</b>





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## 9. Renault CLIO

Weather data		Phase 1: UDC	Phase 2: EUDC	
Temperature	[°C]	21,0	21,0	
Pressure	[kPa]	103,1	103,1	
Humidity	[%]	58	55,00	
kh		0,941	0,928	

Dati del test		Phase 1: UDC	Phase 2: EUDC	
Toil start engine	[°C]	24,0		
V mix	Nm3	68,2	39,5	
Distance	[km]	4,000	7,023	
HC gas dil.	[ppmC]	4,70	3,30	
HC air dil.	[ppmC]	2,75	2,70	
CO gas dil.	[ppm]	10,94	0,00	
CO air dil.	[ppm]	0,00	0,00	
NOx gas dil.	[ppm]	5,25	14,84	
NOx air dil.	[ppm]	0,56	0,35	
CO2 gas dil.	[%]	0,431	0,799	
CO2 air dil.	[%]	0,052	0,050	

Test results		Phase 1: UDC	Phase 2: EUDC	
Dilution Factor (DF)		31,01	16,76	
HC	[g/phase]	0,087	0,019	
CO	[g/phase]	0,933	0,000	
NOx	[g/phase]	0,620	1,092	
CO2	[g/phase]	513,5	587,9	
HC	[mg/km]	21,67	2,67	
CO	[mg/km]	233,17	0,00	
NOx	[mg/km]	154,99	155,47	
CO2	[g/km]	128,4	83,7	
Fuel economy	[l/100km]	4,86	3,16	

NEDC cold results				
HC	CO	NOx	CO2	Fuel economy
[mg/km]	[mg/km]	[mg/km]	[g/km]	[l/100km]
<b>9,56</b>	<b>84,61</b>	<b>155,29</b>	<b>99,9</b>	<b>3,8</b>

PM	PN
[mg/km]	[pt/km]
<b>n.a.</b>	<b>n.a.</b>



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**Project: MIT\_2016**

**Test: NEDC warm**

Vehicle	<b>Renault Clio</b>	Date [dd/mm/yy]	22/09/16
VIN	VF15R040H55223300	Test n.	2
Engine type	1461 cm3 - 55 kW	Driver	M.C.
Engine code	K9KC6	Odometer [km]	3290
Gear shift	manual, 5th gear		
Start&Stop	NO		
Tyres	185/65R15	Notes	

Inerzia [kg] 1130

**ROAD SETTINGS**

f0 [N] 57,128  
f1 [N/km/h] 0,5287  
f2 [N/(km/h)<sup>2</sup>] 0,0298

Weather data	Phase 1: UDC	Phase 2: EUDC
Temperature [°C]	21,7	21,7
Pressure [kPa]	103,7	103,8
Humidity [%]	47	49,00
kh	0,902	0,910

Dati del test	Phase 1: UDC	Phase 2: EUDC
Toil start engine [°C]	80,0	
V mix Nm3	68,7	39,8
Distance [km]	4,000	7,023
HC gas dil. [ppmC]	3,20	3,10
HC air dil. [ppmC]	3,20	3,10
CO gas dil. [ppm]	0,00	0,00
CO air dil. [ppm]	0,00	0,00
NOx gas dil. [ppm]	28,56	63,91
NOx air dil. [ppm]	0,32	0,28
CO2 gas dil. [%]	0,443	0,923
CO2 air dil. [%]	0,052	0,050

Test results	Phase 1: UDC	Phase 2: EUDC
Dilution Factor (DF)	30,23	14,51
HC [g/phase]	0,005	0,005
CO [g/phase]	0,000	0,000
NOx [g/phase]	3,590	4,722
CO2 [g/phase]	534,3	688,8
HC [mg/km]	1,13	0,75
CO [mg/km]	0,00	0,00
NOx [mg/km]	897,62	672,34
CO2 [g/km]	133,6	98,1
Fuel economy [l/100km]	5,04	3,70

**NEDC warm results**

HC	CO	NOx	CO2	Fuel economy
[mg/km]	[mg/km]	[mg/km]	[g/km]	[l/100km]
<b>0,89</b>	<b>0,00</b>	<b>754,09</b>	<b>111,0</b>	<b>4,2</b>

PM	PN
[mg/km]	[pt/km]
<b>0,95</b>	<b>2,78E+09</b>





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**Project: MIT\_2016**

**Test: Artemis Urban**

Vehicle	<b>Renault Clio</b>	Date [dd/mm/yy]	22/09/16
VIN	VF15R040H55223300	Test n.	3
Engine type	1461 cm3 - 55 kW	Driver	M.C.
Engine code	K9KC6	Odometer [km]	3301
Gear shift	manual, 5th gear		
Start&Stop	NO		
Tyres	185/65R15	Notes	

Inerzia [kg] 1130

**ROAD SETTINGS**

f0 [N] 57,128  
f1 [N/km/h] 0,5287  
f2 [N/(km/h)<sup>2</sup>] 0,0298

Weather data		Phase 1: URBAN	
Temperature [°C]		21,6	
Pressure [kPa]		103,8	
Humidity [%]		48	
kh		0,905	

Dati del test		Phase 1: URBAN	
Toil start engine [°C]		91,0	
V mix Nm3		80,8	
Distance [km]		4,480	
HC gas dil. [ppmC]		3,20	
HC air dil. [ppmC]		3,20	
CO gas dil. [ppm]		0,14	
CO air dil. [ppm]		0,00	
NOx gas dil. [ppm]		32,41	
NOx air dil. [ppm]		0,63	
CO2 gas dil. [%]		0,526	
CO2 air dil. [%]		0,052	

Test results		Phase 1: URBAN	
Dilution Factor (DF)		25,46	
HC [g/phase]		0,006	
CO [g/phase]		0,014	
NOx [g/phase]		4,767	
CO2 [g/phase]		760,4	
HC [mg/km]		1,41	
CO [mg/km]		3,16	
NOx [mg/km]		1063,97	
CO2 [g/km]		169,7	
Fuel economy [l/100km]		6,40	

**Artemis URBAN results**

HC	CO	NOx	CO2	Fuel economy
[mg/km]	[mg/km]	[mg/km]	[g/km]	[l/100km]
<b>1,41</b>	<b>3,16</b>	<b>1063,97</b>	<b>169,7</b>	<b>6,4</b>

PM	PN
[mg/km]	[pt/km]
<b>1,70</b>	<b>1,38E+10</b>





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**Project: MIT\_2016**

**Test: NEDC cold REVERSE**

Vehicle	<b>Renault Clio</b>	Date [dd/mm/yy]	23/09/16
VIN	VF15R040H55223300	Test n.	4
Engine type	1461 cm3 - 55 kW	Driver	M.C.
Engine code	K9KC6	Odometer [km]	3362
Gear shift	manual, 5th gear		
Start&Stop	NO		
Tyres	185/65R15	Notes	

Inerzia [kg] 1130

**ROAD SETTINGS**

f0 [N] 57,128  
f1 [N/km/h] 0,5287  
f2 [N/(km/h)<sup>2</sup>] 0,0298

Weather data	Phase 1: EUDC	Phase 2: UDC
Temperature [°C]	22,1	22,8
Pressure [kPa]	103,7	103,7
Humidity [%]	40	40,00
kh	0,877	0,884

Dati del test	Phase 1: EUDC	Phase 2: UDC
Toil start engine [°C]	23,0	
V mix Nm3	39,7	68,0
Distance [km]	7,020	4,020
HC gas dil. [ppmC]	4,30	3,30
HC air dil. [ppmC]	3,00	3,15
CO gas dil. [ppm]	20,20	0,02
CO air dil. [ppm]	0,00	0,00
NOx gas dil. [ppm]	20,30	15,37
NOx air dil. [ppm]	0,28	0,22
CO2 gas dil. [%]	0,866	0,425
CO2 air dil. [%]	0,052	0,053

Test results	Phase 1: EUDC	Phase 2: UDC
Dilution Factor (DF)	15,43	31,50
HC [g/phase]	0,037	0,011
CO [g/phase]	1,001	0,002
NOx [g/phase]	1,428	1,867
CO2 [g/phase]	640,7	502,6
HC [mg/km]	5,26	2,64
CO [mg/km]	142,62	0,42
NOx [mg/km]	203,47	464,37
CO2 [g/km]	91,3	125,0
Fuel economy [l/100km]	3,45	4,72

**NEDC cold REVERSE results**

HC	CO	NOx	CO2	Fuel economy
[mg/km]	[mg/km]	[mg/km]	[g/km]	[l/100km]
<b>4,30</b>	<b>90,84</b>	<b>298,47</b>	<b>103,6</b>	<b>3,9</b>

PM	PN
[mg/km]	[pt/km]
<b>0,39</b>	<b>5,64E+10</b>





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**Project: MIT\_2016**

**Test: NEDC warm**

Vehicle	<b>Renault Clio</b>	Date [dd/mm/yy]	23/09/16
VIN	VF15R040H55223300	Test n.	5
Engine type	1461 cm3 - 55 kW	Driver	M.C.
Engine code	K9KC6	Odometer [km]	3373
Gear shift	manual, 5th gear		
Start&Stop	NO		
Tyres	185/65R15	Notes	

Inerzia [kg] 1130

**ROAD SETTINGS**

f0 [N] 57,128  
f1 [N/km/h] 0,5287  
f2 [N/(km/h)<sup>2</sup>] 0,0298

Weather data	Phase 1: UDC	Phase 2: EUDC
Temperature [°C]	23,1	23,4
Pressure [kPa]	103,6	103,6
Humidity [%]	38	37,00
kh	0,879	0,877

Dati del test	Phase 1: UDC	Phase 2: EUDC
Toil start engine [°C]	80,0	
V mix Nm3	68,0	39,3
Distance [km]	4,000	7,023
HC gas dil. [ppmC]	3,50	3,10
HC air dil. [ppmC]	3,15	3,10
CO gas dil. [ppm]	0,00	10,63
CO air dil. [ppm]	0,00	0,00
NOx gas dil. [ppm]	26,78	46,62
NOx air dil. [ppm]	0,11	0,07
CO2 gas dil. [%]	0,413	0,774
CO2 air dil. [%]	0,053	0,053

Test results	Phase 1: UDC	Phase 2: EUDC
Dilution Factor (DF)	32,46	17,28
HC [g/phase]	0,019	0,004
CO [g/phase]	0,000	0,523
NOx [g/phase]	3,269	3,294
CO2 [g/phase]	486,3	563,1
HC [mg/km]	4,74	0,63
CO [mg/km]	0,00	74,43
NOx [mg/km]	817,17	468,98
CO2 [g/km]	121,6	80,2
Fuel economy [l/100km]	4,59	3,03

**NEDC warm results**

HC	CO	NOx	CO2	Fuel economy
[mg/km]	[mg/km]	[mg/km]	[g/km]	[l/100km]
<b>2,12</b>	<b>47,42</b>	<b>595,33</b>	<b>95,2</b>	<b>3,6</b>

PM	PN
[mg/km]	[pt/km]
n.a.	1,05E+09





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**Vehicle Emission Laboratory E3 - Istituto Motori CNR**

**Project: MIT\_2016**

**Test: NEDC cold**

Vehicle	<b>Renault Clio</b>	Date [dd/mm/yy]	27/09/16
VIN	VF15R040H55223300	Test n.	6
Engine type	1461 cm3 - 55 kW	Driver	M.C.
Engine code	K9KC6	Odometer [km]	3405
Gear shift	manual, 5th gear		
Start&Stop	NO		
Tyres	185/65R15	Notes	

Inerzia [kg] 1130

**ROAD SETTINGS**

f0 [N] 57,128  
f1 [N/km/h] 0,5287  
f2 [N/(km/h)<sup>2</sup>] 0,0298

Weather data	Phase 1: UDC	Phase 2: EUDC
Temperature [°C]	21,7	21,3
Pressure [kPa]	103,7	103,7
Humidity [%]	47	48,00
kh	0,901	0,901

Dati del test	Phase 1: UDC	Phase 2: EUDC
Toil start engine [°C]	19,0	
V mix Nm3	68,9	39,8
Distance [km]	4,000	7,023
HC gas dil. [ppmC]	4,40	3,00
HC air dil. [ppmC]	3,10	2,90
CO gas dil. [ppm]	11,46	0,00
CO air dil. [ppm]	0,00	0,00
NOx gas dil. [ppm]	5,67	20,30
NOx air dil. [ppm]	0,21	0,07
CO2 gas dil. [%]	0,475	0,928
CO2 air dil. [%]	0,050	0,050

Test results	Phase 1: UDC	Phase 2: EUDC
Dilution Factor (DF)	28,12	14,43
HC [g/phase]	0,061	0,007
CO [g/phase]	0,987	0,000
NOx [g/phase]	0,697	1,486
CO2 [g/phase]	581,6	692,7
HC [mg/km]	15,14	1,06
CO [mg/km]	246,79	0,00
NOx [mg/km]	174,13	211,62
CO2 [g/km]	145,4	98,6
Fuel economy [l/100km]	5,50	3,72

**NEDC cold results**

HC	CO	NOx	CO2	Fuel economy
[mg/km]	[mg/km]	[mg/km]	[g/km]	[l/100km]
<b>6,17</b>	<b>89,55</b>	<b>198,01</b>	<b>115,6</b>	<b>4,4</b>

PM	PN
[mg/km]	[pt/km]
<b>0,36</b>	<b>1,94E+11</b>





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## 10. Renault LAGUNA

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Vehicle Emission Laboratory E3 - Istituto Motori CNR				
Project: MIT_2016				
Test: NEDC cold				
Vehicle	<b>Renault Laguna</b>	Date [dd/mm/yy]	07/10/16	
VIN	VF1BT12C652776749	Test n.	1	
Engine type	1461 cm3 - 81 kW	Driver	A.Z.	
Engine code	K9K R8	Odometer [km]	4032	
Gear shift	manual, 6th gear			
Start&Stop	YES	Notes	Start&Stop not working	
Tyres	195/60 R16			
Inerzia [kg]	1470			
<b>ROAD SETTINGS</b>				
f0 [N]	85,797			
f1 [N/km/h]	0,8713			
f2 [N/(km/h) <sup>2</sup> ]	0,0315			
<b>Weather data</b>				
		Phase 1: UDC	Phase 2: EUDC	
Temperature [°C]		23,3	23,7	
Pressure [kPa]		102,2	102,2	
Humidity [%]		58	57,00	
kh		0,985	0,987	
<b>Dati del test</b>				
		Phase 1: UDC	Phase 2: EUDC	
Toil start engine [°C]		23,0		
V mix Nm3		67,3	38,7	
Distance [km]		4,000	7,023	
HC gas dil. [ppmC]		8,60	4,10	
HC air dil. [ppmC]		3,50	3,50	
CO gas dil. [ppm]		28,92	0,94	
CO air dil. [ppm]		0,00	0,00	
NOx gas dil. [ppm]		6,76	15,40	
NOx air dil. [ppm]		0,28	0,21	
CO2 gas dil. [%]		0,549	1,087	
CO2 air dil. [%]		0,055	0,054	
<b>Test results</b>				
		Phase 1: UDC	Phase 2: EUDC	
Dilution Factor (DF)		24,26	12,32	
HC [g/phase]		0,220	0,021	
CO [g/phase]		2,433	0,045	
NOx [g/phase]		0,882	1,192	
CO2 [g/phase]		660,5	794,0	
HC [mg/km]		54,99	3,04	
CO [mg/km]		608,35	6,48	
NOx [mg/km]		220,46	169,67	
CO2 [g/km]		165,1	113,1	
Fuel economy [l/100km]		6,27	4,27	
<b>NEDC cold results</b>				
<b>HC</b>	<b>CO</b>	<b>NOx</b>	<b>CO2</b>	<b>Fuel economy</b>
[mg/km]	[mg/km]	[mg/km]	[g/km]	[l/100km]
<b>21,89</b>	<b>224,88</b>	<b>188,10</b>	<b>131,9</b>	<b>5,0</b>
<b>PM</b>	<b>PN</b>			
[mg/km]	[pt/km]			
<b>n.a.</b>	<b>1,29E+11</b>			



ISTITUTO MOTORI - Via Salaria 1149 - 00198 Roma - Tel. 06/5052111 - Fax 06/5052112 - E-mail: im@im.istitutomotori.it



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**Vehicle Emission Laboratory E3 - Istituto Motori CNR**

**Project: MIT\_2016**

**Test: NEDC warm**

Vehicle	<b>Renault Laguna</b>	Date [dd/mm/yy]	07/10/16
VIN	VF1BT12C652776749	Test n.	2
Engine type	1461 cm3 - 81 kW	Driver	A.Z.
Engine code	K9K R8	Odometer [km]	4043
Gear shift	manual, 6th gear		
Start&Stop	YES		Start&Stop not working
Tyres	195/60 R16	Notes	

Inerzia [kg] 1470

**ROAD SETTINGS**

f0 [N] 85,797  
f1 [N/km/h] 0,8713  
f2 [N/(km/h)<sup>2</sup>] 0,0315

Weather data	Phase 1: UDC	Phase 2: EUDC
Temperature [°C]	23,6	23,8
Pressure [kPa]	102,1	102,1
Humidity [%]	53	57,00
kh	0,962	0,990

Dati del test	Phase 1: UDC	Phase 2: EUDC
Toil start engine [°C]	86,0	
V mix Nm3	67,1	38,7
Distance [km]	4,000	7,023
HC gas dil. [ppmC]	4,30	3,80
HC air dil. [ppmC]	3,60	3,50
CO gas dil. [ppm]	0,25	0,94
CO air dil. [ppm]	0,00	0,00
NOx gas dil. [ppm]	29,23	61,11
NOx air dil. [ppm]	0,25	0,07
CO2 gas dil. [%]	0,542	1,060
CO2 air dil. [%]	0,057	0,054

Test results	Phase 1: UDC	Phase 2: EUDC
Dilution Factor (DF)	24,70	12,64
HC [g/phase]	0,035	0,014
CO [g/phase]	0,021	0,045
NOx [g/phase]	3,838	4,795
CO2 [g/phase]	647,2	773,3
HC [mg/km]	8,84	1,98
CO [mg/km]	5,24	6,48
NOx [mg/km]	959,47	682,70
CO2 [g/km]	161,8	110,1
Fuel economy [l/100km]	6,11	4,15

**NEDC warm results**

HC	CO	NOx	CO2	Fuel economy
[mg/km]	[mg/km]	[mg/km]	[g/km]	[l/100km]
<b>4,47</b>	<b>6,03</b>	<b>783,13</b>	<b>128,9</b>	<b>4,9</b>

PM	PN
[mg/km]	[pt/km]
<b>n.a.</b>	<b>n.a.</b>





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**Vehicle Emission Laboratory E3 - Istituto Motori CNR**

**Project: MIT\_2016**

**Test: Artemis Urban**

Vehicle	<b>Renault Laguna</b>	Date [dd/mm/yy]	07/10/16
VIN	VF1BT12C652776749	Test n.	3
Engine type	1461 cm3 - 81 kW	Driver	A.2.
Engine code	K9K R8	Odometer [km]	4054
Gear shift	manual, 6th gear		
Start&Stop	YES	Start&Stop not	working
Tyres	195/60 R16	Notes	

Inerzia [kg] 1470

**ROAD SETTINGS**

f0 [N]	85,797
f1 [N/km/h]	0,8713
f2 [N/(km/h) <sup>2</sup> ]	0,0315

Weather data		Phase 1: URBAN	
Temperature [°C]		25,0	
Pressure [kPa]		102,5	
Humidity [%]		50	
kh		0,969	

Dati del test		Phase 1: URBAN	
Toil start engine [°C]		85,0	
V mix Nm3		88,7	
Distance [km]		4,480	
HC gas dil. [ppmC]		4,20	
HC air dil. [ppmC]		4,00	
CO gas dil. [ppm]		4,15	
CO air dil. [ppm]		0,00	
NOx gas dil. [ppm]		23,52	
NOx air dil. [ppm]		0,77	
CO2 gas dil. [%]		0,549	
CO2 air dil. [%]		0,055	

Test results		Phase 1: URBAN	
Dilution Factor (DF)		24,37	
HC [g/phase]		0,020	
CO [g/phase]		0,460	
NOx [g/phase]		4,014	
CO2 [g/phase]		869,9	
HC [mg/km]		4,49	
CO [mg/km]		102,68	
NOx [mg/km]		895,93	
CO2 [g/km]		194,2	
Fuel economy [l/100km]		7,33	

**Artemis URBAN results**

HC	CO	NOx	CO2	Fuel economy
[mg/km]	[mg/km]	[mg/km]	[g/km]	[l/100km]
<b>4,49</b>	<b>102,68</b>	<b>895,93</b>	<b>194,2</b>	<b>7,3</b>

PM	PN
[mg/km]	[pt/km]
<b>6,73</b>	<b>2,41E+09</b>





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**Vehicle Emission Laboratory E3 - Istituto Motori CNR**

**Project: MIT\_2016**

**Test: NEDC cold REVERSE**

Vehicle	<b>Renault Laguna</b>	Date [dd/mm/yy]	10/10/16
VIN	VF1BT12C652776749	Test n.	4
Engine type	1461 cm3 - 81 kW	Driver	A.Z.
Engine code	K9K R8	Odometer [km]	4115
Gear shift	manual, 6th gear		
Start&Stop	YES		Start&Stop not working
Tyres	195/60 R16	Notes	

Inerzia [kg] 1470

**ROAD SETTINGS**

f0 [N] 85,797  
f1 [N/km/h] 0,8713  
f2 [N/(km/h)<sup>2</sup>] 0,0315

Weather data	Phase 1: EUDC	Phase 2: UDC
Temperature [°C]	18,7	19,4
Pressure [kPa]	102,3	102,3
Humidity [%]	54	58,00
kh	0,895	0,920

Dati del test	Phase 1: EUDC	Phase 2: UDC
Toil start engine [°C]	20,0	
V mix Nm3	39,7	67,6
Distance [km]	7,020	4,020
HC gas dil. [ppmC]	6,60	4,20
HC air dil. [ppmC]	3,10	3,20
CO gas dil. [ppm]	26,39	0,54
CO air dil. [ppm]	0,00	0,00
NOx gas dil. [ppm]	19,04	7,74
NOx air dil. [ppm]	0,77	0,67
CO2 gas dil. [%]	1,088	0,532
CO2 air dil. [%]	0,056	0,058

Test results	Phase 1: EUDC	Phase 2: UDC
Dilution Factor (DF)	12,28	25,17
HC [g/phase]	0,093	0,047
CO [g/phase]	1,308	0,046
NOx [g/phase]	1,334	0,906
CO2 [g/phase]	812,5	636,8
HC [mg/km]	13,20	11,81
CO [mg/km]	186,32	11,36
NOx [mg/km]	190,04	225,27
CO2 [g/km]	115,7	158,4
Fuel economy [l/100km]	4,38	5,98

**NEDC cold REVERSE results**

HC	CO	NOx	CO2	Fuel economy
[mg/km]	[mg/km]	[mg/km]	[g/km]	[l/100km]
<b>12,70</b>	<b>122,61</b>	<b>202,87</b>	<b>131,3</b>	<b>5,0</b>

PM	PN
[mg/km]	[pt/km]
<b>0,93</b>	<b>2,33E+11</b>





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**Vehicle Emission Laboratory E3 - Istituto Motori CNR**

**Project: MIT\_2016**

**Test: NEDC warm**

Vehicle	<b>Renault Laguna</b>	Date [dd/mm/yy]	10/10/16
VIN	VF1BT12C652776749	Test n.	2
Engine type	1461 cm3 - 81 kW	Driver	A.Z.
Engine code	K9K R8	Odometer [km]	4126
Gear shift	manual, 6th gear		
Start&Stop	YES		Start&Stop not working
Tyres	195/60 R16	Notes	

Inerzia [kg] 1470

**ROAD SETTINGS**

f0 [N] 85,797  
f1 [N/km/h] 0,8713  
f2 [N/(km/h)<sup>2</sup>] 0,0315

Weather data	Phase 1: UDC	Phase 2: EUDC
Temperature [°C]	24,8	25,1
Pressure [kPa]	102,5	102,5
Humidity [%]	51	49,00
kh	0,969	0,965

Dati del test	Phase 1: UDC	Phase 2: EUDC
Toil start engine [°C]	80,0	
V mix Nm3	67,1	38,7
Distance [km]	4,000	7,023
HC gas dil. [ppmC]	4,40	3,80
HC air dil. [ppmC]	3,55	3,50
CO gas dil. [ppm]	5,48	1,69
CO air dil. [ppm]	0,00	0,00
NOx gas dil. [ppm]	21,46	47,04
NOx air dil. [ppm]	0,32	0,28
CO2 gas dil. [%]	0,530	1,066
CO2 air dil. [%]	0,057	0,055

Test results	Phase 1: UDC	Phase 2: EUDC
Dilution Factor (DF)	25,26	12,56
HC [g/phase]	0,041	0,014
CO [g/phase]	0,459	0,082
NOx [g/phase]	2,819	3,583
CO2 [g/phase]	630,6	777,2
HC [mg/km]	10,36	1,99
CO [mg/km]	114,85	11,65
NOx [mg/km]	704,83	510,16
CO2 [g/km]	157,6	110,7
Fuel economy [l/100km]	5,96	4,18

**NEDC warm results**

HC	CO	NOx	CO2	Fuel economy
[mg/km]	[mg/km]	[mg/km]	[g/km]	[l/100km]
<b>5,02</b>	<b>49,09</b>	<b>580,80</b>	<b>127,7</b>	<b>4,8</b>

PM	PN
[mg/km]	[pt/km]
<b>0,25</b>	<b>1,20E+09</b>





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**Vehicle Emission Laboratory E3 - Istituto Motori CNR**

**Project: MIT\_2016**

**Test: NEDC cold**

Vehicle	<b>Renault Laguna</b>	Date [dd/mm/yy]	11/10/16
VIN	VF1BT12C652776749	Test n.	6
Engine type	1461 cm3 - 81 kW	Driver	A.2.
Engine code	K9K R8	Odometer [km]	4158
Gear shift	manual, 6th gear		
Start&Stop	YES		Start&Stop not working
Tyres	195/60 R16	Notes	

Inerzia [kg] 1470

**ROAD SETTINGS**

f0 [N] 85,797  
f1 [N/km/h] 0,8713  
f2 [N/(km/h)<sup>2</sup>] 0,0315

Weather data	Phase 1: UDC	Phase 2: EUDC
Temperature [°C]	23,3	19,2
Pressure [kPa]	102,8	102,8
Humidity [%]	59	61,00
kh	0,908	0,927

Dati del test	Phase 1: UDC	Phase 2: EUDC
Toil start engine [°C]	19,0	
V mix Nm3	68,3	39,4
Distance [km]	4,000	7,023
HC gas dil. [ppmC]	6,10	3,70
HC air dil. [ppmC]	3,25	3,20
CO gas dil. [ppm]	14,91	0,00
CO air dil. [ppm]	0,00	0,00
NOx gas dil. [ppm]	6,51	16,38
NOx air dil. [ppm]	0,60	0,49
CO2 gas dil. [%]	0,548	1,078
CO2 air dil. [%]	0,054	0,052

Test results	Phase 1: UDC	Phase 2: EUDC
Dilution Factor (DF)	24,36	12,43
HC [g/phase]	0,127	0,019
CO [g/phase]	1,273	0,000
NOx [g/phase]	0,756	1,194
CO2 [g/phase]	671,0	803,3
HC [mg/km]	31,75	2,65
CO [mg/km]	318,29	0,00
NOx [mg/km]	188,93	170,02
CO2 [g/km]	167,7	114,4
Fuel economy [l/100km]	6,35	4,32

**NEDC cold results**

HC	CO	NOx	CO2	Fuel economy
[mg/km]	[mg/km]	[mg/km]	[g/km]	[l/100km]
<b>13,21</b>	<b>115,50</b>	<b>176,88</b>	<b>133,7</b>	<b>5,1</b>

PM	PN
[mg/km]	[pt/km]
<b>n.a.</b>	<b>n.a.</b>





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## **Allegato E – Test report di tutte le prove sperimentali eseguite dal CPA di Torino**

### **Indice dei report suddivisi per veicolo**

- 11. FIAT Nuova PANDA 1,3L sde .....
- 12. ALFA ROMEO GIULIETTA 2.0 MULTIJET .....
- 13. FIAT DOBLO' .....
- 14. ALFA GIULIETTA 1.6 MULTIJET.....
- 15. CHEROKEE 2.0 MT .....
- 16. LANCIA Y 1.3 .....
- 17. FIAT 500L 1.6 MJET .....

11. FIAT NUOVA PANDA 1.3L sde .....



# Ministero delle Infrastrutture e dei Trasporti

DIPARTIMENTO PER I TRASPORTI, LA NAVIGAZIONE ED I SISTEMI INFORMATIVI E STATISTICI

Direzione Generale Territoriale del Nord-Ovest

**CENTRO PROVA AUTOVEICOLI TORINO**

Rapporto di prova del

19/04/2016 - 19/05/2016

29/06/2016 - 07/07/2016

Test report on

Pagina (Page) 1/1

OGGETTO  
SUBJECT

Verifiche e prove per quanto riguarda:  
PROGRAMMA DI PROVE PER LA VALLITAZIONE DEL COMPORTAMENTO EMISSIVO  
DI VETTURE DIESEL EURO 5 COMMERCIALIZZATE IN ITALIA CON PROVE IN  
LABORATORIO E SU PISTA

Checks and tests about:

TEST PLAN FOR MARKETED IN ITALY EURO 5 DIESEL VEHICLES EMISSIONS  
BEHAVIOR ASSESSMENT WITH LABORATORY AND TRACK TESTING

Veicolo / Vehicle	Fiat Panda 1.3 SDE	Data / Date [dd/mm/yy]	19/04/2016 – 07/07/2016
VIN	ZFA31200003434870	Prova / Test n.	S.08.????2016 (*)
Tipo motore / Engine Type	1248 cm3	Autista / Driver	Ventura / Albertino
Marcatura motore / Engine Code	199B1000	Odometro / Odometer km]	33132
Cambio / Gear shift	Manuale / Manual M5	Note / Notes	
Start & Stop	SI / YES		
Pneumatici / Tyres	2,3 bar		

Inerzia / Inertia [kg] 1130

Protocollo di prova  
Test ProtocolConforme alle specifiche dell'Istituto Motori di Napoli (C.N.R.)  
Compliant to the specification of Istituto Motori of NaplesNome e indirizzo del Laboratorio di prove  
Name and address of the test laboratory

FIAT POWERTRAIN TECHNOLOGIES, Strada del Drosso 145, TORINO (TO)

**RISULTATI DELLE PROVE**  
**TESTS RESULTS**Riportati nei seguenti allegati:  
Reported in the annexes listed here below

(\*) Prova / Test n.

NEDC cold al banco (report S.08.0662.2016 del 19/04/2016)

NEDC hot al banco (report S.08.0663.2016 del 19/04/2016)

NEDC cold back al banco (report S.08.1187.2016 del 29/06/2016)

NEDC hot back al banco (report S.08.0908.2016 del 19/05/2016)

NEDC cold su pista lim. 70km/h (report NEDC\_Cold70\_070716 del 07/07/2016 + profilo vel.)

NEDC hot su pista lim. 70km/h (report NEDC\_Hot70\_070716 del 07/07/2016 + profilo vel.)

I FUNZIONARI DEL CENTRO PROVA AUTOVEICOLI TORINO

VISTO  
IL DIRETTORE

Dott. Ing. Pietro GERACI

I risultati di misura riportati nel presente rapporto sono stati ottenuti applicando le norme/procedure/protocolli/ regolamenti/direttive indicati e si riferiscono ai soli oggetti provati. Le incertezze di misura, quando indicate, sono espresse come incertezza estesa con fattore di copertura k=2, che per una distribuzione normale corrisponde ad un livello di confidenza di circa il 95%.

The measurement results reported in this document were obtained following the standards / procedures / protocols / regulation / directives reported and them refer to the tested objects only. The uncertainties of measurement stated in this report are calculated as a standard uncertainty multiplied by a coverage factor k=2, corresponding, in the case of a normal distribution, to a confidence level of about 95%.

È vietato riprodurre il presente documento, ed i relativi allegati, senza l'autorizzazione scritta del Laboratorio.

It is forbidden to reproduce the present document and relative enclosures, without written authorization of the Laboratory.

Il testo ufficiale del presente verbale è in lingua italiana. Quello in lingua inglese è da considerarsi solo come fonte di consultazione.

The official text of this test report is only in Italian. The English version is for reference only.

Ciclo freddo



FAT CHRYSLER AUTOMOBILES

EU98M

FIAT\_160310\_002  
S.08.0662.2016

Department — OMOLOGAZIONE

Test date : 19.04.2016

**Vehicle data**

Vehicle ID — 139.9  
 Vehicle model — NUOVA PANDA S&S E5 1248 T.16V 0 KW M5  
 Transmission type — M5  
 Odometer (before Test) — 3312 km  
 Tire pressure — 2.3 bar  
 Tire dimension —  
 VIN — ZFA312000\*\*3434870 (targa EY 389 EJ)

**Fuel data**

Fuel type — GASOLIO EURO 5  
 Batch No. — 202  
 Calculation instruction — DIESEL  
 Density — 0,835 g/cm3 [15°C]  
 Carbon percentage — 86,6 %  
 NHV — 18438,9 btu/lb

**Dyno data**

Inertia — 1130 kg  
 Dyno load — F0/F1/F2 40,0 / 0,430 / 0,0305  
 KW at 80km/h — KW

**Add. data**

Driver — ventura  
 Operator — SBOP  
 aux table — NO AUX  
 Range switch table —  
 Fan speed polynomial — EU

**Reference**

Regulatory frame — EU  
 Limit Range Humidity: —5,7 - 12,5 g/kg  
 Ref. temp. — 273,15 K  
 Ref. Pressure — 1013,3 mbar  
 Calculation Regulatory — EU5  
 CVS flow — 9,0 m3/min

**Test reference data:**

Richiedente — DARGENIO

**Remarks**

Test rem. —

**Conditions**

Phase Results	Ph. 1	Ph. 2	Ph.	Ph.	Phase
Barometric pressure	98,90	98,91			kPa
Ambient air temperature	24,00	24,14			°C
Relative humidity	41,84	41,75			%
Absolute humidity	7,97	8,00			g/kg
NOx correction factor	0,9174	0,9182			
Dilution factor	40,460	19,022			
CVS volume corrected (273,15K)	105,439	54,046			m <sup>3</sup>
Average CVS temperature	39,9	39,9			°C
Average CVS pressure PV	96,5	98,5			kPa
DLS volume corrected (273,15K)	0,6502	0,3331			m <sup>3</sup>
Distance	4,045	6,940			km
Drivers violation	0,0	0,0			sec

**Phase Results**

	HC [mg/km]	CO [mg/km]	CO2 [g/km]	NOx [mg/km]	NO2 [mg/km]	N2O [mg/km]	NMHC [mg/km]	CH4 [mg/km]	Fuel cons. [l/100km]	Particulate [mg/km]
Phase 1										
Bag	86,000	462,000	145,433	156,000					5,55	
Modal										
Phase 2										
Bag	4,000	6,000	101,605	122,000					3,85	
Modal										
Bag										
Modal										
Bag										
Modal										

**Total Results**

Bag	HC [mg/km]	CO [mg/km]	CO2 [g/km]	NOx [mg/km]	NO2 [mg/km]	N2O [mg/km]	NMHC [mg/km]	HC + NOx [mg/km]	Fuel econ [l/100km]	Particulate [mg/km]
Results	34,14	173,24	117,68	134,46				168,60	4,48	
K-Fact.(KI)										
VM x KI	34,14	173,24	117,68	134,46				168,60	4,48	
EVO-F. (EF)										
VMxKixEF	34,14	173,24	117,68	134,46				168,60	4,48	
DET-F. (D.F.)										
Final Result	34,1	173,2	117,7	134,5				168,6	4,5	
Limits										

**Time Control**

Test Date: 19.04.2016  
 Start of test 8:28:28 AM  
 End of test 8:13:20 AM

Start of trace 8:43:57 AM  
 End of trace 8:08:37 AM

29/4/16

**Department -- OMOLOGAZIONE**

**Test date : 19.04.2016**

**Vehicle data**

Vehicle ID ----- 139.9  
 Vehicle model ----- NUOVA PANDA S&S E5 1248 T.16V 0 KW M5  
 Transmission type ----- M5  
 Odometer (before Test) ----- 3312 km  
 Tire pressure ----- 2.3 bar  
 Tire dimension -----  
 VIN ----- ZFA312000\*\*3434870

**Fuel data**

Fuel type ----- GASOLIO EURO 5  
 Batch No. ----- 202  
 Calculation instruction ----- DIESEL  
 Density ----- 0,835 g/cm3 [15°C]  
 Carbon percentage ----- 86,6 %  
 NHV ----- 16436,9 btu/lb

**Dyno data**

Inertia ----- 1130 kg  
 Dyno load ----- F0/F1/F2 40,0 / 0,430 / 0,0305  
 KW at 80km/h ----- KW

**Add. data**

Driver -----  
 Operator ----- S80P  
 aux table ----- NO\_AUX  
 Range switch table -----  
 Fan speed polynom ----- EU

**Reference**

Regulatory frame ----- EU  
 Limit Range Humidity: --5,7 - 12,5 g/kg  
 Ref. temp. ----- 273,15 K  
 Ref. Pressure ----- 1013,3 mbar  
 Calculation Regulatory ----- EU5  
 CVS flow ----- 9,0 m3/min

**Test reference data:**

Richiedente ----- DARGENIO

**Remarks**

Test rem. ----- ,

**Phase Results**

	1	2		Phase
Barometric pressure	98,90	98,91		kPa
Ambient air temperature	24,00	24,14		°C
Relative humidity	41,94	41,75		%
NOx correction factor	0,9174	0,9182		
Dilution factor	40,460	19,022		
CVS volume corrected (273,15K)	105,439	54,046		m <sup>3</sup>
Average CVS temperature	39,9	39,9		°C
Average CVS pressure PV	96,5	96,5		kPa
DLS volume corrected (273,15K)	0,6502	0,3331		m <sup>3</sup>
Average force at dyno	50,0	210,3		N
Minimum oil temperature				°C
Distance	4,045	6,940		km
Drivers violation	0,0	0,0		sec

**Bag Analysis**

	1	2		Phase
Concentration sample THC	8,025	3,331		ppmC1
Concentration ambient THC	2,804	2,634		ppmC1
Emission THC	0,347	0,028		g/Phase
Emission THC	86,000	4,000		mg/km
Concentration sample CH4				ppm
Concentration ambient CH4				ppm
Emission CH4				g/Phase
Emission CH4				mg/km
Concentration sample NMHC				ppmC1
Concentration ambient NMHC				ppmC1
Emission NMHC				g/Phase
Emission NMHC				mg/km
Concentration sample CO	14,580	0,840		ppm
Concentration ambient CO	0,397	0,394		ppm
Emission CO	1,871	0,032		g/Phase
Emission CO	463,000	5,000		mg/km
Concentration sample NOx	3,199	8,310		ppm
Concentration ambient NOx	0,015	0,004		ppm
Emission NOx	0,832	0,845		g/Phase
Emission NOx	156,000	122,000		mg/km
Concentration sample NO2				ppm
Concentration ambient NO2				ppm
Emission NO2				g/Phase
Emission NO2				mg/km
Concentration sample N2O				ppm
Concentration ambient N2O				ppm
Emission N2O				g/Phase
Emission N2O				mg/km
Concentration sample CO2	0,331	0,706		%
Concentration ambient CO2	0,049	0,048		%
Emission CO2	588,277	704,444		g/Phase
Emission CO2	145,433	101,505		g/km
Fuel consumption	5,55	3,85		l/100km

**Total Results**

Emission per	HC	CO	CO2	NOx	NMHC	HC + Nox
total distance [mg/km]	34,140	173,236	117,681	134,460		168,600

Fuel consumption [l/100km]	4,48			NO2	N2O
----------------------------	------	--	--	-----	-----

Department --- OMOLOGAZIONE

Test date : 19.04.2016

**Vehicle data**

Vehicle ID ----- **139.9**  
 Vehicle model ----- NUOVA PANDA S&S E5  
 Transmission type ----- M5  
 Odometer (before Test) ----- 3312 km  
 Tire pressure ----- 2.3 bar  
 VIN ----- 3434870  
 CVS flow ----- 9,0 m3/min

**Fuel data**

Fuel type ----- GASOLIO EURO 5  
 Batch No. ----- 202  
 Calculation instruction ----- DIESEL  
 Density ----- 0,835 g/cm3 [15°C]  
 Carbon percentage ----- 86,6 %  
 NHV ----- 16438,9 btu/lb

**Dyno data**

Inertia ----- 1130 kg  
 Dyno load ----- F0/F1/F2 40,0 / 0,430 / 0,0305

**Add. data**

Driver ----- ventura  
 Operator ----- S8OP  
 AUX table ----- NO\_AUX  
 Range switch table -----  
 Fan speed polynom ----- EU

**Reference**

Regulatory frame ----- EU  
 Ref. temp. ----- 273,15 K  
 Ref. Pressure ----- 1013,3 mbar  
 Calculation Regulatory ----- EU5

**Test reference data:**

GECOM Request No. -----  
 Richiedente ----- DARGENIO

**Remarks**

Test rem. ----- ,  
 Customer ----- mettere sottocarica ciclo freddo  
 Operator ----- /

**Phase Results**

	1	2		Phase
Barometric pressure	98,90	98,91		kPa
Ambient air temperature	24,00	24,14		°C
Relative humidity	41,94	41,75		%
NOx correction factor	0,9174	0,9182		
Dilution factor	40,460	19,022		
CVS volume corrected (273,15K)	105,439	54,046		m <sup>3</sup>
Average CVS temperature	39,9	39,9		°C
Average CVS pressure PV	96,5	96,5		kPa
DLS volume corrected (273,15K)	0,6502	0,3331		m <sup>3</sup>
Average torque at dyno	50,0	210,3		N
Minimum oil temperature				°C
Distance	4,045	6,940		km
Drivers violation	0,0	0,0		sec

**Particulate results**

	1	2		Phase
Main filter before test	78,982			mg
Main filter after test	79,023			mg
Backup filter before test				mg
Backup filter after test				mg
Payload main filter	0,041			mg
Payload backup filter				mg
Efficiency of main filter				%
Calculated payload				mg
mass emission	0,0067			g
mass emission per distance	0,6056			mg/km

**TEOM results**

Payload				mg
TEOM mass emission				g
TEOM mass emission per distance				mg/km
Efficiency TEOM/gravimetric				%

**Particulate total results**

**Remarks**

Total emission 0,0067 g  
 Total emission per total distance **0,6056** mg/km

**Particulate Counter total results**

Total counts: 2,3618E+12  
**Tot.counts/** 2,1500E+11 1/km  
**Tot.distance**

**Weighing chamber data**

Chamber temperature: 22,00 °C  
 Chamber pressure: 984,00 kPa  
 Buoyancy correction factor: 1,000358E+00

**Setup/Checks Particulate Counter**

CPCCFK 1,0571 unity  
 PND1 10 unity  
 PND2 15 unity  
 PCRF 168,74 unity  
 System Ckeck O.K? YES  
 Zero Count 0,02955 1/cm<sup>3</sup>

Department --- OMOLOGAZIONE

Test date : 19.04.2016

**Vehicle data**

Vehicle ID ----- 139.9  
 Vehicle model ----- NUOVA PANDA S&S E5  
 Transmission type ----- M5  
 Odometer (before Test) ----- 3312 km  
 Tire pressure ----- 2.3 bar  
 VIN ----- 3434870  
 CVS flow ----- 9,0 m3/min

**Fuel data**

Fuel type ----- GASOLIO EURO 5  
 Batch No.----- 202  
 Calculation instruction ----- DIESEL  
 Density ----- 0,835 g/cm3 [15°C]  
 Carbon percentage ----- 86,6 %  
 NHV ----- 16438,9 btu/lb

**Dyno data**

Inertia ----- 1130 kg  
 Dyno load ----- F0/F1/F2 40,0 / 0,430 / 0,0305

**Add. data**

Driver ----- ventura  
 Operator ----- S8OP  
 aux table ----- NO\_AUX  
 Range switch table -----  
 Fan speed polynom ----- EU

**Reference**

Regulatory frame ----- EU  
 Ref. temp. ----- 273,15 K  
 Ref. Pressure ----- 1013,3 mbar  
 Calculation Regulatory ----- EU5

**Test reference data:**

GECOM Request No.-----  
 Richiedente----- DARGENIO

**Remarks**

Test rem. ----- ,  
 Customer ----- mettere sottocarica ciclo freddo  
 Operator ----- /

**Phase Results**

	HC	CO	CO2	NOx	NO2	N2O	NMHC	CH4	Fuel cons.	Particulate
	[mg/km]	[mg/km]	[g/km]	[mg/km]	[mg/km]	[mg/km]	[mg/km]	[mg/km]	[l/100km]	[mg/km]
<i>Phase 1</i>										
<b>Bag</b>	86,000	463,000	145,433	156,000					5,55	0,6056
<b>Modal</b>										
<i>Phase 2</i>										
<b>Bag</b>	4,000	5,000	101,505	122,000					3,85	
<b>Modal</b>										
<b>Bag</b>										
<b>Modal</b>										
<b>Bag</b>										
<b>Modal</b>										
<i>Phase 1</i>										
<b>Pre cat avg</b>	HC [ppm]	CO [ppm]	CO2 [%]	NOx [ppm]	O2 [%]	CH4 [ppm]				
<b>Post cat avg</b>										
<b>Cat. efficiency</b>										
<b>Raw/Bag</b>										
<i>Phase 2</i>										
<b>Pre cat avg</b>										
<b>Post cat avg</b>										
<b>Cat. efficiency</b>										
<b>Raw/Bag</b>										
<b>Pre cat avg</b>										
<b>Post cat avg</b>										
<b>Cat. efficiency</b>										
<b>Raw/Bag</b>										
<b>Pre cat avg</b>										
<b>Post cat avg</b>										
<b>Cat. efficiency</b>										
<b>Raw/Bag</b>										

**Total Results**

Bag	HC	CO	CO2	NOx	NO2	N2O	NMHC	HC + NOx	Fuel ecor	Particulate
	[mg/km]	[mg/km]	[g/km]	[mg/km]	[mg/km]	[mg/km]	[mg/km]	[mg/km]	[l/100km]	[mg/km]
	<b>34,140</b>	<b>173,236</b>	<b>117,68</b>	<b>134,460</b>				<b>168,600</b>	<b>4,48</b>	<b>0,6056</b>

**Time Control**

Test Date: 19.04.2016      Start of test 8:28:28 AM      Start of trace 8:43:57 AM  
 End of test 9:13:20 AM      End of trace 9:03:37 AM

Ciclo caldo

Department — OMOLOGAZIONE

Test date : 19.04.2016

**Vehicle data**

Vehicle ID — 139.9  
 Vehicle model — NUOVA PANDA S&S E5 1248 T.16V 0 KW M5  
 Transmission type — M5  
 Odometer (before Test) — 33132 km  
 Tire pressure — 2,3 bar  
 Tire dimension —  
 VIN — ZFA312000\*\*3434870

(targa EY389EJ)

**Fuel data**

Fuel type — GASOLIO EURO 5  
 Batch No. — 202  
 Calculation Instruction — DIESEL  
 Density — 0,835 g/cm3 [15°C]  
 Carbon percentage — 86,6 %  
 NHV — 18438,9 btu/lb

**Dyno data**

Inertia — 1130 kg  
 Dyno load — F0/F1/F2 40,0 / 0,430 / 0,0305  
 KW at 80km/h — KW

**Add. data**

Driver — albarino  
 Operator — SBOP  
 aux table — NO AUX  
 Range switch table —  
 Fan speed polynom — EU

**Reference**

Regulatory frame — EU  
 Limit Range Humidity: -5,7 - 12,5 g/kg  
 Ref. temp. — 273,15 K  
 Ref. Pressure — 1013,3 mbar  
 Calculation Regulatory — EU5  
 CVS flow — 8,0 m3/min

**Test reference data:**

Richiedente — DARGENIO

**Remarks**

Test rem. - Ciclo caldo

**Conditions**

Phase Results	Ph. 1	Ph. 2	Ph.	Ph.	Phase
Barometric pressure	98,98	99,00			kPa
Ambient air temperature	23,84	23,89			°C
Relative humidity	41,55	41,95			%
Absolute humidity	7,81	7,91			g/kg
NOx correction factor	0,9130	0,9158			
Dilution factor	48,020	19,680			
CVS volume corrected (273,15K)	105,540	54,112			m <sup>3</sup>
Average CVS temperature	39,9	39,9			°C
Average CVS pressure PV	96,6	96,6			kPa
DLS volume corrected (273,15K)	0,6501	0,3331			m <sup>3</sup>
Distance	4,077	6,958			km
Drivers violation	0,0	0,0			sec

**Phase Results**

	HC	CO	CO2	NOx	NO2	N2O	NMHC	CH4	Fuel cons.	Particulate
	[mg/km]	[mg/km]	[g/km]	[mg/km]	[mg/km]	[mg/km]	[mg/km]	[mg/km]	[l/100km]	[mg/km]
Phase 1										
Bag	49,000	39,000	119,113	475,000					4,53	
Modal										
Phase 2										
Bag	8,000	5,000	97,941	317,000					3,72	
Modal										
Bag										
Modal										
Bag										
Modal										

19/4/16

**Total Results**

Bag	HC	CO	CO2	NOx	NO2	N2O	NMHC	HC + NOx	Fuel econ	Particulate
	[mg/km]	[mg/km]	[g/km]	[mg/km]	[mg/km]	[mg/km]	[mg/km]	[mg/km]	[l/100km]	[mg/km]
Results	22,84	17,49	105,76	375,35				398,19	4,01	
K-Fact.(KI)										
VM x KI	22,84	17,49	105,76	375,35				398,19	4,01	
EVO-F. (EF)										
VMxKixEF	22,84	17,49	105,76	375,35				398,19	4,01	
DET-F. (D.F.)										
Final Result	22,8	17,5	105,8	375,4				398,2	4,0	
Limits										

**Time Control**

Test Date: 19.04.2016      Start of test 9:15:46 AM      Start of trace 9:28:35 AM  
 End of test 9:57:57 AM      End of trace 9:48:15 AM

Department --- OMOLOGAZIONE

Test date : 19.04.2016

**Vehicle data**

Vehicle ID ----- **139.9**  
Vehicle model ----- NUOVA PANDA S&S E5  
Transmission type ----- M5  
Odometer (before Test) ----- 33132 km  
Tire pressure ----- 2.3 bar  
VIN ----- 3434870  
CVS flow ----- 9,0 m3/min

**Fuel data**

Fuel type ----- GASOLIO EURO 5  
Batch No. ----- 202  
Calculation instruction ----- DIESEL  
Density ----- 0,835 g/cm3 [15°C]  
Carbon percentage ----- 86,6 %  
NHV ----- 16438,9 btu/lb

**Dyno data**

Inertia ----- 1130 kg  
Dyno load ----- F0/F1/F2 40,0 / 0,430 / 0,0305

**Add. data**

Driver ----- albertino  
Operator ----- S8OP  
AUX table ----- NO\_AUX  
Range switch table -----  
Fan speed polynom ----- EU

**Reference**

Regulatory frame ----- EU  
Ref. temp. ----- 273,15 K  
Ref. Pressure ----- 1013,3 mbar  
Calculation Regulatory ----- EU5

**Test reference data:**

GECOM Request No. -----  
Richiedente ----- DARGENIO

**Remarks**

Test rem. ----- 0  
Customer ----- mettere sottocarica ciclo caldo  
Operator ----- /

**Phase Results**

	1	2		Phase
Barometric pressure	98,98	99,00		kPa
Ambient air temperature	23,84	23,89		°C
Relative humidity	41,55	41,95		%
NOx correction factor	0,9130	0,9158		
Dilution factor	48,020	19,680		
CVS volume corrected (273,15K)	105,540	54,112		m <sup>3</sup>
Average CVS temperature	39,9	39,9		°C
Average CVS pressure PV	96,6	96,6		kPa
DLS volume corrected (273,15K)	0,6501	0,3331		m <sup>3</sup>
Average torque at dyno	50,7	211,1		N
Minimum oil temperature				°C
Distance	4,077	6,958		km
Drivers violation	0,0	0,0		sec

**Particulate results**

	1	2		Phase
Main filter before test	87,283			mg
Main filter after test	87,364			mg
Backup filter before test				mg
Backup filter after test				mg
Payload main filter	0,081			mg
Payload backup filter				mg
Efficiency of main filter				%
Calculated payload				mg
mass emission	0,0131			g
mass emission per distance	1,1879			mg/km

**TEOM results**

Payload				mg
TEOM mass emission				g
TEOM mass emission per distance				mg/km
Efficiency TEOM/gravimetric				%

**Particulate total results**

**Remarks**

Total emission 0,0131 g  
Total emission per total distance 1,1879 mg/km

**Particulate Counter total results**

Total counts: 2,2974E+11  
Tot.counts/ 2,0820E+10 1/km  
Tot.distance

**Weighing chamber data**

Chamber temperature: 22,00 °C  
Chamber pressure: 984,00 kPa  
Buoyancy correction factor: 1,000358E+00

**Setup/Checks Particulate Counter**

CPCCFK 1,0571 unity  
PND1 10 unity  
PND2 15 unity  
PCRF 168,74 unity  
System Ckeck O.K? YES  
Zero Count 0,113 1/cm<sup>3</sup>

Department --- OMOLOGAZIONE

Test date : 19.04.2016

**Vehicle data**

Vehicle ID ----- 139.9  
 Vehicle model ----- NUOVA PANDA S&S E5  
 Transmission type ----- M5  
 Odometer (before Test) ----- 33132 km  
 Tire pressure ----- 2.3 bar  
 VIN ----- 3434870  
 CVS flow ----- 9,0 m3/min

**Fuel data**

Fuel type ----- GASOLIO EURO 5  
 Batch No.----- 202  
 Calculation instruction ----- DIESEL  
 Density ----- 0,835 g/cm3 [15 °C]  
 Carbon percentage ----- 86,6 %  
 NHV ----- 16438,9 btu/lb

**Dyno data**

Inertia ----- 1130 kg  
 Dyno load ----- F0/F1/F2 40,0 / 0,430 / 0,0305

**Add. data**

Driver ----- albertino  
 Operator ----- S8OP  
 aux table ----- NO\_AUX  
 Range switch table -----  
 Fan speed polynom ----- EU

**Reference**

Regulatory frame ----- EU  
 Ref. temp. ----- 273,15 K  
 Ref. Pressure ----- 1013,3 mbar  
 Calculation Regulatory ----- EU5

**Test reference data:**

GECOM Request No.-----  
 Richiedente----- DARGENIO

**Remarks**

Test rem. ----- 0  
 Customer ----- mettere sottocarica ciclo caldo  
 Operator ----- /

**Phase Results**

	HC	CO	CO2	NOx	NO2	N2O	NMHC	CH4	Fuel cons.	Particulate
	[mg/km]	[mg/km]	[g/km]	[mg/km]	[mg/km]	[mg/km]	[mg/km]	[mg/km]	[l/100km]	[mg/km]
<i>Phase 1</i>										
<b>Bag</b>	49,000	39,000	119,113	474,000					4,53	1,1879
<b>Modal</b>										
<i>Phase 2</i>										
<b>Bag</b>	8,000	5,000	97,941	317,000					3,72	
<b>Modal</b>										
<b>Bag</b>										
<b>Modal</b>										
<b>Bag</b>										
<b>Modal</b>										
<i>Phase 1</i>										
<b>Pre cat avg</b>	HC [ppm]	CO [ppm]	CO2 [%]	NOx [ppm]	O2 [%]	CH4 [ppm]				
<b>Post cat avg</b>										
<b>Cat. efficiency</b>										
<b>Raw/Bag</b>										
<i>Phase 2</i>										
<b>Pre cat avg</b>										
<b>Post cat avg</b>										
<b>Cat. efficiency</b>										
<b>Raw/Bag</b>										
<b>Pre cat avg</b>										
<b>Post cat avg</b>										
<b>Cat. efficiency</b>										
<b>Raw/Bag</b>										
<b>Pre cat avg</b>										
<b>Post cat avg</b>										
<b>Cat. efficiency</b>										
<b>Raw/Bag</b>										

**Total Results**

Bag	HC	CO	CO2	NOx	NO2	N2O	NMHC	HC + NOx	Fuel ecor	Particulate
	[mg/km]	[mg/km]	[g/km]	[mg/km]	[mg/km]	[mg/km]	[mg/km]	[mg/km]	[l/100km]	[mg/km]
	<b>22,840</b>	<b>17,490</b>	<b>105,76</b>	<b>374,990</b>				<b>397,830</b>	<b>4,01</b>	<b>1,1879</b>

**Time Control**

Test Date: 19.04.2016      Start of test 9:15:46 AM      Start of trace 9:28:35 AM  
 End of test 9:57:57 AM      End of trace 9:48:15 AM

Department --- OMOLOGAZIONE

Test date : 29.06.2016

**Vehicle data**

Vehicle ID ----- 139.9  
Vehicle model ----- NUOVA PANDA S&S E5  
Transmission type ----- M5  
Odometer (before Test) ----- 3330 km  
Tire pressure ----- 2.3 bar  
VIN ----- 3434870  
CVS flow ----- 9,0 m3/min

**Fuel data**

Fuel type ----- GASOLIO EURO 5  
Batch No. ----- 202  
Calculation instruction ----- DIESEL  
Density ----- 0,835 g/cm3 [15°C]  
Carbon percentage ----- 86,8 %  
NFV ----- 16436,9 btu/lb

**Dyno data**

Inertia ----- 1130 kg  
Dyno load ----- F0/F1/F2 40,0 / 0,430 / 0,0305

**Add. data**

Driver ----- albertino  
Operator ----- S8OP  
aux table ----- NO\_AUX  
Range switch table ----- STANDARD  
Fan speed polynom ----- EU

**Reference**

Regulatory frame ----- EU  
Ref. temp. ----- 273,15 K  
Ref. Pressure ----- 1013,3 mbar  
Calculation Regulatory ----- EU5

**Test reference data:**

GECOM Request No. -----  
Richiedente -----

*Handwritten signature and date: 29-06-16*

**Remarks**

Test rem. ----- Ciclo ColdBack -Ufficiale dimostrativo-  
Customer ----- Ciclo ColdBack -Ufficiale dimostrativo- S&S on Attendere omologatore-Ciclo freddo  
Operator ----- /

**Phase Results**

	HC [mg/km]	CO [mg/km]	CO2 [g/km]	NOx [mg/km]	NO2 [mg/km]	N2O [mg/km]	NMHC [mg/km]	CH4 [mg/km]	Fuel cons. [l/100km]	Particulate [mg/km]
Phase 1										
Bag	16,000	95,000	114,674	167,000					4,36	
Modal										
Phase 2										
Bag	25,000	7,000	114,591	378,000					4,35	
Modal										
Bag										
Modal										
Bag										
Modal										
Phase 1										
Pre cat avg	HC [ppm]	CO [ppm]	CO2 [%]	NOx [ppm]	O2 [%]	CH4 [ppm]				
Post cat avg										
Cat. efficiency										
Raw/Bag										
Phase 2										
Pre cat avg										
Post cat avg										
Cat. efficiency										
Raw/Bag										
Pre cat avg										
Post cat avg										
Cat. efficiency										
Raw/Bag										
Pre cat avg										
Post cat avg										
Cat. efficiency										
Raw/Bag										

**Total Results**

Bag	HC [mg/km]	CO [mg/km]	CO2 [g/km]	NOx [mg/km]	NO2 [mg/km]	N2O [mg/km]	NMHC [mg/km]	HC + NOx [mg/km]	Fuel econ [l/100km]	Particulate [mg/km]
	19,090	62,517	114,64	245,270				264,360	4,35	

**Time Control**

Test Date: 29.06.2016      Start of test 10:21:47 AM      End of test 10:58:50 AM  
Start of trace 10:29:28 AM      End of trace 10:49:08 AM

Department --- **OMOLOGAZIONE**

Test date : **29.06.2016**

**Vehicle data**

Vehicle ID ----- **139.9**  
 Vehicle model ----- **NUOVA PANDA S&S E5**  
 Transmission type ----- **M5**  
 Odometer (before Test) ----- **3330 km**  
 Tire pressure ----- **2.3 bar**  
 VIN ----- **3434870**  
 CVS flow ----- **9,0 m3/min**

**Fuel data**

Fuel type ----- **GASOLIO EURO 5**  
 Batch No. ----- **202**  
 Calculation instruction ----- **DIESEL**  
 Density ----- **0,835 g/cm3 [15°C]**  
 Carbon percentage ----- **86,8 %**  
 NHV ----- **18438,9 btu/lb**

**Dyno data**

Inertia ----- **1130 kg**  
 Dyno load ----- **F0/F1/F2 40,0 / 0,430 / 0,0305**

**Add. data**

Driver ----- **albertino**  
 Operator ----- **S&OP**  
 AUX table ----- **NO\_AUX**  
 Range switch table ----- **STANDARD**  
 Fan speed polynom ----- **EU**

**Reference**

Regulatory frame ----- **EU**  
 Ref. temp. ----- **273,15 K**  
 Ref. Pressure ----- **1013,3 mbar**  
 Calculation Regulatory ----- **EU5**

**Test reference data:**

GECOM Request No. -----  
 Richiedente -----

**Remarks**

Test rem. ----- **Ciclo ColdBack -Ufficiale dimostrativo-**  
 Customer ----- **Ciclo ColdBack -Ufficiale dimostrativo- S&S on Attendere omologatore-Ciclo fredd**  
 Operator ----- **/**

**Phase Results**

	1	2		Phase
Barometric pressure	98,78	98,78		kPa
Ambient air temperature	18,95	18,51		°C
Relative humidity	59,04	56,24		%
NOx correction factor	0,9252	0,9083		
Dilution factor	16,955	49,665		
CVS volume corrected (273,15K)	54,044	105,255		m <sup>3</sup>
Average CVS temperature	39,8	39,8		°C
Average CVS pressure PV	96,4	96,4		kPa
DLS volume corrected (273,15K)	0,3333	0,6498		m <sup>3</sup>
Average force at dyno	211,0	50,3		N
Minimum oil temperature				°C
Distance	6,955	4,098		km
Drivers violation	0,0	0,0		sec

**Bag Analysis**

	1	2		Phase
Concentration sample THC	5,928	4,287		ppmC1
Concentration ambient THC	2,874	2,776		ppmC1
Emission THC	0,108	0,103		g/Phase
Emission THC	16,000	25,000		mg/km
Concentration sample CH4				ppm
Concentration ambient CH4				ppm
Emission CH4				g/Phase
Emission CH4				mg/km
Concentration sample NMHC				ppmC1
Concentration ambient NMHC				ppmC1
Emission NMHC				g/Phase
Emission NMHC				mg/km
Concentration sample CO	11,290	1,825		ppm
Concentration ambient CO	1,554	1,651		ppm
Emission CO	0,664	0,027		g/Phase
Emission CO	95,000	7,000		mg/km
Concentration sample NOx	11,390	7,945		ppm
Concentration ambient NOx	0,041	0,055		ppm
Emission NOx	1,164	1,547		g/Phase
Emission NOx	167,000	378,000		mg/km
Concentration sample NO2				ppm
Concentration ambient NO2				ppm
Emission NO2				g/Phase
Emission NO2				mg/km
Concentration sample N2O				ppm
Concentration ambient N2O				ppm
Emission N2O				g/Phase
Emission N2O				mg/km
Concentration sample CO2	0,795	0,271		%
Concentration ambient CO2	0,046	0,045		%
Emission CO2	797,581	469,592		g/Phase
Emission CO2	114,674	114,591		g/km
Fuel consumption	4,36	4,35		l/100km

**Total Results**

Emission per	HC	CO	CO2	NOx	NMHC	HC + Nox
total distance [mg/km]	19,090	62,517	114,643	245,270		264,360

Fuel consumption [l/100km] **4,35**

NO2	N2O

Department -- OMOLOGAZIONE

Test date : 29.06.2016

**Vehicle data**

Vehicle ID ----- 139.9  
Vehicle model ----- NUOVA PANDA S&S E5  
Transmission type ----- M5  
Odometer (before Test) ----- 3330 km  
Tire pressure ----- 2.3 bar  
VIN ----- 3434870  
CVS flow ----- 9,0 m3/min

**Fuel data**

Fuel type ----- GASOLIO EURO 5  
Batch No. ----- 202  
Calculation instruction ----- DIESEL  
Density ----- 0,835 g/cm3 [15°C]  
Carbon percentage ----- 86,6 %  
NHV ----- 16438,9 btu/lb

**Dyno data**

Inertia ----- 1130 kg  
Dyno load ----- F0/F1/F2 40,0 / 0,430 / 0,0305

**Add. data**

Driver ----- albertino  
Operator ----- S8OP  
AUX table ----- NO\_AUX  
Range switch table ----- STANDARD  
Fan speed polynom ----- EU

**Reference**

Regulatory frame ----- EU  
Ref. temp. ----- 273,15 K  
Ref. Pressure ----- 1013,3 mbar  
Calculation Regulatory ----- EU5

**Test reference data:**

GECOM Request No. -----  
Richiedente -----

**Remarks**

Test rem. ----- Ciclo ColdBack -Ufficiale dimostrativo-  
Customer ----- Ciclo ColdBack -Ufficiale dimostrativo- S&S on Attendere omologatore-Ciclo freddo  
Operator ----- /

**Phase Results**

	1	2		Phase
Barometric pressure	98,78	98,78		kPa
Ambient air temperature	18,95	18,51		°C
Relative humidity	59,04	56,24		%
NOx correction factor	0,9252	0,8083		
Dilution factor	16,955	49,685		
CVS volume corrected (273,15K)	54,044	105,255		m <sup>3</sup>
Average CVS temperature	39,8	39,8		°C
Average CVS pressure PV	96,4	96,4		kPa
DLS volume corrected (273,15K)	0,3333	0,6498		m <sup>3</sup>
Average torque at dyno	211,0	50,3		N
Minimum oil temperature				°C
Distance	6,955	4,098		km
Drivers violation	0,0	0,0		sec

**Particulate results**

	1	2		Phase
Main filter before test				mg
Main filter after test				mg
Backup filter before test				mg
Backup filter after test				mg
Payload main filter				mg
Payload backup filter				mg
Efficiency of main filter				%

**Calculated payload**

mass emission -----  
mass emission per distance ----- mg/km

**TEOM results**

Payload ----- mg  
TEOM mass emission ----- g  
TEOM mass emission per distance ----- mg/km  
Efficiency TEOM/gravimetric ----- %

**Particulate total results**

Remarks -----  
Total emission ----- g  
Total emission per total distance ----- mg/km

**Particulate Counter total results**

Total counts: 5,4729E+10  
Tot.counts/ -----  
Tot.distance 4,9515E+09 1/km

**Weighing chamber data**

Chamber temperature: ----- °C  
Chamber pressure: ----- kPa  
Buoyancy correction factor: -----

**Setup/Checks Particulate Counter**

CPCCFK 1,066 unity  
PND1 10 unity  
PND2 15 unity  
PCRF 167,39 unity  
System Ckcek O.K? YES  
Zero Count 0,4286 1/cm<sup>3</sup>

Department --- OMOLOGAZIONE

Test date : 29.06.2016

**Vehicle data**

Vehicle ID ----- **139.9**  
Vehicle model ----- NUOVA PANDA S&S E5  
Transmission type ----- M5  
Odometer (before Test) ----- 3330 km  
Tire pressure ----- 2.3 bar  
VIN ----- 3434870  
CVS flow ----- 9,0 m3/min

**Fuel data**

Fuel type ----- GASOLIO EURO 5  
Batch No. ----- 202  
Calculation instruction ----- DIESEL  
Density ----- 0,835 g/cm3 [15°C]  
Carbon percentage ----- 86,6 %  
NHV ----- 16438,9 btu/lb

**Dyno data**

Inertia ----- 1130 kg  
Dyno load ----- F0/F1/F2 40,0 / 0,430 / 0,0305

**Add. data**

Driver ----- albertino  
Operator ----- S8OP  
AUX table ----- NO\_AUX  
Range switch table ----- STANDARD  
Fan speed polynom ----- EU

**Reference**

Regulatory frame ----- EU  
Ref. temp. ----- 273,15 K  
Ref. Pressure ----- 1013,3 mbar  
Calculation Regulatory ----- EU5

**Test reference data:**

GECOM Request No. -----  
Richiedente -----

**Remarks**

Test rem. ----- Ciclo ColdBack -Ufficiale dimostrativo-  
Customer ----- Ciclo ColdBack -Ufficiale dimostrativo- S&S on Attendere omologatore-Ciclo fredd  
Operator ----- /

**Phase Results**

	1	2		Phase
Barometric pressure	98,78	98,78		kPa
Ambient air temperature	18,95	18,51		°C
Relative humidity	59,04	56,24		%
NOx correction factor	0,9252	0,9083		
Dilution factor	16,955	49,685		
CVS volume corrected (273,15K)	54,044	105,255		m <sup>3</sup>
Average CVS temperature	39,8	39,8		°C
Average CVS pressure PV	96,4	96,4		kPa
DLS volume corrected (273,15K)	0,3333	0,6498		m <sup>3</sup>
Average torque at dyno	211,0	50,3		N
Minimum oil temperature				°C
Distance	6,955	4,098		km
Drivers violation	0,0	0,0		sec

**Particulate results**

	1	2		Phase
Main filter before test	85,950			mg
Main filter after test	85,959			mg
Backup filter before test				mg
Backup filter after test				mg
Payload main filter	0,009			mg
Payload backup filter				mg
Efficiency of main filter				%
Calculated payload				mg
mass emission	0,0014			g
mass emission per distance	0,1291			mg/km

**TEOM results**

Payload				mg
TEOM mass emission				g
TEOM mass emission per distance				mg/km
Efficiency TEOM/gravimetric				%

**Particulate total results**

**Remarks**

Total emission 0,0014 g  
Total emission per total distance 0,1291 mg/km

**Particulate Counter total results**

Total counts: 5,4729E+10  
Tot.counts/ 4,9515E+09 1/km  
Tot.distance

**Weighing chamber data**

Chamber temperature: 21,50 °C  
Chamber pressure: 985,70 kPa  
Buoyancy correction factor: 1,000360E+00

**Setup/Checks Particulate Counter**

CPCCFK 1,066 unity  
PND1 10 unity  
PND2 15 unity  
PCRF 167,39 unity  
System Ckeck O.K? YES  
Zero Count 0,4286 1/cm<sup>3</sup>

Department --- OMOLOGAZIONE

Test date : 29.06.2016

**Vehicle data**

Vehicle ID ----- 139.9  
 Vehicle model ----- NUOVA PANDA S&S E5  
 Transmission type ----- M5  
 Odometer (before Test) ----- 3330 km  
 Tire pressure ----- 2.3 bar  
 VIN ----- 3434870  
 CVS flow ----- 9,0 m3/min

**Fuel data**

Fuel type ----- GASOLIO EURO 5  
 Batch No. ----- 202  
 Calculation instruction ----- DIESEL  
 Density ----- 0,835 g/cm3 [15 °C]  
 Carbon percentage ----- 86,6 %  
 NHV ----- 16438,9 btu/lb

**Dyno data**

Inertia ----- 1130 kg  
 Dyno load ----- F0/F1/F2 40,0 / 0,430 / 0,0305

**Add. data**

Driver ----- albertino  
 Operator ----- S8OP  
 aux table ----- NO\_AUX  
 Range switch table ----- STANDARD  
 Fan speed polynom ----- EU

**Reference**

Regulatory frame ----- EU  
 Ref. temp. ----- 273,15 K  
 Ref. Pressure ----- 1013,3 mbar  
 Calculation Regulatory ----- EU5

**Test reference data:**

GECOM Request No. -----  
 Richiedente -----

**Remarks**

Test rem. ----- Ciclo ColdBack -Ufficiale dimostrativo-  
 Customer ----- Ciclo ColdBack -Ufficiale dimostrativo- S&S on Attendere omologatore-Ciclo fredd  
 Operator ----- /

**Phase Results**

	HC	CO	CO2	NOx	NO2	N2O	NMHC	CH4	Fuel cons.	Particulate
	[mg/km]	[mg/km]	[g/km]	[mg/km]	[mg/km]	[mg/km]	[mg/km]	[mg/km]	[l/100km]	[mg/km]
<i>Phase 1</i>										
<b>Bag</b>	16,000	95,000	114,674	167,000					4,36	0,1291
<b>Modal</b>										
<i>Phase 2</i>										
<b>Bag</b>	25,000	7,000	114,591	378,000					4,35	
<b>Modal</b>										
<b>Bag</b>										
<b>Modal</b>										
<i>Phase 1</i>										
<b>Pre cat avg</b>	HC [ppm]	CO [ppm]	CO2 [%]	NOx [ppm]	O2 [%]	CH4 [ppm]				
<b>Post cat avg</b>										
<b>Cat. efficiency</b>										
<b>Raw/Bag</b>										
<i>Phase 2</i>										
<b>Pre cat avg</b>										
<b>Post cat avg</b>										
<b>Cat. efficiency</b>										
<b>Raw/Bag</b>										
<b>Pre cat avg</b>										
<b>Post cat avg</b>										
<b>Cat. efficiency</b>										
<b>Raw/Bag</b>										
<b>Pre cat avg</b>										
<b>Post cat avg</b>										
<b>Cat. efficiency</b>										
<b>Raw/Bag</b>										

**Total Results**

Bag	HC	CO	CO2	NOx	NO2	N2O	NMHC	HC + NOx	Fuel ecor	Particulate
	[mg/km]	[mg/km]	[g/km]	[mg/km]	[mg/km]	[mg/km]	[mg/km]	[mg/km]	[l/100km]	[mg/km]
	<b>19,090</b>	<b>62,517</b>	<b>114,64</b>	<b>245,270</b>				<b>264,360</b>	<b>4,35</b>	<b>0,1291</b>

**Time Control**

Test Date: 29.06.2016      Start of test 10:21:47 AM      Start of trace 10:29:28 AM  
 End of test 10:58:50 AM      End of trace 10:49:08 AM

Department — **OMOLOGAZIONE**

Test date : **19.05.2016**

**Vehicle data**

Vehicle ID — 139,9  
 Vehicle model — NUOVA PANDA S&S E5  
 Transmission type — M5  
 Odometer (before Test) — 33288 km  
 Tire pressure — 2,3 bar  
 VIN — 3434870  
 CVS flow — 9,0 m3/min

**Fuel data**

Fuel type — GASOLIO EURO 5  
 Batch No. — 202  
 Calculation instruction — DIESEL  
 Density — 0,835 g/cm3 [15°C]  
 Carbon percentage — 86,6 %  
 NHV — 16438,9 btu/lb

**Dyno data**

Inertia — 1130 kg  
 Dyno load — F0/F1/F2 40,0 / 0,430 / 0,0305

**Add. data**

Driver — ventura  
 Operator — S8OP  
 aux table — NO\_AUX  
 Range switch table — STANDARD  
 Fan speed polynom — EU

**Reference**

Regulatory frame — EU  
 Ref. temp. — 273,15 K  
 Ref. Pressure — 1013,3 mbar  
 Calculation Regulatory — EU5

**Test reference data:**

GECOM Request No. —  
 Richiedente —

**Remarks**

Test rem. —  
 Customer — omologazione caldo  
 Operator — /

**Phase Results**

	HC [mg/km]	CO [mg/km]	CO2 [g/km]	NOx [mg/km]	NO2 [mg/km]	N2O [mg/km]	NMHC [mg/km]	CH4 [mg/km]	Fuel cons. [l/100km]	Particulate [mg/km]
<b>Phase 1</b>										
Bag	13,000	12,000	98,133	291,000					3,72	
Modal										
<b>Phase 2</b>										
Bag	38,000	22,000	112,035	432,000					4,25	
Modal										
Bag										
Modal										
Bag										
Modal										
<b>Phase 1</b>										
Pre cat avg										
Post cat avg										
Cat. efficiency										
Raw/Bag										
<b>Phase 2</b>										
Pre cat avg										
Post cat avg										
Cat. efficiency										
Raw/Bag										
Pre cat avg										
Post cat avg										
Cat. efficiency										
Raw/Bag										
Pre cat avg										
Post cat avg										
Cat. efficiency										
Raw/Bag										

**Total Results**

Bag	HC [mg/km]	CO [mg/km]	CO2 [g/km]	NOx [mg/km]	NO2 [mg/km]	N2O [mg/km]	NMHC [mg/km]	HC + NOx [mg/km]	Fuel econ [l/100km]	Particulate [mg/km]
	21,910	15,752	103,28	343,110				365,020	3,92	

**Time Control**

Test Date: 19.05.2016      Start of test 11:28:00 AM      Start of trace 11:35:44 AM  
 End of test 12:05:08 PM      End of trace 11:55:25 AM

*CS* 19/5/16

Department --- OMOLOGAZIONE

Test date : 19.05.2016

**Vehicle data**

Vehicle ID ..... 139.9  
Vehicle model ..... NUOVA PANDA S&S E5 1248 T.16V 0 KW M5  
Transmission type ..... M5  
Odometer (before Test) ..... 33288 km  
Tire pressure ..... 2.3 bar  
Tire dimension .....  
VIN ..... ZFA312000\*\*3434870

**Fuel data**

Fuel type ..... GASOLIO EURO 5  
Batch No. .... 202  
Calculation instruction ..... DIESEL  
Density ..... 0,835 g/cm<sup>3</sup> (15°C)  
Carbon percentage ..... 86,6 %  
NHV ..... 16438,9 btu/lb

**Dyno data**

Inertia ..... 1130 kg  
Dyno load ..... F0/F1/F2 40,0 / 0,430 / 0,0305  
KW at 80km/h ..... KW

**Add. data**

Driver ..... ventura  
Operator ..... SBOP  
aux table ..... NO AUX  
Range switch table ..... STANDARD  
Fan speed polynom ..... EU

**Reference**

Regulatory frame ..... EU  
Limit Range Humidity: -5,7 - 12,5 g/kg  
Ref. temp. .... 273,15 K  
Ref. Pressure ..... 1013,3 mbar  
Calculation Regulatory ..... EUS  
CVS flow ..... 9,0 m<sup>3</sup>/min

**Test reference data:**

Richiedente.....

**Remarks**

Test rem. ....

**Conditions**

Phase Results	Ph. 1	Ph. 2	Ph.	Ph.	Phase
Barometric pressure	97,92	97,92			kPa
Ambient air temperature	20,81	20,34			°C
Relative humidity	59,33	59,12			%
Absolute humidity	9,46	9,10			g/kg
NOx correction factor	0,9606	0,9498			
Dilution factor	19,550	50,780			
CVS volume corrected (273,15K)	53,587	104,382			m <sup>3</sup>
Average CVS temperature	39,8	39,8			°C
Average CVS pressure PV	95,6	95,6			kPa
DLS volume corrected (273,15K)	0,3335	0,6499			m <sup>3</sup>
Distance	6,956	4,090			km
Drivers violation	0,0	0,0			sec

**Phase Results**

	HC [mg/km]	CO [mg/km]	CO2 [g/km]	NOx [mg/km]	NO2 [mg/km]	N2O [mg/km]	NMHC [mg/km]	CH4 [mg/km]	Fuel cons. [l/100km]	Particulate [mg/km]
Phase 1										
Bag	13,000	12,000	98,133	291,000					3,72	0,1368
Modal										
Phase 2										
Bag	36,000	22,000	112,035	432,000					4,25	
Modal										
Bag										
Modal										
Bag										
Modal										

**Total Results**

Bag	HC [mg/km]	CO [mg/km]	CO2 [g/km]	NOx [mg/km]	NO2 [mg/km]	N2O [mg/km]	NMHC [mg/km]	HC + NOx [mg/km]	Fuel econ [l/100km]	Particulate [mg/km]
Results	21,91	15,75	103,28	343,11				365,02	3,92	0,14
K-Fact.(KI)										
VM x KI	21,91	15,75	103,28	343,11				365,02	3,92	0,14
EVO-F. (EF)										
VMxKIxEF	21,91	15,75	103,28	343,11				365,02	3,92	0,14
DET-F. (D.F.)										
Final Result	21,9	15,8	103,3	343,1				365,0	3,9	0,14
Limits										

**Time Control**

Test Date: 19.05.2016

Start of test 11:28:00 AM  
End of test 12:05:08 PM

Start of trace 11:35:44 AM  
End of trace 11:55:25 AM

Case: NEDC\_Cold\_060716

Page: Trip Summary

'Balocco Track'

Start Date: 07/06/2016

Start Time: 08:47:59.0



Concerto M.O.V.E., 2016

Trip Duration	1196.00	s
Trip Duration (a)	1196.00	s
Trip Distance	11.01	km
Trip Distance (a)	11.01	km
Trip Fuel Cons. (b)	0.44	kg
Trip Fuel Cons. (a,b)	0.44	kg
Trip Fuel Cons. EU (a,c)	n/a	kg
Trip Fuel Cons. US (a,c)	n/a	kg
Trip Fuel Cons. Volume (b)	0.52	l
Trip Fuel Cons. Volume (a,b)	0.52	l
Trip Fuel Cons. Volume EU (a,c)	n/a	l
Trip Fuel Cons. Volume US (a,c)	n/a	l
Trip Fuel Economy (b)	4.73	l/km100
Trip Fuel Economy (a,b)	4.73	l/km100
Trip Fuel Economy EU (a,c)	n/a	l/km100
Trip Fuel Economy US (a,c)	n/a	l/km100
Trip Av. Eng. Speed	1309.57	rpm
Trip Av. Torque	25.64	Nm
Trip Av. Power	4.96	kW
Trip Work	1.64	kWh
Trip Av. Eng. Speed (a)	1309.57	rpm
Trip Av. Torque (a)	25.64	Nm
Trip Av. Power (a)	4.96	kW
Trip Work (a)	1.64	kWh
Trip Av. Humidity	55.80	%
Trip Av. Amb. Temperature	27.14	degC
Trip Av. Humidity (a)	55.80	%
Trip Av. Amb. Temperature (a)	27.14	degC

ave THC	0.00000	ppm
ave NMHC	0.00000	ppm
ave CH4	0.00000	ppm
ave CO	82.67424	ppm
ave CO2	4.63886	%
ave NOx	64.12834	ppm
ave PM	0.00046	mg/m3
ave Soot meas	0.00000	mg/m3
ave Soot	0.00046	mg/m3
ave PN	n/a	#/cm3
tot THC	0.00000	g
tot NMHC	0.00000	g
tot CH4	0.00000	g
tot CO	1.56471	g
tot CO2	1357.66622	g
tot NO (c)	1.70043	g
tot NO2	0.38326	g
tot NOx	2.08368	g
tot Soot	0.00000	g
tot Soot meas	0.00000	g
tot PM	0.00000	g
tot PN	n/a	#
PM measurement type	0.00000	-
PM correction type	1.00000	alpha(HC)
tot Soot on PM filter (estim.)	0.00000	mg
Soot -> PM simple scaling factor	1.00000	-
Soot -> PM alpha scaling factor	0.00000	-
Trip Av. Veh. Speed	33.42677	km/h
Trip Distance Share Urban	50.53369	% distance
Trip Distance Share Rural	27.20590	% distance
Trip Distance Share Motorway	21.96041	% distance

BS CO2	830.30274	g/kWh
BS CO	0.95692	g/kWh
BS THC	0.00000	g/kWh
BS NMHC	0.00000	g/kWh
BS CH4	0.00000	g/kWh
BS NO (d)	1.03992	g/kWh
BS NO2	0.23439	g/kWh
BS NOx	1.27431	g/kWh
BS Soot	0.00000	g/kWh
BS Soot meas	0.00000	g/kWh
BS PM	0.00000	g/kWh
BS PN	n/a	#/kWh
DS CO2	123.28674	g/km
DS CO	0.14209	g/km
DS THC	0.00000	g/km
DS NMHC	0.00000	g/km
DS CH4	0.00000	g/km
DS NO (c)	0.15441	g/km
DS NO2	0.03480	g/km
DS NOx	0.18921	g/km
DS Soot	0.00000	g/km
DS Soot meas	0.00000	g/km
DS PM	0.00000	g/km
DS PN	n/a	#/km
FS CO2	3104.54184	g/kg
FS CO	3.57798	g/kg
FS THC	0.00000	g/kg
FS NMHC	0.00000	g/kg
FS CH4	0.00000	g/kg
FS NO (d)	3.88832	g/kg
FS NO2	0.87638	g/kg
FS NOx	4.76470	g/kg
FS Soot	0.00000	g/kg
FS Soot meas	0.00000	g/kg
FS PM	0.00000	g/kg
FS PN	n/a	#/kg

(a) GAS PEMS measurement state only, (b) based on fuel rate input (ECU, Fuel Meter), (c) calculated from carbon balance  
(d) NO calculated using molecular weight of NO2

PEMS Current Case:  
D:\AVL Concerto\Work\Environments\PEMS\_Rel5\_B135\PEMS139\_SDE75cv\_MT5\_tel870\_Ministero\060716\_Engine: SDE\_75cv / Diesel :  
PEMS Result Filename:  
D:\AVL Concerto\MyData\TransportFiles\139\_SDE\_75cv\_E5+\_tel870\_NEDC\_Cold\_060716.ctf

Vehicle: Fiat 139(NewPanda) / MT5 E5+\_tel870  
NOx Ambient Condition Corr.: 5 - CFR40 §86.1342-94 SI  
Dry / Wet Corr.: 1 - ISO16183 (Default)

Version: Rel5\_B135

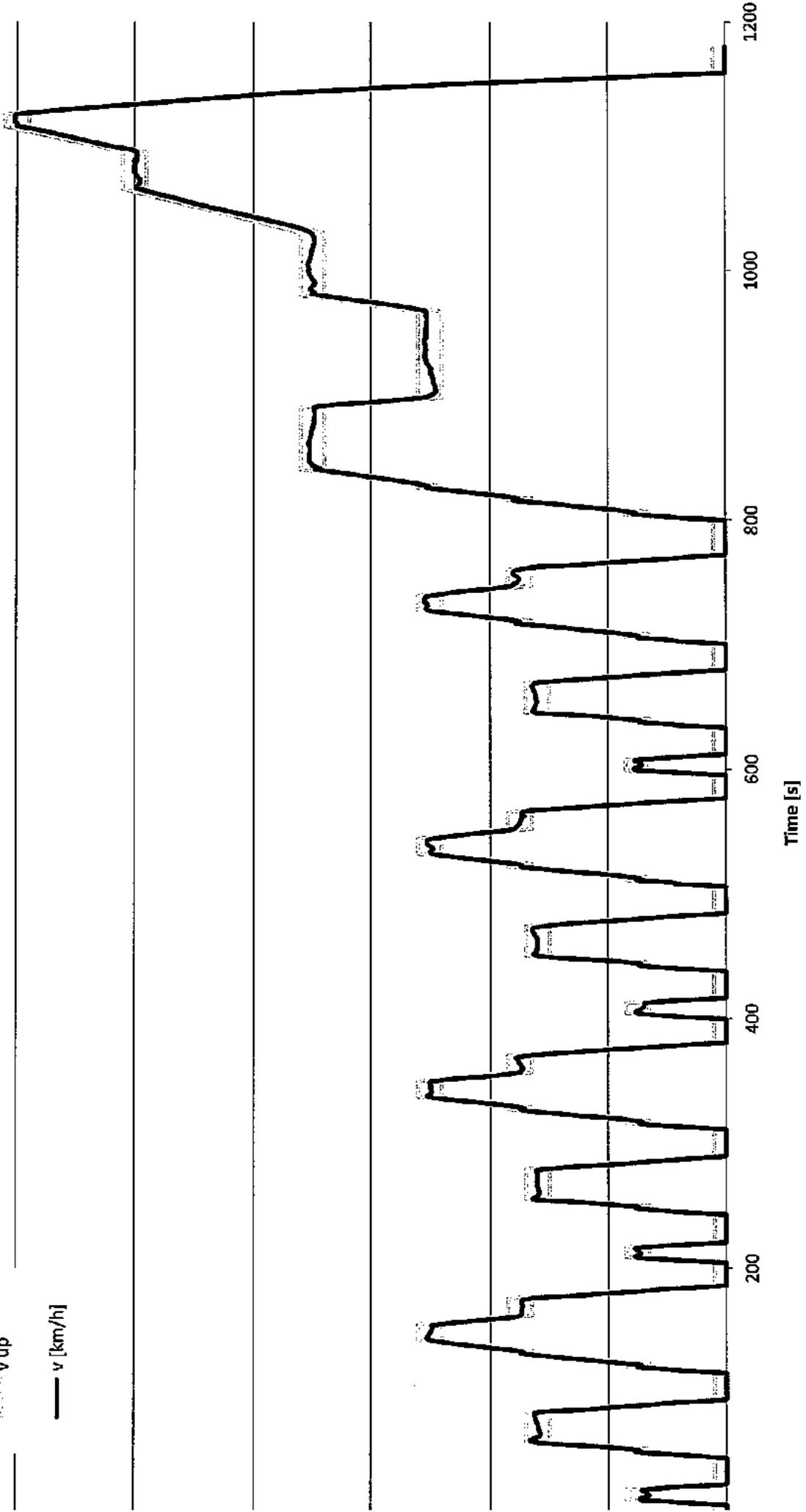
02-6/1/16

# NEDC Hot Panda E5 06/07/16

— v down

— v up

— v [km/h]





Concerto M.O.V.E. 2016

1086.00	s	ave THC	0.00000	ppm	BS CO2	957.74867	g/kWh
Trip Duration	1086.00	ave NMHC	0.00000	ppm	BS CO	1.30710	g/kWh
Trip Duration (a)	1086.00	ave CH4	0.00000	ppm	BS THC	0.00000	g/kWh
Trip Distance	8.10	ave CO	74.45722	ppm	BS NMHC	0.00000	g/kWh
Trip Distance (a)	8.10	ave CO2	3.39399	%	BS CH4	0.00000	g/kWh
Trip Fuel Cons. (b)	0.29	ave NOx	99.56107	ppm	BS NO (d)	1.06570	g/kWh
Trip Fuel Cons. (a,b)	0.29	ave PM	0.00004	mg/m3	BS NO2	0.06608	g/kWh
Trip Fuel Cons. EU (a,c)	n/a	ave Soot meas	0.00000	mg/m3	BS NOx	1.51179	g/kWh
Trip Fuel Cons. US (a,c)	n/a	ave Soot	0.00004	mg/m3	BS Soot	0.00000	g/kWh
Trip Fuel Cons. Volume (b)	0.35	ave PN	n/a	#/cm3	BS Soot meas	0.00000	g/kWh
Trip Fuel Cons. Volume (a,b)	0.35	tot THC	0.00000	g	BS PM	0.00000	g/kWh
Trip Fuel Cons. Volume EU (a,c)	n/a	tot NMHC	0.00000	g	BS PN	n/a	#/km
Trip Fuel Cons. Volume US (a,c)	n/a	tot CH4	0.00000	g	DS CO2	112.81325	g/km
Trip Fuel Economy (b)	4.32	tot CO	1.99267	g	DS CO	0.17191	g/km
Trip Fuel Economy (a,b)	4.32	tot CO2	913.90083	g	DS THC	0.00000	g/km
Trip Fuel Economy EU (a,c)	n/a	tot NO (d)	1.16170	g	DS NMHC	0.00000	g/km
Trip Fuel Economy US (a,c)	n/a	tot NO2	0.07071	g	DS CH4	0.00000	g/km
Trip Av. Eng. Speed	1218.44	tot NOx	1.23241	g	DS NO (d)	0.14342	g/km
Trip Av. Torque	20.32	tot Soot	0.00000	g	DS NO2	0.00873	g/km
Trip Av. Power	3.56	tot Soot meas	0.00000	g	DS NOx	0.15215	g/km
Trip Work	1.07	tot PM	0.00000	g	DS Soot	0.00000	g/km
Trip Av. Eng. Speed (a)	1218.44	tot PN	n/a	#	DS Soot meas	0.00000	g/km
Trip Av. Torque (a)	20.32	PM measurement type	0.00000	-	DS PM	0.00000	g/km
Trip Av. Power (a)	3.56	PM correction type	1.00000	alpha(HC)	DS PN	n/a	#/km
Trip Work (a)	1.07	tot Soot on PM filter (estim.)	0.00000	mg	FS CO2	3111.58989	g/kg
Trip Av. Humidity	34.15	Soot --> PM simple scaling factor	1.00000	-	FS CO	4.74167	g/kg
Trip Av. Amb. Temperature	36.46	Soot --> PM alpha scaling factor	0.00000	-	FS THC	0.00000	g/kg
Trip Av. Humidity (a)	34.15	Trip Av. Veh. Speed	27.07857	km/h	FS NMHC	0.00000	g/kg
Trip Av. Amb. Temperature (a)	36.46	Trip Distance Share Urban	70.95193	% distance	FS CH4	0.00000	g/kg
		Trip Distance Share Rural	29.04807	% distance	FS NO (d)	3.79620	g/kg
		Trip Distance Share Motorway	0.00000	% distance	FS NO2	0.23105	g/kg
					FS NOx	4.02725	g/kg
					FS Soot	0.00000	g/kg
					FS Soot meas	0.00000	g/kg
					FS PM	0.00000	g/kg
					FS PN	n/a	#/kg

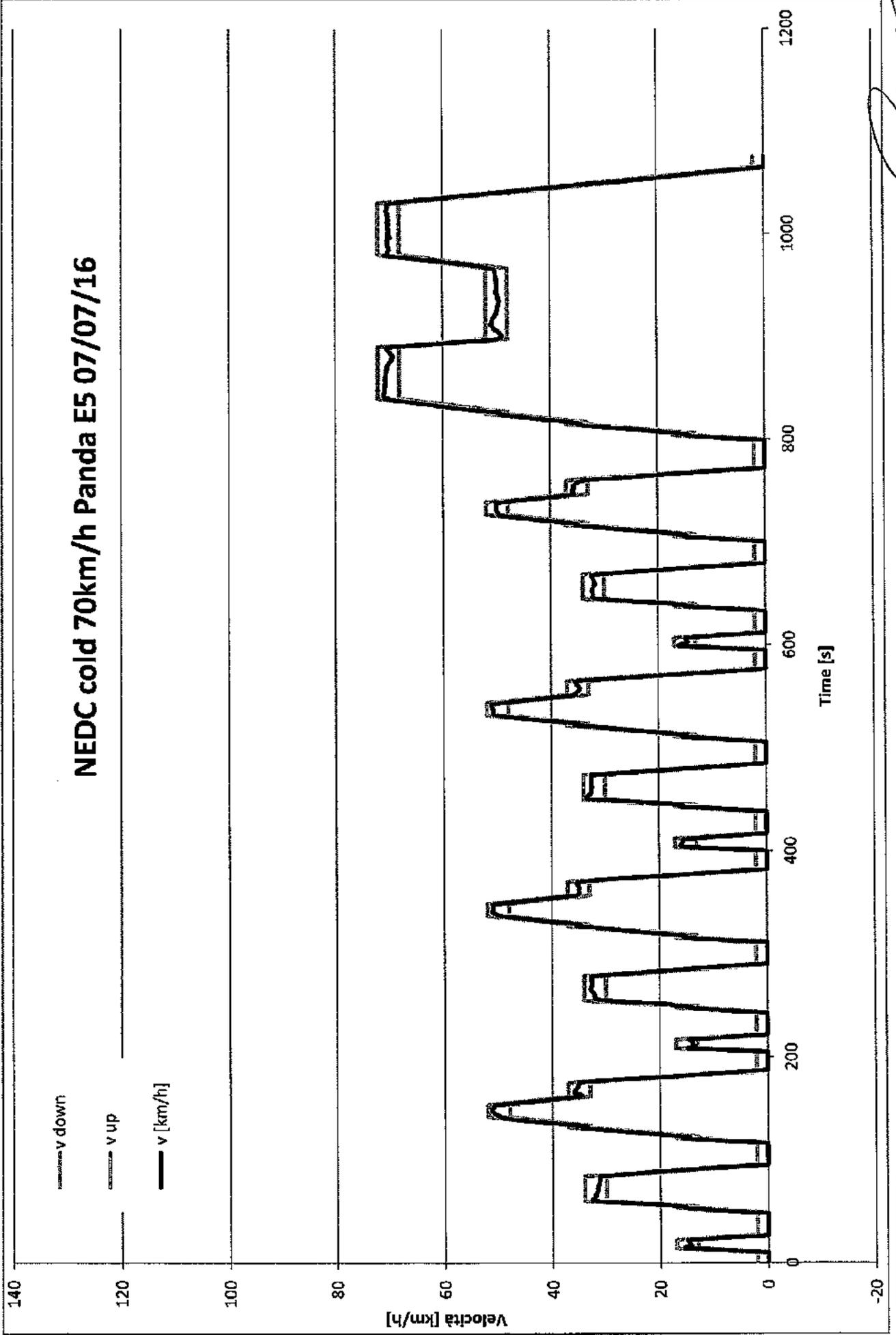
(a) GAS PEMS measurement state only, (b) based on fuel rate input (ECU, Fuel Meter), (c) calculated from carbon balance  
 (d) NO calculated using molecular weight of NO2

PEMS Current Case:  
 D:\AVL Concerto\Work\Environment\PEMS\_Reli5\_B135\PEMS139\_SDE75cv\_MT5\_telB70\_Ministero  
 NEDC\_Result\_070716.pms\_c  
 D:\AVL Concerto\MyData\TransportFiles  
 1139\_SDE\_75cv\_E5\_telB70\_NEDC70\_Cold\_070716.cfi

Vehicle: Fiat 139(NewPanda) / MT5 E5+ telB70  
 Engine: SDE\_75cv / Diesel  
 NOx Ambient Condition Corr.: 5 - CFR40 §86.1342-94 SI  
 Dry / Wet Corr.: 1 - ISO18183 [Default]

Version: Reli5\_B135

# NEDC cold 70km/h Panda E5 07/07/16



Case: NEDC\_Hot70\_070716

Page: Trip Summary

'Balocco Track'

Start Date: 07/05/2016

Start Time: 09:15:45.0



Concerto M.O.V.E., 2016

Trip Duration	1084.00	s
Trip Duration (a)	1084.00	s
Trip Distance	8.10	km
Trip Distance (a)	8.10	km
Trip Fuel Cons. (b)	0.26	kg
Trip Fuel Cons. (a,b)	0.26	kg
Trip Fuel Cons. EU (a,c)	n/a	kg
Trip Fuel Cons. US (a,c)	n/a	kg
Trip Fuel Cons. Volume (b)	0.31	l
Trip Fuel Cons. Volume (a,b)	0.31	l
Trip Fuel Cons. Volume EU (a,c)	n/a	l
Trip Fuel Cons. Volume US (a,c)	n/a	l
Trip Fuel Economy (b)	3.88	l/km100
Trip Fuel Economy (a,b)	3.88	l/km100
Trip Fuel Economy EU (a,c)	n/a	l/km100
Trip Fuel Economy US (a,c)	n/a	l/km100
Trip Av. Eng. Speed	1223.42	rpm
Trip Av. Torque	18.62	Nm
Trip Av. Power	3.25	kW
Trip Work	0.97	kWh
Trip Av. Eng. Speed (a)	1223.42	rpm
Trip Av. Torque (a)	18.62	Nm
Trip Av. Power (a)	3.25	kW
Trip Work (a)	0.97	kWh
Trip Av. Humidity	40.82	%
Trip Av. Amb. Temperature	24.05	degC
Trip Av. Humidity (a)	40.82	%
Trip Av. Amb. Temperature (a)	24.05	degC

ave THC	0.00000	ppm
ave NMHC	0.00000	ppm
ave CH4	0.00000	ppm
ave CO	15.72741	ppm
ave CO2	3.21518	%
ave NOx	134.27426	ppm
ave PM	0.00132	mg/m3
ave Soot meas	0.00000	mg/m3
ave Soot	0.00132	mg/m3
ave PN	n/a	#/cm3
tot THC	0.00000	g
tot NMHC	0.00000	g
tot CH4	0.00000	g
tot CO	0.23975	g
tot CO2	822.04201	g
tot NO (d)	2.32996	g
tot NO2	0.12077	g
tot NOx	2.45073	g
tot Soot	0.00000	g
tot Soot meas	0.00000	g
tot PM	0.00000	g
tot PN	n/a	#
PM measurement type	0.00000	-
PM correction type	1.00000	alpha(HC)
Soot on PM filter (estim.)	0.00000	mg
Soot --> PM simple scaling factor	1.00000	-
Soot --> PM alpha scaling factor	0.00000	-
Trip Av. Veh. Speed	27.14212	km/h
Trip Distance Share Urban	70.76292	% distance
Trip Distance Share Rural	29.23708	% distance
Trip Distance Share Motorway	0.00000	% distance

BS CO2	849.10081	g/kWh
BS CO	0.24764	g/kWh
BS THC	0.00000	g/kWh
BS NMHC	0.00000	g/kWh
BS CH4	0.00000	g/kWh
BS NO (d)	2.32996	g/kWh
BS NO2	0.12450	g/kWh
BS NOx	2.52653	g/kWh
BS Soot	0.00000	g/kWh
BS Soot meas	0.00000	g/kWh
BS PM	0.00000	g/kWh
BS PN	n/a	#/kWh
DS CO2	101.51925	g/km
DS CO	0.02961	g/km
DS THC	0.00000	g/km
DS NMHC	0.00000	g/km
DS CH4	0.00000	g/km
DS NO (d)	0.28765	g/km
DS NO2	0.01491	g/km
DS NOx	0.30256	g/km
DS Soot	0.00000	g/km
DS Soot meas	0.00000	g/km
DS PM	0.00000	g/km
DS PN	n/a	#/km
FS CO2	3116.37026	g/kg
FS CO	0.90888	g/kg
FS THC	0.00000	g/kg
FS NMHC	0.00000	g/kg
FS CH4	0.00000	g/kg
FS NO (d)	9.36790	g/kg
FS NO2	0.46557	g/kg
FS NOx	9.85347	g/kg
FS Soot	0.00000	g/kg
FS Soot meas	0.00000	g/kg
FS PM	0.00000	g/kg
FS PN	n/a	#/kg

(a) GAS PEMS measurement state only, (b) based on fuel rate input (ECU, Fuel Meter), (c) calculated from carbon balance  
(d) NO calculated using molecular weight of NO2

PEMS Current Case: D:\AVL\_Concerto\Work\Environment\PEMS\_Rel5\_B195\PEMS139\_SDE75cv\_M75\_tel870\_Ministero\NEDC\_070716.cdf  
 Vehicle: Fiat 139(NewPanda) / MT5 E5+\_tel870 Version: Rel5\_B195  
 Engine: SDE\_75cv / Diesel  
 PEMS Result Filename: D:\AVL\_Concerto\MyData\TransportFiles  
 NOx Ambient Condition Corr.: 5 - CFR40 §96.1342-94 SI  
 139\_SIDE\_75cv\_ES+\_tel870\_NEDC70\_Cold\_070716.cdf  
 Dry / Wet Corr.: 1 - ISO16183 (Default)

12. ALFA ROMEO GIULIETTA 2.0 MULTIJET .....



# Ministero delle Infrastrutture e dei Trasporti

DIPARTIMENTO PER I TRASPORTI, LA NAVIGAZIONE ED I SISTEMI INFORMATIVI E STATISTICI

Direzione Generale Territoriale del Nord-Ovest

**CENTRO PROVA AUTOVEICOLI TORINO**Rapporto di prova del 19/04/2016-24/05/2016  
29/06/2016 - 11/07/2016

Test report on

Pagina (Page) 1/1

**OGGETTO  
SUBJECT**Verifiche e prove per quanto riguarda:  
PROGRAMMA DI PROVE PER LA VALUTAZIONE DEL COMPORTAMENTO EMISSIVO  
DI VETTURE DIESEL EURO 5 COMMERCIALIZZATE IN ITALIA CON PROVE IN  
LABORATORIO E SU PISTA*Checks and tests about:*  
TEST PLAN FOR MARKETED IN ITALY EURO 5 DIESEL VEHICLES EMISSIONS  
BEHAVIOR ASSESSMENT WITH LABORATORY AND TRACK TESTING

Veicolo / Vehicle	Alfa Romeo Giulietta 2.0 Mijet	Data / Date [dd/mm/yy]	19/04/2016 – 11/07/2016
VIN	ZAR94000007360842	Prova / Test n.	S.08.????2016 (*)
Tipo motore / Engine Type	1956 cm <sup>3</sup>	Autista / Driver	Catanzaro / D'Angelo / Ventura
Marcatura motore / Engine Code	940A3000	Odometro / Odometer [km]	25070
Cambio / Gear shift	Manuale / Manual M6		
Start & Stop	SI / YES	Note / Notes	
Pneumatici / Tyres	2,2 bar		

Inerzia / Inertia [kg] 1360

**Protocollo di prova  
Test Protocol**Conforme alle specifiche dell'Istituto Motori di Napoli (C.N.R.)  
Compliant to the specification of Istituto Motori of Naples**Nome e indirizzo del Laboratorio di prove  
Name and address of the test laboratory**

FIAT POWERTRAIN TECHNOLOGIES, Strada del Drosso 145, TORINO (TO)

**RISULTATI DELLE PROVE  
TESTS RESULTS**Riportati nei seguenti allegati:  
Reported in the annexes listed here below

(\*) Prova / Test n.

NEDC cold al banco (report S.08.0667.2016 del 19/04/2016)  
 NEDC hot al banco (report S.08.0668.2016 del 19/04/2016)  
 NEDC cold back al banco (report S.08.1186.2016 del 29/06/2016)  
 NEDC hot back al banco (report S.08.0941.2016 del 24/05/2016)  
 NEDC cold su pista lim. 70km/h (report NEDC\_Cold70\_110716 del 11/07/2016 + profilo vel.)  
 NEDC hot su pista lim. 70km/h (report NEDC\_Hot70\_110716 del 11/07/2016 + profilo vel.)

I FUNZIONARI DEL CENTRO PROVA AUTOVEICOLI TORINO

VISTO  
IL DIRETTORE

Dott. Ing. Pjale GERACI

I risultati di misura riportati nel presente rapporto sono stati ottenuti applicando le norme/procedure/protocolli/regolamenti/direttive indicati e si riferiscono ai soli oggetti provati. Le incertezze di misura, quando indicate, sono espresse come incertezza estesa con fattore di copertura k=2, che per una distribuzione normale corrisponde ad un livello di confidenza di circa il 95%.

The measurement results reported in this document were obtained following the standards / procedures / protocols / regulation / directives reported and them refer to the tested objects only. The uncertainties of measurement stated in this report are calculated as a standard uncertainty multiplied by a coverage factor k=2, corresponding, in the case of a normal distribution, to a confidence level of about 95%.

È vietato riprodurre il presente documento, ed i relativi allegati, senza l'autorizzazione scritta del Laboratorio.

It is forbidden to reproduce the present document and relative enclosures, without written authorization of the Laboratory.

Il testo ufficiale del presente verbale è in lingua italiana. Quello in lingua inglese è da considerarsi solo come fonte di consultazione.

The official text of this test report is only in Italian. The English version is for reference only.

*cielo freddo*



**EU98M**

AFIAT\_160310\_003  
S.08.0667.2016

Department --- OMOLOGAZIONE

Test date : 19.04.2016

**Vehicle data**

Vehicle ID ----- 940.6  
 Vehicle model ----- GIULIETTA START & STOP F5  
 Transmission type ----- M6  
 Odometer (before Test) ----- 25070 km  
 Tire pressure ----- 2.2 bar  
 VIN ----- 07360842  
 CVS flow ----- 9,0 m3/min

*(Targa EY 895FC)*

**Fuel data**

Fuel type ----- GASOLIO EURO 5  
 Batch No. ----- 202  
 Calculation instruction ----- DIESEL  
 Density ----- 0,835 g/cm3 [15°C]  
 Carbon percentage ----- 86,6 %  
 NHV ----- 16438,9 btu/lb

**Dyno data**

Inertia ----- 1360 kg  
 Dyno load ----- F0/F1/F2 11,0 / -0,260 / 0,0330

**Add. data**

Driver ----- dangelo  
 Operator ----- S8OP  
 aux table ----- NO\_AUX  
 Range switch table -----  
 Fan speed polynom ----- EU

**Reference**

Regulatory frame ----- EU  
 Ref. temp. ----- 273,15 K  
 Ref. Pressure ----- 1013,3 mbar  
 Calculation Regulatory ----- EU5

**Test reference data:**

GECOM Request No. -----  
 Richiedente ----- DARGENIO

**Remarks**

Test rem. -----  
 Customer ----- TRAZIONE ANT POST SEQUENZIALE METTERE SOTTOCARICA marcia dalla 1 alla5 freddo  
 Operator ----- /

**Phase Results**

	HC [mg/km]	CO [mg/km]	CO2 [g/km]	NOx [mg/km]	NO2 [mg/km]	N2O [mg/km]	NMHC [mg/km]	CH4 [mg/km]	Fuel cons. [l/100km]	Particulate [mg/km]
Phase 1 Baq Modal	77,000	454,000	157,478	208,000					6,01	0,5189
Phase 2 Baq Modal	9,000	7,000	108,242	104,000					4,11	
Baq Modal										
Baq Modal										
Phase 1 Pre cat avg										
Post cat avg	54,22	159,40	3,40	43,78	16,36					
Cat. efficiency										
Raw/Baq	16,24	-13,60	-5,47	-13,59						
Phase 2 Pre cat avg										
Post cat avg	20,60	4,20	6,53	59,12	12,18					
Cat. efficiency										
Raw/Baq	19,02	-48,06	-2,10	-9,86						
Pre cat avg										
Post cat avg										
Cat. efficiency										
Raw/Baq										
Pre cat avg										
Post cat avg										
Cat. efficiency										
Raw/Baq										

*19/4/16*

**Total Results**

Bag	HC [mg/km]	CO [mg/km]	CO2 [g/km]	NOx [mg/km]	NO2 [mg/km]	N2O [mg/km]	NMHC [mg/km]	HC + NOx [mg/km]	Fuel econ [l/100km]	Particulate [mg/km]
	<b>33,420</b>	<b>169,674</b>	<b>126,11</b>	<b>142,050</b>				<b>175,470</b>	<b>4,80</b>	<b>0,5189</b>

**Time Control**

Test Date: 19.04.2016      Start of test 2:47:22 PM      Start of trace 3:00:31 PM  
 End of test 3:30:01 PM      End of trace 3:20:11 PM

Department --- OMOLOGAZIONE

Test date : 19.04.2016

**Vehicle data**

Vehicle ID ----- 940.6  
 Vehicle model ----- GIULIETTA START & STOP F  
 Transmission type ----- M6  
 Odometer (before Test) ----- 25070 km  
 Tire pressure ----- 2.2 bar  
 VIN ----- 07360842  
 CVS flow ----- 9,0 m3/min

**Fuel data**

Fuel type ----- GASOLIO EURO 5  
 Batch No. ----- 202  
 Calculation instruction ----- DIESEL  
 Density ----- 0,835 g/cm3 [15°C]  
 Carbon percentage ----- 86,6 %  
 NHV ----- 16438,9 btu/lb

**Dyno data**

Inertia ----- 1360 kg  
 Dyno load ----- F0/F1/F2 11,0 / -0,260 / 0,0330

**Add. data**

Driver ----- dangelo  
 Operator ----- S8OP  
 AUX table ----- NO\_AUX  
 Range switch table -----  
 Fan speed polynom ----- EU

**Reference**

Regulatory frame ----- EU  
 Ref. temp. ----- 273,15 K  
 Ref. Pressure ----- 1013,3 mbar  
 Calculation Regulatory ----- EU5

**Test reference data:**

GECOM Request No. -----  
 Richiedente ----- DARGENIO

**Remarks**

Test rem. -----  
 Customer ----- TRAZIONE ANT POST SEQUENZIALE METTERE SOTTOCARICA marcia dalla 1 alla5 freddo  
 Operator ----- /

**Phase Results**

	1	2		Phase
Barometric pressure	98,90	98,89		kPa
Ambient air temperature	23,79	23,79		°C
Relative humidity	41,62	41,76		%
NOx correction factor	0,9130	0,9136		
Dilution factor	39,455	18,206		
CVS volume corrected (273,15K)	105,555	54,094		m <sup>3</sup>
Average CVS temperature	39,9	39,9		°C
Average CVS pressure PV	96,5	96,5		kPa
DLS volume corrected (273,15K)	0,6502	0,3331		m <sup>3</sup>
Average force at dyno	16,4	151,9		N
Minimum oil temperature				°C
Distance	3,943	6,919		km
Drivers violation	0,0	0,0		sec

**Bag Analysis**

	1	2		Phase
Concentration sample THC	6,990	3,976		ppmC1
Concentration ambient THC	2,481	2,381		ppmC1
Emission THC	0,304	0,059		g/Phase
Emission THC	77,000	9,000		mg/km
Concentration sample CH4				ppm
Concentration ambient CH4				ppm
Emission CH4				g/Phase
Emission CH4				mg/km
Concentration sample NMHC				ppmC1
Concentration ambient NMHC				ppmC1
Emission NMHC				g/Phase
Emission NMHC				mg/km
Concentration sample CO	13,640	0,975		ppm
Concentration ambient CO	0,245	0,236		ppm
Emission CO	1,792	0,051		g/Phase
Emission CO	454,000	7,000		mg/km
Concentration sample NOx	4,143	7,102		ppm
Concentration ambient NOx	0,042	0,039		ppm
Emission NOx	0,820	0,723		g/Phase
Emission NOx	208,000	104,000		mg/km
Concentration sample NO2	1,909	17,088		ppm
Concentration ambient NO2				ppm
Emission NO2				g/Phase
Emission NO2				mg/km
Concentration sample N2O				ppm
Concentration ambient N2O				ppm
Emission N2O				g/Phase
Emission N2O				mg/km
Concentration sample CO2	0,340	0,741		%
Concentration ambient CO2	0,046	0,046		%
Emission CO2	620,934	748,923		g/Phase
Emission CO2	157,478	108,242		g/km
Fuel consumption	6,01	4,11		l/100km

**Total Results**

Emission per	HC	CO	CO2	NOx	NMHC	HC + Nox
total distance [mg/km]	<b>33,420</b>	<b>169,674</b>	<b>126,115</b>	<b>142,050</b>		<b>175,470</b>
Fuel consumption [l/100km]	<b>4,80</b>			<b>NO2</b>	<b>N2O</b>	

Department --- **OMOLOGAZIONE**

Test date : **19.04.2016**

**Vehicle data**

Vehicle ID ----- **940.6**  
 Vehicle model ----- **GIULIETTA START & STOP F5**  
 Transmission type ----- **M6**  
 Odometer (before Test) ----- **25070 km**  
 Tire pressure ----- **2.2 bar**  
 VIN ----- **07360842**  
 CVS flow ----- **9,0 m3/min**

**Fuel data**

Fuel type ----- **GASOLIO EURO 5**  
 Batch No.----- **202**  
 Calculation instruction ----- **DIESEL**  
 Density ----- **0,835 g/cm3 [15°C]**  
 Carbon percentage ----- **86,6 %**  
 NHV ----- **16438,9 btu/lb**

**Dyno data**

Inertia ----- **1360 kg**  
 Dyno load ----- **F0/F1/F2 11,0 / -0,260 / 0,0330**

**Add. data**

Driver ----- **dangelo**  
 Operator ----- **S8OP**  
 AUX table ----- **NO\_AUX**  
 Range switch table -----  
 Fan speed polynom ----- **EU**

**Reference**

Regulatory frame ----- **EU**  
 Ref. temp.. ----- **273,15 K**  
 Ref. Pressure ----- **1013,3 mbar**  
 Calculation Regulatory ----- **EU5**

**Test reference data:**

GECOM Request No.-----  
 Richiedente----- **DARGENIO**

**Remarks**

Test rem. -----  
 Customer ----- **TRAZIONE ANT POST SEQUENZIALE METTERE SOTTOCARICA marcia dalla 1 alla5 freddo**  
 Operator ----- **/**

**Phase Results**

	1	2		Phase
Barometric pressure	98,90	98,89		kPa
Ambient air temperature	23,79	23,79		°C
Relative humidity	41,62	41,76		%
NOx correction factor	0,9130	0,9136		
Dilution factor	39,455	18,206		
CVS volume corrected (273,15K)	105,555	54,094		m <sup>3</sup>
Average CVS temperature	39,9	39,9		°C
Average CVS pressure PV	96,5	96,5		kPa
DLS volume corrected (273,15K)	0,6502	0,3331		m <sup>3</sup>
Average torque at dyno	16,4	151,9		N
Minimum oil temperature				°C
Distance	3,943	6,919		km
Drivers violation	0,0	0,0		sec

**Particulate results**

	1	2		Phase
Main filter before test	78,766			mg
Main filter after test	78,800			mg
Backup filter before test				mg
Backup filter after test				mg
Payload main filter	0,035			mg
Payload backup filter				mg
Efficiency of main filter				%
Calculated payload				mg
mass emission	0,0056			g
mass emission per distance	0,5189			mg/km

**TEOM results**

Payload				mg
TEOM mass emission				g
TEOM mass emission per distance				mg/km
Efficiency TEOM/gravimetric				%

**Particulate total results**

Remarks  
 Total emission **0,0056** g  
 Total emission per total distance **0,5189** mg/km

**Particulate Counter total results**

Total counts: **5,9927E+10**  
**Tot.counts/**  
**Tot.distance** **5,5171E+09** 1/km

**Weighing chamber data**

Chamber temperature: **22,00** °C  
 Chamber pressure: **988,40** kPa  
 Buoyancy correction factor: **1,000360E+00**

**Setup/Checks Particulate Counter**

CPCCFK **1,0571** unity  
 PND1 **10** unity  
 PND2 **15** unity  
 PCRF **168,74** unity  
 System Ckeck O.K? **YES**  
 Zero Count **0,07316** 1/cm<sup>3</sup>

Cielo caldo

Department --- OMOLOGAZIONE

Test date : 19.04.2016

**Vehicle data**

Vehicle ID ----- 940.6  
Vehicle model ----- GIULIETTA START & STOP F5  
Transmission type ----- M6  
Odometer (before Test) ----- 25081 km  
Tire pressure ----- 2.2 bar  
VIN ----- 07360842  
CVS flow ----- 9,0 m3/min

*(Targa EY 895 FC)*

**Fuel data**

Fuel type ----- GASOLIO EURO 5  
Batch No. ----- 202  
Calculation instruction ----- DIESEL  
Density ----- 0,835 g/cm3 [15°C]  
Carbon percentage ----- 86,6 %  
NHV ----- 16438,9 btu/lb

**Dyno data**

Inertia ----- 1360 kg  
Dyno load ----- F0/F1/F2 11,0 / -0,260 / 0,0330

**Add. data**

Driver ----- catanzaro  
Operator ----- S8OP  
aux table ----- NO\_AUX  
Range switch table -----  
Fan speed polynom ----- EU

**Reference**

Regulatory frame ----- EU  
Ref. temp. ----- 273,15 K  
Ref. Pressure ----- 1013,3 mbar  
Calculation Regulatory ----- EU5

**Test reference data:**

GECOM Request No. -----  
Richiedente ----- DARGENIO

**Remarks**

Test rem. -----  
Customer ----- TRAZIONE ANT POST SEQUENZIALE METTERE SOTTOCARICA marcia dalla 1 alla5 freddo  
Operator ----- /

**Phase Results**

	HC	CO	CO2	NOx	NO2	N2O	NMHC	CH4	Fuel cons.	Particulate
	[mg/km]	[mg/km]	[g/km]	[mg/km]	[mg/km]	[mg/km]	[mg/km]	[mg/km]	[l/100km]	[mg/km]
Phase 1										
Bag	50,000	12,000	140,867	562,000					5,35	0,3544
Modal										
Phase 2										
Bag	12,000	5,000	102,814	353,000					3,90	
Modal										
Bag										
Modal										
Bag										
Modal										
Phase 1										
Pre cat avg										
Post cat avg	29,71	1,43	2,47	102,19	17,65					
Cat. efficiency										
Raw/Bag	32,38	-49,01	-3,55	-13,16						
Phase 2										
Pre cat avg										
Post cat avg	21,95	2,12	4,47	156,45	14,90					
Cat. efficiency										
Raw/Bag	25,95	-37,48	-1,72	-11,68						
Pre cat avg										
Post cat avg										
Cat. efficiency										
Raw/Bag										
Pre cat avg										
Post cat avg										
Cat. efficiency										
Raw/Bag										

*19/04/16*  
*[Signature]*

**Total Results**

Bag	HC	CO	CO2	NOx	NO2	N2O	NMHC	HC + NOx	Fuel econ	Particulate
	[mg/km]	[mg/km]	[g/km]	[mg/km]	[mg/km]	[mg/km]	[mg/km]	[mg/km]	[l/100km]	[mg/km]
	26,120	7,399	116,77	429,210				455,330	4,43	0,3544

**Time Control**

Test Date: 19.04.2016  
Start of test 3:32:11 PM  
End of test 4:20:55 PM  
Start of trace 3:51:26 PM  
End of trace 4:11:06 PM

Department --- OMOLOGAZIONE

Test date : 19.04.2016

**Vehicle data**

Vehicle ID ----- 940.6  
 Vehicle model ----- GIULIETTA START & STOP F5  
 Transmission type ----- M6  
 Odometer (before Test) ----- 25081 km  
 Tire pressure ----- 2.2 bar  
 VIN ----- 07360842  
 CVS flow ----- 9,0 m3/min

**Fuel data**

Fuel type ----- GASOLIO EURO 5  
 Batch No. ----- 202  
 Calculation instruction ----- DIESEL  
 Density ----- 0,835 g/cm3 [15°C]  
 Carbon percentage ----- 86,6 %  
 NHV ----- 16438,9 btu/lb

**Dyno data**

Inertia ----- 1360 kg  
 Dyno load ----- F0/F1/F2 11,0 / -0,260 / 0,0330

**Add. data**

Driver ----- catanzaro  
 Operator ----- S80P  
 AUX table ----- NO\_AUX  
 Range switch table -----  
 Fan speed polynom ----- EU

**Reference**

Regulatory frame ----- EU  
 Ref. temp. ----- 273,15 K  
 Ref. Pressure ----- 1013,3 mbar  
 Calculation Regulatory ----- EU5

**Test reference data:**

GECOM Request No. -----  
 Richiedente ----- DARGENIO

**Remarks**

Test rem. -----  
 Customer ----- TRAZIONE ANT POST SEQUENZIALE METTERE SOTTOCARICA marcia dalla 1 alla5 freddo  
 Operator ----- /

**Phase Results**

	1	2		Phase
Barometric pressure	98,87	98,87		kPa
Ambient air temperature	23,60	23,56		°C
Relative humidity	40,03	40,43		%
NOx correction factor	0,9024	0,9039		
Dilution factor	42,761	18,973		
CVS volume corrected (273,15K)	105,509	54,069		m <sup>3</sup>
Average CVS temperature	39,9	39,9		°C
Average CVS pressure PV	96,5	96,5		kPa
DLS volume corrected (273,15K)	0,6501	0,3331		m <sup>3</sup>
Average force at dyno	16,3	152,7		N
Minimum oil temperature				°C
Distance	4,016	6,932		km
Drivers violation	0,0	0,0		sec

**Baq Analysis**

	1	2		Phase
Concentration sample THC	5,462	4,785		ppmC1
Concentration ambient THC	2,491	2,407		ppmC1
Emission THC	0,201	0,085		g/Phase
Emission THC	50,000	12,000		mg/km
Concentration sample CH4				ppm
Concentration ambient CH4				ppm
Emission CH4				g/Phase
Emission CH4				mg/km
Concentration sample NMHC				ppmC1
Concentration ambient NMHC				ppmC1
Emission NMHC				g/Phase
Emission NMHC				mg/km
Concentration sample CO	0,616	0,769		ppm
Concentration ambient CO	0,265	0,284		ppm
Emission CO	0,047	0,034		g/Phase
Emission CO	12,000	5,000		mg/km
Concentration sample NOx	11,460	24,220		ppm
Concentration ambient NOx	0,023	0,006		ppm
Emission NOx	2,255	2,444		g/Phase
Emission NOx	562,000	353,000		mg/km
Concentration sample NO2	7,763	28,118		ppm
Concentration ambient NO2				ppm
Emission NO2				g/Phase
Emission NO2				mg/km
Concentration sample N2O				ppm
Concentration ambient N2O				ppm
Emission N2O				g/Phase
Emission N2O				mg/km
Concentration sample CO2	0,315	0,711		%
Concentration ambient CO2	0,046	0,048		%
Emission CO2	565,720	712,709		g/Phase
Emission CO2	140,867	102,814		g/km
Fuel consumption	5,35	3,90		l/100km

**Total Results**

Emission per	HC	CO	CO2	NOx	NMHC	HC + Nox
total distance [mg/km]	26,120	7,399	116,773	429,210		455,330

Fuel consumption [l/100km]	4,43			NO2	N2O
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Department --- OMOLOGAZIONE

Test date : 29.06.2016

**Vehicle data**

Vehicle ID ----- 940.6  
Vehicle model ----- GIULIETTA START & STOP F5  
Transmission type ----- M6  
Odometer (before Test) ----- 25203 km  
Tire pressure ----- 2.2 bar  
VIN ----- 07360842  
CVS flow ----- 9,0 m3/min

**Fuel data**

Fuel type ----- GASOLIO EURO 5  
Batch No. ----- 202  
Calculation instruction ----- DIESEL  
Density ----- 0,835 g/cm3 [15°C]  
Carbon percentage ----- 86,6 %  
NHV ----- 16438,9 btu/lb

**Dyno data**

Inertia ----- 1360 kg  
Dyno load ----- F0/F1/F2 11,0 / -0,260 / 0,0330

**Add. data**

Driver ----- albertino  
Operator ----- S8OP  
aux table ----- NO\_AUX  
Range switch table ----- STANDARD  
Fan speed polynom ----- EU

**Reference**

Regulatory frame ----- EU  
Ref. temp. ----- 273,15 K  
Ref. Pressure ----- 1013,3 mbar  
Calculation Regulatory ----- EU5

**Test reference data:**

GECOM Request No. -----  
Richiedente -----

*WSD-16*  
*29*

**Remarks**

Test rem. -----  
Customer ----- trazione ant postesequenziale marce dalla 1 -5 omologazione  
Operator ----- /

**Phase Results**

	HC	CO	CO2	NOx	NO2	N2O	NMHC	CH4	Fuel cons.	Particulate
	[mg/km]	[mg/km]	[g/km]	[mg/km]	[mg/km]	[mg/km]	[mg/km]	[mg/km]	[l/100km]	[mg/km]
Phase 1										
Bag	13,000	97,000	127,256	436,000					4,83	
Modal										
Phase 2										
Bag	32,000	11,000	137,796	179,000					5,23	
Modal										
Bag										
Modal										
Bag										
Modal										
Phase 1	HC	CO	CO2	NOx	O2	CH4				
	[ppm]	[ppm]	[%]	[ppm]	[%]	[ppm]				
Pre cat avg										
Post cat avg										
Cat. efficiency										
Raw/Bag										
Phase 2										
Pre cat avg										
Post cat avg										
Cat. efficiency										
Raw/Bag										
Pre cat avg										
Post cat avg										
Cat. efficiency										
Raw/Bag										
Pre cat avg										
Post cat avg										
Cat. efficiency										
Raw/Bag										

**Total Results**

Bag	HC	CO	CO2	NOx	NO2	N2O	NMHC	HC + NOx	Fuel econ	Particulate
	[mg/km]	[mg/km]	[g/km]	[mg/km]	[mg/km]	[mg/km]	[mg/km]	[mg/km]	[l/100km]	[mg/km]
	19,990	65,129	131,16	341,020				361,010	4,98	

**Time Control**

Test Date: 29.06.2016      Start of test 9:12:30 AM      Start of trace 9:25:15 AM  
End of test 9:54:36 AM      End of trace 9:44:55 AM

Department --- OMOLOGAZIONE

Test date : 29.06.2016

**Vehicle data**

Vehicle ID ----- 940.6  
Vehicle model ----- GIULIETTA START & STOP F5  
Transmission type ----- M6  
Odometer (before Test) ----- 25203 km  
Tire pressure ----- 2.2 bar  
VIN ----- 07360842  
CVS flow ----- 9,0 m3/min

**Fuel data**

Fuel type ----- GASOLIO EURO 5  
Batch No. ----- 202  
Calculation instruction ----- DIESEL  
Density ----- 0,835 g/cm3 [15°C]  
Carbon percentage ----- 86,6 %  
NHV ----- 16438,9 btu/lb

**Dyno data**

Inertia ----- 1360 kg  
Dyno load ----- F0/F1/F2 11,0 / -0,260 / 0,0330

**Add. data**

Driver ----- albertino  
Operator ----- S8OP  
AUX table ----- NO\_AUX  
Range switch table ----- STANDARD  
Fan speed polynom ----- EU

**Reference**

Regulatory frame ----- EU  
Ref. temp. ----- 273,15 K  
Ref. Pressure ----- 1013,3 mbar  
Calculation Regulatory ----- EU5

**Test reference data:**

GECOM Request No. -----  
Richiedente -----

**Remarks**

Test rem. -----  
Customer ----- trazione ant postesequenziale marce dalla 1 -5 omologazione  
Operator ----- /

**Phase Results**

	1	2		Phase
Barometric pressure	98,81	98,81		kPa
Ambient air temperature	23,12	20,00		°C
Relative humidity	51,10	60,69		%
NOx correction factor	0,9540	0,9487		
Dilution factor	15,356	42,399		
CVS volume corrected (273,15K)	54,060	105,292		m <sup>3</sup>
Average CVS temperature	39,8	39,8		°C
Average CVS pressure PV	96,4	96,4		kPa
DLS volume corrected (273,15K)	0,3333	0,6497		m <sup>3</sup>
Average force at dyno	154,2	16,1		N
Minimum oil temperature				°C
Distance	6,956	4,099		km
Drivers violation	0,0	0,0		sec

**Bag Analysis**

	1	2		Phase
Concentration sample THC	5,096	4,577		ppmC1
Concentration ambient THC	2,667	2,604		ppmC1
Emission THC	0,088	0,133		g/Phase
Emission THC	13,000	32,000		mg/km
Concentration sample CH4				ppm
Concentration ambient CH4				ppm
Emission CH4				g/Phase
Emission CH4				mg/km
Concentration sample NMHC				ppmC1
Concentration ambient NMHC				ppmC1
Emission NMHC				g/Phase
Emission NMHC				mg/km
Concentration sample CO	11,050	1,486		ppm
Concentration ambient CO	1,166	1,155		ppm
Emission CO	0,673	0,047		g/Phase
Emission CO	97,000	11,000		mg/km
Concentration sample NOx	28,920	3,626		ppm
Concentration ambient NOx	0,236	0,036		ppm
Emission NOx	3,035	0,735		g/Phase
Emission NOx	436,000	179,000		mg/km
Concentration sample NO2				ppm
Concentration ambient NO2				ppm
Emission NO2				g/Phase
Emission NO2				mg/km
Concentration sample N2O				ppm
Concentration ambient N2O				ppm
Emission N2O				g/Phase
Emission N2O				mg/km
Concentration sample CO2	0,878	0,318		%
Concentration ambient CO2	0,047	0,046		%
Emission CO2	885,194	564,826		g/Phase
Emission CO2	127,256	137,796		g/km
Fuel consumption	4,83	5,23		l/100km

**Total Results**

Emission per	HC	CO	CO2	NOx	NMHC	HC + Nox
total distance [mg/km]	19,990	65,129	131,164	341,020		361,010
Fuel consumption [l/100km]	4,98			NO2	N2O	

Department --- OMOLOGAZIONE

Test date : 29.06.2016

**Vehicle data**

Vehicle ID ----- 940.6  
 Vehicle model ----- GIULIETTA START & STOP F5  
 Transmission type ----- M6  
 Odometer (before Test) ----- 25203 km  
 Tire pressure ----- 2.2 bar  
 VIN ----- 07360842  
 CVS flow ----- 9,0 m3/min

**Fuel data**

Fuel type ----- GASOLIO EURO 5  
 Batch No. ----- 202  
 Calculation instruction ----- DIESEL  
 Density ----- 0,835 g/cm3 [15°C]  
 Carbon percentage ----- 86,6 %  
 NHV ----- 16438,9 btu/lb

**Dyno data**

Inertia ----- 1360 kg  
 Dyno load ----- F0/F1/F2 11,0 / -0,260 / 0,0330

**Add. data**

Driver ----- albertino  
 Operator ----- S8OP  
 AUX table ----- NO\_AUX  
 Range switch table ----- STANDARD  
 Fan speed polynom ----- EU

**Reference**

Regulatory frame ----- EU  
 Ref. temp. ----- 273,15 K  
 Ref. Pressure ----- 1013,3 mbar  
 Calculation Regulatory ----- EU5

**Test reference data:**

GECOM Request No. -----  
 Richiedente -----

**Remarks**

Test rem. -----  
 Customer ----- trazione ant postesequenziale marce dalla 1 -5 omologazione  
 Operator ----- /

**Phase Results**

	1	2		Phase
Barometric pressure	98,81	98,81		kPa
Ambient air temperature	23,12	20,00		°C
Relative humidity	51,10	60,69		%
NOx correction factor	0,9540	0,9487		
Dilution factor	15,356	42,399		
CVS volume corrected (273,15K)	54,060	105,292		m <sup>3</sup>
Average CVS temperature	39,8	39,8		°C
Average CVS pressure PV	96,4	96,4		kPa
DLS volume corrected (273,15K)	0,3333	0,6497		m <sup>3</sup>
Average torque at dyno	154.2	16.1		N
Minimum oil temperature				°C
Distance	6,956	4,099		km
Drivers violation	0,0	0,0		sec

**Particulate results**

	1	2		Phase
Main filter before test				mg
Main filter after test				mg
Backup filter before test				mg
Backup filter after test				mg
Payload main filter				mg
Payload backup filter				mg
Efficiency of main filter				%
Calculated payload				mg
mass emission				g
mass emission per distance				mg/km

**TEOM results**

Payload				mg
TEOM mass emission				g
TEOM mass emission per distance				mg/km
Efficiency TEOM/gravimetric				%

**Particulate total results**

Remarks  
 Total emission |g  
 Total emission per total distance |mg/km

**Particulate Counter total results**

Total counts: 1,1585E+10  
 Tot.counts/ 1,0480E+09 1/km  
 Tot.distance

**Weighing chamber data**

Chamber temperature: |°C  
 Chamber pressure: |kPa  
 Buoyancy correction factor:

**Setup/Checks Particulate Counter**

CPCCFK 1,066 unity  
 PND1 10 unity  
 PND2 15 unity  
 PCRF 167,39 unity  
 System Check O.K? YES  
 Zero Count 0,4286 1/cm<sup>3</sup>

Department --- OMOLOGAZIONE

Test date : 24.05.2016

**Vehicle data**

Vehicle ID ----- 940.6  
Vehicle model ----- GIULIETTA START & STOP F5  
Transmission type ----- M6  
Odometer (before Test) ----- 25114 km  
Tire pressure ----- 2.2 bar  
VIN ----- 07360842  
CVS flow ----- 9,0 m3/min

**Fuel data**

Fuel type ----- GASOLIO EURO 5  
Batch No. ----- 202  
Calculation instruction ----- DIESEL  
Density ----- 0,835 g/cm3 [15°C]  
Carbon percentage ----- 86,6 %  
NHV ----- 16438,9 btu/lb

**Dyno data**

Inertia ----- 1360 kg  
Dyno load ----- F0/F1/F2 11,0 / -0,260 / 0,0330

**Add. data**

Driver ----- catanzaro  
Operator ----- S8OP  
aux table ----- NO\_AUX  
Range switch table ----- STANDARD  
Fan speed polynomial ----- EU

**Reference**

Regulatory frame ----- EU  
Ref. temp. ----- 273,15 K  
Ref. Pressure ----- 1013,3 mbar  
Calculation Regulatory ----- EU5

**Test reference data:**

GECOM Request No. -----  
Richiedente -----

**Remarks**

Test rem. -----  
Customer ----- trazione ant postesequenziale marce dalla 1 -5 *whh*  
Operator ----- /

**Phase Results**

	HC [mg/km]	CO [mg/km]	CO2 [g/km]	NOx [mg/km]	NO2 [mg/km]	N2O [mg/km]	NMHC [mg/km]	CH4 [mg/km]	Fuel cons. [l/100km]	Particulate [mg/km]
Phase 1										
Bag	2,000	5,000	107,526	299,000					4,08	
Modal										
Phase 2										
Bag	39,000	10,000	138,074	533,000					5,24	
Modal										
Bag										
Modal										
Bag										
Modal										
Phase 1										
Pre cat avg	HC [ppm]	CO [ppm]	CO2 [%]	NOx [ppm]	O2 [%]	CH4 [ppm]				
Post cat avg										
Cat. efficiency										
Raw/Bag										
Phase 2										
Pre cat avg										
Post cat avg										
Cat. efficiency										
Raw/Bag										
Pre cat avg										
Post cat avg										
Cat. efficiency										
Raw/Bag										
Pre cat avg										
Post cat avg										
Cat. efficiency										
Raw/Bag										

*WSD*  
*PA-95-16*

**Total Results**

Bag	HC [mg/km]	CO [mg/km]	CO2 [g/km]	NOx [mg/km]	NO2 [mg/km]	N2O [mg/km]	NMHC [mg/km]	HC + NOx [mg/km]	Fuel econ [l/100km]	Particulate [mg/km]
	15,620	6,720	118,78	385,310				400,930	4,51	

**Time Control**

Test Date: 24.05.2016      Start of test 8:56:23 AM      Start of trace 9:34:32 AM  
End of test 10:03:54 AM      End of trace 9:54:12 AM

Department --- OMOLOGAZIONE

Test date : 24.05.2016

**Vehicle data**

Vehicle ID ----- 940.6  
 Vehicle model ----- GIULIETTA START & STOP F5  
 Transmission type ----- M6  
 Odometer (before Test) ----- 25114 km  
 Tire pressure ----- 2.2 bar  
 VIN ----- 07360842  
 CVS flow ----- 9,0 m3/min

**Fuel data**

Fuel type ----- GASOLIO EURO 5  
 Batch No. ----- 202  
 Calculation instruction ----- DIESEL  
 Density ----- 0,835 g/cm3 [15°C]  
 Carbon percentage ----- 86,6 %  
 NHV ----- 16438,9 btu/lb

**Dyno data**

Inertia ----- 1360 kg  
 Dyno load ----- F0/F1/F2 11,0 / -0,260 / 0,0330

**Add. data**

Driver ----- catanzaro  
 Operator ----- S8OP  
 AUX table ----- NO\_AUX  
 Range switch table ----- STANDARD  
 Fan speed polynom ----- EU

**Reference**

Regulatory frame ----- EU  
 Ref. temp. ----- 273,15 K  
 Ref. Pressure ----- 1013,3 mbar  
 Calculation Regulatory ----- EU5

**Test reference data:**

GECOM Request No. -----  
 Richiedente -----

**Remarks**

Test rem. -----  
 Customer ----- trazione ant postesequenziale marce dalla 1 -5  
 Operator ----- /

**Phase Results**

	1	2		Phase
Barometric pressure	98,07	98,07		kPa
Ambient air temperature	23,99	23,51		°C
Relative humidity	40,79	40,72		%
NOx correction factor	0,9131	0,9085		
Dilution factor	17,879	42,272		
CVS volume corrected (273,15K)	53,674	104,469		m <sup>3</sup>
Average CVS temperature	39,9	39,9		°C
Average CVS pressure PV	95,7	95,7		kPa
DLS volume corrected (273,15K)	0,3336	0,6499		m <sup>3</sup>
Average force at dyno	153,6	17,7		N
Minimum oil temperature				°C
Distance	6,956	4,056		km
Drivers violation	0,0	0,0		sec

**Baq Analysis**

	1	2		Phase
Concentration sample THC	3,278	5,243		ppmC1
Concentration ambient THC	3,014	2,884		ppmC1
Emission THC	0,014	0,158		g/Phase
Emission THC	2,000	39,000		mg/km
Concentration sample CH4				ppm
Concentration ambient CH4				ppm
Emission CH4				g/Phase
Emission CH4				mg/km
Concentration sample NMHC				ppmC1
Concentration ambient NMHC				ppmC1
Emission NMHC				g/Phase
Emission NMHC				mg/km
Concentration sample CO	0,520	0,332		ppm
Concentration ambient CO	0,032	0,021		ppm
Emission CO	0,033	0,041		g/Phase
Emission CO	5,000	10,000		mg/km
Concentration sample NOx	20,740	11,150		ppm
Concentration ambient NOx	0,021	0,019		ppm
Emission NOx	2,082	2,161		g/Phase
Emission NOx	299,000	533,000		mg/km
Concentration sample NO2				ppm
Concentration ambient NO2				ppm
Emission NO2				g/Phase
Emission NO2				mg/km
Concentration sample N2O				ppm
Concentration ambient N2O				ppm
Emission N2O				g/Phase
Emission N2O				mg/km
Concentration sample CO2	0,755	0,319		%
Concentration ambient CO2	0,048	0,047		%
Emission CO2	747,953	560,028		g/Phase
Emission CO2	107,526	138,074		g/km
Fuel consumption	4,08	5,24		l/100km

**Total Results**

Emission per total distance [mg/km]	HC	CO	CO2	NOx	NMHC	HC + Nox
	15,620	6,720	118,778	385,310		400,930
Fuel consumption [l/100km]	4,51			NO2	N2O	

Department --- OMOLOGAZIONE

Test date : 24.05.2016

**Vehicle data**

Vehicle ID ----- 940.6  
 Vehicle model ----- GIULIETTA START & STOP F5  
 Transmission type ----- M6  
 Odometer (before Test) ----- 25114 km  
 Tire pressure ----- 2.2 bar  
 VIN ----- 07360842  
 CVS flow ----- 9,0 m3/min

**Fuel data**

Fuel type ----- GASOLIO EURO 5  
 Batch No. ----- 202  
 Calculation instruction ----- DIESEL  
 Density ----- 0,835 g/cm3 [15°C]  
 Carbon percentage ----- 86,6 %  
 NHV ----- 16438,9 btu/lb

**Dyno data**

Inertia ----- 1360 kg  
 Dyno load ----- F0/F1/F2 11,0 / -0,260 / 0,0330

**Add. data**

Driver ----- catanzaro  
 Operator ----- S8OP  
 AUX table ----- NO\_AUX  
 Range switch table ----- STANDARD  
 Fan speed polynom ----- EU

**Reference**

Regulatory frame ----- EU  
 Ref. temp. ----- 273,15 K  
 Ref. Pressure ----- 1013,3 mbar  
 Calculation Regulatory ----- EU5

**Test reference data:**

GECOM Request No. -----  
 Richiedente -----

**Remarks**

Test rem. -----  
 Customer ----- trazione ant postesequenziale marce dalla 1 -5  
 Operator ----- /

**Phase Results**

	1	2		Phase
Barometric pressure	98,07	98,07		kPa
Ambient air temperature	23,99	23,51		°C
Relative humidity	40,79	40,72		%
NOx correction factor	0,9131	0,9065		
Dilution factor	17,879	42,272		
CVS volume corrected (273,15K)	53,674	104,469		m <sup>3</sup>
Average CVS temperature	39,9	39,9		°C
Average CVS pressure PV	95,7	95,7		kPa
DLS volume corrected (273,15K)	0,3336	0,6499		m <sup>3</sup>
Average torque at dyno	153,6	17,7		N
Minimum oil temperature				°C
Distance	6,956	4,056		km
Drivers violation	0,0	0,0		sec

**Particulate results**

	1	2		Phase
Main filter before test				mg
Main filter after test				mg
Backup filter before test				mg
Backup filter after test				mg
Payload main filter				mg
Payload backup filter				mg
Efficiency of main filter				%
Calculated payload				mg
mass emission				g
mass emission per distance				mg/km

**TEOM results**

Payload				mg
TEOM mass emission				g
TEOM mass emission per distance				mg/km
Efficiency TEOM/gravimetric				%

**Particulate total results**

**Remarks**  
 Total emission |g  
 Total emission per total distance |mg/km

**Particulate Counter total results**

Total counts: 6907717416  
 Tot.counts/ 6,2729E+08 1/km  
 Tot.distance

**Weighing chamber data**

Chamber temperature: |°C  
 Chamber pressure: |kPa  
 Buoyancy correction factor:

**Setup/Checks Particulate Counter**

CPCCFK 1,0571 unity  
 PND1 10 unity  
 PND2 15 unity  
 PCRF 168,74 unity  
 System Ckeck O.K? YES  
 Zero Count 0,03726 1/cm<sup>3</sup>



Concerto M.O.V.E., 2016

Trip Duration	1189.00	s
Trip Duration (a)	1189.00	s
Trip Distance	11.04	km
Trip Distance (a)	11.04	km
Trip Fuel Cons. (b)	0.52	kg
Trip Fuel Cons. (a,b)	0.52	kg
Trip Fuel Cons. EU (a,c)	0.52	kg
Trip Fuel Cons. US (a,c)	0.51	kg
Trip Fuel Cons. Volume (b)	0.61	l
Trip Fuel Cons. Volume (a,b)	0.61	l
Trip Fuel Cons. Volume EU (a,c)	0.62	l
Trip Fuel Cons. Volume US (a,c)	0.61	l
Trip Fuel Economy (b)	5.56	l/km100
Trip Fuel Economy (a,b)	5.56	l/km100
Trip Fuel Economy EU (a,c)	5.56	l/km100
Trip Fuel Economy US (a,c)	5.55	l/km100
Trip Av. Eng. Speed	1224.35	rpm
Trip Av. Torque	34.14	Nm
Trip Av. Power	6.12	kW
Trip Work	2.00	kWh
Trip Av. Eng. Speed (a)	1224.35	rpm
Trip Av. Torque (a)	34.14	Nm
Trip Av. Power (a)	6.12	kW
Trip Work (a)	2.00	kWh
Trip Av. Humidity	40.11	%
Trip Av. Amb. Temperature	23.44	degC
Trip Av. Humidity (a)	40.11	%
Trip Av. Amb. Temperature (a)	23.44	degC

ave THC	0.00000	ppm
ave NMHC	0.00000	ppm
ave CH4	0.00000	ppm
ave CO	24.67873	ppm
ave CO2	3.51344	%
ave NOx	122.85881	ppm
ave PM	0.00107	mg/m3
ave Soot meas	0.00000	mg/m3
ave Soot	0.00107	mg/m3
ave PN	n/a	#/cm3
tot THC	0.00000	g
tot NMHC	0.00000	g
tot CH4	0.00000	g
tot CO	0.57417	g
tot CO2	1620.19033	g
tot NO (d)	2.54690	g
tot NO2	0.73548	g
tot NOx	3.28239	g
tot Soot	0.00000	g
tot Soot meas	0.00000	g
tot PM	0.00000	g
tot PN	n/a	#
PM measurement type	0.00000	-
PM correction type	1.00000	alpha(HC)
tot Soot on PM filter (estim.)	0.00000	mg
Soot --> PM simple scaling factor	1.00000	-
Soot --> PM alpha scaling factor	0.00000	-
Trip Av. Veh. Speed	33.73481	km/h
Trip Distance Share Urban	50.95292	% distance
Trip Distance Share Rural	26.88001	% distance
Trip Distance Share Motorway	22.16707	% distance

BS CO2	809.56642	g/kWh
BS CO	0.28690	g/kWh
BS THC	0.00000	g/kWh
BS NMHC	0.00000	g/kWh
BS CH4	0.00000	g/kWh
BS NO (d)	1.27345	g/kWh
BS NO2	0.36774	g/kWh
BS NOx	1.64119	g/kWh
BS Soot	0.00000	g/kWh
BS Soot meas	0.00000	g/kWh
BS PM	0.00000	g/kWh
BS PN	n/a	#/kWh
DS CO2	146.77262	g/km
DS CO	0.05201	g/km
DS THC	0.00000	g/km
DS NMHC	0.00000	g/km
DS CH4	0.00000	g/km
DS NO (d)	0.23069	g/km
DS NO2	0.06662	g/km
DS NOx	0.29731	g/km
DS Soot	0.00000	g/km
DS Soot meas	0.00000	g/km
DS PM	0.00000	g/km
DS PN	n/a	#/km
FS CO2	3143.55836	g/kg
FS CO	1.11402	g/kg
FS THC	0.00000	g/kg
FS NMHC	0.00000	g/kg
FS CH4	0.00000	g/kg
FS NO (d)	4.89789	g/kg
FS NO2	1.41439	g/kg
FS NOx	6.31229	g/kg
FS Soot	0.00000	g/kg
FS Soot meas	0.00000	g/kg
FS PM	0.00000	g/kg
FS PN	n/a	#/kg

(a) GAS PEMS measurement state only, (b) based on fuel rate input (ECU, Fuel Meter), (c) calculated from carbon balance  
 (d) NO calculated using molecular weight of NO2

PEMS Current Case:

Version: Rel5\_B135

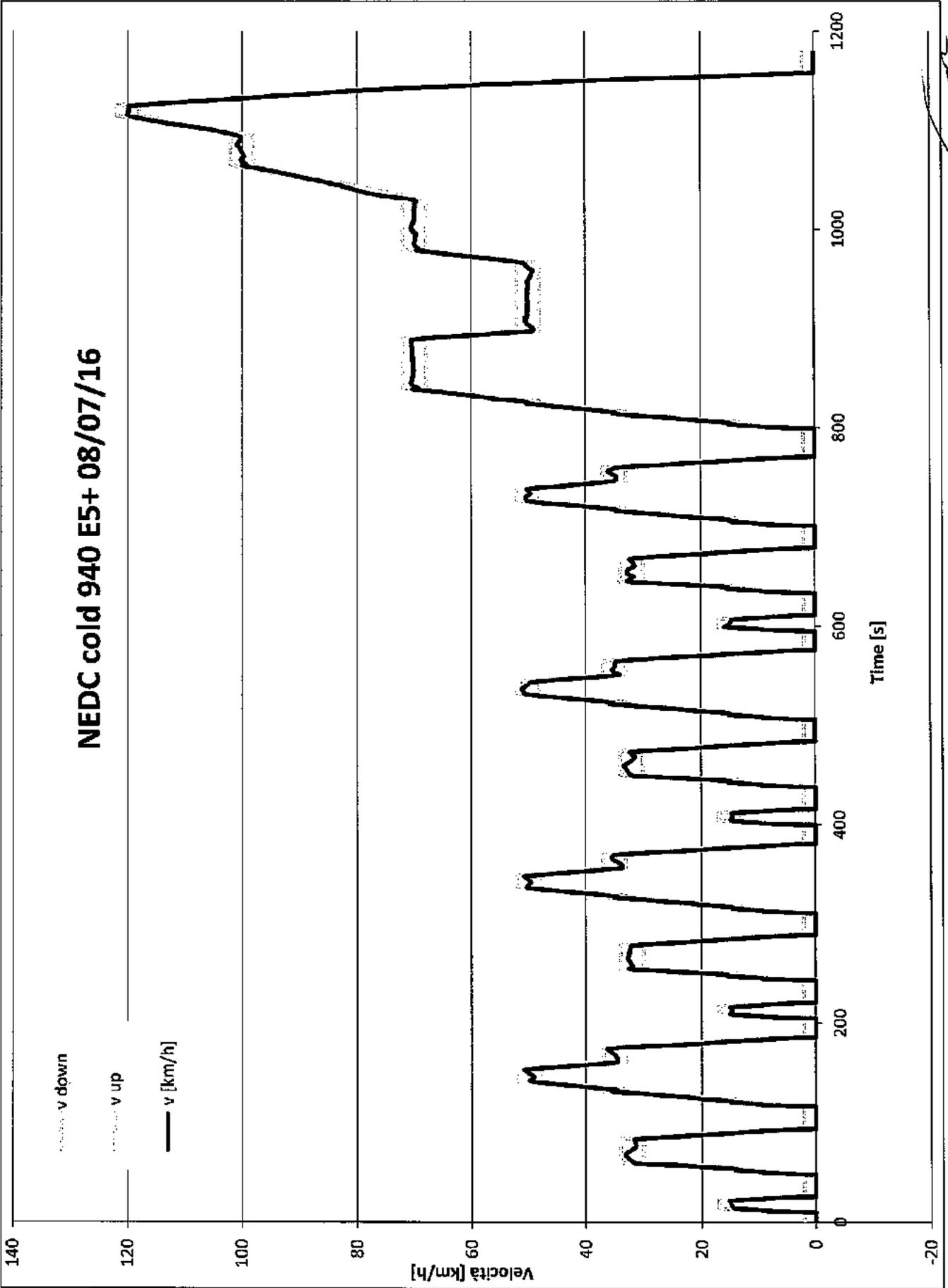
D:\AVL Concerto\Work\Environments\PEMS\_Rel5\_B135\PEMS\AR940\Giulietta)\_2.0Jtd16v\_150cv\_MT6\_E5+\_tel842 Vehicle: AR 940 (Giulietta) / MT6 E5+\_tel842

PEMS Result - 080716\_fgms\_c Engine: 2.0Jtd16v\_150cv / Diesel NOx Ambient Condition Corr.: 5 - CFR40 §86.1342-94 SI

D:\AVL Concerto\MyData\TransportFiles \940\_tel842\_NEDC2\_Cold\_080716.ctf Dry / Wet Corr.: 1 - ISO16183 [Default]



# NEDC cold 940 E5+ 08/07/16



*[Handwritten signature]*



Concerto M.O.V.E., 2016

Parameter	Value	Unit	Parameter	Value	Unit
Trip Duration	1089.00	s	ave THC	0.00000	ppm
Trip Duration (a)	1089.00	s	ave NMHC	0.00000	ppm
Trip Distance	8.11	km	ave CH4	0.00000	ppm
Trip Distance (a)	8.11	km	ave CO	62.76631	ppm
Trip Fuel Cons. (b)	0.37	kg	ave CO2	3.99324	%
Trip Fuel Cons. (a,b)	0.37	kg	ave NOx	58.05643	ppm
Trip Fuel Cons. EU (a,c)	0.36	kg	ave PM	0.00121	mg/m3
Trip Fuel Cons. US (a,c)	0.35	kg	ave Soot meas	0.00000	mg/m3
Trip Fuel Cons. Volume (b)	0.44	l	ave Soot	0.00121	mg/m3
Trip Fuel Cons. Volume (a,b)	0.44	l	ave PN	n/a	#/cm3
Trip Fuel Cons. Volume EU (a,c)	0.43	l	tot THC	0.00000	g
Trip Fuel Cons. Volume US (a,c)	0.42	l	tot NMHC	0.00000	g
Trip Fuel Economy (b)	5.38	l/km100	tot CH4	0.00000	g
Trip Fuel Economy (a,b)	5.38	l/km100	tot CO2	1.12787	g
Trip Fuel Economy EU (a,c)	5.28	l/km100	tot CO	1109.03931	g
Trip Fuel Economy US (a,c)	5.17	l/km100	tot NO (d)	1.39477	g
Trip Av. Eng. Speed	1163.66	rpm	tot NO2	0.25039	g
Trip Av. Torque	26.01	Nm	tot NOx	1.64515	g
Trip Av. Power	4.36	kW	tot Soot	0.00000	g
Trip Work	1.30	kWh	tot Soot meas	0.00000	g
Trip Av. Eng. Speed (a)	1163.66	rpm	tot PM	0.00000	g
Trip Av. Torque (a)	26.01	Nm	tot PN	n/a	#
Trip Av. Power (a)	4.36	kW	PM measurement type	0.00000	
Trip Work (a)	1.30	kWh	PM correction type	1.00000	alpha(HC)
Trip Av. Humidity	65.24	%	tot Soot on PM filter (estim.)	0.00000	mg
Trip Av. Amb. Temperature	27.80	degC	Soot --> PM simple scaling factor	1.00000	
Trip Av. Humidity (a)	65.24	%	Soot --> PM alpha scaling factor	0.00000	
Trip Av. Amb. Temperature (a)	27.80	degC	Trip Av. Veh. Speed	27.11751	km/h

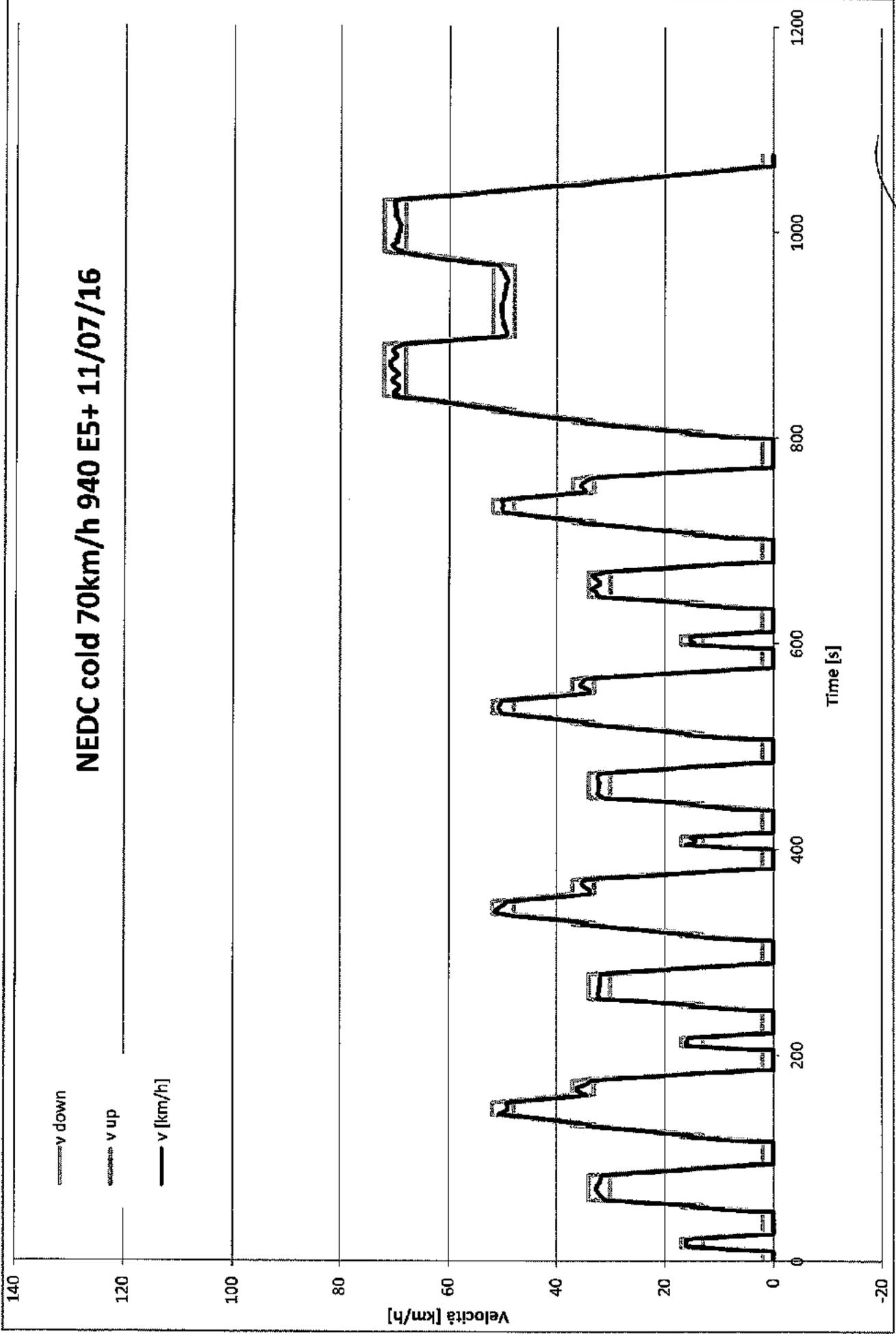
(a) GAS PEMS measurement state only, (b) based on fuel rate input (ECU, Fuel Meter), (c) calculated from carbon balance  
 (d) NO calculated using molecular weight of NO2

Parameter	Value	Unit
BS CO2	850.39605	g/kWh
BS CO	0.86562	g/kWh
BS THC	0.00000	g/kWh
BS NMHC	0.00000	g/kWh
BS CH4	0.00000	g/kWh
BS NO (d)	1.07045	g/kWh
BS NO2	0.19217	g/kWh
BS NOx	1.26262	g/kWh
BS Soot	0.00000	g/kWh
BS Soot meas	0.00000	g/kWh
BS PM	0.00000	g/kWh
BS PN	n/a	#/kWh
DS CO2	136.58158	g/km
DS CO	0.13903	g/km
DS THC	0.00000	g/km
DS NMHC	0.00000	g/km
DS CH4	0.00000	g/km
DS NO (d)	0.17192	g/km
DS NO2	0.03086	g/km
DS NOx	0.20279	g/km
DS Soot	0.00000	g/km
DS Soot meas	0.00000	g/km
DS PM	0.00000	g/km
DS PN	n/a	#/km
FS CO2	3021.73412	g/kg
FS CO	3.07582	g/kg
FS THC	0.00000	g/kg
FS NMHC	0.00000	g/kg
FS CH4	0.00000	g/kg
FS NO (d)	3.80367	g/kg
FS NO2	0.68283	g/kg
FS NOx	4.48648	g/kg
FS Soot	0.00000	g/kg
FS Soot meas	0.00000	g/kg
FS PM	0.00000	g/kg
FS PN	n/a	#/kg

PEMS Current Case: D:\AVL Concerto\WorkEnvironment\PEMS\_Files\_B135\PEMS\AFR940(Giulietta)\_2.0Jtd16v\_150cv\_MIT6\_E5+\_telB42\_Vehicle: AR 940 (Giulietta) / MIT6 E5+\_telB42  
 D:\AVL Concerto\MyData\Transport\Files\940\_telB42\_NEDC70\_Cold\_110716.ctf PEMS Result Filename: D:\AVL Concerto\MyData\Transport\Files\940\_telB42\_NEDC70\_Cold\_110716.ctf  
 Version: Relis\_B135  
 NOx Ambient Condition Corr.: 5 - CFR40 \$86.1942-94 SI  
 Dry / Wet Corr.: 1 - ISO16183 [Default]



# NEDC cold 70km/h 940 E5+ 11/07/16



Trip Duration	1085.00	s
Trip Duration (a)	1085.00	s
Trip Distance	8.09	km
Trip Distance (a)	8.09	km
Trip Fuel Cons. (b)	0.30	kg
Trip Fuel Cons. (a,b)	0.30	kg
Trip Fuel Cons. EU (a,c)	0.30	kg
Trip Fuel Cons. US (a,c)	0.30	kg
Trip Fuel Cons. Volume (b)	0.37	l
Trip Fuel Cons. Volume (a,b)	0.37	l
Trip Fuel Cons. Volume EU (a,c)	0.37	l
Trip Fuel Cons. Volume US (a,c)	0.37	l
Trip Fuel Economy (b)	4.36	l/km100
Trip Fuel Economy (a,b)	4.36	l/km100
Trip Fuel Economy EU (a,c)	4.36	l/km100
Trip Fuel Economy US (a,c)	4.36	l/km100
Trip Av. Eng. Speed	1160.45	rpm
Trip Av. Torque	29.91	Nm
Trip Av. Power	3.77	kW
Trip Work	1.13	kWh
Trip Av. Eng. Speed (a)	1160.45	rpm
Trip Av. Torque (a)	29.91	Nm
Trip Av. Power (a)	3.77	kW
Trip Work (a)	1.13	kWh
Trip Av. Humidity	44.11	%
Trip Av. Amb. Temperature	28.49	degC
Trip Av. Humidity (a)	44.11	%
Trip Av. Amb. Temperature (a)	28.49	degC

ave THC	0.00000	ppm
ave NMHC	0.00000	ppm
ave CH4	0.00000	ppm
ave CO	2.78947	ppm
ave CO2	2.33167	%
ave NOx	178.95963	ppm
ave PM	0.00183	mg/m3
ave Soot meas	0.00000	mg/m3
ave Soot	0.00183	mg/m3
ave PN	n/a	#/cm3
tot THC	0.00000	g
tot NMHC	0.00000	g
tot CH4	0.00000	g
tot CO	0.06601	g
tot CO2	887.84386	g
tot NO (d)	1.05546	g
tot NO2	2.39286	g
tot NOx	3.44832	g
tot Soot	0.00000	g
tot Soot meas	0.00000	g
tot PM	0.00000	g
tot PN	n/a	#
PM measurement type	0.00000	-
PM correction type	1.00000	alpha(HC)
tot Soot on PM filter (estirm.)	0.00000	mg
Soot --> PM simple scaling factor	1.00000	-
Soot --> PM alpha scaling factor	0.00000	-
Trip Av. Veh. Speed	26.8+254	km/h
Trip Distance Share Urban	71.09570	% distance
Trip Distance Share Rural	28.90430	% distance
Trip Distance Share Motorway	0.00000	% distance

BS CO2	785.70253	g/kWh
BS CO	0.05856	g/kWh
BS THC	0.00000	g/kWh
BS NMHC	0.00000	g/kWh
BS CH4	0.00000	g/kWh
BS NO (d)	0.93403	g/kWh
BS NO2	2.11757	g/kWh
BS NOx	3.05161	g/kWh
BS Soot	0.00000	g/kWh
BS Soot meas	0.00000	g/kWh
BS PM	0.00000	g/kWh
BS PN	n/a	#/kWh
DS CO2	109.74584	g/km
DS CO	0.00813	g/km
DS THC	0.00000	g/km
DS NMHC	0.00000	g/km
DS CH4	0.00000	g/km
DS NO (d)	0.13046	g/km
DS NO2	0.29578	g/km
DS NOx	0.42624	g/km
DS Soot	0.00000	g/km
DS Soot meas	0.00000	g/km
DS PM	0.00000	g/km
DS PN	n/a	#/km
FS CO2	2959.47953	g/kg
FS CO	0.20557	g/kg
FS THC	0.00000	g/kg
FS NMHC	0.00000	g/kg
FS CH4	0.00000	g/kg
FS NO (d)	3.51820	g/kg
FS NO2	7.97620	g/kg
FS NOx	11.49445	g/kg
FS Soot	0.00000	g/kg
FS Soot meas	0.00000	g/kg
FS PM	0.00000	g/kg
FS PN	n/a	#/kg

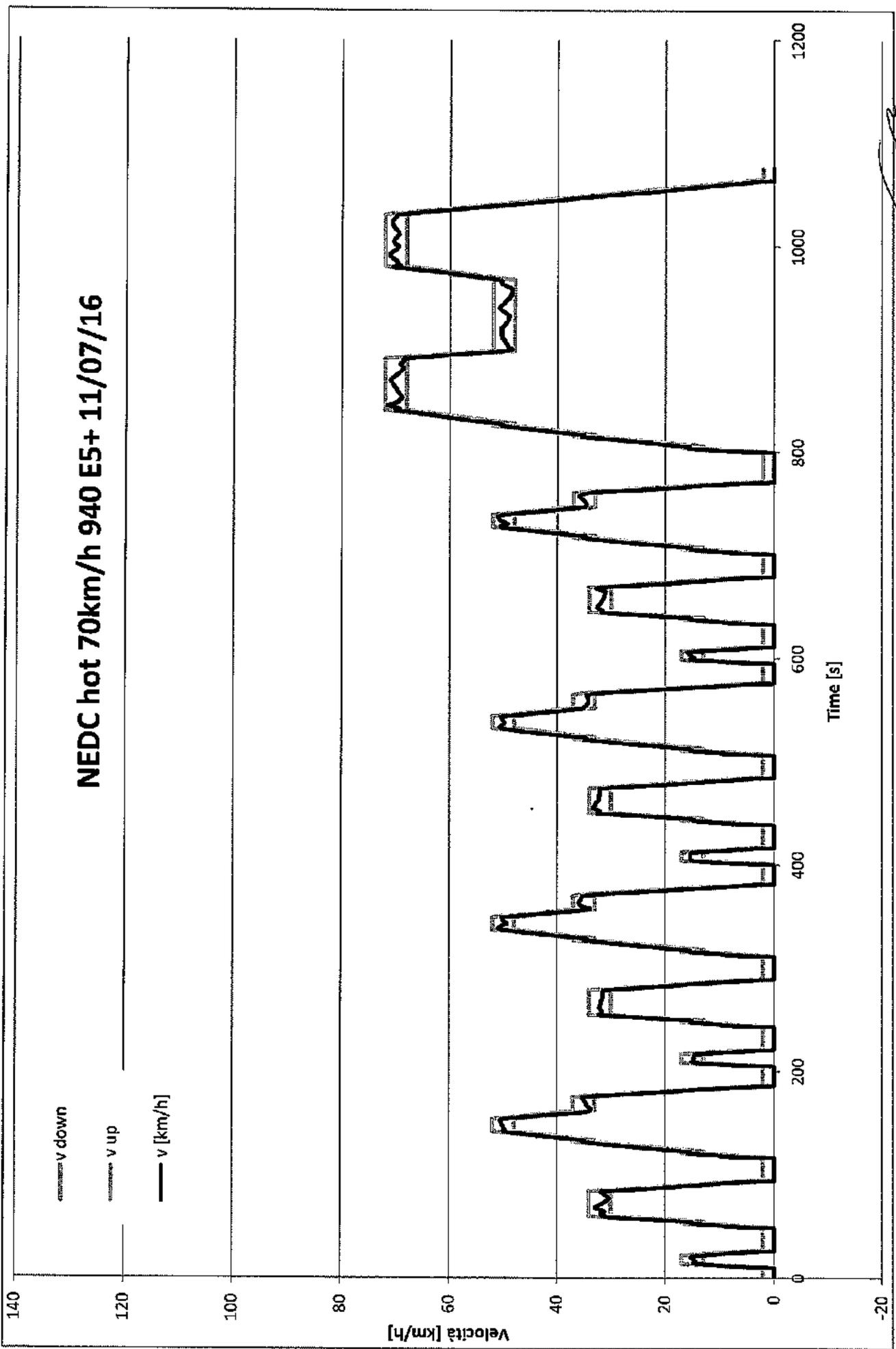
(a) GAS PEMS measurement state only, (b) based on fuel rate input (ECU, Fuel Meter), (c) calculated from carbon balance  
 (d) NO calculated using molecular weight of NO2

PEMS Current Case:  
 D:\AVL Concerto\Work\Environments\PEMS\_Rel5\_B135\PEMS\AF940\Giulietta\_2.0\td16v\_150cv\_MT6\_E5+  
 PEMS\_Hot70\_110716\_pms\_c  
 D:\AVL Concerto\MyData\TransportFiles  
 \_940\_tel842\_NEDC70\_Hot\_110716.cif

Vehicle: AR 940 (Giulietta) / MT6 E5+\_tel842  
 Engine: 2.0Jtd16v\_150cv / Diesel  
 NOx Ambient Condition Corr.: 5 - CFR40 §86.1342-94 SI  
 Dry / Wet Corr.: 1 - ISO16183 [Default]

Version: Rel5\_B135

# NEDC hot 70km/h 940 E5+ 11/07/16



13. FIAT DOBLO' .....



# Ministero delle Infrastrutture e dei Trasporti

DIPARTIMENTO PER I TRASPORTI, LA NAVIGAZIONE ED I SISTEMI INFORMATIVI E STATISTICI

Direzione Generale Territoriale del Nord-Ovest

**CENTRO PROVA AUTOVEICOLI TORINO**Rapporto di prova del 20/04/2016 - 15/07/2016 - 25/07/2016 - 16/02/2017  
Test report on

Pagina (Page) 1/1

**OGGETTO  
SUBJECT**Verifiche e prove per quanto riguarda:  
PROGRAMMA DI PROVE PER LA VALUTAZIONE DEL COMPORTAMENTO EMISSIVO  
DI VETTURE DIESEL EURO 5 COMMERCIALIZZATE IN ITALIA CON PROVE IN  
LABORATORIO E SU PISTA*Checks and tests about:*  
TEST PLAN FOR MARKETED IN ITALY EURO 5 DIESEL VEHICLES EMISSIONS  
BEHAVIOR ASSESSMENT WITH LABORATORY AND TRACK TESTING

Veicolo / Vehicle	Fiat Doblo 1.3 SDE	Data / Date [dd/mm/yy]	20/04/2016 - 16/02/2017
VIN	ZFA26300006973164	Prova / Test n.	S.07.?????.201? (*)
Tipo motore / Engine Type	1248 cm3	Autista / Driver	Catanzaro /Albertino/Ventura /Melis
Marcatura motore / Engine Code	263A2000	Odometro /Odometer [km]	11184
Cambio / Gear shift	Manuale / Manual M5	Note / Notes	
Start & Stop	NO		
Pneumatici / Tyres	2,2 bar		

Inerzia / Inertia [kg] 1360

Protocollo di prova  
Test ProtocolConforme alle specifiche dell'Istituto Motori di Napoli (C.N.R.)  
Compliant to the specification of Istituto Motori of NaplesNome e indirizzo del Laboratorio di prove  
Name and address of the test laboratory

FIAT POWERTRAIN TECHNOLOGIES, Strada del Drosso 145, TORINO (TO)

**RISULTATI DELLE PROVE  
TESTS RESULTS**Riportati nei seguenti allegati:  
Reported in the annexes listed here below

(\*) Prova / Test n.

NEDC cold al banco (report S.08.0676.2016 del 20/04/2016)

NEDC hot al banco (report S.08.0677.2016 del 20/04/2016)

NEDC cold back al banco (report S.08.1403.2016 del 25/07/2016)

NEDC hot back al banco (report S.09.0298.2017 del 16/02/2017)

NEDC cold su pista lim. 70km/h (report NEDC\_Cold70\_150716 del 15/07/2016 + profilo vel.)

NEDC hot su pista lim. 70km/h (report NEDC\_Hot70\_150716 del 15/07/2016 + profilo vel.)

I FUNZIONARI DEL CENTRO PROVA AUTOVEICOLI TORINO

VISTO  
IL DIRETTORE

Dott. Ing. Pietro GERACI

I risultati di misura riportati nel presente rapporto sono stati ottenuti applicando le norme/procedure/protocolli/regolamenti/direttive indicati e si riferiscono ai soli oggetti provati. Le incertezze di misura, quando indicate, sono espresse come incertezza estesa con fattore di copertura k=2, che per una distribuzione normale corrisponde ad un livello di confidenza di circa il 95%.

The measurement results reported in this document were obtained following the standards / procedures / protocols / regulation / directives reported and them refer to the tested objects only. The uncertainties of measurement stated in this report are calculated as a standard uncertainty multiplied by a coverage factor k=2, corresponding, in the case of a normal distribution, to a confidence level of about 95%.

È vietato riprodurre il presente documento, ed i relativi allegati, senza l'autorizzazione scritta del Laboratorio.

It is forbidden to reproduce the present document and relative enclosures, without written authorization of the Laboratory.

Il testo ufficiale del presente verbale è in lingua italiana. Quello in lingua inglese è da considerarsi solo come fonte di consultazione.

The official text of this test report is only in Italian. The English version is for reference only.

ciclo freddo



EU98M

AFIAT\_160317\_001  
S.08.0676.2016

Department --- OMOLOGAZIONE

Test date : 20.04.2016

**Vehicle data**

Vehicle ID ----- 263.5  
 Vehicle model ----- DOBLO 2009  
 Transmission type ----- M5  
 Odometer (before Test) ----- 11195 km  
 Tire pressure ----- 2.2 bar  
 VIN ----- ZFA26300006973164  
 CVS flow ----- 9,0 m3/min

**Fuel data**

Fuel type ----- GASOLIO EURO 5  
 Batch No. ----- 202  
 Calculation instruction ----- DIESEL  
 Density ----- 0,835 g/cm3 [15°C]  
 Carbon percentage ----- 86,6 %  
 NHV ----- 16438,9 btu/lb

**Dyno data**

Inertia ----- 1360 kg  
 Dyno load ----- F0/F1/F2 32,0 / -0,180 / 0,0425

**Add. data**

Driver ----- albertino  
 Operator ----- S8OP  
 aux table ----- NO\_AUX  
 Range switch table -----  
 Fan speed polynom ----- EU

**Reference**

Regulatory frame ----- EU  
 Ref. temp. ----- 273,15 K  
 Ref. Pressure ----- 1013,3 mbar  
 Calculation Regulatory ----- EU5

**Test reference data:**

GECOM Request No. -----  
 Richiedente ----- DARGENIO

**Remarks**

Test rem. ----- 0  
 Customer ----- TRAZIONE ANT POST SEUENZIALE ciclo freddo  
 Operator ----- /

**Phase Results**

	HC [mg/km]	CO [mg/km]	CO2 [g/km]	NOx [mg/km]	NO2 [mg/km]	N2O [mg/km]	NMHC [mg/km]	CH4 [mg/km]	Fuel cons. [l/100km]	Particulate [mg/km]
Phase 1 Bag Modal	71,000	567,000	158,075	160,000					6,04	
Phase 2 Bag Modal	5,000	5,000	119,910	135,000					4,55	
Bag Modal										
Bag Modal										
Phase 1 Pre cat avg Post cat avg Cat. efficiency Raw/Bag	HC [ppm]	CO [ppm]	CO2 [%]	NOx [ppm]	O2 [%]	CH4 [ppm]				
Phase 2 Pre cat avg Post cat avg Cat. efficiency Raw/Bag										
Pre cat avg Post cat avg Cat. efficiency Raw/Bag										
Pre cat avg Post cat avg Cat. efficiency Raw/Bag										

20/4/16  
m

**Total Results**

Bag	HC [mg/km]	CO [mg/km]	CO2 [g/km]	NOx [mg/km]	NO2 [mg/km]	N2O [mg/km]	NMHC [mg/km]	HC + NOx [mg/km]	Fuel econ [l/100km]	Particulate [mg/km]
	29,120	211,610	133,95	144,310				173,430	5,10	

**Time Control**

Test Date: 20.04.2016      Start of test 9:14:43 AM      End of test 9:58:06 AM      Start of trace 9:28:42 AM      End of trace 9:48:22 AM

Department --- OMOLOGAZIONE

Test date : 20.04.2016

**Vehicle data**

Vehicle ID ----- 263.5  
 Vehicle model ----- DOBLO 2009  
 Transmission type ----- M5  
 Odometer (before Test) ----- 11195 km  
 Tire pressure ----- 2.2 bar  
 VIN ----- ZFA26300006973164  
 CVS flow ----- 9,0 m3/min

**Fuel data**

Fuel type ----- GASOLIO EURO 5  
 Batch No. ----- 202  
 Calculation instruction ----- DIESEL  
 Density ----- 0,835 g/cm3 [15°C]  
 Carbon percentage ----- 86,6 %  
 NHV ----- 16438,9 btu/lb

**Dyno data**

Inertia ----- 1360 kg  
 Dyno load ----- F0/F1/F2 32,0 / -0,180 / 0,0425

**Add. data**

Driver ----- albertino  
 Operator ----- S8OP  
 AUX table ----- NO\_AUX  
 Range switch table -----  
 Fan speed polynom ----- EU

**Reference**

Regulatory frame ----- EU  
 Ref. temp. ----- 273,15 K  
 Ref. Pressure ----- 1013,3 mbar  
 Calculation Regulatory ----- EU5

**Test reference data:**

GECOM Request No. -----  
 Richiedente ----- DARGENIO

**Remarks**

Test rem. ----- 0  
 Customer ----- TRAZIONE ANT POST SEUENZIALE ciclo freddo  
 Operator ----- /

**Phase Results**

	1	2		Phase
Barometric pressure	99,49	99,49		kPa
Ambient air temperature	24,25	24,36		°C
Relative humidity	40,96	41,00		%
NOx correction factor	0,9142	0,9158		
Dilution factor	37,860	16,292		
CVS volume corrected (273,15K)	106,095	54,371		m <sup>3</sup>
Average CVS temperature	39,9	39,9		°C
Average CVS pressure PV	97,1	97,1		kPa
DLS volume corrected (273,15K)	0,6501	0,3333		m <sup>3</sup>
Average force at dyno	40,2	225,4		N
Minimum oil temperature				°C
Distance	4,055	6,970		km
Drivers violation	0,0	0,0		sec

**Baq Analysis**

	1	2		Phase
Concentration sample THC	6,988	3,417		ppmC1
Concentration ambient THC	2,702	2,590		ppmC1
Emission THC	0,288	0,033		g/Phase
Emission THC	71,000	5,000		mg/km
Concentration sample CH4				ppm
Concentration ambient CH4				ppm
Emission CH4				g/Phase
Emission CH4				mg/km
Concentration sample NMHC				ppmC1
Concentration ambient NMHC				ppmC1
Emission NMHC				g/Phase
Emission NMHC				mg/km
Concentration sample CO	17,810	0,978		ppm
Concentration ambient CO	0,490	0,506		ppm
Emission CO	2,299	0,034		g/Phase
Emission CO	567,000	5,000		mg/km
Concentration sample NOx	3,294	9,245		ppm
Concentration ambient NOx	0,037	0,012		ppm
Emission NOx	0,648	0,943		g/Phase
Emission NOx	160,000	135,000		mg/km
Concentration sample NO2				ppm
Concentration ambient NO2				ppm
Emission NO2				g/Phase
Emission NO2				mg/km
Concentration sample N2O				ppm
Concentration ambient N2O				ppm
Emission N2O				g/Phase
Emission N2O				mg/km
Concentration sample CO2	0,354	0,828		%
Concentration ambient CO2	0,048	0,049		%
Emission CO2	640,996	835,772		g/Phase
Emission CO2	158,075	119,910		g/km
Fuel consumption	6,04	4,55		l/100km

**Total Results**

Emission per	HC	CO	CO2	NOx	NMHC	HC + Nox
total distance [mg/km]	29,120	211,610	133,947	144,310		173,430

Fuel consumption [l/100km]	5,10			NO2	N2O
----------------------------	------	--	--	-----	-----

Department --- OMOLOGAZIONE

Test date : 20.04.2016

**Vehicle data**

Vehicle ID ----- 263.5  
Vehicle model ----- DOBLO 2009  
Transmission type ----- M5  
Odometer (before Test) ----- 11195 km  
Tire pressure ----- 2.2 bar  
VIN ----- ZFA26300006973164  
CVS flow ----- 9,0 m3/min

**Fuel data**

Fuel type ----- GASOLIO EURO 5  
Batch No.----- 202  
Calculation instruction ----- DIESEL  
Density ----- 0,835 g/cm3 [15°C]  
Carbon percentage ----- 86,6 %  
NHV ----- 16438,9 btu/lb

**Dyno data**

Inertia ----- 1360 kg  
Dyno load ----- F0/F1/F2 32,0 / -0,180 / 0,0425

**Add. data**

Driver ----- albertino  
Operator ----- S8OP  
AUX table ----- NO\_AUX  
Range switch table -----  
Fan speed polynom ----- EU

**Reference**

Regulatory frame ----- EU  
Ref. temp. ----- 273,15 K  
Ref. Pressure ----- 1013,3 mbar  
Calculation Regulatory ----- EU5

**Test reference data:**

GECOM Request No.-----  
Richiedente----- DARGENIO

**Remarks**

Test rem. ----- 0  
Customer ----- TRAZIONE ANT POST SEUENZIALE ciclo freddo  
Operator ----- /

**Phase Results**

	1	2		Phase
Barometric pressure	99,49	99,49		kPa
Ambient air temperature	24,25	24,36		°C
Relative humidity	40,96	41,00		%
NOx correction factor	0,9142	0,9158		
Dilution factor	37,860	16,292		
CVS volume corrected (273,15K)	106,095	54,371		m <sup>3</sup>
Average CVS temperature	39,9	39,9		°C
Average CVS pressure PV	97,1	97,1		kPa
DLS volume corrected (273,15K)	0,6501	0,3333		m <sup>3</sup>
Average torque at dyno	40,2	225,4		N
Minimum oil temperature				°C
Distance	4,055	6,970		km
Drivers violation	0,0	0,0		sec

**Particulate results**

	1	2		Phase
Main filter before test				mg
Main filter after test				mg
Backup filter before test				mg
Backup filter after test				mg
Payload main filter				mg
Payload backup filter				mg
Efficiency of main filter				%
Calculated payload				mg
mass emission				g
mass emission per distance				mg/km

**TEOM results**

Payload				mg
TEOM mass emission				g
TEOM mass emission per distance				mg/km
Efficiency TEOM/gravimetric				%

**Particulate total results**

Remarks  
Total emission |g  
Total emission per total distance |mg/km

**Particulate Counter total results**

Total counts: 1,006E+11  
Tot.counts/ 9,1243E+09 1/km  
Tot.distance

**Weighing chamber data**

Chamber temperature: |°C  
Chamber pressure: |kPa

**Buoyancy correction factor:**

**Setup/Checks Particulate Counter**

CPCCFK 1,0571 unity  
PND1 10 unity  
PND2 15 unity  
PCRF 168,74 unity  
System Ccheck O.K? YES  
Zero Count 0,08005 1/cm<sup>3</sup>

ciclo caldo



EU98M

AFIAT\_160317\_001  
S.08.0677.2016

Department --- OMOLOGAZIONE

Test date : 20.04.2016

**Vehicle data**

Vehicle ID ----- 263.5  
 Vehicle model ----- DOBLO 2009  
 Transmission type ----- M5  
 Odometer (before Test) ----- 11206 km  
 Tire pressure ----- 2.2 bar  
 VIN ----- ZFA26300006973164  
 CVS flow ----- 9,0 m3/min

**Fuel data**

Fuel type ----- GASOLIO EURO 5  
 Batch No. ----- 202  
 Calculation instruction ----- DIESEL  
 Density ----- 0,835 g/cm3 [15°C]  
 Carbon percentage ----- 86,6 %  
 NHV ----- 16438,9 btu/lb

**Dyno data**

Inertia ----- 1360 kg  
 Dyno load ----- F0/F1/F2 32,0 / -0,180 / 0,0425

**Add. data**

Driver ----- ventura  
 Operator ----- S8OP  
 aux table ----- NO\_AUX  
 Range switch table -----  
 Fan speed polynom ----- EU

**Reference**

Regulatory frame ----- EU  
 Ref. temp. ----- 273,15 K  
 Ref. Pressure ----- 1013,3 mbar  
 Calculation Regulatory ----- EU5

**Test reference data:**

GECOM Request No. -----  
 Richiedente ----- DARGENIO

**Remarks**

Test rem. -----  
 Customer ----- TRAZIONE ANT POST SEUENZIALE ciclo caldo  
 Operator ----- /

**Phase Results**

	HC	CO	CO2	NOx	NO2	N2O	NMHC	CH4	Fuel cons.	Particulate
	[mg/km]	[mg/km]	[g/km]	[mg/km]	[mg/km]	[mg/km]	[mg/km]	[mg/km]	[l/100km]	[mg/km]
Phase 1										
Bag	32,000	12,000	132,515	495,000					5,03	
Modal										
Phase 2										
Bag	5,000	5,000	114,417	421,000					4,34	
Modal										
Bag										
Modal										
Bag										
Modal										
Phase 1										
Pre cat avg	HC [ppm]	CO [ppm]	CO2 [%]	NOx [ppm]	O2 [%]	CH4 [ppm]				
Post cat avg										
Cat. efficiency										
Raw/Bag										
Phase 2										
Pre cat avg										
Post cat avg										
Cat. efficiency										
Raw/Bag										
Pre cat avg										
Post cat avg										
Cat. efficiency										
Raw/Bag										
Pre cat avg										
Post cat avg										
Cat. efficiency										
Raw/Bag										

20/4/16

**Total Results**

Bag	HC	CO	CO2	NOx	NO2	N2O	NMHC	HC + NOx	Fuel econ	Particulate
	[mg/km]	[mg/km]	[g/km]	[mg/km]	[mg/km]	[mg/km]	[mg/km]	[mg/km]	[l/100km]	[mg/km]
	15,110	7,829	121,10	448,700				463,810	4,60	

**Time Control**

Test Date: 20.04.2016      Start of test 10:02:45 AM      Start of trace 10:15:50 AM  
 End of test 10:45:12 AM      End of trace 10:35:30 AM

Department --- OMOLOGAZIONE

Test date : 20.04.2016

**Vehicle data**

Vehicle ID ----- 263.5  
 Vehicle model ----- DOBLO 2009  
 Transmission type ----- M5  
 Odometer (before Test) ----- 11208 km  
 Tire pressure ----- 2.2 bar  
 VIN ----- ZFA26300006973164  
 CVS flow ----- 9,0 m3/min

**Fuel data**

Fuel type ----- GASOLIO EURO 5  
 Batch No. ----- 202  
 Calculation instruction ----- DIESEL  
 Density ----- 0,835 g/cm3 [15°C]  
 Carbon percentage ----- 86,6 %  
 NHV ----- 16438,9 btu/lb

**Dyno data**

Inertia ----- 1360 kg  
 Dyno load ----- F0/F1/F2 32,0 / -0,180 / 0,0425

**Add. data**

Driver ----- ventura  
 Operator ----- S8OP  
 aux table ----- NO\_AUX  
 Range switch table -----  
 Fan speed polynom ----- EU

**Reference**

Regulatory frame ----- EU  
 Ref. temp. ----- 273,15 K  
 Ref. Pressure ----- 1013,3 mbar  
 Calculation Regulatory ----- EU5

**Test reference data:**

GECOM Request No. -----  
 Richiedente ----- DARGENIO

**Remarks**

Test rem. -----  
 Customer ----- TRAZIONE ANT POST SEUENZIALE ciclo caldo  
 Operator ----- /

**Phase Results**

	HC [mg/km]	CO [mg/km]	CO2 [g/km]	NOx [mg/km]	NO2 [mg/km]	N2O [mg/km]	NMHC [mg/km]	CH4 [mg/km]	Fuel cons. [l/100km]	Particulate [mg/km]
<b>Phase 1</b>										
Bag	32,000	12,000	132,515	495,000					5,03	0,1843
Modal										
<b>Phase 2</b>										
Bag	5,000	5,000	114,417	421,000					4,34	
Modal										
Bag										
Modal										
Bag										
Modal										
	HC [ppm]	CO [ppm]	CO2 [%]	NOx [ppm]	O2 [%]	CH4 [ppm]				
<b>Phase 1</b>										
Pre cat avg										
Post cat avg										
Cat. efficiency										
Raw/Bag										
<b>Phase 2</b>										
Pre cat avg										
Post cat avg										
Cat. efficiency										
Raw/Bag										
Pre cat avg										
Post cat avg										
Cat. efficiency										
Raw/Bag										
Pre cat avg										
Post cat avg										
Cat. efficiency										
Raw/Bag										

**Total Results**

Bag	HC [mg/km]	CO [mg/km]	CO2 [g/km]	NOx [mg/km]	NO2 [mg/km]	N2O [mg/km]	NMHC [mg/km]	HC + NOx [mg/km]	Fuel econ [l/100km]	Particulate [mg/km]
	15,110	7,829	121,10	448,700				463,810	4,60	0,1843

**Time Control**

Test Date: 20.04.2016  
 Start of test 10:02:45 AM  
 End of test 10:45:12 AM

Start of trace 10:15:50 AM  
 End of trace 10:35:30 AM

Department --- OMOLOGAZIONE

Test date : 20.04.2016

**Vehicle data**

Vehicle ID ----- 263.5  
 Vehicle model ----- DOBLO 2009  
 Transmission type ----- M5  
 Odometer (before Test) ----- 11206 km  
 Tire pressure ----- 2.2 bar  
 VIN ----- ZFA26300006973164  
 CVS flow ----- 9,0 m3/min

**Fuel data**

Fuel type ----- GASOLIO EURO 5  
 Batch No. ----- 202  
 Calculation instruction ----- DIESEL  
 Density ----- 0,835 g/cm3 [15°C]  
 Carbon percentage ----- 86,6 %  
 NHV ----- 16438,9 btu/lb

**Dyno data**

Inertia ----- 1360 kg  
 Dyno load ----- F0/F1/F2 32,0 / -0,180 / 0,0425

**Add. data**

Driver ----- ventura  
 Operator ----- S80P  
 AUX table ----- NO\_AUX  
 Range switch table -----  
 Fan speed polynom ----- EU

**Reference**

Regulatory frame ----- EU  
 Ref. temp. ----- 273,15 K  
 Ref. Pressure ----- 1013,3 mbar  
 Calculation Regulatory ----- EU5

**Test reference data:**

GECOM Request No. -----  
 Richiedente ----- DARGENIO

**Remarks**

Test rem. -----  
 Customer ----- TRAZIONE ANT POST SEUENZIALE ciclo caldo  
 Operator ----- /

**Phase Results**

	1	2		Phase
Barometric pressure	99,51	99,52		kPa
Ambient air temperature	24,87	24,26		°C
Relative humidity	40,41	36,77		%
NOx correction factor	0,9193	0,8924		
Dilution factor	44,184	17,124		
CVS volume corrected (273,15K)	108,103	54,395		m <sup>3</sup>
Average CVS temperature	39,9	39,9		°C
Average CVS pressure PV	97,1	97,1		kPa
DLS volume corrected (273,15K)	0,6501	0,3331		m <sup>3</sup>
Average force at dyno	39,6	222,9		N
Minimum oil temperature				°C
Distance	4,058	5,927		km
Drivers violation	0,1	0,0		sec

**Baq Analysis**

	1	2		Phase
Concentration sample THC	4,539	3,500		ppmC1
Concentration ambient THC	2,650	2,545		ppmC1
Emission THC	0,129	0,037		g/Phase
Emission THC	32,000	5,000		mg/km
Concentration sample CH4				ppm
Concentration ambient CH4				ppm
Emission CH4				g/Phase
Emission CH4				mg/km
Concentration sample NMHC				ppmC1
Concentration ambient NMHC				ppmC1
Emission NMHC				g/Phase
Emission NMHC				mg/km
Concentration sample CO	0,875	1,012		ppm
Concentration ambient CO	0,509	0,509		ppm
Emission CO	0,050	0,036		g/Phase
Emission CO	12,000	5,000		mg/km
Concentration sample NOx	10,030	29,340		ppm
Concentration ambient NOx	-0,021	0,011		ppm
Emission NOx	2,010	2,919		g/Phase
Emission NOx	495,000	421,000		mg/km
Concentration sample NO2				ppm
Concentration ambient NO2				ppm
Emission NO2				g/Phase
Emission NO2				mg/km
Concentration sample N2O				ppm
Concentration ambient N2O				ppm
Emission N2O				g/Phase
Emission N2O				mg/km
Concentration sample CO2	0,305	0,788		%
Concentration ambient CO2	0,048	0,049		%
Emission CO2	537,746	792,566		g/Phase
Emission CO2	132,515	114,417		g/km
Fuel consumption	5,03	4,34		l/100km

**Total Results**

Emission per	HC	CO	CO2	NOx	NMHC	HC + Nox
total distance [mg/km]	<b>15,110</b>	<b>7,828</b>	<b>121,103</b>	<b>448,700</b>		<b>463,810</b>
Fuel consumption [l/100km]	<b>4,60</b>			<b>NO2</b>	<b>N2O</b>	

Department — OMOLOGAZIONE

Test date : 20.04.2016

**Vehicle data**

Vehicle ID ..... 263.5  
 Vehicle model ..... DOBLO 2009  
 Transmission type ..... M5  
 Odometer (before Test) ..... 11206 km  
 Tire pressure ..... 2.2 bar  
 VIN ..... ZFA28300006973164  
 CVS flow ..... 9.0 m3/min

**Fuel data**

Fuel type ..... GASOLIO EURO 5  
 Batch No. .... 202  
 Calculation instruction ..... DIESEL  
 Density ..... 0,835 g/cm3 [15°C]  
 Carbon percentage ..... 86,6 %  
 NHV ..... 18438,9 btu/lb

**Dyno data**

Inertia ..... 1360 kg  
 Dyno load ..... F0/F1/F2 32,0 / -0,180 / 0,0425

**Add. data**

Driver ..... ventura  
 Operator ..... SBOP  
 AUX table ..... NO\_AUX  
 Range switch table .....  
 Fan speed polynom ..... EU

**Reference**

Regulatory frame ..... EU  
 Ref. temp. .... 273,15 K  
 Ref. Pressure ..... 1013,3 mbar  
 Calculation Regulatory ..... EU5

**Test reference data:**

GECOM Request No. ....  
 Richiedente ..... DARGENIO

**Remarks**

Test rem. ....  
 Customer ..... TRAZIONE ANT POST SEUENZIALE ciclo caldo  
 Operator ..... /

**Phase Results**

	1	2		Phase
Barometric pressure	99,51	99,52		kPa
Ambient air temperature	24,87	24,26		°C
Relative humidity	40,41	36,77		%
NOx correction factor	0,9193	0,8924		
Dilution factor	44,184	17,124		
CVS volume corrected (273,15K)	108,103	54,385		m <sup>3</sup>
Average CVS temperature	39,9	39,9		°C
Average CVS pressure PV	97,1	97,1		kPa
DLS volume corrected (273,15K)	0,6501	0,3331		m <sup>3</sup>
Average torque at dyno	39,6	222,9		N
Minimum oil temperature				°C
Distance	4,058	6,927		km
Drivers violation	0,1	0,0		sec

**Particulate results**

	1	2		Phase
Main filter before test	79,215			mg
Main filter after test	79,227			mg
Backup filter before test				mg
Backup filter after test				mg
Payload main filter	0,012			mg
Payload backup filter				mg
Efficiency of main filter				%
Calculated payload				mg
mass emission	0,0020			g
mass emission per distance	0,1843			mg/km

**TEOM results**

Payload				mg
TEOM mass emission				g
TEOM mass emission per distance				mg/km
Efficiency TEOM/gravimetric				%

**Particulate total results**

Remarks  
 Total emission 0,0020 g  
 Total emission per total distance 0,1843 mg/km

**Particulate Counter total results**

Total counts: 4,9053E+10  
 Tot.counts/ 4,6654E+09 1/km  
 Tot.distance

**Weighing chamber data**

Chamber temperature: 22,50 °C  
 Chamber pressure: 990,20 kPa  
 Buoyancy correction factor: 1,000360E+00

**Setup/Checks Particulate Counter**

CPCCFK 1,0571 unity  
 PND1 10 unity  
 PND2 15 unity  
 PCRF 168,74 unity  
 System Check O.K? YES  
 Zero Count 0,09101 1/cm<sup>3</sup>

Department --- OMOLOGAZIONE

Test date : 25.07.2016

**Vehicle data**

Vehicle ID ----- 263.5  
 Vehicle model ----- DOBLO 2009  
 Transmission type ----- M5  
 Odometer (before Test) ----- 15775 km  
 Tire pressure ----- 2.2 bar  
 VIN ----- 06973164  
 CVS flow ----- 9,0 m3/min

**Fuel data**

Fuel type ----- GASOLIO EURO 5  
 Batch No.----- 202  
 Calculation instruction ----- DIESEL  
 Density ----- 0,835 g/cm3 [15 °C]  
 Carbon percentage ----- 86,6 %  
 NHV ----- 16438,9 btu/lb

**Dyno data**

Inertia ----- 1360 kg  
 Dyno load ----- F0/F1/F2 32,0 / -0,180 / 0,0425

**Add. data**

Driver ----- catanzaro  
 Operator ----- S8OP  
 aux table ----- NO\_AUX  
 Range switch table ----- STANDARD  
 Fan speed polynom ----- EU

**Reference**

Regulatory frame ----- EU  
 Ref. temp. ----- 273,15 K  
 Ref. Pressure ----- 1013,3 mbar  
 Calculation Regulatory ----- EU5

**Test reference data:**

GECOM Request No.-----  
 Richiedente-----

**Remarks**

Test rem. ----- test ufficiale dimostrativo cold back  
 Customer ----- ant+post sequenziale ciclo freddo test ufficiale attendere omologatore  
 Operator ----- /

**Phase Results**

	HC	CO	CO2	NOx	NO2	N2O	NMHC	CH4	Fuel cons.	Particulate
	[mg/km]	[mg/km]	[g/km]	[mg/km]	[mg/km]	[mg/km]	[mg/km]	[mg/km]	[l/100km]	[mg/km]
<i>Phase 1</i>										
<b>Bag</b>	15,000	108,000	135,377	215,000					5,14	0,8938
<b>Modal</b>										
<i>Phase 2</i>										
<b>Bag</b>	17,000	11,000	147,455	323,000					5,60	
<b>Modal</b>										
<b>Bag</b>										
<b>Modal</b>										
<b>Bag</b>										
<b>Modal</b>										
<i>Phase 1</i>										
<b>Pre cat avg</b>	HC [ppm]	CO [ppm]	CO2 [%]	NOx [ppm]	O2 [%]	CH4 [ppm]				
<b>Post cat avg</b>										
<b>Cat.efficiency</b>										
<b>Raw/Bag</b>										
<i>Phase 2</i>										
<b>Pre cat avg</b>										
<b>Post cat avg</b>										
<b>Cat.efficiency</b>										
<b>Raw/Bag</b>										
<b>Pre cat avg</b>										
<b>Post cat avg</b>										
<b>Cat.efficiency</b>										
<b>Raw/Bag</b>										
<b>Pre cat avg</b>										
<b>Post cat avg</b>										
<b>Cat.efficiency</b>										
<b>Raw/Bag</b>										

**Total Results**

Bag	HC	CO	CO2	NOx	NO2	N2O	NMHC	HC + NOx	Fuel ecor	Particulate
	[mg/km]	[mg/km]	[g/km]	[mg/km]	[mg/km]	[mg/km]	[mg/km]	[mg/km]	[l/100km]	[mg/km]
	<b>15,700</b>	<b>72,330</b>	<b>139,85</b>	<b>255,100</b>				<b>270,800</b>	<b>5,31</b>	<b>0,8938</b>

**Time Control**

Test Date: 25.07.2016      Start of test 3:33:00 PM      Start of trace 3:54:25 PM  
 End of test 4:29:55 PM      End of trace 4:14:05 PM

Department --- OMOLOGAZIONE

Test date : 25.07.2016

**Vehicle data**

Vehicle ID ----- 263.5  
Vehicle model ----- DOBLO 2009  
Transmission type ----- M5  
Odometer (before Test) ----- 15775 km  
Tire pressure ----- 2.2 bar  
VIN ----- 06973164  
CVS flow ----- 9,0 m3/min

**Fuel data**

Fuel type ----- GASOLIO EURO 5  
Batch No. ----- 202  
Calculation instruction ----- DIESEL  
Density ----- 0,835 g/cm3 [15°C]  
Carbon percentage ----- 86,6 %  
NHV ----- 16438,9 btu/lb

**Dyno data**

Inertia ----- 1360 kg  
Dyno load ----- F0/F1/F2 32,0 / -0,180 / 0,0425

**Add. data**

Driver ----- catanzaro  
Operator ----- S8OP  
aux table ----- NO\_AUX  
Range switch table ----- STANDARD  
Fan speed polynom ----- EU

**Reference**

Regulatory frame ----- EU  
Ref. temp.. ----- 273,15 K  
Ref. Pressure ----- 1013,3 mbar  
Calculation Regulatory ----- EU5

**Test reference data:**

GECOM Request No. -----  
Richiedente -----

**Remarks**

Test rem. ----- test ufficiale dimostrativo cold back  
Customer ----- ant+post sequenziale ciclo freddo test ufficiale attendere omologatore  
Operator ----- /

*Handwritten signature and date:*  
25.07.16

**Phase Results**

	HC	CO	CO2	NOx	NO2	N2O	NMHC	CH4	Fuel cons.	Particulate
	[mg/km]	[mg/km]	[g/km]	[mg/km]	[mg/km]	[mg/km]	[mg/km]	[mg/km]	[l/100km]	[mg/km]
Phase 1										
Bag	15,000	108,000	135,377	215,000					5,14	
Modal										
Phase 2										
Bag	17,000	11,000	147,455	323,000					5,60	
Modal										
Bag										
Modal										
Bag										
Modal										
Phase 1										
Pre cat avg	HC [ppm]	CO [ppm]	CO2 [%]	NOx [ppm]	O2 [%]	CH4 [ppm]				
Post cat avg										
Cat. efficiency										
Raw/Bag										
Phase 2										
Pre cat avg										
Post cat avg										
Cat. efficiency										
Raw/Bag										
Pre cat avg										
Post cat avg										
Cat. efficiency										
Raw/Bag										
Pre cat avg										
Post cat avg										
Cat. efficiency										
Raw/Bag										

**Total Results**

Bag	HC	CO	CO2	NOx	NO2	N2O	NMHC	HC + NOx	Fuel econ	Particulate
	[mg/km]	[mg/km]	[g/km]	[mg/km]	[mg/km]	[mg/km]	[mg/km]	[mg/km]	[l/100km]	[mg/km]
	15,700	72,330	139,85	255,100				270,800	5,31	

**Time Control**

Test Date: 25.07.2016      Start of test 3:33:00 PM      Start of trace 3:54:25 PM  
End of test 4:29:55 PM      End of trace 4:14:05 PM

Department --- **OMOLOGAZIONE**

Test date : **25.07.2016**

**Vehicle data**

Vehicle ID ----- **263.5**  
Vehicle model ----- **DOBLO 2009**  
Transmission type ----- **M5**  
Odometer (before Test) ----- **15775 km**  
Tire pressure ----- **2.2 bar**  
VIN ----- **06973164**  
CVS flow ----- **9,0 m3/min**

**Fuel data**

Fuel type ----- **GASOLIO EURO 5**  
Batch No.----- **202**  
Calculation instruction ----- **DIESEL**  
Density ----- **0,835 g/cm3 [15°C]**  
Carbon percentage ----- **86,6 %**  
NHV ----- **16438,9 btu/lb**

**Dyno data**

Inertia ----- **1360 kg**  
Dyno load ----- **F0/F1/F2 32,0 / -0,180 / 0,0425**

**Add. data**

Driver ----- **catanzaro**  
Operator ----- **S8OP**  
AUX table ----- **NO\_AUX**  
Range switch table ----- **STANDARD**  
Fan speed polynom ----- **EU**

**Reference**

Regulatory frame ----- **EU**  
Ref. temp.. ----- **273,15 K**  
Ref. Pressure ----- **1013,3 mbar**  
Calculation Regulatory ----- **EU5**

**Test reference data:**

GECOM Request No.-----  
Richiedente-----

**Remarks**

Test rem. ----- **test ufficiale dimostrativo cold back**  
Customer ----- **ant+post sequenziale ciclo freddo test ufficiale attendere omologatore**  
Operator ----- **/**

**Phase Results**

	1	2		Phase
Barometric pressure	98,57	98,55		kPa
Ambient air temperature	21,62	21,21		°C
Relative humidity	51,71	52,40		%
NOx correction factor	0,9336	0,9306		
Dilution factor	14,517	40,349		
CVS volume corrected (273,15K)	53,925	105,014		m <sup>3</sup>
Average CVS temperature	39,8	39,8		°C
Average CVS pressure PV	96,2	96,2		kPa
DLS volume corrected (273,15K)	0,3333	0,6498		m <sup>3</sup>
Average torque at dyno	224,4	39,5		N
Minimum oil temperature				°C
Distance	6,942	4,077		km
Drivers violation	0,0	0,0		sec

**Particulate results**

	1	2		Phase
Main filter before test	85,142			mg
Main filter after test	85,203			mq
Backup filter before test				mq
Backup filter after test				mq
Payload main filter	0,061			mq
Payload backup filter				mq
Efficiency of main filter				%
Calculated payload				mg
mass emission	0,0098			g
mass emission per distance	0,8938			mg/km

**TEOM results**

Payload				mg
TEOM mass emission				g
TEOM mass emission per distance				mg/km
Efficiency TEOM/gravimetric				%

**Particulate total results**

**Remarks**  
Total emission **0,0098** g  
**Total emission per total distance 0,8938** mg/km

**Particulate Counter total results**

Total counts: **1,51E+12**  
**Tot.counts/ 1,3704E+11** 1/km  
**Tot.distance**

**Weighing chamber data**

Chamber temperature: **22,00** °C  
Chamber pressure: **992,50** kPa  
Buoyancy correction factor: **1,000361E+00**

**Setup/Checks Particulate Counter**

CPCCFK **1,066** unity  
PND1 **10** unity  
PND2 **15** unity  
PCRF **167,39** unity  
System Ckeck O.K? **YES**  
Zero Count **0,05081** 1/cm<sup>3</sup>

Department --- OMOLOGAZIONE

Test date : 25.07.2016

**Vehicle data**

Vehicle ID ----- 263.5  
 Vehicle model ----- DOBLO 2009  
 Transmission type ----- M5  
 Odometer (before Test) ----- 15775 km  
 Tire pressure ----- 2.2 bar  
 VIN ----- 06973164  
 CVS flow ----- 9,0 m3/min

**Fuel data**

Fuel type ----- GASOLIO EURO 5  
 Batch No. ----- 202  
 Calculation instruction ----- DIESEL  
 Density ----- 0,835 g/cm3 [15 °C]  
 Carbon percentage ----- 86,6 %  
 NHV ----- 16438,9 btu/lb

**Dyno data**

Inertia ----- 1360 kg  
 Dyno load ----- F0/F1/F2 32,0 / -0,180 / 0,0425

**Add. data**

Driver ----- catanzaro  
 Operator ----- S8OP  
 AUX table ----- NO\_AUX  
 Range switch table ----- STANDARD  
 Fan speed polynom ----- EU

**Reference**

Regulatory frame ----- EU  
 Ref. temp. ----- 273,15 K  
 Ref. Pressure ----- 1013,3 mbar  
 Calculation Regulatory ----- EU5

**Test reference data:**

GECOM Request No. -----  
 Richiedente -----

**Remarks**

Test rem. ----- test ufficiale dimostrativo cold back  
 Customer ----- ant+post sequenziale ciclo freddo test ufficiale attendere omologatore  
 Operator ----- /

**Phase Results**

	1	2		Phase
Barometric pressure	98,57	98,55		kPa
Ambient air temperature	21,62	21,21		°C
Relative humidity	51,71	52,40		%
NOx correction factor	0,9336	0,9306		
Dilution factor	14,517	40,349		
CVS volume corrected (273,15K)	53,925	105,014		m <sup>3</sup>
Average CVS temperature	39,8	39,8		°C
Average CVS pressure PV	96,2	96,2		kPa
DLS volume corrected (273,15K)	0,3333	0,6498		m <sup>3</sup>
Average force at dyno	224,4	39,5		N
Minimum oil temperature				°C
Distance	6,942	4,077		km
Drivers violation	0,0	0,0		sec

**Baq Analysis**

	1	2		Phase
Concentration sample THC	5,849	3,019		ppmC1
Concentration ambient THC	2,997	1,994		ppmC1
Emission THC	0,103	0,070		g/Phase
Emission THC	15,000	17,000		mg/km
Concentration sample CH4				ppm
Concentration ambient CH4				ppm
Emission CH4				g/Phase
Emission CH4				mg/km
Concentration sample NMHC				ppmC1
Concentration ambient NMHC				ppmC1
Emission NMHC				g/Phase
Emission NMHC				mg/km
Concentration sample CO	12,560	1,754		ppm
Concentration ambient CO	1,509	1,450		ppm
Emission CO	0,752	0,045		g/Phase
Emission CO	108,000	11,000		mg/km
Concentration sample NOx	14,550	6,683		ppm
Concentration ambient NOx	0,075	0,117		ppm
Emission NOx	1,495	1,316		g/Phase
Emission NOx	215,000	323,000		mg/km
Concentration sample NO2				ppm
Concentration ambient NO2				ppm
Emission NO2				g/Phase
Emission NO2				mg/km
Concentration sample N2O				ppm
Concentration ambient N2O				ppm
Emission N2O				g/Phase
Emission N2O				mg/km
Concentration sample CO2	0,928	0,334		%
Concentration ambient CO2	0,044	0,044		%
Emission CO2	939,790	601,174		g/Phase
Emission CO2	135,377	147,455		g/km
Fuel consumption	5,14	5,60		l/100km

**Total Results**

Emission per total distance [mg/km]	<b>HC</b> <b>15,700</b>	<b>CO</b> <b>72,330</b>	<b>CO2</b> <b>139,846</b>	<b>NOx</b> <b>255,100</b>	<b>NMHC</b>	<b>HC + Nox</b> <b>270,800</b>
Fuel consumption [l/100km]	<b>5,31</b>			<b>NO2</b>	<b>N2O</b>	

Department -- OMOLOGAZIONE

Test date : 16.02.2017

**Vehicle data**

Vehicle ID ----- 263.5  
 Vehicle model ----- DOBLO 2009  
 Transmission type ----- M5  
 Odometer (before Test) ----- 15713 km  
 Tire pressure ----- 2.2 bar  
 VIN ----- ZFA26300006973164  
 CVS flow ----- 9,0 m3/min

**Fuel data**

Fuel type ----- GASOLIO EURO 5  
 Batch No. ----- 202  
 Calculation instruction ----- DIESEL  
 Density ----- 0,835 g/cm3 [15°C]  
 Carbon percentage ----- 86,6 %  
 NHV ----- 16438,9 btu/lb

**Dyno data**

Inertia ----- 1360 kg  
 Dyno load ----- F0/F1/F2 32,0 / -0,180 / 0,0425

**Add. data**

Driver ----- MELIS  
 Operator ----- S9OP  
 aux table ----- NO\_AUX  
 Range switch table ----- STANDARD  
 Fan speed polynom ----- EU

**Reference**

Regulatory frame ----- EU  
 Ref. temp. ----- 273,15 K  
 Ref. Pressure ----- 1013,3 mbar  
 Calculation Regulatory ----- EU5

**Test reference data:**

GECOM Request No. -----  
 Richiedente -----

**Remarks**

Test rem. ----- Test HOT  
 Customer -----  
 Operator ----- /

**Phase Results**

	HC [mg/km]	CO [mg/km]	CO2 [g/km]	NOx [mg/km]	NO2 [mg/km]	N2O [mg/km]	NMHC [mg/km]	CH4 [mg/km]	Fuel cons. [l/100km]	Particulate [mg/km]
Phase 1										
Bag	3,000	8,000	108,542	310,000		0,000			4,12	0,2025
Modal										
Phase 2										
Bag	17,000	16,000	144,943	481,000		2,000			5,50	
Modal										
Bag										
Modal										
Bag										
Modal										
Phase 1										
Pre cat avg	HC [ppm]	CO [ppm]	CO2 [%]	NOx [ppm]	O2 [%]	CH4 [ppm]				
Post cat avg										
Cat. efficiency										
Raw/Bag										
Phase 2										
Pre cat avg										
Post cat avg										
Cat. efficiency										
Raw/Bag										
Pre cat avg										
Post cat avg										
Cat. efficiency										
Raw/Bag										
Pre cat avg										
Post cat avg										
Cat. efficiency										
Raw/Bag										

**Total Results**

Bag	HC [mg/km]	CO [mg/km]	CO2 [g/km]	NOx [mg/km]	NO2 [mg/km]	N2O [mg/km]	NMHC [mg/km]	HC + NOx [mg/km]	Fuel econ [l/100km]	Particulate [mg/km]
	8,030	11,001	122,08	373,410		0,900		381,440	4,63	0,2025

**Time Control**

Test Date: 16.02.2017  
 Start of test 10:14:11 AM  
 End of test 10:47:34 AM

Start of trace 10:22:31 AM  
 End of trace 10:42:11 AM

Department — OMOLOGAZIONE

Test date : 16.02.2017

**Vehicle data**

Vehicle ID ..... 263.5  
 Vehicle model ..... DOBLO 2009  
 Transmission type ..... M5  
 Odometer (before Test) ..... 15713 km  
 Tire pressure ..... 2.2 bar  
 VIN ..... ZFA26300006973164  
 CVS flow ..... 9,0 m3/min

**Fuel data**

Fuel type ..... GASOLIO EURO 5  
 Batch No ..... 202  
 Calculation instruction ..... DIESEL  
 Density ..... 0,835 g/cm3 [15°C]  
 Carbon percentage ..... 86,6 %  
 NHV ..... 16438,9 btu/lb

**Dyno data**

Inertia ..... 1360 kg  
 Dyno load ..... F0/F1/F2 32,0 / -0,180 / 0,0425

**Add. data**

Driver ..... MELIS  
 Operator ..... S90P  
 AUX table ..... NO\_AUX  
 Range switch table ..... STANDARD  
 Fan speed polynom ..... EU

**Reference**

Regulatory frame ..... EU  
 Ref. temp. .... 273,15 K  
 Ref. Pressure ..... 1013,3 mbar  
 Calculation Regulatory ..... EU5

**Test reference data:**

GECOM Request No .....  
 Richiedente .....

**Remarks**

Test rem. .... Test HOT  
 Customer .....  
 Operator ..... /

**Phase Results**

	1	2		Phase
Barometric pressure	100,20	100,19		kPa
Ambient air temperature	27,04	24,80		°C
Relative humidity	46,94	47,28		%
NOx correction factor	0,9961	0,9565		
Dilution factor	17,983	40,892		
CVS volume corrected (273,15K)	58,274	109,441		m <sup>3</sup>
Average CVS temperature	26,7	27,1		°C
Average CVS pressure PV	98,4	98,4		kPa
DLS volume corrected (273,15K)	0,3332	0,6486		m <sup>3</sup>
Average force at dyno	226,2	46,8		N
Minimum oil temperature				°C
Distance	6,964	4,126		km
Drivers violation	0,0	0,0		sec

**Baq Analysis**

	1	2		Phase
Concentration sample THC	3,690	4,538		ppmC1
Concentration ambient THC	3,562	3,582		ppmC1
Emission THC	0,018	0,071		g/Phase
Emission THC	3,000	17,000		mg/km
Concentration sample CH4				ppm
Concentration ambient CH4				ppm
Emission CH4				g/Phase
Emission CH4				mg/km
Concentration sample NMHC				ppmC1
Concentration ambient NMHC				ppmC1
Emission NMHC				g/Phase
Emission NMHC				mg/km
Concentration sample CO	2,059	1,802		ppm
Concentration ambient CO	1,370	1,339		ppm
Emission CO	0,054	0,068		g/Phase
Emission CO	8,000	16,000		mg/km
Concentration sample NOx	19,010	9,450		ppm
Concentration ambient NOx	0,249	0,215		ppm
Emission NOx	2,158	1,983		g/Phase
Emission NOx	310,000	481,000		mg/km
Concentration sample NO2	0,362	0,362		ppm
Concentration ambient NO2				ppm
Emission NO2				g/Phase
Emission NO2				mg/km
Concentration sample N2O	-0,109	0,069		ppm
Concentration ambient N2O	-0,077	0,024		ppm
Emission N2O	0,000	0,010		g/Phase
Emission N2O	0,000	2,000		mg/km
Concentration sample CO2	0,750	0,330		%
Concentration ambient CO2	0,070	0,053		%
Emission CO2	755,849	598,022		g/Phase
Emission CO2	108,542	144,943		g/km
Fuel consumption	4,12	5,50		l/100km

**Total Results**

Emission per total distance [mg/km]	HC	CO	CO2	NOx	NMHC	HC + Nox
	8,030	11,001	122,085	373,410		381,440
Fuel consumption [l/100km]	4,83			NO2	N2O	
					0,900	

Department --- OMOLOGAZIONE

Test date : 16.02.2017

**Vehicle data**

Vehicle ID ----- 263.5  
 Vehicle model ----- DOBLO 2009  
 Transmission type ----- M5  
 Odometer (before Test) ----- 15713 km  
 Tire pressure ----- 2.2 bar  
 VIN ----- ZFA26300006973164  
 CVS flow ----- 9,0 m3/min

**Fuel data**

Fuel type ----- GASOLIO EURO 5  
 Batch No. ----- 202  
 Calculation instruction ----- DIESEL  
 Density ----- 0,835 g/cm3 (15°C)  
 Carbon percentage ----- 86,6 %  
 NHV ----- 16436,9 btu/lb

**Dyno data**

Inertia ----- 1360 kg  
 Dyno load ----- F0/F1/F2 32,0 / -0,180 / 0,0425

**Add. data**

Driver ----- MELIS  
 Operator ----- S90P  
 AUX table ----- NO\_AUX  
 Range switch table ----- STANDARD  
 Fan speed polynom ----- EU

**Reference**

Regulatory frame ----- EU  
 Ref. temp. ----- 273,15 K  
 Ref. Pressure ----- 1013,3 mbar  
 Calculation Regulatory ----- EU5

**Test reference data:**

GECOM Request No. -----  
 Richiedente -----

**Remarks**

Test rem. ----- Test HOT  
 Customer -----  
 Operator ----- /

**Phase Results**

	1	2		Phase
Barometric pressure	100,20	100,19		kPa
Ambient air temperature	27,04	24,80		°C
Relative humidity	48,94	47,28		%
NOx correction factor	0,9961	0,9565		
Dilution factor	17,983	40,892		
CVS volume corrected (273,15K)	58,274	109,441		m <sup>3</sup>
Average CVS temperature	26,7	27,1		°C
Average CVS pressure PV	98,4	98,4		kPa
DLS volume corrected (273,15K)	0,3332	0,6486		m <sup>3</sup>
Average torque at dyno	226,2	46,8		N
Minimum oil temperature				°C
Distance	6,964	4,126		km
Drivers violation	0,0	0,0		sec

**Particulate results**

	1	2		Phase
Main filter before test	83,933			mg
Main filter after test	83,947			mg
Backup filter before test				mg
Backup filter after test				mg
Payload main filter	0,013			mg
Payload backup filter				mg
Efficiency of main filter				%
Calculated payload				mg
mass emission	0,0022			g
mass emission per distance	0,2025			mg/km

**TEOM results**

Payload				mg
TEOM mass emission				g
TEOM mass emission per distance				mg/km
Efficiency TEOM/gravimetric				%

**Particulate total results**

Remarks  
 Total emission 0,0022 g  
 Total emission per total distance 0,2025 mg/km

**Particulate Counter total results**

Total counts: 1,0522E+11  
 Tot.counts/ 9,4882E+09 1/km  
 Tot.distance

**Weighing chamber data**

Chamber temperature: 22,10 °C  
 Chamber pressure: 1000,50 kPa  
 Buoyancy correction factor: 1,000364E+00

**Setup/Checks Particulate Counter**

CPCCFK 1,0434 unity  
 PND1 10 unity  
 PND2 15 unity  
 PCRF 168,74 unity  
 System Check O.K? YES  
 Zero Count 0,02885 1/cm<sup>3</sup>

Case: NEDC\_Cold70\_150716

Page: Trip Summary

'Balocco Track'

Start Date: 07/15/2016

Start Time: 08:47:54.0



Concerto M.C.V.E., 2016

Trip Duration	1090.00	s
Trip Distance	1090.00	s
Trip Distance (a)	8.03	km
Trip Distance (a)	8.03	km
Trip Fuel Cons. (b)	0.44	kg
Trip Fuel Cons. (a,b)	0.44	kg
Trip Fuel Cons. EU (a,c)	n/a	kg
Trip Fuel Cons. US (a,c)	n/a	kg
Trip Fuel Cons. Volume (b)	0.52	l
Trip Fuel Cons. Volume (a,b)	0.52	l
Trip Fuel Cons. Volume EU (a,c)	n/a	l
Trip Fuel Cons. Volume US (a,c)	n/a	l
Trip Fuel Economy (b)	6.49	/km100
Trip Fuel Economy (a,b)	6.49	/km100
Trip Fuel Economy EU (a,c)	n/a	/km100
Trip Fuel Economy US (a,c)	n/a	/km100
Trip Av. Eng. Speed	1359.56	rpm
Trip Av. Torque	24.07	Nm
Trip Av. Power	4.71	kW
Trip Work	1.41	kWh
Trip Av. Eng. Speed (a)	1359.56	rpm
Trip Av. Torque (a)	24.07	Nm
Trip Av. Power (a)	4.71	kW
Trip Work (a)	1.41	kWh
Trip Av. Humidity	36.62	%
Trip Av. Amb. Temperature	23.13	degC
Trip Av. Humidity (a)	36.62	%
Trip Av. Amb. Temperature (a)	23.13	degC

ave THC	0.00000	ppm
ave NMHC	0.00000	ppm
ave CH4	0.00000	ppm
ave CO	108.40754	ppm
ave CO2	4.62312	%
ave NOx	46.81917	ppm
ave PM	0.00003	mg/m3
ave Soot meas	0.00000	mg/m3
ave Soot	0.00003	mg/m3
ave PN	n/a	#/cm3
tot THC	0.00000	g
tot NMHC	0.00000	g
tot CH4	0.00000	g
tot CO	2.66795	g
tot CO2	1364.88807	g
tot NO (d)	1.28719	g
tot NO2	0.21493	g
tot NOx	1.50212	g
tot Soot	0.00000	g
tot Soot meas	0.00000	g
tot PM	0.00000	g
tot PN	n/a	#
PM measurement type	0.00000	-
PM correction type	1.00000	alpha(HC)
tot Soot on PM filter (estim.)	0.00000	mg
Soot --> PM simple scaling factor	1.00000	-
Soot --> PM alpha scaling factor	0.00000	-
Trip Av. Veh. Speed	26.80048	km/h
Trip Distance Share Urban	70.94553	% distance
Trip Distance Share Rural	29.05347	% distance
Trip Distance Share Motorway	0.00000	% distance

BS CO2	967.26259	g/kWh
BS CO	1.89071	g/kWh
BS THC	0.00000	g/kWh
BS NMHC	0.00000	g/kWh
BS CH4	0.00000	g/kWh
BS NO (d)	0.91220	g/kWh
BS NO2	0.15231	g/kWh
BS NOx	1.06451	g/kWh
BS Soot	0.00000	g/kWh
BS Soot meas	0.00000	g/kWh
BS PM	0.00000	g/kWh
BS PN	n/a	#/kWh
DS CO2	169.91648	g/km
DS CO	0.33214	g/km
DS THC	0.00000	g/km
DS NMHC	0.00000	g/km
DS CH4	0.00000	g/km
DS NO (d)	0.16024	g/km
DS NO2	0.02676	g/km
DS NOx	0.18700	g/km
DS Soot	0.00000	g/km
DS Soot meas	0.00000	g/km
DS PM	0.00000	g/km
DS PN	n/a	#/km
FS CO2	3115.57447	g/kg
FS CO	6.09003	g/kg
FS THC	0.00000	g/kg
FS NMHC	0.00000	g/kg
FS CH4	0.00000	g/kg
FS NO (d)	2.93822	g/kg
FS NO2	0.49050	g/kg
FS NOx	3.42882	g/kg
FS Soot	0.00000	g/kg
FS Soot meas	0.00000	g/kg
FS PM	0.00000	g/kg
FS PN	n/a	#/kg

(a) GAS PEMS measurement state only, (b) based on fuel rate input (ECU, Fuel Meter), (c) calculated from carbon balance  
 (d) NO calculated using molecular weight of NO2

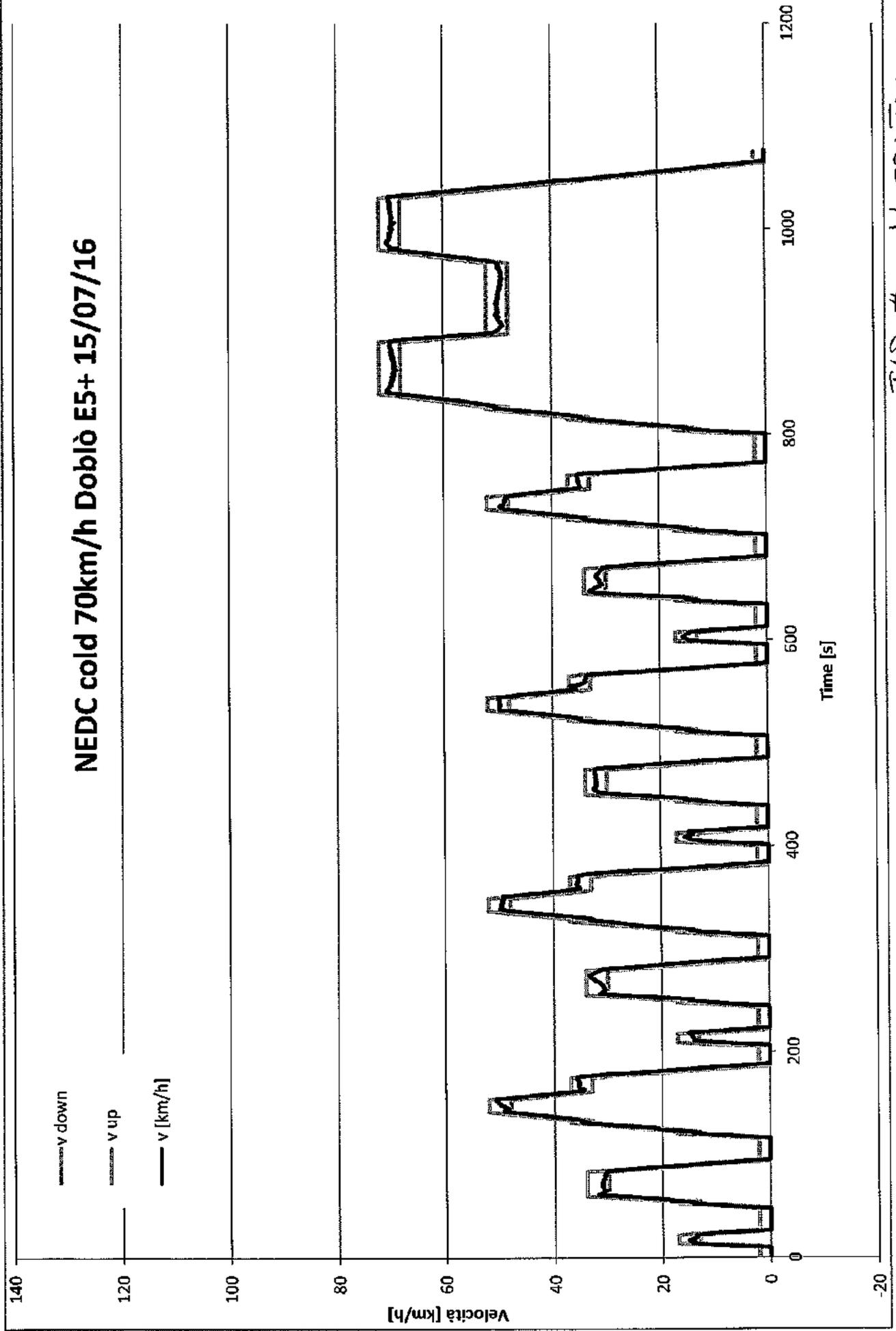
PEMS Current Case:  
 D:\AVL Concerto\Work\Environments\PEMS\_Rel5\_B135\PEMS263\_SDE\_90cv\_MTS\_E5+\_tel164\_Ministero\Engine: SDE\_90cv / Diesel.g  
 PEMS Result Filename:  
 D:\AVL Concerto\MyData\TransportFiles\263\_SDE90cv\_E5+\_tel164\_Balocco\_NEDC70\_Cold\_150716.cif

Vehicle: Fiat 263(Dobbi) / MTS E5+\_tel164  
 Engine: SDE\_90cv / Diesel.g  
 NOx Ambient Condition Corr.: 5 - CFR40 §86.1342-§4.SI  
 Dry / Wet Corr.: 1 - ISO16183 [Default]

Version: Rel5\_B135

Il Direttore del CPA di Torino

# NEDC cold 70km/h Doblò ES+ 15/07/16



I Direttore del CBA TORINO

Case: NEDC70\_Hot\_150716

Page: Trip Summary

'Balocco Track'

Start Date: 07/15/2016

Start Time: 09:14:44.0



Concerto M.O.V.E., 2016

Trip Duration	1090.00	s
Trip Distance	1090.00	s
Trip Distance (a)	8.07	km
Trip Distance (a)	8.07	km
Trip Fuel Cons. (b)	0.37	kg
Trip Fuel Cons. (a,b)	0.37	kg
Trip Fuel Cons. EU (a,c)	n/a	kg
Trip Fuel Cons. US (a,c)	n/a	kg
Trip Fuel Cons. Volume (b)	0.44	l
Trip Fuel Cons. Volume (a,b)	0.44	l
Trip Fuel Cons. Volume EU (a,c)	n/a	l
Trip Fuel Cons. Volume US (a,c)	n/a	l
Trip Fuel Economy (b)	5.51	l/km100
Trip Fuel Economy (a,b)	5.51	l/km100
Trip Fuel Economy EU (a,c)	n/a	l/km100
Trip Fuel Economy US (a,c)	n/a	l/km100
Trip Av. Eng. Speed	1409.69	rpm
Trip Av. Torque	20.89	Nm
Trip Av. Power	4.14	kW
Trip Work	1.24	kWh
Trip Av. Eng. Speed (a)	1409.69	rpm
Trip Av. Torque (a)	20.89	Nm
Trip Av. Power (a)	4.14	kW
Trip Work (a)	1.24	kWh
Trip Av. Humidity	36.46	%
Trip Av. Amb. Temperature	23.73	degC
Trip Av. Humidity (a)	36.46	%
Trip Av. Amb. Temperature (a)	23.73	degC

ave THC	0.00000	ppm
ave NMHC	0.00000	ppm
ave CH4	0.00000	ppm
ave CO	3.10600	ppm
ave CO2	3.53396	%
ave NOx	100.23010	ppm
ave PM	0.00003	mg/m3
ave Soot means	0.00000	mg/m3
ave Soot	0.00003	mg/m3
ave PN	n/a	#/cm3
tot THC	0.00000	g
tot NMHC	0.00000	g
tot CH4	0.00000	g
tot CO	0.05673	g
tot CO2	1170.22890	g
tot NO (d)	2.94382	g
tot NO2	0.56150	g
tot NOx	3.50531	g
tot Soot	0.00000	g
tot Soot means	0.00000	g
tot PM	0.00000	g
tot PN	n/a	#
PM measurement type	0.00000	-
PM correction type	1.00000	alpha(HC)
tot Soot on PM filter (estim.)	0.00000	mg
Soot --> PM simple scaling factor	1.00000	-
Soot --> PM alpha scaling factor	0.00000	-
Trip Av. Veh. Speed	26.88658	km/h
Trip Distance Share Urban	71.31905	% distance
Trip Distance Share Rural	28.68095	% distance
Trip Distance Share Motorway	0.00000	% distance

BS CO2	942.44658	g/kWh
BS CO	0.04569	g/kWh
BS THC	0.00000	g/kWh
BS NMHC	0.00000	g/kWh
BS CH4	0.00000	g/kWh
BS NO (d)	2.37081	g/kWh
BS NO2	0.45220	g/kWh
BS NOx	2.82301	g/kWh
BS Soot	0.00000	g/kWh
BS Soot means	0.00000	g/kWh
BS PM	0.00000	g/kWh
BS PN	n/a	#/kWh
DS CO2	145.08216	g/km
DS CO	0.00703	g/km
DS THC	0.00000	g/km
DS NMHC	0.00000	g/km
DS CH4	0.00000	g/km
DS NO (d)	0.36497	g/km
DS NO2	0.06961	g/km
DS NOx	0.43458	g/km
DS Soot	0.00000	g/km
DS Soot means	0.00000	g/km
DS PM	0.00000	g/km
DS PN	n/a	#/km
FS CO2	3131.84982	g/kg
FS CO	0.15184	g/kg
FS THC	0.00000	g/kg
FS NMHC	0.00000	g/kg
FS CH4	0.00000	g/kg
FS NO (d)	7.87846	g/kg
FS NO2	1.50271	g/kg
FS NOx	9.38117	g/kg
FS Soot	0.00000	g/kg
FS Soot means	0.00000	g/kg
FS PM	0.00000	g/kg
FS PN	n/a	#/kg

(a) GAS PEMS measurement state only, (b) based on fuel rate input (ECU, Fuel Meter), (c) calculated from carbon balance  
 (d) NO calculated using molecular weight of NO2

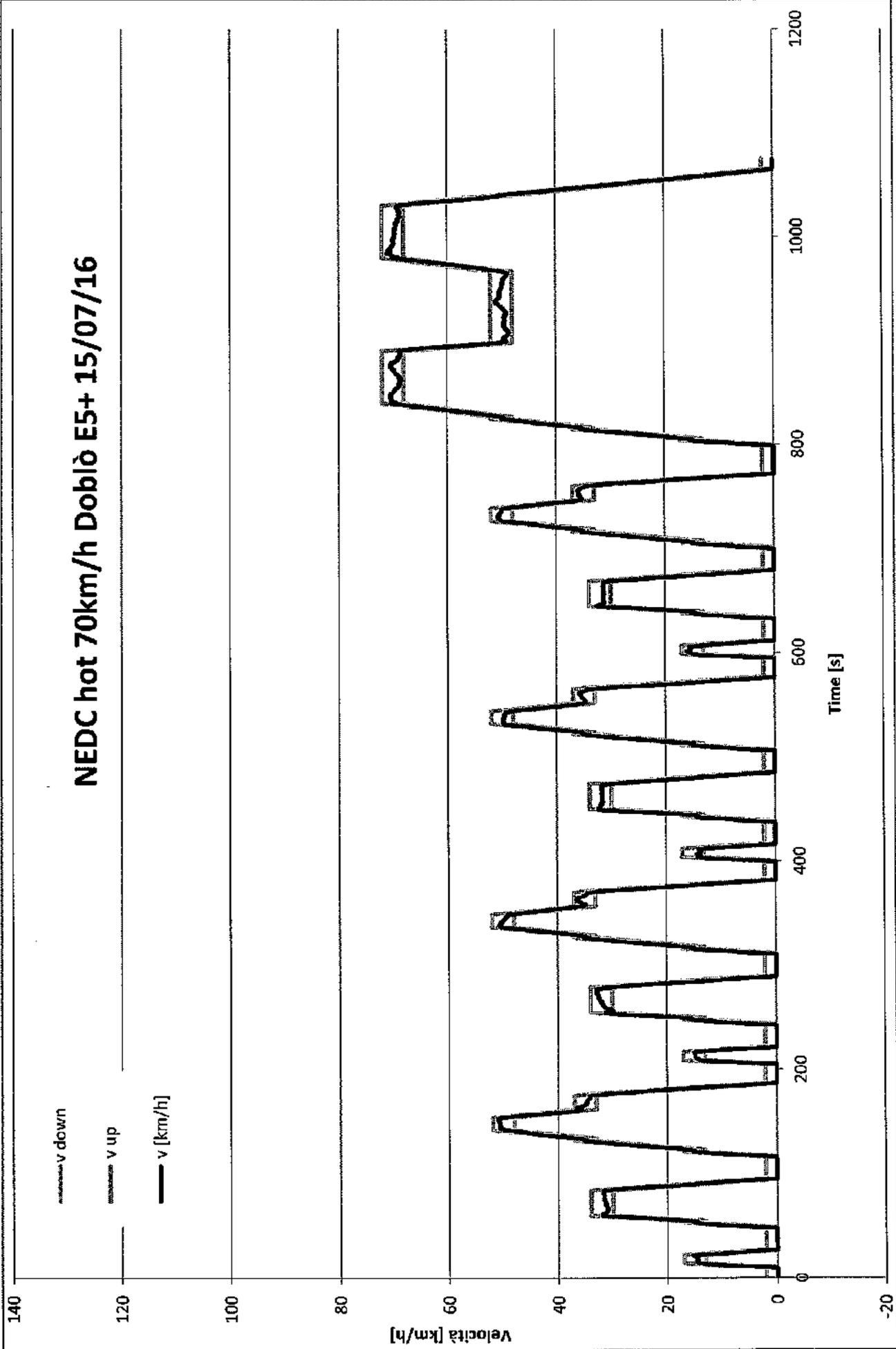
PEMS Current Case:  
 D:\AVL Concerto\Work\Environments\PEMS\_Rel5\_B135\PEMS263\_SDE\_90cv\_MTS\_E5+\_tel164\_Ministarot\ Engine: SDE\_90cv / Diesel  
 PEMS Result Filename:  
 D:\AVL Concerto\MyData\Transport\Files\263\_SDE90cv\_E5+\_tel164\_Balocco\_NEDC70\_Hot\_150716.cdf

Vehicle: Fiat 263(Dobbi) / MT5 E5+\_tel164  
 Version: Rel5\_B135

NOx Ambient Condition Corr.: 5 - CFR40 §86.1342-94 SI  
 Dry / Wet Corr.: 1 - ISO16183 [Default]

Il Direttore del CPA di Torino

# NEDC hot 70km/h Doblò E5+ 15/07/16



Il Direttore CPA Torino

14. ALFA ROMEO GIULIETTA 1.6 MJET .....



# Ministero delle Infrastrutture e dei Trasporti

DIPARTIMENTO PER I TRASPORTI, LA NAVIGAZIONE ED I SISTEMI INFORMATIVI E STATISTICI

**Direzione Generale Territoriale del Nord-Ovest**

**CENTRO PROVA AUTOVEICOLI TORINO**

Rapporto di prova del **29/04/2016 - 17/11/2016 - 31/01/2017**  
*Test report on*

Pagina (Page) 1/1

**OGGETTO**  
**SUBJECT**

Verifiche e prove per quanto riguarda:  
**PROGRAMMA DI PROVE PER LA VALUTAZIONE DEL COMPORTAMENTO EMISSIVO  
 DI VETTURE DIESEL EURO 5 COMMERCIALIZZATE IN ITALIA CON PROVE IN  
 LABORATORIO E SU PISTA**

*Checks and tests about:*  
**TEST PLAN FOR MARKETED IN ITALY EURO 5 DIESEL VEHICLES EMISSIONS  
 BEHAVIOR ASSESSMENT WITH LABORATORY AND TRACK TESTING**

Veicolo / Vehicle VIN	Alfa Romeo Giulietta 1.6 Mjet ZAR94000007381632 ZAR94000007380880	Data / Date [dd/mm/yy] Prova / Test n.	29/04/2016 - 17/11/2016 31/01/2017 S.08.????2016 (*)
Tipo motore / Engine Type Marcatura motore / Engine Code Cambio / Gear shift Start & Stop Pneumatici / Tyres	1598 cm <sup>3</sup> 940A3000 Manuale / Manual M6 SI / YES 2,2 bar	Autista / Driver Odometro / Odometer [km] Note / Notes	Calanzaro / D'Angelo / Ventura 26977 / 31550
Inerzia / Inertia [kg]	1360		
Protocollo di prova Test Protocol		Conforme alle specifiche dell'Istituto Motori di Napoli (C.N.R.) Compliant to the specification of Istituto Motori di Naples	
Nome e indirizzo del Laboratorio di prove Name and address of the test laboratory		FIAT POWERTRAIN TECHNOLOGIES, Strada del Drosso 145, TORINO (TO)	

**RISULTATI DELLE PROVE**  
**TESTS RESULTS**

Riportati nei seguenti allegati:  
*Reported in the annexes listed here below*

(\*) Prova / Test n.

NEDC cold al banco (report S.08.0733.2016 del 29/04/2016)  
 NEDC hot al banco (report S.08.0734.2016 del 29/04/2016)  
 NEDC cold back al banco (report S.08.2084.2016 del 17/11/2016)  
 NEDC hot back al banco (report S.08.2085.2016 del 17/11/2016)  
 NEDC cold su pista lim. 70km/h (report NEDC\_Cold\_310117 del 31/01/2017 + profilo vel.)  
 NEDC hot su pista lim. 70km/h (report NEDC\_Hot\_310117 del 31/01/2017 + profilo vel.)

I FUNZIONARI DEL CENTRO PROVA AUTOVEICOLI TORINO

*Pietro Geraci*



VISTO  
 IL DIRETTORE

Dott. Ing. Pietro GERACI

I risultati di misura riportati nel presente rapporto sono stati ottenuti applicando le norme/procedure/protocolli/regolamenti/direttive indicati e si riferiscono ai soli oggetti provati. Le incertezze di misura, quando indicate, sono espresse come incertezza estesa con fattore di copertura k=2, che per una distribuzione normale corrisponde ad un livello di confidenza di circa il 95%.

The measurement results reported in this document were obtained following the standards / procedures / protocols / regulation / directives reported and them refer to the tested objects only. The uncertainties of measurement stated in this report are calculated as a standard uncertainty multiplied by a coverage factor k=2, corresponding, in the case of a normal distribution, to a confidence level of about 95%.

È vietato riprodurre il presente documento, ed i relativi allegati, senza l'autorizzazione scritta del Laboratorio.

It is forbidden to reproduce the present document and relative enclosures, without written authorization of the Laboratory.

Il testo ufficiale del presente verbale è in lingua italiana. Quello in lingua inglese è da considerarsi solo come fonte di consultazione.

The official text of this test report is only in Italian. The English version is for reference only.

Department --- OMOLOGAZIONE

Test date : 29.04.2016

**Vehicle data**

Vehicle ID ----- 940.2  
 Vehicle model ----- GIULIETTA START & STOP F5  
 Transmission type ----- M6  
 Odometer (before Test) ----- 26977 km  
 Tire pressure ----- 2.2 bar  
 VIN ----- 07381632  
 CVS flow ----- 9,0 m3/min

*(targa EY781XY)*

**Fuel data**

Fuel type ----- GASOLIO EURO 5  
 Batch No. ----- 202  
 Calculation instruction ----- DIESEL  
 Density ----- 0,835 g/cm3 [15°C]  
 Carbon percentage ----- 86,6 %  
 NHV ----- 16438,9 btu/lb

**Dyno data**

Inertia ----- 1360 kg  
 Dyno load ----- F0/F1/F2 45,0 / 0,070 / 0,0313

**Reference**

Regulatory frame ----- EU  
 Ref. temp. ----- 273,15 K  
 Ref. Pressure ----- 1013,3 mbar  
 Calculation Regulatory ----- EU5

**Add. data**

Driver ----- catanzaro  
 Operator ----- SBOP  
 aux table ----- NO\_AUX  
 Range switch table -----  
 Fan speed polynom ----- EU

**Test reference data:**

GECOM Request No. -----  
 Richiedente ----- DARGENIO

**Remarks**

Test rem. -----  
 Customer ----- TRAZIONE ANT POST SEQUENZIALE METTERE SOTTOCARICA FREDDO MARCE I-V  
 Operator ----- /

**Phase Results**

	HC	CO	CO2	NOx	NO2	N2O	NMHC	CH4	Fuel cons.	Particulate
	[mg/km]	[mg/km]	[g/km]	[mg/km]	[mg/km]	[mg/km]	[mg/km]	[mg/km]	[l/100km]	[mg/km]
Phase 1										
Bag	135,000	865,000	143,424	160,000					5,51	0,3512
Modal										
Phase 2										
Bag	7,000	1,000	109,420	106,000					4,15	
Modal										
Bag										
Modal										
Bag										
Modal										
Phase 1										
Pre cat avg	HC [ppm]	CO [ppm]	CO2 [%]	NOx [ppm]	O2 [%]	CH4 [ppm]				
Post cat avg										
Cat. efficiency										
Raw/Bag										
Phase 2										
Pre cat avg										
Post cat avg										
Cat. efficiency										
Raw/Bag										
Pre cat avg										
Post cat avg										
Cat. efficiency										
Raw/Bag										
Pre cat avg										
Post cat avg										
Cat. efficiency										
Raw/Bag										

*MS*  
29.04.16

**Total Results**

Bag	HC	CO	CO2	NOx	NO2	N2O	NMHC	HC + NOx	Fuel econ	Particulate
	[mg/km]	[mg/km]	[g/km]	[mg/km]	[mg/km]	[mg/km]	[mg/km]	[mg/km]	[l/100km]	[mg/km]
	53,960	317,904	121,90	125,540				179,500	4,65	0,3512

**Time Control**

Test Date: 29.04.2016      Start of test 7:54:23 AM      Start of trace 8:07:43 AM  
 End of test 8:37:06 AM      End of trace 8:27:23 AM

Department --- OMOLOGAZIONE

Test date : 29.04.2016

**Vehicle data**

Vehicle ID ----- 940.2  
Vehicle model ----- GIULIETTA START & STOP F  
Transmission type ----- M6  
Odometer (before Test) ----- 26977 km  
Tire pressure ----- 2.2 bar  
VIN ----- 07381632  
CVS flow ----- 9,0 m3/min

**Fuel data**

Fuel type ----- GASOLIO EURO 5  
Batch No. ----- 202  
Calculation instruction ----- DIESEL  
Density ----- 0,835 g/cm3 [15°C]  
Carbon percentage ----- 86,6 %  
NHV ----- 16438,9 btu/lb

**Dyno data**

Inertia ----- 1360 kg  
Dyno load ----- F0/F1/F2 45,0 / 0,070 / 0,0313

**Add. data**

Driver ----- catanzaro  
Operator ----- S8OP  
AUX table ----- NO\_AUX  
Range switch table -----  
Fan speed polynom ----- EU

**Reference**

Regulatory frame ----- EU  
Ref. temp. ----- 273,15 K  
Ref. Pressure ----- 1013,3 mbar  
Calculation Regulatory ----- EU5

**Test reference data:**

GECOM Request No. -----  
Richiedente ----- DARGENIO

**Remarks**

Test rem. -----  
Customer ----- TRAZIONE ANT POST SEQUENZIALE METTERE SOTTOCARICA FREDDO MARCE I-V  
Operator ----- /

**Phase Results**

	1	2		Phase
Barometric pressure	98,93	98,94		kPa
Ambient air temperature	24,31	24,34		°C
Relative humidity	40,20	40,47		%
NOx correction factor	0,9121	0,9139		
Dilution factor	41,058	17,755		
CVS volume corrected (273,15K)	105,476	54,080		m <sup>3</sup>
Average CVS temperature	39,9	39,9		°C
Average CVS pressure PV	96,5	96,5		kPa
DLS volume corrected (273,15K)	0,8502	0,3332		m <sup>3</sup>
Average force at dyno	45,5	195,7		N
Minimum oil temperature				°C
Distance	4,019	6,934		km
Drivers violation	0,0	0,0		sec

**Baq Analysis**

	1	2		Phase
Concentration sample THC	11,434	4,329		ppmC1
Concentration ambient THC	3,240	3,075		ppmC1
Emission THC	0,543	0,048		g/Phase
Emission THC	135,000	7,000		mg/km
Concentration sample CH4				ppm
Concentration ambient CH4				ppm
Emission CH4				g/Phase
Emission CH4				mg/km
Concentration sample NMHC				ppmC1
Concentration ambient NMHC				ppmC1
Emission NMHC				g/Phase
Emission NMHC				mg/km
Concentration sample CO	26,560	0,251		ppm
Concentration ambient CO	0,189	0,210		ppm
Emission CO	3,478	0,004		g/Phase
Emission CO	865,000	1,000		mg/km
Concentration sample NOx	3,359	7,320		ppm
Concentration ambient NOx	0,100	0,098		ppm
Emission NOx	0,643	0,732		g/Phase
Emission NOx	160,000	106,000		mg/km
Concentration sample NO2				ppm
Concentration ambient NO2				ppm
Emission NO2				g/Phase
Emission NO2				mg/km
Concentration sample N2O				ppm
Concentration ambient N2O				ppm
Emission N2O				g/Phase
Emission N2O				mg/km
Concentration sample CO2	0,325	0,760		%
Concentration ambient CO2	0,048	0,048		%
Emission CO2	576,420	758,719		g/Phase
Emission CO2	143,424	109,420		g/km
Fuel consumption	5,51	4,15		l/100km

**Total Results**

Emission per	HC	CO	CO2	NOx	NMHC	HC + Nox
total distance [mg/km]	53,960	317,904	121,897	125,540		179,500
Fuel consumption [l/100km]	4,65			NO2	N2O	

Department --- OMOLOGAZIONE

Test date : 29.04.2016

**Vehicle data**

Vehicle ID ----- 940.2  
Vehicle model ----- GIULIETTA START & STOP F5  
Transmission type ----- M6  
Odometer (before Test) ----- 26977 km  
Tire pressure ----- 2.2 bar  
VIN ----- 07381632  
CVS flow ----- 9,0 m3/min

**Fuel data**

Fuel type ----- GASOLIO EURO 5  
Batch No. ----- 202  
Calculation instruction ----- DIESEL  
Density ----- 0,835 g/cm3 [15°C]  
Carbon percentage ----- 86,6 %  
NHV ----- 16438,9 btu/lb

**Dyno data**

Inertia ----- 1360 kg  
Dyno load ----- F0/F1/F2 45,0 / 0,070 / 0,0313

**Add. data**

Driver ----- catanzaro  
Operator ----- S8OP  
AUX table ----- NO\_AUX  
Range switch table -----  
Fan speed polynom ----- EU

**Reference**

Regulatory frame ----- EU  
Ref. temp. ----- 273,15 K  
Ref. Pressure ----- 1013,3 mbar  
Calculation Regulatory ----- EU5

**Test reference data:**

GECOM Request No. -----  
Richiedente ----- DARGENIO

**Remarks**

Test rem. -----  
Customer ----- TRAZIONE ANT POST SEQUENZIALE METTERE SOTTOCARICA FREDDO MARCE I-V  
Operator ----- /

**Phase Results**

	1	2		Phase
Barometric pressure	98,93	98,94		kPa
Ambient air temperature	24,31	24,34		°C
Relative humidity	40,20	40,47		%
NOx correction factor	0,9121	0,9139		
Dilution factor	41,058	17,755		
CVS volume corrected (273,15K)	105,476	54,080		m <sup>3</sup>
Average CVS temperature	39,9	39,9		°C
Average CVS pressure PV	96,5	96,5		kPa
DLS volume corrected (273,15K)	0,6502	0,3332		m <sup>3</sup>
Average torque at dyno	45,5	195,7		N
Minimum oil temperature				°C
Distance	4,019	6,934		km
Drivers violation	0,0	0,0		sec

**Particulate results**

	1	2		Phase
Main filter before test	80,914			mg
Main filter after test	80,937			mg
Backup filter before test				mg
Backup filter after test				mg
Payload main filter	0,024			mg
Payload backup filter				mg
Efficiency of main filter				%
Calculated payload				mg
mass emission	0,0038			g
mass emission per distance	0,3512			mg/km

**TEOM results**

Payload				mg
TEOM mass emission				g
TEOM mass emission per distance				mg/km
Efficiency TEOM/gravimetric				%

**Particulate total results**

Remarks	
Total emission	0,0038 g
Total emission per total distance	0,3512 mg/km

**Particulate Counter total results**

Total counts:	2,0003E+10
Tot.counts/	1,8263E+09
Tot.distance	1/km

**Weighing chamber data**

Chamber temperature: 22,00 °C  
Chamber pressure: 985,60 kPa  
Buoyancy correction factor: 1,000359E+00

**Setup/Checks Particulate Counter**

CPCCFK	1,0571	unity
PND1	10	unity
PND2	15	unity
PCRF	168,74	unity
System Ccheck O.K?	YES	
Zero Count	0,0517	1/cm <sup>3</sup>

Department --- OMOLOGAZIONE

Test date : 29.04.2016

**Vehicle data**

Vehicle ID ----- 940.2  
 Vehicle model ----- GIULIETTA START & STOP F5  
 Transmission type ----- M6  
 Odometer (before Test) ----- 26988 km  
 Tire pressure ----- 2.2 bar  
 VIN ----- 07381632  
 CVS flow ----- 9,0 m3/min

*(Target EY781xy)*

**Fuel data**

Fuel type ----- GASOLIO EURO 5  
 Batch No. ----- 202  
 Calculation instruction ----- DIESEL  
 Density ----- 0,835 g/cm3 [15°C]  
 Carbon percentage ----- 86,6 %  
 NHV ----- 16438,9 btu/lb

**Dyno data**

Inertia ----- 1360 kg  
 Dyno load ----- F0/F1/F2 45,0 / 0,070 / 0,0313

**Add. data**

Driver ----- dangelo  
 Operator ----- S8OP  
 aux table ----- NO\_AUX  
 Range switch table -----  
 Fan speed polynom ----- EU

**Reference**

Regulatory frame ----- EU  
 Ref. temp. ----- 273,15 K  
 Ref. Pressure ----- 1013,3 mbar  
 Calculation Regulatory ----- EU5

**Test reference data:**

GECOM Request No. -----  
 Richiedente ----- DARGENIO

**Remarks**

Test rem. -----  
 Customer ----- TRAZIONE ANT POST SEQUENZIALE METTERE SOTTOCARICA CICLO CALDO MARCE I-V  
 Operator ----- /

**Phase Results**

	HC [mg/km]	CO [mg/km]	CO2 [g/km]	NOx [mg/km]	NO2 [mg/km]	N2O [mg/km]	NMHC [mg/km]	CH4 [mg/km]	Fuel cons. [l/100km]	Particulate [mg/km]
Phase 1 Bag Modal	29,000	12,000	130,681	634,000					4,96	1,1876
Phase 2 Bag Modal	7,000	7,000	107,648	378,000					4,08	
Bag Modal										
Bag Modal										
	HC [ppm]	CO [ppm]	CO2 [%]	NOx [ppm]	O2 [%]	CH4 [ppm]				
Phase 1 Pre cat avg Post cat avg Cat. efficiency Raw/Bag										
Phase 2 Pre cat avg Post cat avg Cat. efficiency Raw/Bag										
Pre cat avg Post cat avg Cat. efficiency Raw/Bag										
Pre cat avg Post cat avg Cat. efficiency Raw/Bag										

*MS*  
*29-04-16*

**Total Results**

Bag	HC [mg/km]	CO [mg/km]	CO2 [g/km]	NOx [mg/km]	NO2 [mg/km]	N2O [mg/km]	NMHC [mg/km]	HC + NOx [mg/km]	Fuel econ [l/100km]	Particulate [mg/km]
	14,890	8,951	116,09	471,680				486,570	4,40	1,1876

**Time Control**

Test Date: 29.04.2016      Start of test 8:40:07 AM      Start of trace 8:52:03 AM  
 End of test 9:21:27 AM      End of trace 9:11:43 AM

Department --- OMOLOGAZIONE

Test date : 29.04.2016

**Vehicle data**

Vehicle ID ----- 940.2  
Vehicle model ----- GIULIETTA START & STOP F5  
Transmission type ----- M6  
Odometer (before Test) ----- 26988 km  
Tire pressure ----- 2.2 bar  
VIN ----- 07381632  
CVS flow ----- 9,0 m3/min

**Fuel data**

Fuel type ----- GASOLIO EURO 5  
Batch No. ----- 202  
Calculation instruction ----- DIESEL  
Density ----- 0,835 g/cm3 [15°C]  
Carbon percentage ----- 86,6 %  
NHV ----- 16438,9 btu/lb

**Dyno data**

Inertia ----- 1360 kg  
Dyno load ----- F0/F1/F2 45,0 / 0,070 / 0,0313

**Add. data**

Driver ----- dangelo  
Operator ----- S8OP  
AUX table ----- NO\_AUX  
Range switch table -----  
Fan speed polynom ----- EU

**Reference**

Regulatory frame ----- EU  
Ref. temp. ----- 273,15 K  
Ref. Pressure ----- 1013,3 mbar  
Calculation Regulatory ----- EU5

**Test reference data:**

GECOM Request No. -----  
Richiedente ----- DARGENIO

**Remarks**

Test rem. -----  
Customer ----- TRAZIONE ANT POST SEQUENZIALE METTERE SOTTOCARICA CICLO CALDO MARCE I-V  
Operator ----- /

**Phase Results**

	1	2		Phase
Barometric pressure	98,95	98,96		kPa
Ambient air temperature	24,06	24,11		°C
Relative humidity	40,87	40,44		%
NOx correction factor	0,9124	0,9107		
Dilution factor	45,008	18,023		
CVS volume corrected (273,15K)	105,495	54,053		m <sup>3</sup>
Average CVS temperature	39,9	40,0		°C
Average CVS pressure PV	96,6	96,6		kPa
DLS volume corrected (273,15K)	0,6502	0,3331		m <sup>3</sup>
Average torque at dyno	45,7	195,7		N
Minimum oil temperature				°C
Distance	4,011	6,937		km
Drivers violation	0,0	0,0		sec

**Particulate results**

	1	2		Phase
Main filter before test	82,108			mg
Main filter after test	82,188			mg
Backup filter before test				mg
Backup filter after test				mg
Payload main filter	0,080			mg
Payload backup filter				mg
Efficiency of main filter				%
Calculated payload				mg
mass emission	0,0130			g
mass emission per distance	1,1876			mg/km

**TEOM results**

Payload				mg
TEOM mass emission				g
TEOM mass emission per distance				mg/km
Efficiency TEOM/gravimetric				%

**Particulate total results**

**Remarks**

Total emission 0,0130 g  
Total emission per total distance 1,1876 mg/km

**Particulate Counter total results**

Total counts: 8519991810  
Tot.counts/ 7,7822E+08 1/km  
Tot.distance

**Weighing chamber data**

Chamber temperature: 22,00 °C  
Chamber pressure: 985,60 kPa

Buoyancy correction factor: 1,000359E+00

**Setup/Checks Particulate Counter**

CPCCFK 1,0571 unity  
PND1 10 unity  
PND2 15 unity  
PCRF 168,74 unity  
System Ccheck O.K? YES  
Zero Count 0,04656 1/cm<sup>3</sup>

Department --- OMOLOGAZIONE

Test date : 29.04.2016

**Vehicle data**

Vehicle ID ----- 940.2  
Vehicle model ----- GIULIETTA START & STOP F5  
Transmission type ----- M6  
Odometer (before Test) ----- 26988 km  
Tire pressure ----- 2.2 bar  
VIN ----- 07381632  
CVS flow ----- 9,0 m3/min

**Fuel data**

Fuel type ----- GASOLIO EURO 5  
Batch No. ----- 202  
Calculation instruction ----- DIESEL  
Density ----- 0,835 g/cm3 [15°C]  
Carbon percentage ----- 86,6 %  
NHV ----- 16438,9 btu/lb

**Dyno data**

Inertia ----- 1360 kg  
Dyno load ----- F0/F1/F2 45,0 / 0,070 / 0,0313

**Add. data**

Driver ----- dangelo  
Operator ----- S8OP  
AUX table ----- NO\_AUX  
Range switch table -----  
Fan speed polynom ----- EU

**Reference**

Regulatory frame ----- EU  
Ref. temp. ----- 273,15 K  
Ref. Pressure ----- 1013,3 mbar  
Calculation Regulatory ----- EU5

**Test reference data:**

GECOM Request No. -----  
Richiedente ----- DARGENIO

**Remarks**

Test rem. -----  
Customer ----- TRAZIONE ANT POST SEQUENZIALE METTERE SOTTOCARICA CICLO CALDO MARCE I-V  
Operator ----- /

**Phase Results**

	1	2		Phase
Barometric pressure	98,95	98,96		kPa
Ambient air temperature	24,06	24,11		°C
Relative humidity	40,87	40,44		%
NOx correction factor	0,9124	0,9107		
Dilution factor	45,008	18,023		
CVS volume corrected (273,15K)	105,495	54,053		m <sup>3</sup>
Average CVS temperature	39,9	40,0		°C
Average CVS pressure PV	96,6	96,6		kPa
DLS volume corrected (273,15K)	0,6502	0,3331		m <sup>3</sup>
Average force at dyno	45,7	195,7		N
Minimum oil temperature				°C
Distance	4,011	6,937		km
Drivers violation	0,0	0,0		sec

**Bag Analysis**

	1	2		Phase
Concentration sample THC	3,887	4,261		ppmC1
Concentration ambient THC	2,153	3,058		ppmC1
Emission THC	0,117	0,046		g/Phase
Emission THC	29,000	7,000		mg/km
Concentration sample CH4				ppm
Concentration ambient CH4				ppm
Emission CH4				g/Phase
Emission CH4				mg/km
Concentration sample NMHC				ppmC1
Concentration ambient NMHC				ppmC1
Emission NMHC				g/Phase
Emission NMHC				mg/km
Concentration sample CO	0,560	0,997		ppm
Concentration ambient CO	0,197	0,270		ppm
Emission CO	0,048	0,050		g/Phase
Emission CO	12,000	7,000		mg/km
Concentration sample NOx	12,960	26,100		ppm
Concentration ambient NOx	0,088	0,116		ppm
Emission NOx	2,541	2,623		g/Phase
Emission NOx	634,000	378,000		mg/km
Concentration sample NO2				ppm
Concentration ambient NO2				ppm
Emission NO2				g/Phase
Emission NO2				mg/km
Concentration sample N2O				ppm
Concentration ambient N2O				ppm
Emission N2O				g/Phase
Emission N2O				mg/km
Concentration sample CO2	0,300	0,749		%
Concentration ambient CO2	0,048	0,048		%
Emission CO2	524,160	746,752		g/Phase
Emission CO2	130,681	107,648		g/km
Fuel consumption	4,96	4,08		l/100km

**Total Results**

Emission per	HC	CO	CO2	NOx	NMHC	HC + Nox
total distance [mg/km]	14,890	8,951	116,086	471,680		486,570
Fuel consumption [l/100km]	4,40			NO2	N2O	

Department --- OMOLOGAZIONE

Test date : 17.11.2016

**Vehicle data**

Vehicle ID ----- 940.2  
Vehicle model ----- GIULIETTA START & STOP F5  
Transmission type ----- M6  
Odometer (before Test) ----- 31550 km  
Tire pressure ----- 2.2 bar  
VIN ----- 07380880  
CVS flow ----- 9,0 m3/min

**Fuel data**

Fuel type ----- GASOLIO EURO 5  
Batch No. ----- 202  
Calculation instruction ----- DIESEL  
Density ----- 0,835 g/cm3 [15°C]  
Carbon percentage ----- 86,6 %  
NHV ----- 16438,9 btu/lb

**Dyno data**

Inertia ----- 1360 kg  
Dyno load ----- F0/F1/F2 54,0 / 0,000 / 0,0317

**Add. data**

Driver ----- ventura  
Operator ----- S8OP  
aux table ----- NO\_AUX  
Range switch table ----- STANDARD  
Fan speed polynom ----- EU

**Reference**

Regulatory frame ----- EU  
Ref. temp. ----- 273,15 K  
Ref. Pressure ----- 1013,3 mbar  
Calculation Regulatory ----- EU5

**Test reference data:**

GECOM Request No. -----  
Richiedente -----

**Remarks**

Test rem. ----- Test Cold  
Customer ----- CICLO FREDDO EUDC+ECE (EY180YW)  
Operator ----- /

**Phase Results**

	HC [mg/km]	CO [mg/km]	CO2 [g/km]	NOx [mg/km]	NO2 [mg/km]	N2O [mg/km]	NMHC [mg/km]	CH4 [mg/km]	Fuel cons. [l/100km]	Particulate [mg/km]
<b>Phase 1</b>										
Bag	24,000	157,000	123,280	332,000					4,69	0,4269
Modal										
<b>Phase 2</b>										
Bag	12,000	7,000	131,789	125,000					5,00	
Modal										
Bag										
Modal										
Bag										
Modal										
<b>Phase 1</b>										
Pre cat avg	HC [ppm]	CO [ppm]	CO2 [%]	NOx [ppm]	O2 [%]	CH4 [ppm]				
Post cat avg										
Cat. efficiency										
Raw/Bag										
<b>Phase 2</b>										
Pre cat avg										
Post cat avg										
Cat. efficiency										
Raw/Bag										
Pre cat avg										
Post cat avg										
Cat. efficiency										
Raw/Bag										
Pre cat avg										
Post cat avg										
Cat. efficiency										
Raw/Bag										

**Total Results**

Bag	HC [mg/km]	CO [mg/km]	CO2 [g/km]	NOx [mg/km]	NO2 [mg/km]	N2O [mg/km]	NMHC [mg/km]	HC + NOx [mg/km]	Fuel econ [l/100km]	Particulate [mg/km]
	19,330	101,833	126,42	256,130				275,460	4,80	0,4269

**Time Control**

Test Date: 17.11.2016  
Start of test 10:24:29 AM  
End of test 11:07:13 AM

Start of trace 10:37:50 AM  
End of trace 10:57:30 AM

Department --- OMOLOGAZIONE

Test date : 17.11.2016

**Vehicle data**

Vehicle ID ----- 940.2  
Vehicle model ----- GIULIETTA START & STOP F5  
Transmission type ----- M6  
Odometer (before Test) ----- 31550 km  
Tire pressure ----- 2.2 bar  
VIN ----- 07380880  
CVS flow ----- 9,0 m3/min

**Fuel data**

Fuel type ----- GASOLIO EURO 5  
Batch No. ----- 202  
Calculation instruction ----- DIESEL  
Density ----- 0,835 g/cm3 [15°C]  
Carbon percentage ----- 86,6 %  
NHV ----- 16438,9 btu/lb

**Dyno data**

Inertia ----- 1360 kg  
Dyno load ----- F0/F1/F2 54,0 / 0,000 / 0,0317

**Add. data**

Driver ----- ventura  
Operator ----- S80P  
AUX table ----- NO\_AUX  
Range switch table ----- STANDARD  
Fan speed polynom ----- EU

**Reference**

Regulatory frame ----- EU  
Ref. temp. ----- 273,15 K  
Ref. Pressure ----- 1013,3 mbar  
Calculation Regulatory ----- EU5

**Test reference data:**

GECOM Request No. -----  
Richiedente -----

**Remarks**

Test rem. ----- Test Cold  
Customer ----- CICLO FREDDO EUDC+ECE (EY190YW)  
Operator ----- /

**Phase Results**

	1	2		Phase
Barometric pressure	99,27	99,27		kPa
Ambient air temperature	25,60	25,20		°C
Relative humidity	50,89	50,91		%
NOx correction factor	0,9979	0,9898		
Dilution factor	15,629	42,735		
CVS volume corrected (273,15K)	54,250	105,683		m <sup>3</sup>
Average CVS temperature	40,0	40,0		°C
Average CVS pressure PV	96,8	96,8		kPa
DLS volume corrected (273,15K)	0,3333	0,6498		m <sup>3</sup>
Average torque at dyno	202,8	49,8		N
Minimum oil temperature				°C
Distance	6,954	4,064		km
Drivers violation	0,0	0,0		sec

**Particulate results**

	1	2		Phase
Main filter before test	76,967			mg
Main filter after test	76,996			mg
Backup filter before test				mg
Backup filter after test				mg
Payload main filter	0,029			mg
Payload backup filter				mg
Efficiency of main filter				%
Calculated payload				mg
mass emission	0,0047			g
mass emission per distance	0,4269			mg/km

**TEOM results**

Payload				mg
TEOM mass emission				g
TEOM mass emission per distance				mg/km
Efficiency TEOM/gravimetric				%

**Particulate total results**

Remarks  
Total emission 0,0047 g  
Total emission per total distance 0,4269 mg/km

**Particulate Counter total results**

Total counts: 1,4194E+11  
Tot.counts/ 1,2883E+10  
Tot.distance 1/km

**Weighing chamber data**

Chamber temperature: 22,00 °C  
Chamber pressure: 990,60 kPa  
Buoyancy correction factor: 1,000361E+00

**Setup/Checks Particulate Counter**

CPCCFK 1,068 unity  
PND1 10 unity  
PND2 15 unity  
PCRF 167,39 unity  
System Check O.K? YES  
Zero Count 0,01856 1/cm<sup>3</sup>

Department --- OMOLOGAZIONE

Test date : 17.11.2016

**Vehicle data**

Vehicle ID ----- 940.2  
Vehicle model ----- GIULIETTA START & STOP F5  
Transmission type ----- M6  
Odometer (before Test) ----- 31550 km  
Tire pressure ----- 2.2 bar  
VIN ----- 07380880  
CVS flow ----- 9,0 m3/min

**Fuel data**

Fuel type ----- GASOLIO EURO 5  
Batch No. ----- 202  
Calculation instruction ----- DIESEL  
Density ----- 0,835 g/cm3 [15°C]  
Carbon percentage ----- 86,6 %  
NHV ----- 16438,9 btu/lb

**Dyno data**

Inertia ----- 1360 kg  
Dyno load ----- F0/F1/F2 54,0 / 0,000 / 0,0317

**Add. data**

Driver ----- ventura  
Operator ----- S8OP  
AUX table ----- NO\_AUX  
Range switch table ----- STANDARD  
Fan speed polynom ----- EU

**Reference**

Regulatory frame ----- EU  
Ref. temp. ----- 273,15 K  
Ref. Pressure ----- 1013,3 mbar  
Calculation Regulatory ----- EU5

**Test reference data:**

GECOM Request No. -----  
Richiedente -----

**Remarks**

Test rem. ----- Test Cold  
Customer ----- TRAZ POST SEQUENZ METTERE SOTTOCARICA CICLO FREDDO  
Operator ----- /

Phase Results	1	2		Phase
Barometric pressure	99,27	99,27		kPa
Ambient air temperature	25,60	25,20		°C
Relative humidity	50,89	50,91		%
NOx correction factor	0,9979	0,9898		
Dilution factor	15,629	42,735		
CVS volume corrected (273,15K)	54,250	105,683		m <sup>3</sup>
Average CVS temperature	40,0	40,0		°C
Average CVS pressure PV	96,8	96,8		kPa
DLS volume corrected (273,15K)	0,3333	0,6498		m <sup>3</sup>
Average force at dyno	202,8	49,8		N
Minimum oil temperature				°C
Distance	6,954	4,064		km
Drivers violation	0,0	0,0		sec
Bag Analysis	1	2		Phase
Concentration sample THC	8,720	4,863		ppmC1
Concentration ambient THC	4,134	4,016		ppmC1
Emission THC	0,164	0,049		g/Phase
Emission THC	24,000	12,000		mg/km
Concentration sample CH4				ppm
Concentration ambient CH4				ppm
Emission CH4				g/Phase
Emission CH4				mg/km
Concentration sample NMHC				ppmC1
Concentration ambient NMHC				ppmC1
Emission NMHC				g/Phase
Emission NMHC				mg/km
Concentration sample CO	17,280	1,352		ppm
Concentration ambient CO	1,241	1,181		ppm
Emission CO	1,093	0,029		g/Phase
Emission CO	157,000	7,000		mg/km
Concentration sample NOx	21,010	2,450		ppm
Concentration ambient NOx	0,197	0,073		ppm
Emission NOx	2,312	0,510		g/Phase
Emission NOx	332,000	125,000		mg/km
Concentration sample NO2				ppm
Concentration ambient NO2				ppm
Emission NO2				g/Phase
Emission NO2				mg/km
Concentration sample N2O				ppm
Concentration ambient N2O				ppm
Emission N2O				g/Phase
Emission N2O				mg/km
Concentration sample CO2	0,861	0,315		%
Concentration ambient CO2	0,061	0,059		%
Emission CO2	857,289	535,589		g/Phase
Emission CO2	123,280	131,789		g/km
Fuel consumption	4,69	5,00		l/100km

**Total Results**

Emission per total distance [mg/km]	HC	CO	CO2	NOx	NMHC	HC + Nox
	19,330	101,833	126,418	256,130		275,460

Fuel consumption [l/100km]	4,80	NO2	N2O

Department --- OMOLOGAZIONE

Test date : 17.11.2016

**Vehicle data**

Vehicle ID ----- 940.2  
Vehicle model ----- GIULIETTA START & STOP F5  
Transmission type ----- M6  
Odometer (before Test) ----- 31561 km  
Tire pressure ----- 2.2 bar  
VIN ----- 07380880  
CVS flow ----- 9,0 m3/min

**Fuel data**

Fuel type ----- GASOLIO EURO 5  
Batch No. ----- 202  
Calculation instruction ----- DIESEL  
Density ----- 0,835 g/cm3 [15°C]  
Carbon percentage ----- 86,6 %  
NHV ----- 16438,9 btu/lb

**Dyno data**

Inertia ----- 1360 kg  
Dyno load ----- F0/F1/F2 54,0 / 0,000 / 0,0317

**Add. data**

Driver ----- albertino  
Operator ----- S8OP  
aux table ----- NO\_AUX  
Range switch table ----- STANDARD  
Fan speed polynom ----- EU

**Reference**

Regulatory frame ----- EU  
Ref. temp. ----- 273,15 K  
Ref. Pressure ----- 1013,3 mbar  
Calculation Regulatory ----- EU5

**Test reference data:**

GECOM Request No. -----  
Richiedente -----

**Remarks**

Test rem. ----- Test Hot  
Customer ----- CICLO CALDO EUDC+ECE (EY190YW)  
Operator ----- /

**Phase Results**

	HC [mg/km]	CO [mg/km]	CO2 [g/km]	NOx [mg/km]	NO2 [mg/km]	N2O [mg/km]	NMHC [mg/km]	CH4 [mg/km]	Fuel cons. [l/100km]	Particulate [mg/km]
<b>Phase 1</b>										
Bag	4,000	4,000	111,797	338,000					4,24	0,3617
Modal										
<b>Phase 2</b>										
Bag	22,000	9,000	127,829	585,000					4,85	
Modal										
Bag										
Modal										
Bag										
Modal										
<b>Phase 1</b>										
Pre cat avg	HC [ppm]	CO [ppm]	CO2 [%]	NOx [ppm]	O2 [%]	CH4 [ppm]				
Post cat avg										
Cat. efficiency										
Raw/Bag										
<b>Phase 2</b>										
Pre cat avg										
Post cat avg										
Cat. efficiency										
Raw/Bag										
Pre cat avg										
Post cat avg										
Cat. efficiency										
Raw/Bag										
Pre cat avg										
Post cat avg										
Cat. efficiency										
Raw/Bag										

**Total Results**

Bag	HC [mg/km]	CO [mg/km]	CO2 [g/km]	NOx [mg/km]	NO2 [mg/km]	N2O [mg/km]	NMHC [mg/km]	HC + NOx [mg/km]	Fuel econ [l/100km]	Particulate [mg/km]
	11,160	5,759	117,76	429,820				440,980	4,47	0,3617

**Time Control**

Test Date: 17.11.2016      Start of test 11:14:09 AM      Start of trace 11:25:15 AM  
End of test 11:54:36 AM      End of trace 11:44:55 AM

Department --- OMOLOGAZIONE

Test date : 17.11.2016

**Vehicle data**

Vehicle ID ----- 940.2  
Vehicle model ----- GIULIETTA START & STOP F5  
Transmission type ----- M6  
Odometer (before Test) ----- 31561 km  
Tire pressure ----- 2.2 bar  
VIN ----- 07380880  
CVS flow ----- 9,0 m3/min

**Fuel data**

Fuel type ----- GASOLIO EURO 5  
Batch No. ----- 202  
Calculation instruction ----- DIESEL  
Density ----- 0,835 g/cm3 [15°C]  
Carbon percentage ----- 86,6 %  
NHV ----- 16438,9 btu/lb

**Dyno data**

Inertia ----- 1360 kg  
Dyno load ----- F0/F1/F2 54,0 / 0,000 / 0.0317

**Add. data**

Driver ----- albertino  
Operator ----- S8OP  
AUX table ----- NO\_AUX  
Range switch table ----- STANDARD  
Fan speed polynom ----- EU

**Reference**

Regulatory frame ----- EU  
Ref. temp. ----- 273,15 K  
Ref. Pressure ----- 1013,3 mbar  
Calculation Regulatory ----- EU5

**Test reference data:**

GECOM Request No. -----  
Richiedente -----

**Remarks**

Test rem. ----- Test Hot  
Customer ----- CICLO CALDO EUDC+ECE (EY190YW)  
Operator ----- /

**Phase Results**

	1	2		Phase
Barometric pressure	99,26	99,27		kPa
Ambient air temperature	25,94	24,37		°C
Relative humidity	50,85	50,84		%
NOx correction factor	1,0049	0,9732		
Dilution factor	17,188	44,010		
CVS volume corrected (273,15K)	54,240	105,680		m <sup>3</sup>
Average CVS temperature	40,1	40,1		°C
Average CVS pressure PV	96,8	96,8		kPa
DLS volume corrected (273,15K)	0,3333	0,6497		m <sup>3</sup>
Average torque at dyno	203,7	50,9		N
Minimum oil temperature				°C
Distance	6,980	4,134		km
Drivers violation	0,0	0,0		sec

**Particulate results**

	1	2		Phase
Main filter before test	79,415			mg
Main filter after test	79,439			mg
Backup filter before test				mg
Backup filter after test				mg
Payload main filter	0,025			mg
Payload backup filter				mg
Efficiency of main filter				%
Calculated payload				mg
mass emission	0,0040			g
mass emission per distance	0,3617			mg/km

**TEOM results**

Payload				mg
TEOM mass emission				g
TEOM mass emission per distance				mg/km
Efficiency TEOM/gravimetric				%

**Particulate total results**

Remarks  
Total emission 0,0040 g  
Total emission per total distance 0,3617 mg/km

**Particulate Counter total results**

Total counts: 9,7624E+10  
Tot.counts/ 8,7839E+09 1/km  
Tot.distance

**Weighing chamber data**

Chamber temperature: 22,00 °C  
Chamber pressure: 990,60 kPa  
Buoyancy correction factor: 1,000361E+00

**Setup/Checks Particulate Counter**

CPCCFK 1,066 unity  
PND1 10 unity  
PND2 15 unity  
PCRF 167,39 unity  
System Ckeck O.K? YES  
Zero Count 0,03046 1/cm<sup>3</sup>

Department --- **OMOLOGAZIONE**

Test date : **17.11.2016**

**Vehicle data**

Vehicle ID ----- **940.2**  
 Vehicle model ----- **GIULIETTA START & STOP F5**  
 Transmission type ----- **M6**  
 Odometer (before Test) ----- **31561 km**  
 Tire pressure ----- **2.2 bar**  
 VIN ----- **07380880**  
 CVS flow ----- **9,0 m3/min**

**Fuel data**

Fuel type ----- **GASOLIO EURO 5**  
 Batch No. ----- **202**  
 Calculation instruction ----- **DIESEL**  
 Density ----- **0,835 g/cm3 (15°C)**  
 Carbon percentage ----- **86,6 %**  
 NHV ----- **16436,9 btu/lb**

**Dyno data**

Inertia ----- **1360 kg**  
 Dyno load ----- **F0/F1/F2 54,0 / 0,000 / 0,0317**

**Add. data**

Driver ----- **albertino**  
 Operator ----- **S80P**  
 AUX table ----- **NO\_AUX**  
 Range switch table ----- **STANDARD**  
 Fan speed polynom ----- **EU**

**Reference**

Regulatory frame ----- **EU**  
 Ref. temp. ----- **273,15 K**  
 Ref. Pressure ----- **1013,3 mbar**  
 Calculation Regulatory ----- **EU5**

**Test reference data:**

GECOM Request No. -----  
 Richiedente -----

**Remarks**

Test rem. ----- **Test Hot**  
 Customer ----- **TRAZ POST SEQUENZ METTERE SOTTOCARICA CICLO CALDO**  
 Operator ----- **/**

	1	2		Phase
Barometric pressure	99,26	99,27		kPa
Ambient air temperature	25,94	24,37		°C
Relative humidity	50,85	50,84		%
NOx correction factor	1,0049	0,9732		
Dilution factor	17,186	44,010		
CVS volume corrected (273,15K)	54,240	105,680		m <sup>3</sup>
Average CVS temperature	40,1	40,1		°C
Average CVS pressure PV	96,8	96,8		kPa
DLS volume corrected (273,15K)	0,3333	0,6497		m <sup>3</sup>
Average force at dyno	203,7	50,9		N
Minimum oil temperature				°C
Distance	6,980	4,134		km
Drivers violation	0,0	0,0		sec
<b>Bag Analysis</b>	<b>1</b>	<b>2</b>		<b>Phase</b>
Concentration sample THC	3,854	4,307		ppmC1
Concentration ambient THC	3,108	2,959		ppmC1
Emission THC	0,031	0,093		g/Phase
Emission THC	4,000	22,000		mg/km
Concentration sample CH4				ppm
Concentration ambient CH4				ppm
Emission CH4				g/Phase
Emission CH4				mg/km
Concentration sample NMHC				ppmC1
Concentration ambient NMHC				ppmC1
Emission NMHC				g/Phase
Emission NMHC				mg/km
Concentration sample CO	1,419	1,180		ppm
Concentration ambient CO	1,080	0,921		ppm
Emission CO	0,027	0,037		g/Phase
Emission CO	4,000	9,000		mg/km
Concentration sample NOx	21,150	11,500		ppm
Concentration ambient NOx	0,060	0,022		ppm
Emission NOx	2,357	2,420		g/Phase
Emission NOx	338,000	585,000		mg/km
Concentration sample NO2				ppm
Concentration ambient NO2				ppm
Emission NO2				g/Phase
Emission NO2				mg/km
Concentration sample N2O				ppm
Concentration ambient N2O				ppm
Emission N2O				g/Phase
Emission N2O				mg/km
Concentration sample CO2	0,785	0,306		%
Concentration ambient CO2	0,056	0,053		%
Emission CO2	780,346	528,446		g/Phase
Emission CO2	111,797	127,829		g/km
Fuel consumption	4,24	4,85		l/100km

**Total Results**

Emission per	HC	CO	CO2	NOx	NMHC	HC + Nox
total distance [mg/km]	11,160	5,759	117,761	429,820		440,980
Fuel consumption [l/100km]	4,47			NO2	N2O	

Case: Nedc\_Cold\_310117\_OK  
 Page: Trip Summary

'NTC Track'  
 Start Date: 01/31/2017  
 Start Time: 11:44:03.0



Trip Duration	1111.00	s
Trip Duration (a)	1111.00	s
Trip Distance	8.03	km
Trip Distance (a)	8.03	km
Trip Fuel Cons. (b)	0.33	kg
Trip Fuel Cons. (a,b)	0.33	kg
Trip Fuel Cons. EU (a,c)	0.32	kg
Trip Fuel Cons. US (a,c)	0.31	kg
Trip Fuel Cons. Volume (b)	0.40	l
Trip Fuel Cons. Volume (a,b)	0.40	l
Trip Fuel Cons. Volume EU (a,c)	0.40	l
Trip Fuel Cons. Volume US (a,c)	0.41	l
Trip Fuel Economy (b)	5.06	l/km100
Trip Fuel Economy (a,b)	5.06	l/km100
Trip Fuel Economy EU (a,c)	4.97	l/km100
Trip Fuel Economy US (a,c)	5.18	l/km100
Trip Av. Eng. Speed	1196.22	rpm
Trip Av. Torque	37.53	Nm
Trip Av. Power	5.77	kW
Trip Work	1.76	kWh
Trip Av. Eng. Speed (a)	1196.22	rpm
Trip Av. Torque (a)	37.53	Nm
Trip Av. Power (a)	5.77	kW
Trip Work (a)	1.76	kWh
Trip Av. Humidity	54.31	%
Trip Av. Amb. Temperature	14.55	degC
Trip Av. Humidity (a)	54.31	%
Trip Av. Amb. Temperature (a)	14.55	degC

ave THC	0.00000	ppm
ave NMHC	0.00000	ppm
ave CH4	0.00000	ppm
ave CO	181.05242	ppm
ave CO2	3.37929	%
ave NOx	254.69408	ppm
ave PM	0.00108	mg/m3
ave Soot meas	0.00000	mg/m3
ave Soot	0.00108	mg/m3
ave PN	n/a	#/cm3
tot THC	0.00000	g
tot NMHC	0.00000	g
tot CH4	0.00000	g
tot CO	4.33940	g
tot CO2	1099.54643	g
tot NO (d)	1.36673	g
tot NO2	0.26130	g
tot NOx	1.62803	g
tot Soot	0.00000	g
tot Soot meas	0.00000	g
tot PM	0.00000	g
tot PN	n/a	#
PM measurement type	0.00000	-
PM correction type	1.00000	alpha(HC)
tot Soot on PM filter (estim.)	0.00000	mg
Soot --> PM simple scaling factor	1.00000	-
Soot --> PM alpha scaling factor	0.00000	-
Trip Av. Veh. Speed	26.26859	km/h
Trip Distance Share Urban	70.51722	% distance
Trip Distance Share Rural	29.48278	% distance
Trip Distance Share Motorway	0.00000	% distance

BS CO2	624.74228	g/kWh
BS CO	2.46556	g/kWh
BS THC	0.00000	g/kWh
BS NMHC	0.00000	g/kWh
BS CH4	0.00000	g/kWh
BS NO (d)	0.77655	g/kWh
BS NO2	0.14865	g/kWh
BS NOx	0.91809	g/kWh
BS Soot	0.00000	g/kWh
BS Soot meas	0.00000	g/kWh
BS PM	0.00000	g/kWh
BS PN	n/a	#/kWh
DS CO2	136.88972	g/km
DS CO	0.54063	g/km
DS THC	0.00000	g/km
DS NMHC	0.00000	g/km
DS CH4	0.00000	g/km
DS NO (d)	0.16646	g/km
DS NO2	0.03254	g/km
DS NOx	0.19900	g/km
DS Soot	0.00000	g/km
DS Soot meas	0.00000	g/km
DS PM	0.00000	g/km
DS PN	n/a	#/km
FS CO2	3331.95887	g/kg
FS CO	13.13333	g/kg
FS THC	0.00000	g/kg
FS NMHC	0.00000	g/kg
FS CH4	0.00000	g/kg
FS NO (d)	4.14160	g/kg
FS NO2	0.79181	g/kg
FS NOx	4.93342	g/kg
FS Soot	0.00000	g/kg
FS Soot meas	0.00000	g/kg
FS PM	0.00000	g/kg
FS PN	n/a	#/kg

(a) GAS PEMS measurement state only, (b) based on fuel rate input (ECU, Fuel Meter), (c) calculated from carbon balance  
 (d) NO calculated using molecular weight of NO2

PEMS Current Case: Version: Rel5\_B135  
 D:\AVL Concerto\WorkEnvironments\PEMS\_Rel5\_B135\PEMS\_Ar940\_MDE\_105cv\_MT6\_E5+\_le880\_Nardb\_Engine: MDE\_105cv / Diesel \_C  
 PEMS Result Filename: NOx Ambient Condition Corr.: 8 - NONE  
 D:\AVL Concerto\MyData\TransportFiles\940\_Nardb\_310117\_NedcCold\_3.crf Dry / Wet Corr.: 4 - NONE  
 Vehicle: AR 940MJet E5+ / Tel ZAR94000007380880  
 Engine: MDE\_105cv / Diesel \_C  
 NOx Ambient Condition Corr.: 8 - NONE  
 Dry / Wet Corr.: 4 - NONE

Handwritten signature and date: 31/01/17

Case: Nedc\_Cold\_310117\_OK

Page: Engine (1)

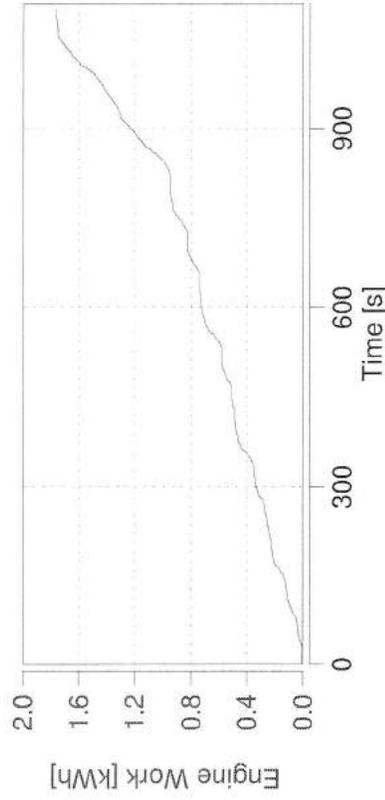
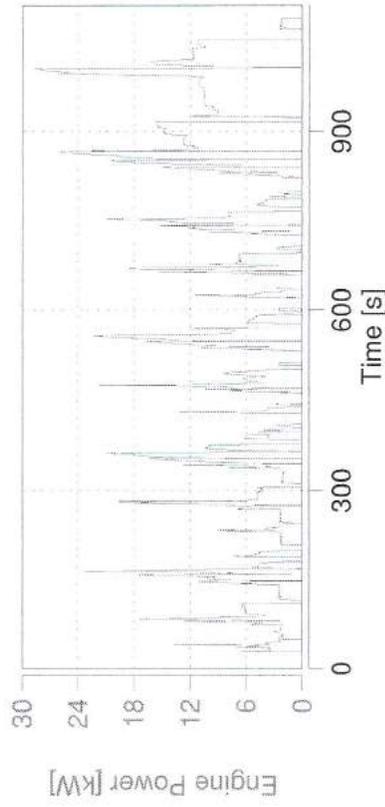
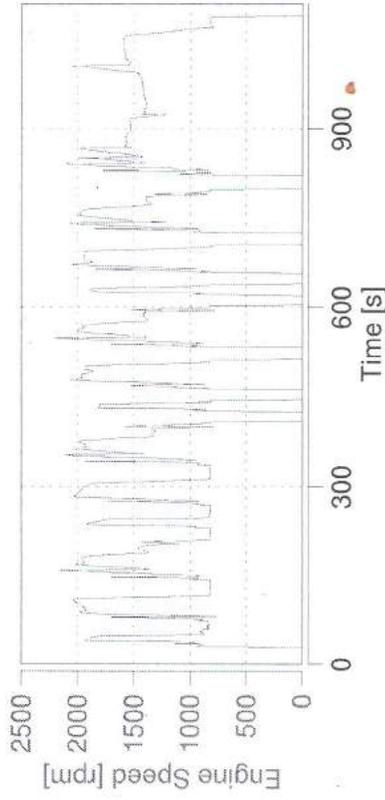
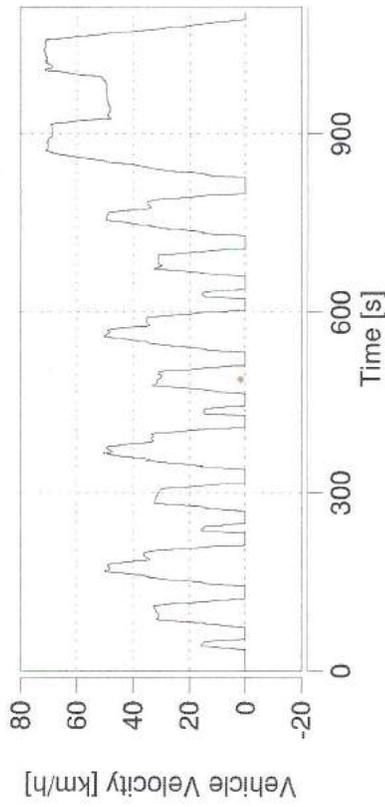
'NTC Track'

Start Date: 01/31/2017

Start Time: 11:44:03.0



Concerto M.O.V.E., 2016



PEMS Current Case:

D:\AVL Concerto\WorkEnvironments\PEMS\_Rel5\_B135\PEMS\AR940\_MDE\_105cv\_MT6\_E5+\_tel880

PEMS Result Filename:

D:\AVL Concerto\MyData\TransportFiles\940\_Nardo\_310117\_NedcCold\_3.cif

Vehicle: AR 940MJet E5+ / Tel ZAR94000007380880

Engine: MDE\_105cv / Diesel\_c

NOx Ambient Condition Corr.: 8 - NONE

Dry / Wet Corr.: 4 - NONE

Version: Rel5\_B135

31/1/17

Case: Nedc\_Hot\_310117

Page: Trip Summary

'NTC Track'

Start Date: 01/31/2017

Start Time: 12:30:54.0



Concerto M.O.V.E., 2016

Trip Duration	1096.00	s
Trip Duration (a)	1096.00	s
Trip Distance	8.08	km
Trip Distance (a)	8.08	km
Trip Fuel Cons. (b)	0.31	kg
Trip Fuel Cons. (a,b)	0.31	kg
Trip Fuel Cons. EU (a,c)	0.31	kg
Trip Fuel Cons. US (a,c)	0.32	kg
Trip Fuel Cons. Volume (b)	0.38	l
Trip Fuel Cons. Volume (a,b)	0.38	l
Trip Fuel Cons. Volume EU (a,c)	0.38	l
Trip Fuel Cons. Volume US (a,c)	0.39	l
Trip Fuel Economy (b)	4.75	l/km100
Trip Fuel Economy (a,b)	4.75	l/km100
Trip Fuel Economy EU (a,c)	4.74	l/km100
Trip Fuel Economy US (a,c)	4.75	l/km100
Trip Av. Eng. Speed	1148.59	rpm
Trip Av. Torque	27.23	Nm
Trip Av. Power	4.28	kW
Trip Work	1.29	kWh
Trip Av. Eng. Speed (a)	1148.59	rpm
Trip Av. Torque (a)	27.23	Nm
Trip Av. Power (a)	4.28	kW
Trip Work (a)	1.29	kWh
Trip Av. Humidity	55.16	%
Trip Av. Amb. Temperature	14.88	degC
Trip Av. Humidity (a)	55.16	%
Trip Av. Amb. Temperature (a)	14.88	degC

ave THC	0.00000	ppm
ave NMHC	0.00000	ppm
ave CH4	0.00000	ppm
ave CO	36.61967	ppm
ave CO2	2.65358	%
ave NOx	230.94908	ppm
ave PM	0.00096	mg/m3
ave Soot meas	0.00000	mg/m3
ave Soot	0.00096	mg/m3
ave PN	n/a	#/cm3
tot THC	0.00000	g
tot NMHC	0.00000	g
tot CH4	0.00000	g
tot CO	0.71979	g
tot CO2	1014.98083	g
tot NO (d)	2.71382	g
tot NO2	0.24118	g
tot NOx	2.95501	g
tot Soot	0.00000	g
tot Soot meas	0.00000	g
tot PM	0.00000	g
tot PN	n/a	#
PM measurement type	0.00000	-
PM correction type	1.00000	alpha(HC)
tot Soot on PM filter (estim.)	0.00000	mg
Soot --> PM simple scaling factor	1.00000	-
Soot --> PM alpha scaling factor	0.00000	-
Trip Av. Veh. Speed	26.81508	km/h
Trip Distance Share Urban	70.85765	% distance
Trip Distance Share Rural	29.14235	% distance
Trip Distance Share Motorway	0.00000	% distance

BS CO2	780.75448	g/kWh
BS CO	0.55368	g/kWh
BS THC	0.00000	g/kWh
BS NMHC	0.00000	g/kWh
BS CH4	0.00000	g/kWh
BS NO (d)	2.08755	g/kWh
BS NO2	0.18552	g/kWh
BS NOx	2.27307	g/kWh
BS Soot	0.00000	g/kWh
BS Soot meas	0.00000	g/kWh
BS PM	0.00000	g/kWh
BS PN	n/a	#/kWh
DS CO2	125.61644	g/km
DS CO	0.08908	g/km
DS THC	0.00000	g/km
DS NMHC	0.00000	g/km
DS CH4	0.00000	g/km
DS NO (d)	0.33587	g/km
DS NO2	0.02985	g/km
DS NOx	0.36575	g/km
DS Soot	0.00000	g/km
DS Soot meas	0.00000	g/km
DS PM	0.00000	g/km
DS PN	n/a	#/km
FS CO2	3274.13170	g/kg
FS CO	2.32191	g/kg
FS THC	0.00000	g/kg
FS NMHC	0.00000	g/kg
FS CH4	0.00000	g/kg
FS NO (d)	8.75425	g/kg
FS NO2	0.78801	g/kg
FS NOx	9.53225	g/kg
FS Soot	0.00000	g/kg
FS Soot meas	0.00000	g/kg
FS PM	0.00000	g/kg
FS PN	n/a	#/kg

(a) GAS PEMS measurement state only, (b) based on fuel rate input (ECU, Fuel Meter), (c) calculated from carbon balance  
 (d) NO calculated using molecular weight of NO2

PEMS Current Case:  
 D:\AVL Concerto\WorkEnvironments\PEMS\_Rel5\_B135\PEMS\A940\_MDE\_105cv\_MT6\_E5+\_Tel880\_Nard0\_310117\_NedcHot.ctf  
 PEMS Result Filename:  
 D:\AVL Concerto\MyData\TransportFiles\940\_Nard0\_310117\_NedcHot.ctf  
 Vehicle: AR 940MJet E5+ / Tel ZAR94000007980880  
 Engine: MDE\_105cv / Diesel  
 NOx Ambient Condition Corr.: 8 - NONE  
 Dry / Wet Corr.: 4 - NONE  
 Version: Rel5\_B135

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Case: Nedc\_Hot\_310117

Page: Engine (1)

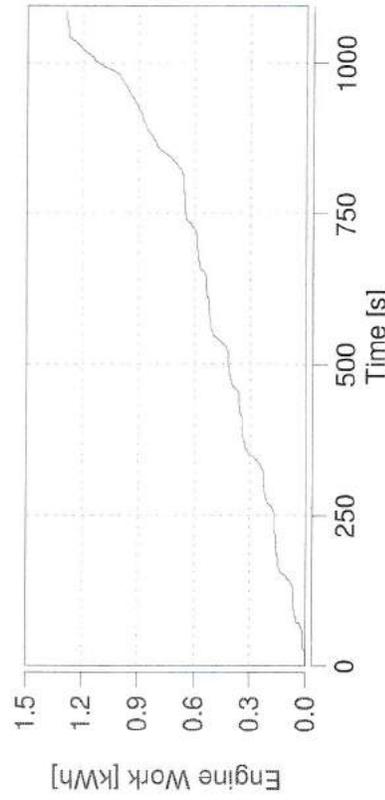
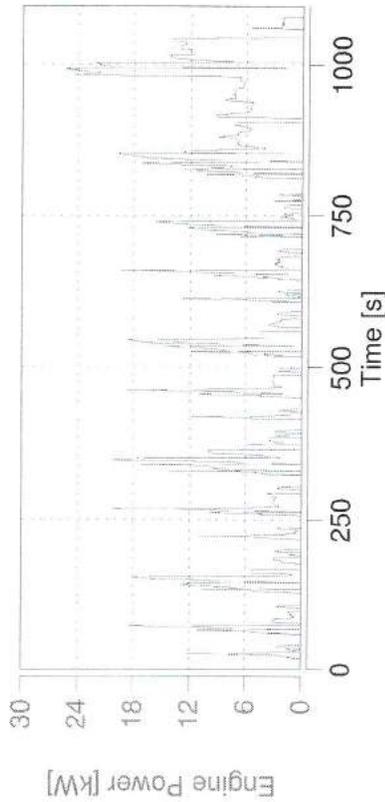
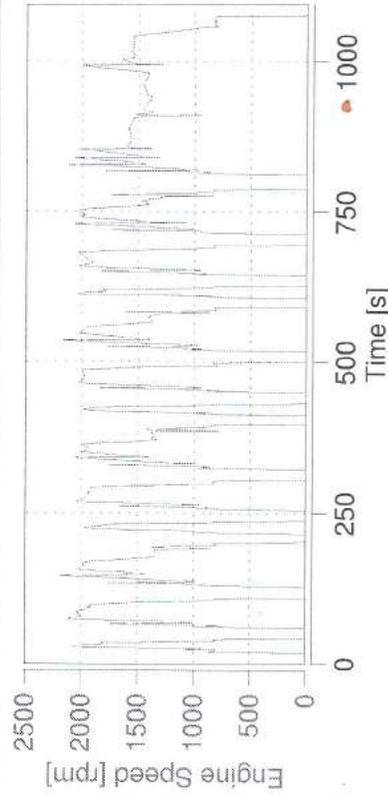
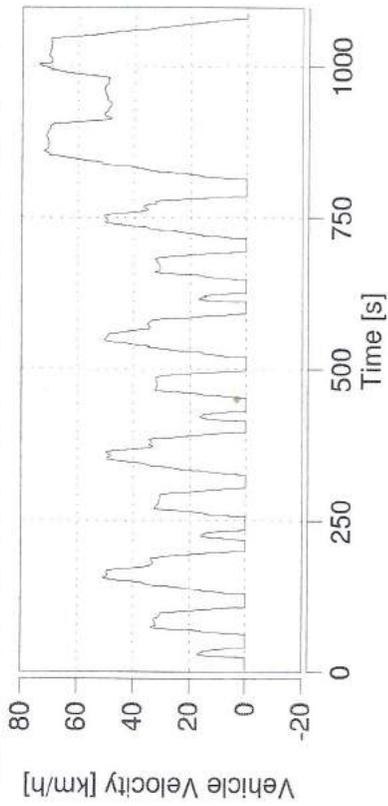
'NTC Track'

Start Date: 01/31/2017

Start Time: 12:30:54.0



Concerto M.O.V.E., 2016



PEMS Current Case:  
 D:\AVL\_Concerto\WorkEnvironments\PEMS\_Rel5\_B135\PEMS\AR940\_MDE\_105cv\_MT6\_E5+\_tel880\_Nardo  
 Vehicle: AR 940MJet E5+ / Tel ZAR94000007380880      Version: Rel5\_B135  
 PEMS Result Filename: MDE\_105cv / Diesel  
 Engine: MDE\_105cv / Diesel  
 NOx Ambient Condition Corr.: 8 - NONE  
 Dry / Wet Corr.: 4 - NONE  
 D:\AVL\_Concerto\MyData\TransportFiles\940\_Nardo\_310117\_NedcHot.ctf

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15. CHEROKEE 2.0 MT .....



# Ministero delle Infrastrutture e dei Trasporti

DIPARTIMENTO PER I TRASPORTI, LA NAVIGAZIONE ED I SISTEMI INFORMATIVI E STATISTICI

**Direzione Generale Territoriale del Nord-Ovest****CENTRO PROVA AUTOVEICOLI TORINO**Rapporto di prova del **28/04/2016 - 11/11/2016 - 01/02/2017**  
Test report on

Pagina (Page) 1/1

**OGGETTO  
SUBJECT**Verifiche e prove per quanto riguarda:  
PROGRAMMA DI PROVE PER LA VALUTAZIONE DEL COMPORTAMENTO EMISSIVO  
DI VETTURE DIESEL EURO 5 COMMERCIALIZZATE IN ITALIA CON PROVE IN  
LABORATORIO E SU PISTA*Checks and tests about:*TEST PLAN FOR MARKETED IN ITALY EURO 5 DIESEL VEHICLES EMISSIONS  
BEHAVIOR ASSESSMENT WITH LABORATORY AND TRACK TESTING

Veicolo / Vehicle	Jeep Cherokee 2.0 MT	Data / Date [dd/mm/yy]	28/04/2016 - 11/11/2016 01/02/2017
VIN	1C4PJLCY5EW116071 1C4PJLDY1EW225304	Prova / Test n.	S.08.????2016 (*)
Tipo motore / Engine Type	1956 cm <sup>3</sup>	Autista / Driver	D'Angelo / Mancuso
Marchatura motore / Engine Code	"Y" 8th digit of the VIN	Odometro / Odometer [km]	16408 / 15972
Cambio / Gear shift	Manuale / Manual M6	Note / Notes	
Start & Stop	SI / YES		
Pneumatici / Tyres	2,2 bar		
Inerzia / Inertia [kg]	1810		

**Protocollo di prova  
Test Protocol**Conforme alla specifica dell'Istituto Motori di Napoli (C.N.R.)  
Compliant to the specification of Istituto Motori of Naples**Nome e indirizzo del Laboratorio di prove  
Name and address of the test laboratory**

FIAT POWERTRAIN TECHNOLOGIES, Strada del Drosso 145, TORINO (TO)

**RISULTATI DELLE PROVE  
TESTS RESULTS**Riportati nei seguenti allegati:  
Reported in the annexes listed here below

## (\*) Prova / Test n.

NEDC cold al banco (report S.08.0724.2016 del 28/04/2016)  
 NEDC hot al banco (report S.08.0725.2016 del 28/04/2016)  
 NEDC cold back al banco (report S.08.2048.2016 del 11/11/2016)  
 NEDC hot back al banco (report S.08.2049.2016 del 11/11/2016)  
 NEDC cold su pista lim. 70km/h (report NEDC\_Cold\_010217 del 01/02/2017 + profilo vel.)  
 NEDC hot su pista lim. 70km/h (report NEDC\_Hot\_010217 del 01/02/2017 + profilo vel.)

I FUNZIONARI DEL CENTRO PROVA AUTOVEICOLI TORINO

VISTO  
IL DIRETTORE

Dott. Ing. Pietro GERACI

I risultati di misura riportati nel presente rapporto sono stati ottenuti applicando le norme/procedure/protocolli/regolamenti/direttive indicati e si riferiscono ai soli oggetti provati. Le incertezze di misura, quando indicate, sono espresse come incertezza estesa con fattore di copertura k=2, che per una distribuzione normale corrisponde ad un livello di confidenza di circa il 95%.

The measurement results reported in this document were obtained following the standards / procedures / protocols / regulation / directives reported and them refer to the tested objects only. The uncertainties of measurement stated in this report are calculated as a standard uncertainty multiplied by a coverage factor k=2, corresponding, in the case of a normal distribution, to a confidence level of about 95%.

È vietato riprodurre il presente documento, ed i relativi allegati, senza l'autorizzazione scritta del Laboratorio.  
 It is forbidden to reproduce the present document and relative enclosures, without written authorization of the Laboratory.  
 Il testo ufficiale del presente verbale è in lingua italiana. Quello in lingua inglese è da considerarsi solo come fonte di consultazione.  
 The official text of this test report is only in Italian. The English version is for reference only.

Department --- OMOLOGAZIONE

Test date : 28.04.2016

**Vehicle data**

Vehicle ID ----- KL.2  
 Vehicle model ----- JEEP KL AWD E5  
 Transmission type ----- M6  
 Odometer (before Test) ----- 16408 km  
 Tire pressure ----- 2.2 bar  
 VIN ----- EW11607  
 CVS flow ----- 9,0 m3/min

**Fuel data**

Fuel type ----- GASOLIO EURO 5  
 Batch No. ----- 202  
 Calculation instruction ----- DIESEL  
 Density ----- 0,835 g/cm3 [15°C]  
 Carbon percentage ----- 86,6 %  
 NHV ----- 16438,9 btu/lb

**Dyno data**

Inertia ----- 1810 kg  
 Dyno load ----- F0/F1/F2 29,0 / 0,170 / 0,0407

**Add. data**

Driver ----- catanzaro  
 Operator ----- SBOP  
 aux table ----- NO\_AUX  
 Range switch table -----  
 Fan speed polynom ----- EU

**Reference**

Regulatory frame ----- EU  
 Ref. temp.. ----- 273,15 K  
 Ref. Pressure ----- 1013,3 mbar  
 Calculation Regulatory ----- EU5

**Test reference data:**

GECOM Request No. -----  
 Richiedente ----- DARGENIO

**Remarks**

Test rem. -----  
 Customer ----- TRAZION EANT POSTS EQUENZIALE METTERE SOTOCARICA MARCE I-V  
 Operator ----- /

**Phase Results**

	HC [mg/km]	CO [mg/km]	CO2 [g/km]	NOx [mg/km]	NO2 [mg/km]	N2O [mg/km]	NMHC [mg/km]	CH4 [mg/km]	Fuel cons. [l/100km]	Particulate [mg/km]
Phase 1										
Bag	132,000	852,000	180,971	194,000					6,93	0,9255
Modal										
Phase 2										
Bag	5,000	5,000	139,002	95,000					5,27	
Modal										
Bag										
Modal										
Bag										
Modal										
Phase 1										
Pre cat avg	HC [ppm]	CO [ppm]	CO2 [%]	NOx [ppm]	O2 [%]	CH4 [ppm]				
Post cat avg										
Cat. efficiency										
Raw/Bag										
Phase 2										
Pre cat avg										
Post cat avg										
Cat. efficiency										
Raw/Bag										
Pre cat avg										
Post cat avg										
Cat. efficiency										
Raw/Bag										
Pre cat avg										
Post cat avg										
Cat. efficiency										
Raw/Bag										

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**Total Results**

Bag	HC [mg/km]	CO [mg/km]	CO2 [g/km]	NOx [mg/km]	NO2 [mg/km]	N2O [mg/km]	NMHC [mg/km]	HC + NOx [mg/km]	Fuel econ [l/100km]	Particulate [mg/km]
	51,480	317,267	154,46	131,480				182,960	5,88	0,9255

**Time Control**

Test Date: 28.04.2016      Start of test 8:40:28 AM      Start of trace 8:54:51 AM  
 End of test 9:24:15 AM      End of trace 9:14:31 AM

Department --- OMOLOGAZIONE

Test date : 28.04.2016

**Vehicle data**

Vehicle ID ----- KL.2  
Vehicle model ----- JEEP KL AWD E5  
Transmission type ----- M6  
Odometer (before Test) ----- 16408 km  
Tire pressure ----- 2.2 bar  
VIN ----- EW11607  
CVS flow ----- 9,0 m3/min

**Fuel data**

Fuel type ----- GASOLIO EURO 5  
Batch No. ----- 202  
Calculation instruction ----- DIESEL  
Density ----- 0,835 g/cm3 [15°C]  
Carbon percentage ----- 86,6 %  
NHV ----- 16438,9 btu/lb

**Dyno data**

Inertia ----- 1810 kg  
Dyno load ----- F0/F1/F2 29,0 / 0,170 / 0,0407

**Add. data**

Driver ----- catanzaro  
Operator ----- S8OP  
AUX table ----- NO\_AUX  
Range switch table -----  
Fan speed polynom ----- EU

**Reference**

Regulatory frame ----- EU  
Ref. temp. ----- 273,15 K  
Ref. Pressure ----- 1013,3 mbar  
Calculation Regulatory ----- EU5

**Test reference data:**

GECOM Request No. -----  
Richiedente ----- DARGENIO

**Remarks**

Test rem. -----  
Customer ----- TRAZION EANT POSTS EQUENZIALE METTERE SOTOCARICA MARCE I-V  
Operator ----- /

**Phase Results**

	1	2		Phase
Barometric pressure	98,42	98,42		kPa
Ambient air temperature	24,28	24,60		°C
Relative humidity	39,58	40,41		%
NOx correction factor	0,9094	0,9183		
Dilution factor	33,447	14,118		
CVS volume corrected (273,15K)	104,925	53,777		m <sup>3</sup>
Average CVS temperature	39,9	39,9		°C
Average CVS pressure PV	96,0	96,0		kPa
DLS volume corrected (273,15K)	0,6501	0,3330		m <sup>3</sup>
Average torque at dyno	41,4	233,0		N
Minimum oil temperature				°C
Distance	4,042	6,933		km
Drivers violation	0,0	0,0		sec

**Particulate results**

	1	2		Phase
Main filter before test	75,990			mg
Main filter after test	76,053			mg
Backup filter before test				mg
Backup filter after test				mg
Payload main filter	0,063			mg
Payload backup filter				mg
Efficiency of main filter				%
Calculated payload				mg
mass emission	0,0102			g
mass emission per distance	0,9255			mg/km

**TEOM results**

Payload				mg
TEOM mass emission				g
TEOM mass emission per distance				mg/km
Efficiency TEOM/gravimetric				%

**Particulate total results**

Remarks				
Total emission	0,0102	g		
Total emission per total distance	0,9255	mg/km		

**Particulate Counter total results**

Total counts: 8,3399E+11  
Tot.counts/  
Tot.distance 7,5990E+10 1/km

**Weighing chamber data**

Chamber temperature: 22,00 °C  
Chamber pressure: 989,40 kPa  
Buoyancy correction factor: 1,000360E+00

**Setup/Checks Particulate Counter**

CPCCFK 1,0571 unity  
PND1 10 unity  
PND2 15 unity  
PCRF 168,74 unity  
System Ckeck O.K? YES  
Zero Count 0,07432 1/cm<sup>3</sup>

Department --- OMOLOGAZIONE

Test date : 28.04.2016

**Vehicle data**

Vehicle ID ----- KL.2  
Vehicle model ----- JEEP KL AWD E5  
Transmission type ----- M6  
Odometer (before Test) ----- 16408 km  
Tire pressure ----- 2.2 bar  
VIN ----- EW11607  
CVS flow ----- 9,0 m3/min

**Fuel data**

Fuel type ----- GASOLIO EURO 5  
Batch No. ----- 202  
Calculation instruction ----- DIESEL  
Density ----- 0,835 g/cm3 [15°C]  
Carbon percentage ----- 86,6 %  
NHV ----- 16438,9 btu/lb

**Dyno data**

Inertia ----- 1810 kg  
Dyno load ----- F0/F1/F2 29,0 / 0,170 / 0,0407

**Add. data**

Driver ----- catanzaro  
Operator ----- S8OP  
AUX table ----- NO\_AUX  
Range switch table -----  
Fan speed polynom ----- EU

**Reference**

Regulatory frame ----- EU  
Ref. temp. ----- 273,15 K  
Ref. Pressure ----- 1013,3 mbar  
Calculation Regulatory ----- EU5

**Test reference data:**

GECOM Request No. -----  
Richiedente ----- DARGENIO

**Remarks**

Test rem. -----  
Customer ----- TRAZION EANT POSTS EQUENZIALE METTERE SOTOCARICA MARCE I-V  
Operator ----- /

**Phase Results**

	1	2		Phase
Barometric pressure	98,42	98,42		kPa
Ambient air temperature	24,28	24,60		°C
Relative humidity	39,58	40,41		%
NOx correction factor	0,9094	0,9183		
Dilution factor	33,447	14,118		
CVS volume corrected (273,15K)	104,925	53,777		m <sup>3</sup>
Average CVS temperature	39,9	39,9		°C
Average CVS pressure PV	96,0	96,0		kPa
DLS volume corrected (273,15K)	0,6501	0,3330		m <sup>3</sup>
Average force at dyno	41,4	233,0		N
Minimum oil temperature				°C
Distance	4,042	6,933		km
Drivers violation	0,0	0,0		sec

**Bag Analysis**

	1	2		Phase
Concentration sample THC	10,427	3,063		ppmC1
Concentration ambient THC	2,353	2,248		ppmC1
Emission THC	0,532	0,033		g/Phase
Emission THC	132,000	5,000		mg/km
Concentration sample CH4				ppm
Concentration ambient CH4				ppm
Emission CH4				g/Phase
Emission CH4				mg/km
Concentration sample NMHC				ppmC1
Concentration ambient NMHC				ppmC1
Emission NMHC				g/Phase
Emission NMHC				mg/km
Concentration sample CO	26,800	1,063		ppm
Concentration ambient CO	0,558	0,532		ppm
Emission CO	3,444	0,038		g/Phase
Emission CO	852,000	5,000		mg/km
Concentration sample NOx	4,023	6,520		ppm
Concentration ambient NOx	0,014	0,015		ppm
Emission NOx	0,784	0,659		g/Phase
Emission NOx	194,000	95,000		mg/km
Concentration sample NO2				ppm
Concentration ambient NO2				ppm
Emission NO2				g/Phase
Emission NO2				mg/km
Concentration sample N2O				ppm
Concentration ambient N2O				ppm
Emission N2O				g/Phase
Emission N2O				mg/km
Concentration sample CO2	0,400	0,956		%
Concentration ambient CO2	0,046	0,047		%
Emission CO2	731,486	963,701		g/Phase
Emission CO2	180,971	139,002		g/km
Fuel consumption	6,93	5,27		l/100km

**Total Results**

Emission per total distance [mg/km]	HC	CO	CO2	NOx	NMHC	HC + Nox
	51,480	317,267	154,459	131,480		182,960
Fuel consumption [l/100km]	5,88			NO2	N2O	

Department --- OMOLOGAZIONE

Test date : 28.04.2016

**Vehicle data**

Vehicle ID ----- KL.2  
Vehicle model ----- JEEP KL AWD E5  
Transmission type ----- M6  
Odometer (before Test) ----- 16419 km  
Tire pressure ----- 2.2 bar  
VIN ----- EW11607  
CVS flow ----- 9,0 m3/min

**Fuel data**

Fuel type ----- GASOLIO EURO 5  
Batch No. ----- 202  
Calculation instruction ----- DIESEL  
Density ----- 0,835 g/cm3 [15°C]  
Carbon percentage ----- 86,6 %  
NHV ----- 16438,9 btu/lb

**Dyno data**

Inertia ----- 1810 kg  
Dyno load ----- F0/F1/F2 29,0 / 0,170 / 0,0407

**Add. data**

Driver ----- dangelo  
Operator ----- S8OP  
aux table ----- NO\_AUX  
Range switch table -----  
Fan speed polynom ----- EU

**Reference**

Regulatory frame ----- EU  
Ref. temp. ----- 273,15 K  
Ref. Pressure ----- 1013,3 mbar  
Calculation Regulatory ----- EU5

**Test reference data:**

GECOM Request No. -----  
Richiedente ----- DARGENIO

**Remarks**

Test rem. -----  
Customer ----- TRAZION EANT POSTS EQUENZIALE METTERE SOTOCARICA CICLO CALDO MARCE I-V  
Operator ----- /

**Phase Results**

	HC	CO	CO2	NOx	NO2	N2O	NMHC	CH4	Fuel cons.	Particulate
	[mg/km]	[mg/km]	[g/km]	[mg/km]	[mg/km]	[mg/km]	[mg/km]	[mg/km]	[l/100km]	[mg/km]
Phase 1										
Bag	20,000	11,000	154,812	554,000					5,87	0,9461
Modal										
Phase 2										
Bag	3,000	6,000	128,042	519,000					4,86	
Modal										
Bag										
Modal										
Bag										
Modal										
Phase 1										
Pre cat avg	HC [ppm]	CO [ppm]	CO2 [%]	NOx [ppm]	O2 [%]	CH4 [ppm]				
Post cat avg										
Cat. efficiency										
Raw/Bag										
Phase 2										
Pre cat avg										
Post cat avg										
Cat. efficiency										
Raw/Bag										
Pre cat avg										
Post cat avg										
Cat. efficiency										
Raw/Bag										
Pre cat avg										
Post cat avg										
Cat. efficiency										
Raw/Bag										

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**Total Results**

Bag	HC	CO	CO2	NOx	NO2	N2O	NMHC	HC + NOx	Fuel econ	Particulate
	[mg/km]	[mg/km]	[g/km]	[mg/km]	[mg/km]	[mg/km]	[mg/km]	[mg/km]	[l/100km]	[mg/km]
	9,380	7,926	137,89	531,890				541,270	5,23	0,9461

**Time Control**

Test Date: 28.04.2016      Start of test 9:26:19 AM      Start of trace 9:38:36 AM  
End of test 10:07:58 AM      End of trace 9:58:16 AM

Department --- OMOLOGAZIONE

Test date : 28.04.2016

**Vehicle data**

Vehicle ID ----- KL.2  
 Vehicle model ----- JEEP KL AWD E5  
 Transmission type ----- M6  
 Odometer (before Test) ----- 16419 km  
 Tire pressure ----- 2.2 bar  
 VIN ----- EW11607  
 CVS flow ----- 9,0 m3/min

**Fuel data**

Fuel type ----- GASOLIO EURO 5  
 Batch No. ----- 202  
 Calculation instruction ----- DIESEL  
 Density ----- 0,835 g/cm3 [15°C]  
 Carbon percentage ----- 86,6 %  
 NHV ----- 16438,9 btu/lb

**Dyno data**

Inertia ----- 1810 kg  
 Dyno load ----- F0/F1/F2 29,0 / 0,170 / 0,0407

**Add. data**

Driver ----- dangelo  
 Operator ----- S8OP  
 AUX table ----- NO\_AUX  
 Range switch table -----  
 Fan speed polynomial ----- EU

**Reference**

Regulatory frame ----- EU  
 Ref. temp. ----- 273,15 K  
 Ref. Pressure ----- 1013,3 mbar  
 Calculation Regulatory ----- EU5

**Test reference data:**

GECOM Request No. -----  
 Richiedente ----- DARGENIO

**Remarks**

Test rem. -----  
 Customer ----- TRAZION EANT POSTS EQUENZIALE METTERE SOTOCARICA CICLO CALDO MARCE I-V  
 Operator ----- /

**Phase Results**

	1	2		Phase
Barometric pressure	98,43	98,44		kPa
Ambient air temperature	24,21	24,67		°C
Relative humidity	39,29	39,62		%
NOx correction factor	0,9071	0,9147		
Dilution factor	38,756	15,254		
CVS volume corrected (273,15K)	104,940	53,780		m <sup>3</sup>
Average CVS temperature	39,9	40,0		°C
Average CVS pressure PV	96,1	96,1		kPa
DLS volume corrected (273,15K)	0,6501	0,3330		m <sup>3</sup>
Average torque at dyno	41,6	233,7		N
Minimum oil temperature				°C
Distance	4,037	6,939		km
Drivers violation	0,0	0,0		sec

**Particulate results**

	1	2		Phase
Main filter before test	81,998			mg
Main filter after test	82,062			mg
Backup filter before test				mg
Backup filter after test				mg
Payload main filter	0,064			mg
Payload backup filter				mg
Efficiency of main filter				%
Calculated payload				mg
mass emission	0,0104			g
mass emission per distance	0,9461			mg/km

**TEOM results**

Payload				mg
TEOM mass emission				g
TEOM mass emission per distance				mg/km
Efficiency TEOM/gravimetric				%

**Particulate total results**

Remarks  
 Total emission 0,0104 g  
 Total emission per total distance 0,9461 mg/km

**Particulate Counter total results**

Total counts: 4,7155E+10  
 Tot.counts/ 4,2962E+09  
 Tot.distance 1/km

**Weighing chamber data**

Chamber temperature: 22,00 °C  
 Chamber pressure: 989,40 kPa  
 Buoyancy correction factor: 1,000360E+00

**Setup/Checks Particulate Counter**

CPCCFK 1,0571 unity  
 PND1 10 unity  
 PND2 15 unity  
 PCRF 168,74 unity  
 System Ckeck O.K? YES  
 Zero Count 0,1048 1/cm<sup>3</sup>

Department --- OMOLOGAZIONE

Test date : 28.04.2016

**Vehicle data**

Vehicle ID ----- KL.2  
Vehicle model ----- JEEP KL AWD E5  
Transmission type ----- M6  
Odometer (before Test) ----- 16419 km  
Tire pressure ----- 2.2 bar  
VIN ----- EW11807  
CVS flow ----- 9,0 m3/min

**Fuel data**

Fuel type ----- GASOLIO EURO 5  
Batch No. ----- 202  
Calculation instruction ----- DIESEL  
Density ----- 0,835 g/cm3 [15°C]  
Carbon percentage ----- 86,6 %  
NHV ----- 16438,9 btu/lb

**Dyno data**

Inertia ----- 1810 kg  
Dyno load ----- F0/F1/F2 29,0 / 0,170 / 0,0407

**Add. data**

Driver ----- dangelo  
Operator ----- S8OP  
AUX table ----- NO\_AUX  
Range switch table -----  
Fan speed polynom ----- EU

**Reference**

Regulatory frame ----- EU  
Ref. temp. ----- 273,15 K  
Ref. Pressure ----- 1013,3 mbar  
Calculation Regulatory ----- EU5

**Test reference data:**

GECOM Request No. -----  
Richiedente ----- DARGENIO

**Remarks**

Test rem. -----  
Customer ----- TRAZION EANT POSTS EQUENZIALE METTERE SOTOCARICA CICLO CALDO MARCE I-V  
Operator ----- /

**Phase Results**

	1	2		Phase
Barometric pressure	98,43	98,44		kPa
Ambient air temperature	24,21	24,67		°C
Relative humidity	39,29	39,62		%
NOx correction factor	0,9071	0,9147		
Dilution factor	38,756	15,254		
CVS volume corrected (273,15K)	104,940	53,780		m <sup>3</sup>
Average CVS temperature	39,9	40,0		°C
Average CVS pressure PV	96,1	96,1		kPa
DLS volume corrected (273,15K)	0,6501	0,3330		m <sup>3</sup>
Average force at dyno	41,6	233,7		N
Minimum oil temperature				°C
Distance	4,037	6,939		km
Drivers violation	0,0	0,0		sec

**Bag Analysis**

	1	2		Phase
Concentration sample THC	3,445	2,800		ppmC1
Concentration ambient THC	2,297	2,233		ppmC1
Emission THC	0,079	0,024		g/Phase
Emission THC	20,000	3,000		mg/km
Concentration sample CH4				ppm
Concentration ambient CH4				ppm
Emission CH4				g/Phase
Emission CH4				mg/km
Concentration sample NMHC				ppmC1
Concentration ambient NMHC				ppmC1
Emission NMHC				g/Phase
Emission NMHC				mg/km
Concentration sample CO	0,923	1,236		ppm
Concentration ambient CO	0,597	0,654		ppm
Emission CO	0,045	0,042		g/Phase
Emission CO	11,000	6,000		mg/km
Concentration sample NOx	11,460	35,770		ppm
Concentration ambient NOx	0,001	0,055		ppm
Emission NOx	2,236	3,602		g/Phase
Emission NOx	554,000	519,000		mg/km
Concentration sample NO2				ppm
Concentration ambient NO2				ppm
Emission NO2				g/Phase
Emission NO2				mg/km
Concentration sample N2O				ppm
Concentration ambient N2O				ppm
Emission N2O				g/Phase
Emission N2O				mg/km
Concentration sample CO2	0,348	0,885		%
Concentration ambient CO2	0,046	0,047		%
Emission CO2	624,975	888,481		g/Phase
Emission CO2	154,812	128,042		g/km
Fuel consumption	5,87	4,86		l/100km

**Total Results**

Emission per total distance [mg/km]	HC	CO	CO2	NOx	NMHC	HC + Nox
	9,380	7,926	137,888	531,890		541,270
Fuel consumption [l/100km]	5,23			NO2	N2O	

Department --- OMOLOGAZIONE

Test date : 11.11.2016

**Vehicle data**

Vehicle ID ----- KL.1  
Vehicle model ----- JEEP KL FWD E5  
Transmission type ----- M6  
Odometer (before Test) ----- 15972 km  
Tire pressure ----- 2.3 bar  
VIN ----- EW225304  
CVS flow ----- 9.0 m3/min

**Fuel data**

Fuel type ----- GASOLIO EURO 5  
Batch No. ----- 202  
Calculation instruction ----- DIESEL  
Density ----- 0,835 g/cm3 [15°C]  
Carbon percentage ----- 86,6 %  
NHV ----- 16438,9 btu/lb

**Dyno data**

Inertia ----- 1810 kg  
Dyno load ----- F0/F1/F2 74,0 / -0,510 / 0,0442

**Add. data**

Driver ----- MANCUSO  
Operator ----- S80P  
aux table ----- NO\_AUX  
Range switch table ----- STANDARD  
Fan speed polynom ----- EU

**Reference**

Regulatory frame ----- EU  
Ref. temp. ----- 273,15 K  
Ref. Pressure ----- 1013,3 mbar  
Calculation Regulatory ----- EU5

**Test reference data:**

GECOM Request No. -----  
Richiedente -----

**Remarks**

Test rem. -----  
Customer ----- TRAZIONE ANT-POST SEQUENZIALE CICLO COLD  
Operator ----- CICLO FREDDO /

**Phase Results**

	HC [mg/km]	CO [mg/km]	CO2 [g/km]	NOx [mg/km]	NO2 [mg/km]	N2O [mg/km]	NMHC [mg/km]	CH4 [mg/km]	Fuel cons. [l/100km]	Particulate [mg/km]
Phase 1 Bag Modal	14,000	103,000	146,609	454,000					5,57	0,7086
Phase 2 Bag Modal	9,000	10,000	161,757	189,000					6,14	
Bag Modal										
Bag Modal										
	HC [ppm]	CO [ppm]	CO2 [%]	NOx [ppm]	O2 [%]	CH4 [ppm]				
Phase 1 Pre cat avg										
Post cat avg										
Cat. efficiency										
Raw/Bag										
Phase 2 Pre cat avg										
Post cat avg										
Cat. efficiency										
Raw/Bag										
Pre cat avg										
Post cat avg										
Cat. efficiency										
Raw/Bag										
Pre cat avg										
Post cat avg										
Cat. efficiency										
Raw/Bag										

**Total Results**

Bag	HC [mg/km]	CO [mg/km]	CO2 [g/km]	NOx [mg/km]	NO2 [mg/km]	N2O [mg/km]	NMHC [mg/km]	HC + NOx [mg/km]	Fuel econ [l/100km]	Particulate [mg/km]
	12,530	68,828	152,21	355,940				368,470	5,78	0,7086

**Time Control**

Test Date: 11.11.2016      Start of test 9:01:40 AM      Start of trace 9:17:31 AM  
End of test 9:46:54 AM      End of trace 9:37:11 AM

Department --- OMOLOGAZIONE

Test date : 11.11.2016

**Vehicle data**

Vehicle ID ----- KL.1  
Vehicle model ----- JEEP KL FWD E5  
Transmission type ----- M6  
Odometer (before Test) ----- 15972 km  
Tire pressure ----- 2.3 bar  
VIN ----- EW225304  
CVS flow ----- 9,0 m3/min

**Fuel data**

Fuel type ----- GASOLIO EURO 5  
Batch No. ----- 202  
Calculation instruction ----- DIESEL  
Density ----- 0,835 g/cm3 [15°C]  
Carbon percentage ----- 86,6 %  
NHV ----- 16438,9 btu/lb

**Dyno data**

Inertia ----- 1810 kg  
Dyno load ----- F0/F1/F2 74,0 / -0,510 / 0,0442

**Add. data**

Driver ----- MANCUSO  
Operator ----- S8OP  
AUX table ----- NO\_AUX  
Range switch table ----- STANDARD  
Fan speed polynom ----- EU

**Reference**

Regulatory frame ----- EU  
Ref. temp. ----- 273,15 K  
Ref. Pressure ----- 1013,3 mbar  
Calculation Regulatory ----- EU5

**Test reference data:**

GECOM Request No. -----  
Richiedente -----

**Remarks**

Test rem. -----  
Customer ----- TRAZIONE ANT-POST SEQUENZIALE CICLO COLD  
Operator ----- CICLO FREDDO /

**Phase Results**

	1	2		Phase
Barometric pressure	98,33	98,32		kPa
Ambient air temperature	25,70	25,15		°C
Relative humidity	50,87	50,87		%
NOx correction factor	1,0033	0,9918		
Dilution factor	13,342	36,550		
CVS volume corrected (273,15K)	53,763	104,687		m <sup>3</sup>
Average CVS temperature	40,0	40,0		°C
Average CVS pressure PV	95,9	95,9		kPa
DLS volume corrected (273,15K)	0,3333	0,6498		m <sup>3</sup>
Average torque at dyno	248,8	61,3		N
Minimum oil temperature				°C
Distance	6,939	4,074		km
Drivers violation	0,0	0,0		sec

**Particulate results**

	1	2		Phase
Main filter before test	78,823			mg
Main filter after test	78,872			mg
Backup filter before test				mg
Backup filter after test				mg
Payload main filter	0,048			mg
Payload backup filter				mg
Efficiency of main filter				%
Calculated payload				mg
mass emission	0,0078			g
mass emission per distance	0,7086			mg/km

**TEOM results**

Payload				mg
TEOM mass emission				g
TEOM mass emission per distance				mg/km
Efficiency TEOM/gravimetric				%

**Particulate total results**

Remarks	
Total emission	0,0078 g
Total emission per total distance	0,7086 mg/km

**Particulate Counter total results**

Total counts:	1,2351E+11
Tot.counts/	
Tot.distance	1,1215E+10 1/km

**Weighing chamber data**

Chamber temperature:	22,00	°C
Chamber pressure:	1000,30	kPa
Buoyancy correction factor:	1,000364E+00	

**Setup/Checks Particulate Counter**

CPCCFK	1,066	unity
PND1	10	unity
PND2	15	unity
PCRF	167,39	unity
System Ckeck O.K?	YES	
Zero Count	0,02248	1/cm <sup>3</sup>

Department --- OMOLOGAZIONE

Test date : 11.11.2016

**Vehicle data**

Vehicle ID ..... KL.1  
Vehicle model ..... JEEP KL FWD E5  
Transmission type ..... M6  
Odometer (before Test) ..... 15972 km  
Tire pressure ..... 2.3 bar  
VIN ..... EW225304  
CVS flow ..... 9,0 m3/min

**Fuel data**

Fuel type ..... GASOLIO EURO 5  
Batch No. .... 202  
Calculation instruction ..... DIESEL  
Density ..... 0,835 g/cm3 [15°C]  
Carbon percentage ..... 86,6 %  
NHV ..... 16438,9 btu/lb

**Dyno data**

Inertia ..... 1810 kg  
Dyno load ..... F0/F1/F2 74,0 / -0,510 / 0,0442

**Add. data**

Driver ..... MANCUSO  
Operator ..... S80P  
AUX table ..... NO AUX  
Range switch table ..... STANDARD  
Fan speed polynom ..... EU

**Reference**

Regulatory frame ..... EU  
Ref. temp. .... 273,15 K  
Ref. Pressure ..... 1013,3 mbar  
Calculation Regulatory ..... EU5

**Test reference data:**

GECOM Request No. ....  
Richiedente.....

**Remarks**

Test rem. ....  
Customer ..... TRAZIONE ANT-POST SEQUENZIALE CICLO COLD  
Operator ..... CICLO FREDDO /

	1	2		Phase
Barometric pressure	98,33	98,32		kPa
Ambient air temperature	25,70	25,15		°C
Relative humidity	50,87	50,87		%
NOx correction factor	1,0033	0,9918		
Dilution factor	13,342	36,550		
CVS volume corrected (273,15K)	53,763	104,687		m <sup>3</sup>
Average CVS temperature	40,0	40,0		°C
Average CVS pressure PV	95,9	95,9		kPa
DLS volume corrected (273,15K)	0,3333	0,6498		m <sup>3</sup>
Average force at dyno	248,8	61,3		N
Minimum oil temperature				°C
Distance	6,939	4,074		km
Drivers violation	0,0	0,0		sec
<b>Bag Analysis</b>	<b>1</b>	<b>2</b>		<b>Phase</b>
Concentration sample THC	5,709	3,463		ppmC1
Concentration ambient THC	2,952	2,954		ppmC1
Emission THC	0,100	0,038		g/Phase
Emission THC	14,000	9,000		mg/km
Concentration sample CH4				ppm
Concentration ambient CH4				ppm
Emission CH4				g/Phase
Emission CH4				mg/km
Concentration sample NMHC				ppmC1
Concentration ambient NMHC				ppmC1
Emission NMHC				g/Phase
Emission NMHC				mg/km
Concentration sample CO	11,560	1,083		ppm
Concentration ambient CO	0,945	0,797		ppm
Emission CO	0,718	0,040		g/Phase
Emission CO	103,000	10,000		mg/km
Concentration sample NOx	28,530	3,851		ppm
Concentration ambient NOx	0,062	0,028		ppm
Emission NOx	3,149	0,771		g/Phase
Emission NOx	454,000	189,000		mg/km
Concentration sample NO2				ppm
Concentration ambient NO2				ppm
Emission NO2				g/Phase
Emission NO2				mg/km
Concentration sample N2O				ppm
Concentration ambient N2O				ppm
Emission N2O				g/Phase
Emission N2O				mg/km
Concentration sample CO2	1,010	0,399		%
Concentration ambient CO2	0,051	0,050		%
Emission CO2	1017,323	658,997		g/Phase
Emission CO2	146,609	161,757		g/km
Fuel consumption	5,57	6,14		l/100km

**Total Results**

Emission per	HC	CO	CO2	NOx	NMHC	HC + Nox
total distance [mg/km]	12,530	68,828	152,213	355,940		388,470

Fuel consumption [l/100km]	5,78	NO2	N2O

Department --- OMOLOGAZIONE

Test date : 11.11.2016

**Vehicle data**

Vehicle ID ----- KL.1  
Vehicle model ----- JEEP KL FWD E5  
Transmission type ----- M6  
Odometer (before Test) ----- 15983 km  
Tire pressure ----- 2.3 bar  
VIN ----- EW225304  
CVS flow ----- 9,0 m3/min

**Fuel data**

Fuel type ----- GASOLIO EURO 5  
Batch No. ----- 202  
Calculation instruction ----- DIESEL  
Density ----- 0,835 g/cm3 [15°C]  
Carbon percentage ----- 86,6 %  
NHV ----- 16438,9 btu/lb

**Dyno data**

Inertia ----- 1810 kg  
Dyno load ----- F0/F1/F2 74,0 / -0,510 / 0,0442

**Add. data**

Driver ----- CATANZARO  
Operator ----- S8OP  
aux table ----- NO\_AUX  
Range switch table ----- STANDARD  
Fan speed polynom ----- EU

**Reference**

Regulatory frame ----- EU  
Ref. temp. ----- 273,15 K  
Ref. Pressure ----- 1013,3 mbar  
Calculation Regulatory ----- EU5

**Test reference data:**

GECOM Request No. -----  
Richiedente -----

**Remarks**

Test rem. -----  
Customer ----- TRAZIONE ANT-POST SEQUENZIALE CICLO HOT  
Operator ----- / CICLO CALDO

**Phase Results**

	HC [mg/km]	CO [mg/km]	CO2 [g/km]	NOx [mg/km]	NO2 [mg/km]	N2O [mg/km]	NMHC [mg/km]	CH4 [mg/km]	Fuel cons. [l/100km]	Particulate [mg/km]
<b>Phase 1</b>										
Bag	3,000	4,000	130,668	465,000					4,96	0,9171
Modal										
<b>Phase 2</b>										
Bag	12,000	10,000	157,257	479,000					5,97	
Modal										
Bag										
Modal										
Bag										
Modal										
<b>Phase 1</b>										
Pre cat avg	HC [ppm]	CO [ppm]	CO2 [%]	NOx [ppm]	O2 [%]	CH4 [ppm]				
Post cat avg										
Cat. efficiency										
Raw/Bag										
<b>Phase 2</b>										
Pre cat avg										
Post cat avg										
Cat. efficiency										
Raw/Bag										
Pre cat avg										
Post cat avg										
Cat. efficiency										
Raw/Bag										
Pre cat avg										
Post cat avg										
Cat. efficiency										
Raw/Bag										

**Total Results**

Bag	HC [mg/km]	CO [mg/km]	CO2 [g/km]	NOx [mg/km]	NO2 [mg/km]	N2O [mg/km]	NMHC [mg/km]	HC + NOx [mg/km]	Fuel econ [l/100km]	Particulate [mg/km]
	6,460	6,098	140,51	470,420				476,880	5,33	0,9171

**Time Control**

Test Date: 11.11.2016      Start of test 9:48:13 AM      Start of trace 10:00:32 AM  
End of test 10:29:55 AM      End of trace 10:20:12 AM

Department — OMOLOGAZIONE

Test date : 11.11.2016

**Vehicle data**

Vehicle ID \_\_\_\_\_ KL.1  
Vehicle model \_\_\_\_\_ JEEP KL FWD E5  
Transmission type \_\_\_\_\_ M6  
Odometer (before Test) \_\_\_\_\_ 15983 km  
Tire pressure \_\_\_\_\_ 2.3 bar  
VIN \_\_\_\_\_ EW225304  
CVS flow \_\_\_\_\_ 9,0 m3/min

**Fuel data**

Fuel type \_\_\_\_\_ GASOLIO EURO 5  
Batch No. \_\_\_\_\_ 202  
Calculation instruction \_\_\_\_\_ DIESEL  
Density \_\_\_\_\_ 0,835 g/cm3 [15°C]  
Carbon percentage \_\_\_\_\_ 86,6 %  
NHV \_\_\_\_\_ 16438,9 btu/lb

**Dyno data**

Inertia \_\_\_\_\_ 1810 kg  
Dyno load \_\_\_\_\_ F0/F1/F2 74,0 / -0,510 / 0,0442

**Add. data**

Driver \_\_\_\_\_ CATANZARO  
Operator \_\_\_\_\_ S8OP  
AUX table \_\_\_\_\_ NO\_AUX  
Range switch table \_\_\_\_\_ STANDARD  
Fan speed polynom \_\_\_\_\_ EU

**Reference**

Regulatory frame \_\_\_\_\_ EU  
Ref. temp. \_\_\_\_\_ 273,15 K  
Ref. Pressure \_\_\_\_\_ 1013,3 mbar  
Calculation Regulatory \_\_\_\_\_ EU5

**Test reference data:**

GECOM Request No. \_\_\_\_\_  
Richiedente \_\_\_\_\_

**Remarks**

Test rem. \_\_\_\_\_  
Customer \_\_\_\_\_ TRAZIONE ANT-POST SEQUENZIALE CICLO HOT  
Operator \_\_\_\_\_ / CICLO CALDO

**Phase Results**

	1	2		Phase
Barometric pressure	98,31	98,32		kPa
Ambient air temperature	25,52	24,88		°C
Relative humidity	50,83	50,85		%
NOx correction factor	0,9993	0,9861		
Dilution factor	14,931	37,577		
CVS volume corrected (273,15K)	53,753	104,713		m <sup>3</sup>
Average CVS temperature	40,1	40,1		°C
Average CVS pressure PV	95,9	95,9		kPa
DLS volume corrected (273,15K)	0,3333	0,6499		m <sup>3</sup>
Average torque at dyno	248,2	59,9		N
Minimum oil temperature				°C
Distance	6,922	4,066		km
Drivers violation	0,0	0,0		sec

**Particulate results**

	1	2		Phase
Main filter before test	77,564			mg
Main filter after test	77,627			mg
Backup filter before test				mg
Backup filter after test				mg
Payload main filter	0,063			mg
Payload backup filter				mg
Efficiency of main filter				%
Calculated payload				mg
mass emission	0,0101			g
mass emission per distance	0,9171			mg/km

**TEOM results**

Payload				mg
TEOM mass emission				g
TEOM mass emission per distance				mg/km
Efficiency TEOM/gravimetric				%

**Particulate total results**

Remarks \_\_\_\_\_  
Total emission 0,0101 g  
Total emission per total distance 0,9171 mg/km

**Particulate Counter total results**

Total counts: 3,6081E+10  
Tot.counts/ 3,2837E+09 1/km  
Tot.distance

**Weighing chamber data**

Chamber temperature: 22,00 °C  
Chamber pressure: 1000,30 kPa  
Buoyancy correction factor: 1,000364E+00

**Setup/Checks Particulate Counter**

CPCCFK 1,066 unity  
PND1 10 unity  
PND2 15 unity  
PCRF 167,39 unity  
System Ccheck O.K? YES  
Zero Count 0,03748 1/cm<sup>3</sup>

Department --- **OMOLOGAZIONE**

Test date : **11.11.2016**

**Vehicle data**

Vehicle ID ----- **KL.1**  
Vehicle model ----- **JEEP KL FWD E5**  
Transmission type ----- **M8**  
Odometer (before Test) ----- **15983 km**  
Tire pressure ----- **2.3 bar**  
VIN ----- **EW225304**  
CVS flow ----- **9,0 m3/min**

**Fuel data**

Fuel type ----- **GASOLIO EURO 5**  
Batch No. ----- **202**  
Calculation instruction ----- **DIESEL**  
Density ----- **0,835 g/cm3 [15°C]**  
Carbon percentage ----- **86,6 %**  
NHV ----- **16438,9 btu/lb**

**Dyno data**

Inertia ----- **1810 kg**  
Dyno load ----- **F0/F1/F2 74,0 / -0,510 / 0,0442**

**Add. data**

Driver ----- **CATANZARO**  
Operator ----- **S80P**  
AUX table ----- **NO\_AUX**  
Range switch table ----- **STANDARD**  
Fan speed polynom ----- **EU**

**Reference**

Regulatory frame ----- **EU**  
Ref. temp. ----- **273,15 K**  
Ref. Pressure ----- **1013,3 mbar**  
Calculation Regulatory ----- **EU5**

**Test reference data:**

GECOM Request No. -----  
Richiedente -----

**Remarks**

Test rem. -----  
Customer ----- **TRAZIONE ANT-POST SEQUENZIALE CICLO HOT**  
Operator ----- **/ CICLO CALDO**

**Phase Results**

	1	2		Phase
Barometric pressure	98,31	98,32		kPa
Ambient air temperature	25,52	24,88		°C
Relative humidity	50,83	50,85		%
NOx correction factor	0,9993	0,9861		
Dilution factor	14,931	37,577		
CVS volume corrected (273,15K)	53,753	104,713		m <sup>3</sup>
Average CVS temperature	40,1	40,1		°C
Average CVS pressure PV	95,9	95,9		kPa
DLS volume corrected (273,15K)	0,3333	0,6499		m <sup>3</sup>
Average force at dyno	248,2	59,9		N
Minimum oil temperature				°C
Distance	6,922	4,066		km
Drivers violation	0,0	0,0		sec

**Bag Analysis**

	1	2		Phase
Concentration sample THC	3,405	3,583		ppmC1
Concentration ambient THC	2,935	2,901		ppmC1
Emission THC	0,022	0,049		g/Phase
Emission THC	3,000	12,000		mg/km
Concentration sample CH4				ppm
Concentration ambient CH4				ppm
Emission CH4				g/Phase
Emission CH4				mg/km
Concentration sample NMHC				ppmC1
Concentration ambient NMHC				ppmC1
Emission NMHC				g/Phase
Emission NMHC				mg/km
Concentration sample CO	1,214	1,031		ppm
Concentration ambient CO	0,853	0,755		ppm
Emission CO	0,028	0,039		g/Phase
Emission CO	4,000	10,000		mg/km
Concentration sample NOx	29,300	9,250		ppm
Concentration ambient NOx	0,050	0,054		ppm
Emission NOx	3,222	1,947		g/Phase
Emission NOx	465,000	479,000		mg/km
Concentration sample NO2				ppm
Concentration ambient NO2				ppm
Emission NO2				g/Phase
Emission NO2				mg/km
Concentration sample N2O				ppm
Concentration ambient N2O				ppm
Emission N2O				g/Phase
Emission N2O				mg/km
Concentration sample CO2	0,904	0,359		%
Concentration ambient CO2	0,050	0,049		%
Emission CO2	904,484	639,408		g/Phase
Emission CO2	130,668	157,257		g/km
Fuel consumption	4,96	5,97		l/100km

**Total Results**

Emission per total distance [mg/km]	HC	CO	CO2	NOx	NMHC	HC + Nox
	6,460	6,098	140,507	470,420		476,880

Fuel consumption [l/100km]	5,33	NO2	N2O



Trip Duration	1098.00	s
Trip Duration (a)	1098.00	s
Trip Distance	8.08	km
Trip Distance (a)	8.08	km
Trip Fuel Cons. (b)	0.43	kg
Trip Fuel Cons. (a,b)	0.43	kg
Trip Fuel Cons. EU (a,c)	0.42	kg
Trip Fuel Cons. US (a,c)	0.43	kg
Trip Fuel Cons. Volume (b)	0.52	l
Trip Fuel Cons. Volume (a,b)	0.52	l
Trip Fuel Cons. Volume EU (a,c)	0.50	l
Trip Fuel Cons. Volume US (a,c)	0.52	l
Trip Fuel Economy (b)	6.49	l/km100
Trip Fuel Economy (a,b)	6.49	l/km100
Trip Fuel Economy EU (a,c)	6.19	l/km100
Trip Fuel Economy US (a,c)	6.51	l/km100
Trip Av. Eng. Speed	1251.26	rpm
Trip Av. Torque	n/a	Nm
Trip Av. Power	n/a	kW
Trip Work	n/a	kWh
Trip Av. Eng. Speed (a)	1251.26	rpm
Trip Av. Torque (a)	n/a	Nm
Trip Av. Power (a)	n/a	kW
Trip Work (a)	n/a	kWh
Trip Av. Humidity	50.92	%
Trip Av. Amb. Temperature	17.62	degC
Trip Av. Humidity (a)	50.92	%
Trip Av. Amb. Temperature (a)	17.62	degC

ave THC	0.00000	ppm
ave NMHC	0.00000	ppm
ave CH4	0.00000	ppm
ave CO	89.40323	ppm
ave CO2	3.63243	%
ave NOx	260.12713	ppm
ave PM	0.00180	mg/m3
ave Soot meas	0.00000	mg/m3
ave Soot	0.00180	mg/m3
ave PN	n/a	#/cm3
tot THC	0.00000	g
tot NMHC	0.00000	g
tot CH4	0.00000	g
tot CO	2.35386	g
tot CO2	1388.88865	g
tot NO (d)	1.54594	g
tot NO2	0.16256	g
tot NOx	1.70850	g
tot Soot	0.00000	g
tot Soot meas	0.00000	g
tot PM	0.00000	g
tot PN	n/a	#
PM measurement type	0.00000	-
PM correction type	1.00000	alpha(HC)
tot Soot on PM filter (estim.)	0.00000	mg
Soot --> PM simple scaling factor	1.00000	-
Soot --> PM alpha scaling factor	0.00000	-
Trip Av. Veh. Speed	26.76272	km/h
Trip Distance Share Urban	70.84860	% distance
Trip Distance Share Rural	29.15140	% distance
Trip Distance Share Motorway	0.00000	% distance

BS CO2	n/a	g/kWh
BS CO	n/a	g/kWh
BS THC	n/a	g/kWh
BS NMHC	n/a	g/kWh
BS CH4	n/a	g/kWh
BS NO (d)	n/a	g/kWh
BS NO2	n/a	g/kWh
BS NOx	n/a	g/kWh
BS Soot	n/a	g/kWh
BS Soot meas	n/a	g/kWh
BS PM	n/a	g/kWh
BS PN	n/a	#/kWh
DS CO2	171.89216	g/km
DS CO	0.29132	g/km
DS THC	0.00000	g/km
DS NMHC	0.00000	g/km
DS CH4	0.00000	g/km
DS NO (d)	0.19133	g/km
DS NO2	0.02012	g/km
DS NOx	0.21145	g/km
DS Soot	0.00000	g/km
DS Soot meas	0.00000	g/km
DS PM	0.00000	g/km
DS PN	n/a	#/km
FS CO2	3229.97360	g/kg
FS CO	5.47409	g/kg
FS THC	0.00000	g/kg
FS NMHC	0.00000	g/kg
FS CH4	0.00000	g/kg
FS NO (d)	3.59520	g/kg
FS NO2	0.37804	g/kg
FS NOx	3.97325	g/kg
FS Soot	0.00000	g/kg
FS Soot meas	0.00000	g/kg
FS PM	0.00000	g/kg
FS PN	n/a	#/kg

(a) GAS PEMS measurement state only, (b) based on fuel rate input (ECU, Fuel Meter), (c) calculated from carbon balance  
 (d) NO calculated using molecular weight of NO2

PEMS Current Case:  
 D:\AVL Concerto\WorkEnvironments\PEMS\_Rel5\_B135\PEMS\Nardo\_Gen2017\Jeep575\_FamB\_140cv\_MTG6  
 PEMS Result Filename:  
 D:\AVL Concerto\MyData\TransportFiles\01022017\_Cherokee\_NEDC\_Cold\_2.ctf

Vehicle: Jeep 575MJet E5+ / Tel 1C4PJLDY1EW225304 Version: Rel5\_B135  
 Engine: FamB\_140cv / Diesel I\_010217.pms\_c  
 NOx Ambient Condition Corr.: 8 - NONE  
 Dry / Wet Corr.: 4 - NONE

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Case: Nedc\_Cold\_010217

Page: Engine (1)

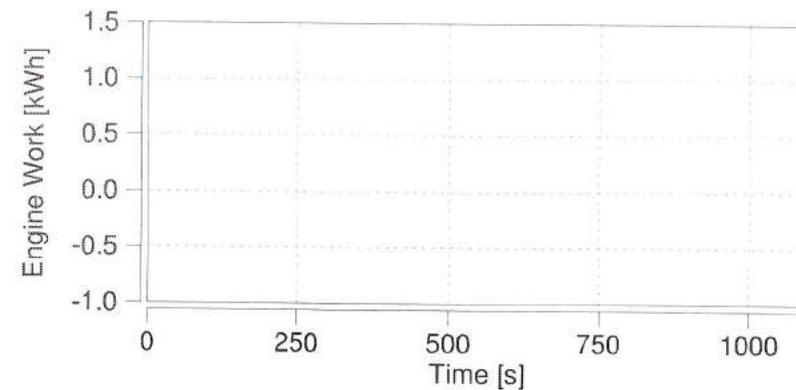
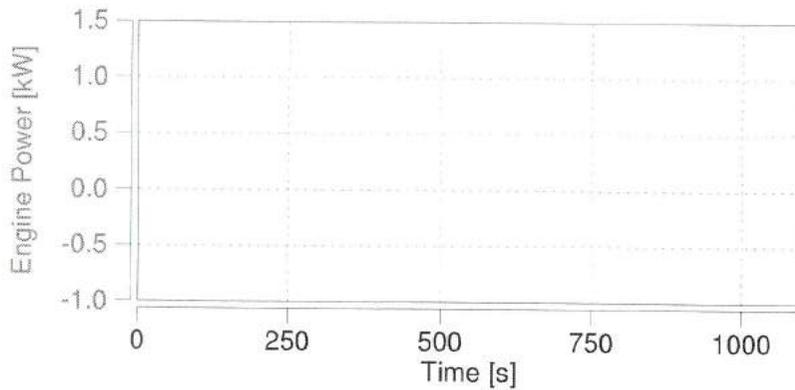
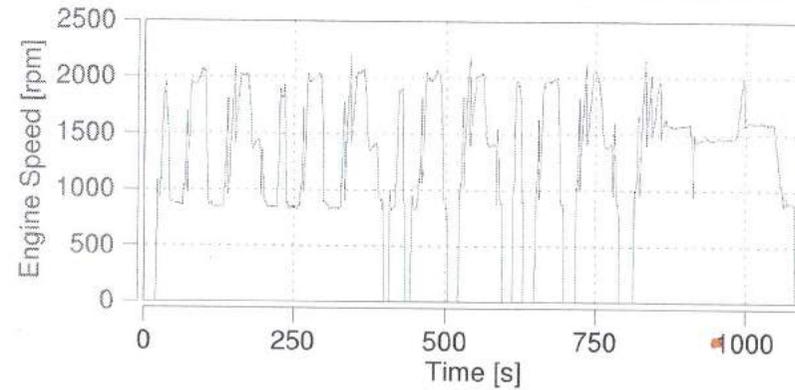
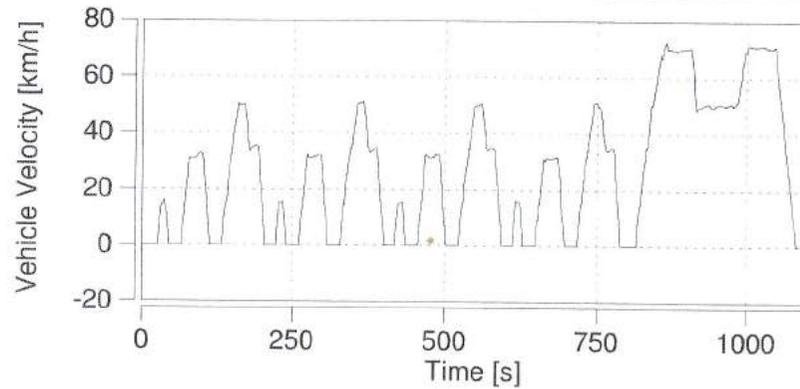
'NTC Track'

Start Date: 02/01/2017

Start Time: 11:42:57.0



Concerto M.O.V.E., 2016



PEMS Current Case:  
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PEMS Result Filename:  
D:\AVL\_Concerto\MyData\TransportFiles\01022017\_Cherokee\_NEDC\_Cold\_2.ctf

Vehicle: Jeep 575MJet E5+ / TeI 1C4PJLDY1EW225304 Version: Rel5\_B135  
Engine: FamB\_140cv / Diesel 1\_010217.pms\_c  
NOx Ambient Condition Corr.: 8 - NONE  
Dry / Wet Corr.: 4 - NONE

*Handwritten signature* 1/2/17

Case: Nedc\_Hot\_010217

Page: Trip Summary

'NTC Track'

Start Date: 02/01/2017

Start Time: 12:34:27.0



Concerto M.O.V.E., 2016

Trip Duration	1096.00	s	ave THC	0.00000	ppm	BS CO2	n/a	g/kWh
Trip Duration (a)	1096.00	s	ave NMHC	0.00000	ppm	BS CO	n/a	g/kWh
Trip Distance	8.09	km	ave CH4	0.00000	ppm	BS THC	n/a	g/kWh
Trip Distance (a)	8.09	km	ave CO	6.44223	ppm	BS NMHC	n/a	g/kWh
Trip Fuel Cons. (b)	0.31	kg	ave CO2	3.24250	%	BS CH4	n/a	g/kWh
Trip Fuel Cons. (a,b)	0.31	kg	ave NOx	161.79327	ppm	BS NO (d)	n/a	g/kWh
Trip Fuel Cons. EU (a,c)	0.36	kg	ave PM	0.00117	mg/m3	BS NO2	n/a	g/kWh
Trip Fuel Cons. US (a,c)	0.38	kg	ave Soot meas	0.00000	mg/m3	BS NOx	n/a	g/kWh
Trip Fuel Cons. Volume (b)	0.37	l	ave Soot	0.00117	mg/m3	BS Soot	n/a	g/kWh
Trip Fuel Cons. Volume (a,b)	0.37	l	ave PN	n/a	#/cm3	BS Soot meas	n/a	g/kWh
Trip Fuel Cons. Volume EU (a,c)	0.43	l	tot THC	0.00000	g	BS PM	n/a	g/kWh
Trip Fuel Cons. Volume US (a,c)	0.45	l	tot NMHC	0.00000	g	BS PN	n/a	#/kWh
Trip Fuel Economy (b)	4.57	l/km100	tot CH4	0.00000	g	DS CO2	157.06714	g/km
Trip Fuel Economy (a,b)	4.57	l/km100	tot CO	0.12551	g	DS CO	0.01551	g/km
Trip Fuel Economy EU (a,c)	5.33	l/km100	tot CO2	1270.67316	g	DS THC	0.00000	g/km
Trip Fuel Economy US (a,c)	5.60	l/km100	tot NO (d)	2.99517	g	DS NMHC	0.00000	g/km
Trip Av. Eng. Speed	1219.88	rpm	tot NO2	0.57793	g	DS CH4	0.00000	g/km
Trip Av. Torque	n/a	Nm	tot NOx	3.57310	g	DS NO (d)	0.37014	g/km
Trip Av. Power	n/a	kW	tot Soot	0.00000	g	DS NO2	0.07142	g/km
Trip Work	n/a	kWh	tot Soot meas	0.00000	g	DS NOx	0.44156	g/km
Trip Av. Eng. Speed (a)	1219.88	rpm	tot PM	0.00000	g	DS Soot	0.00000	g/km
Trip Av. Torque (a)	n/a	Nm	tot PN	n/a	#	DS Soot meas	0.00000	g/km
Trip Av. Power (a)	n/a	kW	PM measurement type	0.00000	-	DS PM	0.00000	g/km
Trip Work (a)	n/a	kWh	PM correction type	1.00000	alpha(HC)	DS PN	n/a	#/km
Trip Av. Humidity	52.77	%	tot Soot on PM filter (estim.)	0.00000	mg	FS CO2	3854.79409	g/kg
Trip Av. Amb. Temperature	17.99	degC	Soot --> PM simple scaling factor	1.00000	-	FS CO	0.40380	g/kg
Trip Av. Humidity (a)	52.77	%	Soot --> PM alpha scaling factor	0.00000	-	FS THC	0.00000	g/kg
Trip Av. Amb. Temperature (a)	17.99	degC	Trip Av. Veh. Speed	26.84893	km/h	FS NMHC	0.00000	g/kg
			Trip Distance Share Urban	71.02169	% distance	FS CH4	0.00000	g/kg
			Trip Distance Share Rural	28.97831	% distance	FS NO (d)	9.63664	g/kg
			Trip Distance Share Motorway	0.00000	% distance	FS NO2	1.85943	g/kg
						FS NOx	11.49607	g/kg
						FS Soot	0.00000	g/kg
						FS Soot meas	0.00000	g/kg
						FS PM	0.00000	g/kg
						FS PN	n/a	#/kg

(a) GAS PEMS measurement state only. (b) based on fuel rate input (ECU, Fuel Meter), (c) calculated from carbon balance  
 (d) NO calculated using molecular weight of NO2

PEMS Current Case:  
 D:\AVL Concerto\WorkEnvironments\PEMS\_Rel5\_B135\PEMS\Nedc\_Gen2017\Jeep575\_FamB\_140cv\_MT6  
 PEMS Result Filename:  
 D:\AVL Concerto\MyData\TransportFiles\01022017\_Cherokee\_NEDC\_Hot.ctf

Vehicle: Jeep 575MJet E5+ / Tel 1C4PJLDY1EW225304 Version: Rel5\_B135  
 Engine: FamB\_140cv / Diesel\_010217.pms\_c  
 NOx Ambient Condition Corr.: 8 - NONE  
 Dry / Wet Corr.: 4 - NONE

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 1/2/17

Case: Nedc\_Hot\_010217

Page: Engine (1)

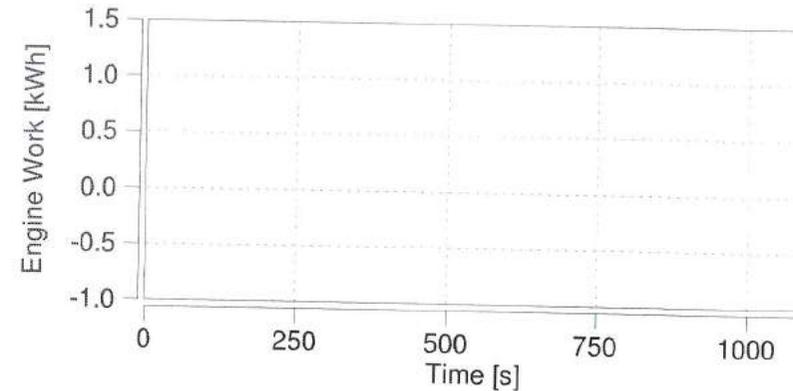
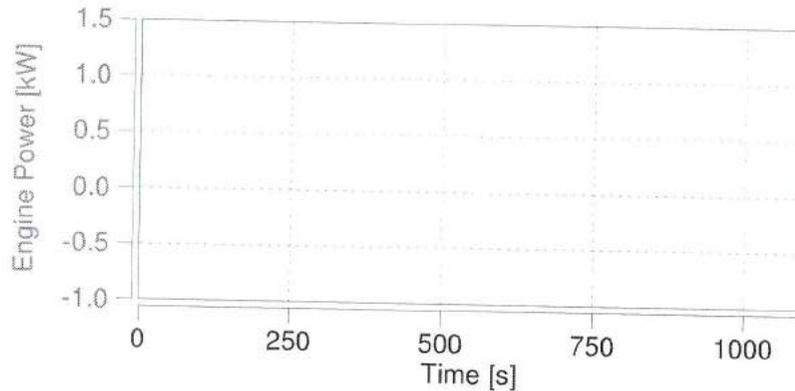
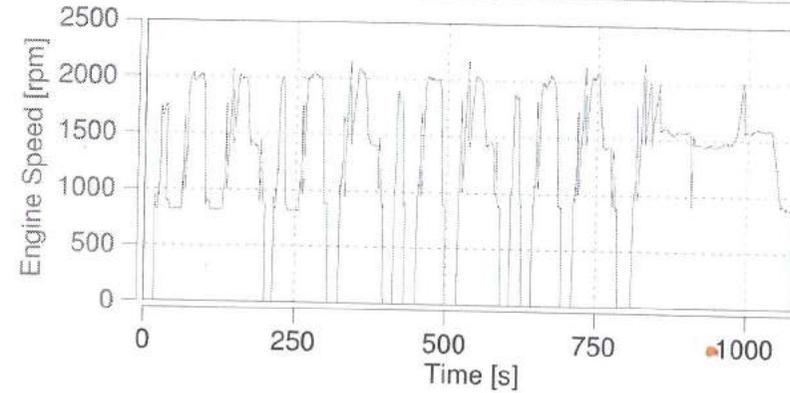
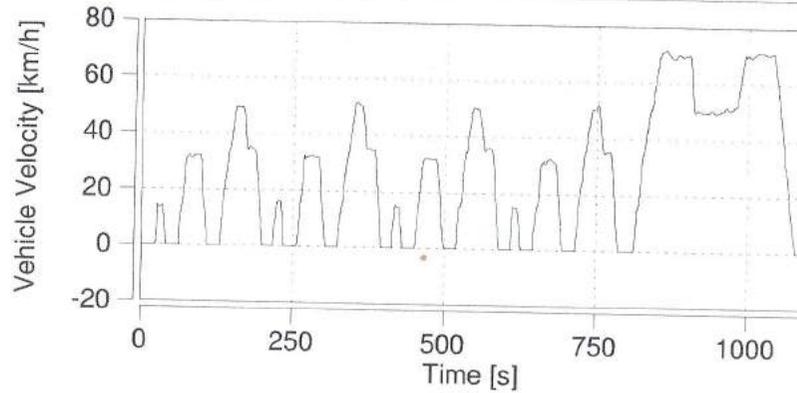
'NTC Track'

Start Date: 02/01/2017

Start Time: 12:34:27.0



Concerto M.O.V.E., 2016



PEMS Current Case:

D:\AVL Concerto\WorkEnvironments\PEMS\_Rel5\_B135\PEMS\Nardo\_Gen2017\Jeep575\_FamB\_140cv\_MT6

PEMS Result Filename:

D:\AVL Concerto\MyData\TransportFiles\01022017\_Cherokee\_NEDC\_Hot.ctf

Vehicle: Jeep 575MJet E5+ / Tel 1C4PJLDY1EW225304 Version: Rel5\_B135

Engine: FamB\_140cv / Diesel\_010217.pms\_c

NOx Ambient Condition Corr.: 8 - NONE

Dry / Wet Corr.: 4 - NONE

*Handwritten signature and date: 2/1/17*

16. LANCIA Y 1.3.....



# Ministero delle Infrastrutture e dei Trasporti

DIPARTIMENTO PER I TRASPORTI, LA NAVIGAZIONE ED I SISTEMI INFORMATIVI E STATISTICI

Direzione Generale Territoriale del Nord-Ovest

**CENTRO PROVA AUTOVEICOLI TORINO**Rapporto di prova del 02/05/2016 - 25/11/2016 - 02/02/2017  
Test report on

Pagina (Page) 1/1

**OGGETTO  
SUBJECT**Verifiche e prove per quanto riguarda:  
PROGRAMMA DI PROVE PER LA VALUTAZIONE DEL COMPORTAMENTO EMISSIVO  
DI VETTURE DIESEL EURO 5 COMMERCIALIZZATE IN ITALIA CON PROVE IN  
LABORATORIO E SU PISTA*Checks and tests about:*TEST PLAN FOR MARKETED IN ITALY EURO 5 DIESEL VEHICLES EMISSIONS  
BEHAVIOR ASSESSMENT WITH LABORATORY AND TRACK TESTING

Veicolo / Vehicle	Lancia Ypsilon 1.3 SDE	Data / Date [dd/mm/yy]	02/05/2016 - 25/11/2016 02/02/2017
VIN	ZLA31200005015878 ZLA31200005174617	Prova / Test n.	S.08.?????.2016 (*)
Tipo motore / Engine Type	1248 cm3	Autista / Driver	Catanzaro
Marcatura motore / Engine Code	199B1000	Odometro / Odometer km]	18659 / 12602
Cambio / Gear shift	Manuale / Manual M5	Note / Notes	
Start & Stop	SI / YES		
Pneumatici / Tyres	2,3 bar		
Inerzia / Inertia [kg]	1130		
Protocollo di prova Test Protocol	Conforme alle specifiche dell'Istituto Motori di Napoli (C.N.R.) Compliant to the specification of Istituto Motori di Naples		
Nome e indirizzo del Laboratorio di prove Name and address of the test laboratory	FIAT POWERTRAIN TECHNOLOGIES, Strada del Drosso 145, TORINO (TO)		

**RISULTATI DELLE PROVE  
TESTS RESULTS**Riportati nei seguenti allegati:  
Reported in the annexes listed here below

## (\*) Prova / Test n.

NEDC cold al banco (report S.08.0750.2016 del 02/05/2016).  
 NEDC hot al banco (report S.08.0751.2016 del 02/05/2016).  
 NEDC cold back al banco (report S.08.2155.2016 del 25/11/2016).  
 NEDC hot back al banco (report S.08.2156.2016 del 25/11/2016).  
 NEDC cold su pista lim. 70km/h (report NEDC\_Cold\_020217 del 02/02/2017 + profilo vel.)  
 NEDC hot su pista lim. 70km/h (report NEDC\_Hot\_020217 del 02/02/2017 + profilo vel.)

I FUNZIONARI DEL CENTRO PROVA AUTOVEICOLI TORINO

VISTO  
IL DIRETTORE

Dott. Ing. Pietro GERACI

I risultati di misura riportati nel presente rapporto sono stati ottenuti applicando le norme/procedure/protocolli/regolamenti/direttive indicati e si riferiscono ai soli oggetti provati. Le incertezze di misura, quando indicate, sono espresse come incertezza estesa con fattore di copertura  $k=2$ , che per una distribuzione normale corrisponde ad un livello di confidenza di circa il 95%.

The measurement results reported in this document were obtained following the standards / procedures / protocols / regulation / directives reported and them refer to the tested objects only. The uncertainties of measurement stated in this report are calculated as a standard uncertainty multiplied by a coverage factor  $k=2$ , corresponding, in the case of a normal distribution, to a confidence level of about 95%.

È vietato riprodurre il presente documento, ed i relativi allegati, senza l'autorizzazione scritta del Laboratorio.  
 It is forbidden to reproduce the present document and relative enclosures, without written authorization of the Laboratory.  
 Il testo ufficiale del presente verbale è in lingua italiana. Quello in lingua inglese è da considerarsi solo come fonte di consultazione.  
 The official text of this test report is only in Italian. The English version is for reference only.

Department --- OMOLOGAZIONE

Test date : 02.05.2016

**Vehicle data**

Vehicle ID ----- 846.1  
 Vehicle model ----- NUOVA YPSILON START & STOP F5  
 Transmission type ----- M5  
 Odometer (before Test) ----- 18659 km  
 Tire pressure ----- 2.2 bar  
 VIN ----- 05015878  
 CVS flow ----- 9,0 m3/min

**Fuel data**

Fuel type ----- GASOLIO EURO 5  
 Batch No.----- 202  
 Calculation instruction ----- DIESEL  
 Density ----- 0,835 g/cm3 [15°C]  
 Carbon percentage ----- 86,6 %  
 NHV ----- 16438,9 btu/lb

**Dyno data**

Inertia ----- 1130 kg  
 Dyno load ----- F0/F1/F2 12,0 / 0,240 / 0,0327

**Add. data**

Driver ----- catanzaro  
 Operator ----- S8OP  
 aux table ----- NO\_AUX  
 Range switch table -----  
 Fan speed polynom ----- EU

**Reference**

Regulatory frame ----- EU  
 Ref. temp. ----- 273,15 K  
 Ref. Pressure ----- 1013,3 mbar  
 Calculation Regulatory ----- EU5

**Test reference data:**

GECOM Request No.-----  
 Richiedente----- DARGENIO SOTGIU

**Remarks**

Test rem. -----  
 Customer ----- TRAZIONE ANT POSTS EQUENZIALE CICLO FREDDO  
 Operator ----- /

**Phase Results**

	HC	CO	CO2	NOx	NO2	N2O	NMHC	CH4	Fuel cons.	Particulate
	[mg/km]	[mg/km]	[g/km]	[mg/km]	[mg/km]	[mg/km]	[mg/km]	[mg/km]	[l/100km]	[mg/km]
<i>Phase 1</i>										
<b>Bag</b>	95,000	443,000	136,136	147,000					5,20	0,7230
<b>Modal</b>										
<i>Phase 2</i>										
<b>Bag</b>	5,000	4,000	95,377	122,000					3,62	
<b>Modal</b>										
<b>Bag</b>										
<b>Modal</b>										
<i>Phase 1</i>										
<b>Pre cat avg</b>	HC [ppm]	CO [ppm]	CO2 [%]	NOx [ppm]	O2 [%]	CH4 [ppm]				
<b>Post cat avg</b>										
<b>Cat. efficiency</b>										
<b>Raw/Bag</b>										
<i>Phase 2</i>										
<b>Pre cat avg</b>										
<b>Post cat avg</b>										
<b>Cat. efficiency</b>										
<b>Raw/Bag</b>										
<b>Pre cat avg</b>										
<b>Post cat avg</b>										
<b>Cat. efficiency</b>										
<b>Raw/Bag</b>										
<b>Pre cat avg</b>										
<b>Post cat avg</b>										
<b>Cat. efficiency</b>										
<b>Raw/Bag</b>										

**Total Results**

Bag	HC	CO	CO2	NOx	NO2	N2O	NMHC	HC + NOx	Fuel ecor	Particulate
	[mg/km]	[mg/km]	[g/km]	[mg/km]	[mg/km]	[mg/km]	[mg/km]	[mg/km]	[l/100km]	[mg/km]
	<b>38,090</b>	<b>165,144</b>	<b>110,33</b>	<b>130,980</b>				<b>169,070</b>	<b>4,20</b>	<b>0,7230</b>

**Time Control**

Test Date: 02.05.2016      Start of test 1:15:23 PM      Start of trace 1:43:49 PM  
 End of test 2:13:12 PM      End of trace 2:03:29 PM

Department --- OMOLOGAZIONE

Test date : 02.05.2016

**Vehicle data**

Vehicle ID ----- **846.1**  
 Vehicle model ----- NUOVA YPSILON START & S  
 Transmission type ----- M5  
 Odometer (before Test) ----- 18659 km  
 Tire pressure ----- 2.2 bar  
 VIN ----- 05015878  
 CVS flow ----- 9,0 m3/min

**Fuel data**

Fuel type ----- GASOLIO EURO 5  
 Batch No. ----- 202  
 Calculation instruction ----- DIESEL  
 Density ----- 0,835 g/cm3 [15°C]  
 Carbon percentage ----- 86,6 %  
 NHV ----- 16438,9 btu/lb

**Dyno data**

Inertia ----- 1130 kg  
 Dyno load ----- F0/F1/F2 12,0 / 0,240 / 0,0327

**Add. data**

Driver ----- catanzaro  
 Operator ----- S8OP  
 AUX table ----- NO\_AUX  
 Range switch table -----  
 Fan speed polynom ----- EU

**Reference**

Regulatory frame ----- EU  
 Ref. temp. ----- 273,15 K  
 Ref. Pressure ----- 1013,3 mbar  
 Calculation Regulatory ----- EU5

**Test reference data:**

GECOM Request No. -----  
 Richiedente ----- DARGENIO SOTGIU

**Remarks**

Test rem. -----  
 Customer ----- TRAZIONE ANT POSTS EQUENZIALE CICLO FREDDO  
 Operator ----- /

**Phase Results**

	1	2		Phase
Barometric pressure	98,44	98,44		kPa
Ambient air temperature	20,03	20,20		°C
Relative humidity	55,56	58,44		%
NOx correction factor	0,9276	0,9428		
Dilution factor	46,076	20,753		
CVS volume corrected (273,15K)	104,976	53,821		m <sup>3</sup>
Average CVS temperature	39,8	39,8		°C
Average CVS pressure PV	96,1	96,1		kPa
DLS volume corrected (273,15K)	0,6502	0,3332		m <sup>3</sup>
Average torque at dyno	28,1	184,1		N
Minimum oil temperature				°C
Distance	4,016	6,932		km
Drivers violation	0,3	0,0		sec

**Particulate results**

	1	2		Phase
Main filter before test	90,538			mg
Main filter after test	90,587			mg
Backup filter before test				mg
Backup filter after test				mg
Payload main filter	0,049			mg
Payload backup filter				mg
Efficiency of main filter				%
Calculated payload				mg
mass emission	0,0079			g
mass emission per distance	0,7230			mg/km

**TEOM results**

Payload				mg
TEOM mass emission				g
TEOM mass emission per distance				mg/km
Efficiency TEOM/gravimetric				%

**Particulate total results**

**Remarks**

Total emission 0,0079 g  
 Total emission per total distance 0,7230 mg/km

**Particulate Counter total results**

Total counts: 4,4812E+11  
 Tot.counts/ 4,0932E+10 1/km  
 Tot.distance

**Weighing chamber data**

Chamber temperature: 22,00 °C  
 Chamber pressure: 984,00 kPa  
 Buoyancy correction factor: 1,000358E+00

**Setup/Checks Particulate Counter**

CPCCFK 1,0571 unity  
 PND1 10 unity  
 PND2 15 unity  
 PCRF 168,74 unity  
 System Ckeck O.K? YES  
 Zero Count 0,01485 1/cm<sup>3</sup>

Department --- OMOLOGAZIONE

Test date : 02.05.2016

**Vehicle data**

Vehicle ID ----- 846.1  
 Vehicle model ----- NUOVA YPSILON START & STOP F5  
 Transmission type ----- M5  
 Odometer (before Test) ----- 18670 km  
 Tire pressure ----- 2.2 bar  
 VIN ----- 05015878  
 CVS flow ----- 9,0 m3/min

**Fuel data**

Fuel type ----- GASOLIO EURO 5  
 Batch No.----- 202  
 Calculation instruction ----- DIESEL  
 Density ----- 0,835 g/cm3 [15 °C]  
 Carbon percentage ----- 86,6 %  
 NHV ----- 16438,9 btu/lb

**Dyno data**

Inertia ----- 1130 kg  
 Dyno load ----- F0/F1/F2 12,0 / 0,240 / 0,0327

**Add. data**

Driver ----- dangelo  
 Operator ----- S8OP  
 aux table ----- NO\_AUX  
 Range switch table -----  
 Fan speed polynom ----- EU

**Reference**

Regulatory frame ----- EU  
 Ref. temp. ----- 273,15 K  
 Ref. Pressure ----- 1013,3 mbar  
 Calculation Regulatory ----- EU5

**Test reference data:**

GECOM Request No.-----  
 Richiedente----- DARGENIO SOTGIU

**Remarks**

Test rem. -----  
 Customer ----- TRAZIONE ANT POSTS EQUENZIALE CICLO CALDO  
 Operator ----- /

**Phase Results**

	HC	CO	CO2	NOx	NO2	N2O	NMHC	CH4	Fuel cons.	Particulate
	[mg/km]	[mg/km]	[g/km]	[mg/km]	[mg/km]	[mg/km]	[mg/km]	[mg/km]	[l/100km]	[mg/km]
<i>Phase 1</i>										
<b>Bag</b>	39,000	60,000	118,653	236,000					4,51	0,7073
<b>Modal</b>										
<i>Phase 2</i>										
<b>Bag</b>	8,000	5,000	97,125	467,000					3,68	
<b>Modal</b>										
<b>Bag</b>										
<b>Modal</b>										
<i>Phase 1</i>										
<b>Pre cat avg</b>	HC [ppm]	CO [ppm]	CO2 [%]	NOx [ppm]	O2 [%]	CH4 [ppm]				
<b>Post cat avg</b>										
<b>Cat. efficiency</b>										
<b>Raw/Bag</b>										
<i>Phase 2</i>										
<b>Pre cat avg</b>										
<b>Post cat avg</b>										
<b>Cat. efficiency</b>										
<b>Raw/Bag</b>										
<b>Pre cat avg</b>										
<b>Post cat avg</b>										
<b>Cat. efficiency</b>										
<b>Raw/Bag</b>										
<b>Pre cat avg</b>										
<b>Post cat avg</b>										
<b>Cat. efficiency</b>										
<b>Raw/Bag</b>										

**Total Results**

Bag	HC	CO	CO2	NOx	NO2	N2O	NMHC	HC + NOx	Fuel ecor	Particulate
	[mg/km]	[mg/km]	[g/km]	[mg/km]	[mg/km]	[mg/km]	[mg/km]	[mg/km]	[l/100km]	[mg/km]
	<b>19,200</b>	<b>24,954</b>	<b>105,00</b>	<b>382,080</b>				<b>401,280</b>	<b>3,99</b>	<b>0,7073</b>

**Time Control**

Test Date: 02.05.2016      Start of test 2:25:00 PM      Start of trace 2:37:00 PM  
 End of test 3:18:22 PM      End of trace 2:56:40 PM

Department --- OMOLOGAZIONE

Test date : 02.05.2016

**Vehicle data**

Vehicle ID ----- **846.1**  
 Vehicle model ----- NUOVA YPSILON START & S  
 Transmission type ----- M5  
 Odometer (before Test) ----- 18670 km  
 Tire pressure ----- 2.2 bar  
 VIN ----- 05015878  
 CVS flow ----- 9,0 m3/min

**Fuel data**

Fuel type ----- GASOLIO EURO 5  
 Batch No. ----- 202  
 Calculation instruction ----- DIESEL  
 Density ----- 0,835 g/cm3 [15°C]  
 Carbon percentage ----- 86,6 %  
 NHV ----- 16438,9 btu/lb

**Dyno data**

Inertia ----- 1130 kg  
 Dyno load ----- F0/F1/F2 12,0 / 0,240 / 0,0327

**Add. data**

Driver ----- dangelo  
 Operator ----- S8OP  
 AUX table ----- NO\_AUX  
 Range switch table -----  
 Fan speed polynom ----- EU

**Reference**

Regulatory frame ----- EU  
 Ref. temp. ----- 273,15 K  
 Ref. Pressure ----- 1013,3 mbar  
 Calculation Regulatory ----- EU5

**Test reference data:**

GECOM Request No. -----  
 Richiedente ----- DARGENIO SOTGIU

**Remarks**

Test rem. -----  
 Customer ----- TRAZIONE ANT POSTS EQUENZIALE CICLO CALDO  
 Operator ----- /

**Phase Results**

	1	2		Phase
Barometric pressure	98,43	98,43		kPa
Ambient air temperature	20,24	20,29		°C
Relative humidity	58,91	58,12		%
NOx correction factor	0,9456	0,9429		
Dilution factor	52,795	20,381		
CVS volume corrected (273,15K)	104,979	53,814		m <sup>3</sup>
Average CVS temperature	39,7	39,8		°C
Average CVS pressure PV	96,1	96,1		kPa
DLS volume corrected (273,15K)	0,6502	0,3331		m <sup>3</sup>
Average torque at dyno	28,4	184,2		N
Minimum oil temperature				°C
Distance	4,003	6,937		km
Drivers violation	0,7	0,0		sec

**Particulate results**

	1	2		Phase
Main filter before test	88,411			mg
Main filter after test	88,459			mg
Backup filter before test				mg
Backup filter after test				mg
Payload main filter	0,048			mg
Payload backup filter				mg
Efficiency of main filter				%
Calculated payload				mg
mass emission	0,0077			g
mass emission per distance	0,7073			mg/km

**TEOM results**

Payload				mg
TEOM mass emission				g
TEOM mass emission per distance				mg/km
Efficiency TEOM/gravimetric				%

**Particulate total results**

**Remarks**

Total emission 0,0077 g  
 Total emission per total distance 0,7073 mg/km

**Particulate Counter total results**

Total counts: 2,1541E+11  
 Tot.counts/ 1,9690E+10  
 Tot.distance 1/km

**Weighing chamber data**

Chamber temperature: 22,00 °C  
 Chamber pressure: 984,00 kPa  
 Buoyancy correction factor: 1,000358E+00

**Setup/Checks Particulate Counter**

CPCCFK 1,0571 unity  
 PND1 10 unity  
 PND2 15 unity  
 PCRF 168,74 unity  
 System Ckeck O.K? YES  
 Zero Count 0,01633 1/cm<sup>3</sup>

Department --- OMOLOGAZIONE

Test date : 25.11.2016

**Vehicle data**

Vehicle ID ----- 846.12  
Vehicle model ----- N.YPSILON 1248 SDE S&S E5  
Transmission type ----- M5  
Odometer (before Test) ----- 12602 km  
Tire pressure ----- 2.3 bar  
VIN ----- 05174617  
CVS flow ----- 9,0 m3/min

**Fuel data**

Fuel type ----- GASOLIO EURO 5  
Batch No. ----- 202  
Calculation instruction ----- DIESEL  
Density ----- 0,835 g/cm3 [15°C]  
Carbon percentage ----- 86,6 %  
NHV ----- 16438,9 btu/lb

**Dyno data**

Inertia ----- 1130 kg  
Dyno load ----- F0/F1/F2 9,0 / 0,280 / 0,0325

**Add. data**

Driver ----- CATANZARO  
Operator ----- S8OP  
aux table ----- NO\_AUX  
Range switch table ----- STANDARD  
Fan speed polynom ----- EU

**Reference**

Regulatory frame ----- EU  
Ref. temp. ----- 273,15 K  
Ref. Pressure ----- 1013,3 mbar  
Calculation Regulatory ----- EU5

**Test reference data:**

GECOM Request No. -----  
Richiedente -----

**Remarks**

Test rem. ----- TEST COLD  
Customer ----- TRAZIONE ANT POST SEQUENZ MARCIA I-V CICLO FREDDO  
Operator ----- /

**Phase Results**

	HC [mg/km]	CO [mg/km]	CO2 [g/km]	NOx [mg/km]	NO2 [mg/km]	N2O [mg/km]	NMHC [mg/km]	CH4 [mg/km]	Fuel cons. [l/100km]	Particulate [mg/km]
<b>Phase 1</b>										
Bag	16,000	86,000	107,559	181,000					4,09	0,1010
Modal										
<b>Phase 2</b>										
Bag	18,000	6,000	116,930	261,000					4,44	
Modal										
Bag										
Modal										
Bag										
Modal										
<b>Phase 1</b>	HC [ppm]	CO [ppm]	CO2 [%]	NOx [ppm]	O2 [%]	CH4 [ppm]				
Pre cat avg										
Post cat avg										
Cat. efficiency										
Raw/Bag										
<b>Phase 2</b>										
Pre cat avg										
Post cat avg										
Cat. efficiency										
Raw/Bag										
Pre cat avg										
Post cat avg										
Cat. efficiency										
Raw/Bag										
Pre cat avg										
Post cat avg										
Cat. efficiency										
Raw/Bag										

**Total Results**

Bag	HC [mg/km]	CO [mg/km]	CO2 [g/km]	NOx [mg/km]	NO2 [mg/km]	N2O [mg/km]	NMHC [mg/km]	HC + NOx [mg/km]	Fuel econ [l/100km]	Particulate [mg/km]
	16,850	56,793	111,01	210,330				227,180	4,22	0,1010

**Time Control**

Test Date: 25.11.2016      Start of test 11:33:08 AM      Start of trace 11:47:26 AM  
End of test 12:16:50 PM      End of trace 12:07:06 PM

Department --- OMOLOGAZIONE

Test date : 25.11.2016

**Vehicle data**

Vehicle ID ----- 846.12  
Vehicle model ----- N.YPSILON 1248 SDE S&S E5  
Transmission type ----- M5  
Odometer (before Test) ----- 12602 km  
Tire pressure ----- 2.3 bar  
VIN ----- 05174617  
CVS flow ----- 9,0 m3/min

**Fuel data**

Fuel type ----- GASOLIO EURO 5  
Batch No. ----- 202  
Calculation instruction ----- DIESEL  
Density ----- 0,835 g/cm3 [15°C]  
Carbon percentage ----- 86,6 %  
NHV ----- 16438,9 btu/lb

**Dyno data**

Inertia ----- 1130 kg  
Dyno load ----- FDF1/F2 9,0 / 0,280 / 0,0325

**Add. data**

Driver ----- CATANZARO  
Operator ----- S8OP  
AUX table ----- NO\_AUX  
Range switch table ----- STANDARD  
Fan speed polynom ----- EU

**Reference**

Regulatory frame ----- EU  
Ref. temp. ----- 273,15 K  
Ref. Pressure ----- 1013,3 mbar  
Calculation Regulatory ----- EU5

**Test reference data:**

GECOM Request No. -----  
Richiedente -----

**Remarks**

Test rem. ----- TEST COLD  
Customer ----- TRAZIONE ANT POST SEQUENZ MARCIA I-V CICLO FREDDO  
Operator ----- /

**Phase Results**

	1	2		Phase
Barometric pressure	98,52	98,53		kPa
Ambient air temperature	22,72	22,18		°C
Relative humidity	51,47	51,52		%
NOx correction factor	0,9499	0,9414		
Dilution factor	17,802	48,148		
CVS volume corrected (273,15K)	53,865	104,931		m <sup>3</sup>
Average CVS temperature	39,8	39,8		°C
Average CVS pressure PV	96,1	96,1		kPa
DLS volume corrected (273,15K)	0,3334	0,6498		m <sup>3</sup>
Average torque at dyno	184,2	27,1		N
Minimum oil temperature				°C
Distance	6,972	4,068		km
Drivers violation	0,0	0,0		sec

**Particulate results**

	1	2		Phase
Main filter before test	93,729			mg
Main filter after test	93,735			mg
Backup filter before test				mg
Backup filter after test				mg
Payload main filter	0,007			mg
Payload backup filter				mg
Efficiency of main filter				%
Calculated payload				mg
mass emission	0,0011			g
mass emission per distance	0,1010			mg/km

**TEOM results**

Payload				mg
TEOM mass emission				g
TEOM mass emission per distance				mg/km
Efficiency TEOM/gravimetric				%

**Particulate total results**

Remarks  
Total emission 0,0011 g  
Total emission per total distance 0,1010 mg/km

**Particulate Counter total results**

Total counts: 1,7025E+12  
Tot.counts/ 1,5421E+11 1/km  
Tot.distance

**Weighing chamber data**

Chamber temperature: 22,50 °C  
Chamber pressure: 991,60 kPa  
Buoyancy correction factor: 1,000361E+00

**Setup/Checks Particulate Counter**

CPCCFK 1,066 unity  
PND1 10 unity  
PND2 15 unity  
PCRF 167,39 unity  
System Ccheck O.K? YES  
Zero Count 0,006731 1/cm<sup>3</sup>

Department --- OMOLOGAZIONE

Test date : 25.11.2016

**Vehicle data**

Vehicle ID ----- 846.12  
 Vehicle model ----- N.YPSILON 1248 SDE S&S E5  
 Transmission type ----- M5  
 Odometer (before Test) ----- 12602 km  
 Tire pressure ----- 2.3 bar  
 VIN ----- 05174617  
 CVS flow ----- 9,0 m3/min

**Fuel data**

Fuel type ----- GASOLIO EURO 5  
 Batch No. ----- 202  
 Calculation instruction ----- DIESEL  
 Density ----- 0,835 g/cm3 [15°C]  
 Carbon percentage ----- 86,6 %  
 NHV ----- 16438,9 btu/lb

**Dyno data**

Inertia ----- 1130 kg  
 Dyno load ----- F0/F1/F2 9,0 / 0,280 / 0,0325

**Add. data**

Driver ----- CATANZARO  
 Operator ----- SEOP  
 AUX table ----- NO\_AUX  
 Range switch table ----- STANDARD  
 Fan speed polynom ----- EU

**Reference**

Regulatory frame --- EU  
 Ref. temp. ----- 273,15 K  
 Ref. Pressure ----- 1013,3 mbar  
 Calculation Regulatory --- EU5

**Test reference data:**

GECOM Request No. -----  
 Richiedente -----

**Remarks**

Test rem. --- TEST COLD  
 Customer --- TRAZIONE ANT POST SEQUENZ MARCIA I-V CICLO FREDDO  
 Operator --- /

**Phase Results**

	1	2		Phase
Barometric pressure	98,52	98,53		kPa
Ambient air temperature	22,72	22,18		°C
Relative humidity	51,47	51,52		%
NOx correction factor	0,9489	0,9414		
Dilution factor	17,802	48,148		
CVS volume corrected (273,15K)	53,865	104,931		m <sup>3</sup>
Average CVS temperature	39,8	39,8		°C
Average CVS pressure PV	96,1	96,1		kPa
DLS volume corrected (273,15K)	0,3334	0,6498		m <sup>3</sup>
Average force at dyno	184,2	27,1		N
Minimum oil temperature				°C
Distance	6,972	4,068		km
Drivers violation	0,0	0,0		sec

**Bag Analysis**

	1	2		Phase
Concentration sample THC	5,790	3,758		ppmC1
Concentration ambient THC	2,621	2,660		ppmC1
Emission THC	0,111	0,075		g/Phase
Emission THC	16,000	18,000		mg/km
Concentration sample CH4				ppm
Concentration ambient CH4				ppm
Emission CH4				g/Phase
Emission CH4				mg/km
Concentration sample NMHC				ppmC1
Concentration ambient NMHC				ppmC1
Emission NMHC				g/Phase
Emission NMHC				mg/km
Concentration sample CO	9,796	1,088		ppm
Concentration ambient CO	0,888	0,926		ppm
Emission CO	0,603	0,024		g/Phase
Emission CO	86,000	6,000		mg/km
Concentration sample NOx	12,020	5,258		ppm
Concentration ambient NOx	0,019	0,007		ppm
Emission NOx	1,259	1,063		g/Phase
Emission NOx	181,000	261,000		mg/km
Concentration sample NO2				ppm
Concentration ambient NO2				ppm
Emission NO2				g/Phase
Emission NO2				mg/km
Concentration sample N2O				ppm
Concentration ambient N2O				ppm
Emission N2O				g/Phase
Emission N2O				mg/km
Concentration sample CO2	0,757	0,280		%
Concentration ambient CO2	0,051	0,050		%
Emission CO2	749,904	475,670		g/Phase
Emission CO2	107,559	116,930		g/km
Fuel consumption	4,09	4,44		l/100km

**Total Results**

Emission per total distance [mg/km]	HC	CO	CO2	NOx	NMHC	HC + Nox
	16,850	56,793	111,012	210,330		227,180
Fuel consumption [l/100km]	4,22			NO2	N2O	

Department -- OMOLOGAZIONE

Test date : 25.11.2016

**Vehicle data**

Vehicle ID ----- 846.12  
 Vehicle model ----- N.YPSILON 1248 SDE S&S E5  
 Transmission type ----- M5  
 Odometer (before Test) ----- 12614 km  
 Tire pressure ----- 2.3 bar  
 VIN ----- 05174617  
 CVS flow ----- 9.0 m3/min

**Fuel data**

Fuel type ----- GASOLIO EURO 5  
 Batch No. ----- 202  
 Calculation instruction ----- DIESEL  
 Density ----- 0,835 g/cm3 [15°C]  
 Carbon percentage ----- 86,6 %  
 NHV ----- 16438,9 btu/lb

**Dyno data**

Inertia ----- 1130 kg  
 Dyno load ----- FQ/F1/F2 9,0 / 0,280 / 0,0325

**Add. data**

Driver ----- CATANZARO  
 Operator ----- S8OP  
 aux table ----- NO AUX  
 Range switch table ----- STANDARD  
 Fan speed polynom ----- EU

**Reference**

Regulatory frame ----- EU  
 Ref. temp. ----- 273,15 K  
 Ref. Pressure ----- 1013,3 mbar  
 Calculation Regulatory ----- EU5

**Test reference data:**

GECOM Request No. -----  
 Richiedente -----

**Remarks**

Test rem. ----- TEST HOT  
 Customer ----- TRAZIONE ANT POST SEQUENZ MARCIA I-V CICLO CALDO  
 Operator ----- /

**Phase Results**

	HC [mg/km]	CO [mg/km]	CO2 [g/km]	NOx [mg/km]	NO2 [mg/km]	N2O [mg/km]	NMHC [mg/km]	CH4 [mg/km]	Fuel cons. [l/100km]	Particulate [mg/km]
<b>Phase 1</b>										
Bag	9,000	12,000	96,149	275,000					3,65	0,2707
Modal										
<b>Phase 2</b>										
Bag	25,000	8,000	119,921	437,000					4,55	
Modal										
Bag										
Modal										
Bag										
Modal										
<b>Phase 1</b>										
Pre cat avg	HC [ppm]	CO [ppm]	CO2 [%]	NOx [ppm]	O2 [%]	CH4 [ppm]				
Post cat avg										
Cat. efficiency										
Raw/Bag										
<b>Phase 2</b>										
Pre cat avg										
Post cat avg										
Cat. efficiency										
Raw/Bag										
Pre cat avg										
Post cat avg										
Cat. efficiency										
Raw/Bag										
Pre cat avg										
Post cat avg										
Cat. efficiency										
Raw/Bag										

**Total Results**

Bag	HC [mg/km]	CO [mg/km]	CO2 [g/km]	NOx [mg/km]	NO2 [mg/km]	N2O [mg/km]	NMHC [mg/km]	HC + NOx [mg/km]	Fuel econ [l/100km]	Particulate [mg/km]
	14,670	10,506	104,93	334,750				349,420	3,98	0,2707

**Time Control**

Test Date: 25.11.2016      Start of test 12:19:15 PM      Start of trace 12:36:21 PM  
 End of test 1:05:42 PM      End of trace 12:56:01 PM

*Handwritten signature and date: 25/11/16*

Department -- OMOLOGAZIONE

Test date : 25.11.2016

**Vehicle data**

Vehicle ID ----- 846.12  
Vehicle model ----- N.YPSILON 1248 SDE S&S E5  
Transmission type ----- M5  
Odometer (before Test) ----- 12614 km  
Tire pressure ----- 2.3 bar  
VIN ----- 05174817  
CVS flow ----- 9,0 m3/min

**Fuel data**

Fuel type ----- GASOLIO EURO 5  
Batch No. ----- 202  
Calculation instruction ----- DIESEL  
Density ----- 0,835 g/cm3 [15°C]  
Carbon percentage ----- 86,6 %  
NHV ----- 16438,9 btu/lb

**Dyno data**

Inertia ----- 1130 kg  
Dyno load ----- F0/F1/F2 9,0 / 0,260 / 0,0325

**Add. data**

Driver ----- CATANZARO  
Operator ----- S&OP  
AUX table ----- NO\_AUX  
Range switch table ----- STANDARD  
Fan speed polynom ----- EU

**Reference**

Regulatory frame ----- EU  
Ref. temp. ----- 273,15 K  
Ref. Pressure ----- 1013,3 mbar  
Calculation Regulatory ----- EU5

**Test reference data:**

GECOM Request No. -----  
Richiedente -----

**Remarks**

Test rem. ----- TEST HOT  
Customer ----- TRAZIONE ANT POST SEQUENZ MARCIA I-V CICLO CALDO  
Operator ----- /

**Phase Results**

	1	2		Phase
Barometric pressure	98,53	98,51		kPa
Ambient air temperature	22,67	22,04		°C
Relative humidity	51,47	51,54		%
NOx correction factor	0,9492	0,9394		
Dilution factor	19,841	47,187		
CVS volume corrected (273,15K)	53,883	104,892		m <sup>3</sup>
Average CVS temperature	39,8	39,9		°C
Average CVS pressure PV	95,1	96,1		kPa
DLS volume corrected (273,15K)	0,3335	0,6498		m <sup>3</sup>
Average force at dyno	184,7	27,1		N
Minimum oil temperature				°C
Distance	6,963	4,076		km
Drivers violation	0,0	0,0		sec

**Bag Analysis**

	1	2		Phase
Concentration sample THC	4,319	4,051		ppmC1
Concentration ambient THC	2,585	2,578		ppmC1
Emission THC	0,062	0,100		g/Phase
Emission THC	9,000	25,000		mg/km
Concentration sample CH4				ppm
Concentration ambient CH4				ppm
Emission CH4				g/Phase
Emission CH4				mg/km
Concentration sample NMHC				ppmC1
Concentration ambient NMHC				ppmC1
Emission NMHC				g/Phase
Emission NMHC				mg/km
Concentration sample CO	1,893	0,889		ppm
Concentration ambient CO	0,696	0,653		ppm
Emission CO	0,083	0,033		g/Phase
Emission CO	12,000	8,000		mg/km
Concentration sample NOx	18,200	8,840		ppm
Concentration ambient NOx	-0,038	0,009		ppm
Emission NOx	1,912	1,784		g/Phase
Emission NOx	275,000	437,000		mg/km
Concentration sample NO2				ppm
Concentration ambient NO2				ppm
Emission NO2				g/Phase
Emission NO2				mg/km
Concentration sample N2O				ppm
Concentration ambient N2O				ppm
Emission N2O				g/Phase
Emission N2O				mg/km
Concentration sample CO2	0,680	0,286		%
Concentration ambient CO2	0,050	0,049		%
Emission CO2	669,466	489,036		g/Phase
Emission CO2	96,149	119,921		g/km
Fuel consumption	3,65	4,55		l/100km

**Total Results**

Emission per	HC	CO	CO2	NOx	NMHC	HC + Nox
total distance [mg/km]	14,670	10,506	104,929	334,750		349,420
Fuel consumption [l/100km]	3,98			NO2	N2O	

Department --- OMOLOGAZIONE

Test date : 25.11.2016

**Vehicle data**

Vehicle ID ----- 846.12  
Vehicle model ----- N.YPSILON 1248 SDE S&S E5  
Transmission type ----- M5  
Odometer (before Test) ----- 12614 km  
Tire pressure ----- 2.3 bar  
VIN ----- 05174617  
CVS flow ----- 9,0 m3/min

**Fuel data**

Fuel type ----- GASOLIO EURO 5  
Batch No. ----- 202  
Calculation instruction ----- DIESEL  
Density ----- 0,835 g/cm3 [15°C]  
Carbon percentage ----- 86,6 %  
NHV ----- 16438,9 btu/lb

**Dyno data**

Inertia ----- 1130 kg  
Dyno load ----- F0/F1/F2 9,0 / 0,280 / 0,0325

**Add. data**

Driver ----- CATANZARO  
Operator ----- S8OP  
AUX table ----- NO\_AUX  
Range switch table ----- STANDARD  
Fan speed polynom ----- EU

**Reference**

Regulatory frame ----- EU  
Ref. temp. ----- 273,15 K  
Ref. Pressure ----- 1013,3 mbar  
Calculation Regulatory ----- EU5

**Test reference data:**

GECOM Request No. -----  
Richiedente -----

**Remarks**

Test rem. ----- TEST HOT  
Customer ----- TRAZIONE ANT POST SEQUENZ MARCIA I-V CICLO CALDO  
Operator ----- /

**Phase Results**

	1	2		Phase
Barometric pressure	98,53	98,51		kPa
Ambient air temperature	22,67	22,04		°C
Relative humidity	51,47	51,54		%
NOx correction factor	0,9492	0,9394		
Dilution factor	19,841	47,187		
CVS volume corrected (273,15K)	53,883	104,892		m <sup>3</sup>
Average CVS temperature	38,8	39,9		°C
Average CVS pressure PV	96,1	96,1		kPa
DLS volume corrected (273,15K)	0,3335	0,6498		m <sup>3</sup>
Average torque at dyno	184,7	27,1		N
Minimum oil temperature				°C
Distance	6,963	4,078		km
Drivers violation	0,0	0,0		sec

**Particulate results**

	1	2		Phase
Main filter before test	90,459			mg
Main filter after test	90,478			mg
Backup filter before test				mg
Backup filter after test				mg
Payload main filter	0,019			mg
Payload backup filter				mg
Efficiency of main filter				%
Calculated payload				mg
mass emission	0,0030			g
mass emission per distance	0,2707			mg/km

**TEOM results**

Payload				mg
TEOM mass emission				g
TEOM mass emission per distance				mg/km
Efficiency TEOM/gravimetric				%

**Particulate total results**

Remarks  
Total emission 0,0030 g  
Total emission per total distance 0,2707 mg/km

**Particulate Counter total results**

Total counts: 9,2911E+11  
Tot.counts/ 8,4151E+10 1/km  
Tot.distance

**Weighing chamber data**

Chamber temperature: 22,50 °C  
Chamber pressure: 991,30 kPa  
Buoyancy correction factor: 1,000360E+00

**Setup/Checks Particulate Counter**

CPCCFK 1,066 unity  
PND1 10 unity  
PND2 15 unity  
PCRF 167,39 unity  
System Ckeck O.K? YES  
Zero Count 0,01496 1/cm<sup>3</sup>

Case: Nedc\_Cold\_020217

Page: Trip Summary

'NTC Track'

Start Date: 02/02/2017

Start Time: 11:41:52.0



Concerto M.O.V.E. 2016

Trip Duration	1106.00	s	ave THC	0.00000	ppm	BS CO2	857.6941	g/kWh
Trip Duration (a)	1106.00	s	ave NMHC	0.00000	ppm	BS CO	2.27954	g/kWh
Trip Distance	8.06	km	ave CH4	0.00000	ppm	BS THC	0.00000	g/kWh
Trip Distance (a)	8.06	km	ave CO	154.50455	ppm	BS NMHC	0.00000	g/kWh
Trip Fuel Cons. (b)	0.30	kg	ave CO2	4.94302	%	BS CH4	0.00000	g/kWh
Trip Fuel Cons. (a,b)	0.30	kg	ave NOx	164.87037	ppm	BS NO (d)	0.86460	g/kWh
Trip Fuel Cons. EU (a,c)	0.29	kg	ave PM	0.00021	mg/m3	BS NO2	0.10481	g/kWh
Trip Fuel Cons. US (a,c)	0.31	kg	ave Soot meas	0.00000	mg/m3	BS NOx	0.96941	g/kWh
Trip Fuel Cons. Volume (b)	0.37	l	ave Soot	0.00021	mg/m3	BS Soot	0.00000	g/kWh
Trip Fuel Cons. Volume (a,b)	0.37	l	ave PN	n/a	#/cm3	BS Soot meas	0.00000	g/kWh
Trip Fuel Cons. Volume EU (a,c)	0.36	l	tot THC	0.00000	g	BS PM	0.00000	g/kWh
Trip Fuel Cons. Volume US (a,c)	0.38	l	tot NMHC	0.00000	g	BS PN	n/a	#/kWh
Trip Fuel Economy (b)	4.66	l/km100	tot CH4	2.68912	g	DS CO2	125.56812	g/km
Trip Fuel Economy (a,b)	4.66	l/km100	tot CO	1012.07904	g	DS CO	0.33373	g/km
Trip Fuel Economy EU (a,c)	4.48	l/km100	tot CO2	1.02023	g	DS THC	0.00000	g/km
Trip Fuel Economy US (a,c)	4.75	l/km100	tot NO (d)	0.12368	g	DS NMHC	0.00000	g/km
Trip Av. Eng. Speed	1344.77	rpm	tot NO2	1.14391	g	DS CH4	0.12658	g/km
Trip Av. Torque	22.74	Nm	tot NOx	0.00000	g	DS NO (d)	0.01534	g/km
Trip Av. Power	3.86	kW	tot Soot	0.00000	g	DS NOx	0.14192	g/km
Trip Work	1.18	kWh	tot Soot meas	0.00000	g	DS Soot	0.00000	g/km
Trip Av. Eng. Speed (a)	1344.77	rpm	tot PM	0.00000	g	DS Soot meas	0.00000	g/km
Trip Av. Torque (a)	22.74	Nm	tot PN	n/a	#	DS PM	0.00000	g/km
Trip Av. Power (a)	3.86	kW	PM measurement type	0.00000	alpha(HC)	DS PN	n/a	#/km
Trip Work (a)	1.18	kWh	PM correction type	1.00000	mg	FS CO2	3373.59680	g/kg
Trip Av. Humidity	56.64	%	tot Soot on PM filter (estim.)	0.00000	mg	FS CO	8.96620	g/kg
Trip Av. Amb. Temperature	16.07	degC	Soot --> PM simple scaling factor	0.00000	-	FS THC	0.00000	g/kg
Trip Av. Humidity (a)	56.64	%	Soot --> PM alpha scaling factor	0.00000	-	FS NMHC	0.00000	g/kg
Trip Av. Amb. Temperature (a)	16.07	degC	Trip Av. Veh. Speed	26.46686	km/h	FS CH4	0.00000	g/kg
			Trip Distance Share Urban	71.06022	% distance	FS NO (d)	3.40076	g/kg
			Trip Distance Share Rural	28.93978	% distance	FS NO2	0.41226	g/kg
			Trip Distance Share Motorway	0.00000	% distance	FS NOx	3.81303	g/kg
						FS Soot	0.00000	g/kg
						FS Soot meas	0.00000	g/kg
						FS PM	0.00000	g/kg
						FS PN	n/a	#/kg

(a) GAS PEMS measurement state only, (b) based on fuel rate input (ECU, Fuel Meter), (c) calculated from carbon balance  
 (d) NO calculated using molecular weight of NO2

PEMS Current Case:  
 D:\AVL Concerto\Work\Environments\PEMS\_Rel5\_B135\PEMS\Nardo\_Gen2017\Lancia846\_SDE\_95cv\_MT5\_E5\_telZLA31\_Cold\_020217.pms\_c  
 PEMS Result Filename:  
 D:\AVL Concerto\MyData\TransportFiles\846\_Nardo\_020217\_Nedc70\_Cold\_2.cif

Vehicle: Lancia 846 MJet E5+ / Tel ZLA31200005174617 Version: Rel5\_B135  
 Engine: SDE\_95cv / Diesel\_Cold\_020217.pms\_c  
 NOx Ambient Condition Corr.: 8 - NONE  
 Dry / Wet Corr.: 4 - NONE

2/2/17

Case: Nedc\_Cold\_020217

Page: Engine (1)

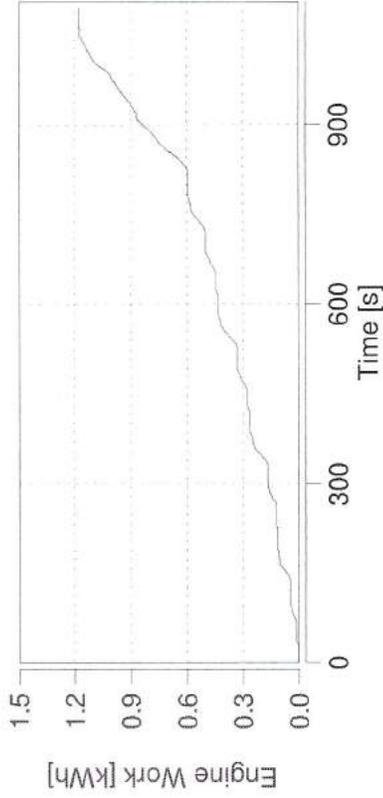
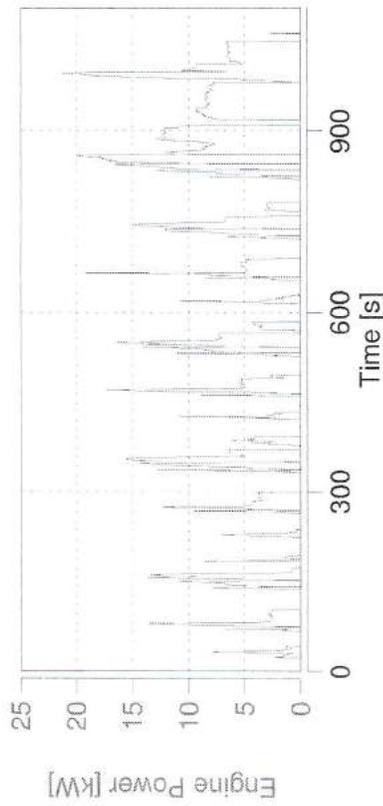
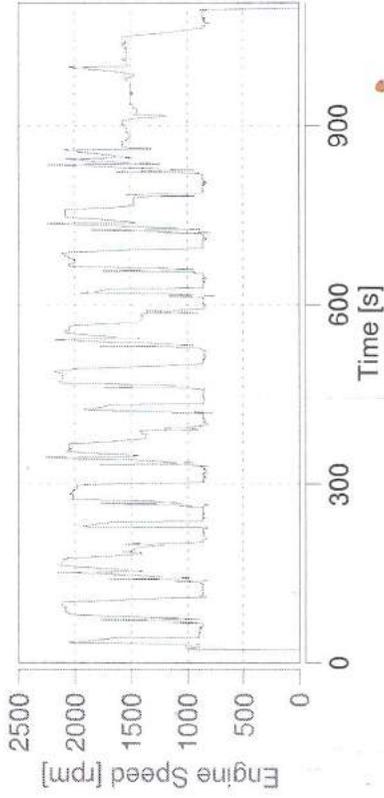
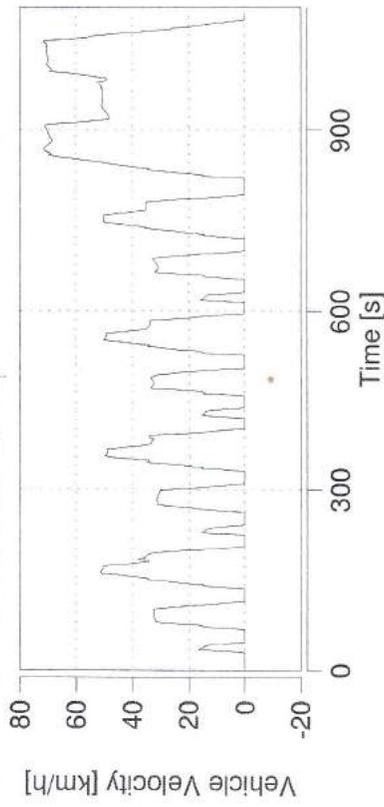
'NTC Track'

Start Date: 02/02/2017

Start Time: 11:41:52.0



Concerto M.O.V.E., 2016



PEMS Current Case: D:\AVL Concerto\Work\Environments\PEMS\_Rel5\_B135\PEMS\Nardo\_Gen2017\Lancia846\_SDE\_95cv\_MTS\_E5+\_telZLA31\_Vehicle: Lancia 846 Mulet E5+ / Tel ZLA31200005174617 Version: Rel5\_B135  
 PEMS Result Filename: D:\AVL Concerto\MyData\TransportFiles\846\_Nardo\_020217\_Nedc70\_Cold\_2.cif Engine: SDE\_95cv / Diesel\_Cold\_020217.pms\_c  
 NOx Ambient Condition Corr.: 8 - NONE  
 Dry / Wet Corr.: 4 - NONE

*Handwritten signature and date: 2/2/17*

Case: Nedc\_Hot\_020217

Page: Trip Summary

'NTC Track'

Start Date: 02/02/2017

Start Time: 12:23:50.0



Concerto M.O.V.E., 2016

Trip Duration	1103.00	s	ave THC	0.00000	ppm	BS CO2	980.83622	g/kWh
Trip Duration (a)	1103.00	s	ave NMHC	0.00000	ppm	BS CO	0.07271	g/kWh
Trip Distance	8.08	km	ave CH4	0.00000	ppm	BS THC	0.00000	g/kWh
Trip Distance (a)	8.08	km	ave CO	4.66936	ppm	BS NMHC	0.00000	g/kWh
Trip Fuel Cons. (b)	0.26	kg	ave CO2	4.26936	%	BS CH4	0.00000	g/kWh
Trip Fuel Cons. (a,b)	0.26	kg	ave NOx	177.31519	ppm	BS NO (d)	1.89502	g/kWh
Trip Fuel Cons. EU (a,c)	0.25	kg	ave PM	0.00006	mg/m3	BS NO2	0.36220	g/kWh
Trip Fuel Cons. US (a,c)	0.27	kg	ave Soot meas	0.00000	mg/m3	BS NOx	2.25722	g/kWh
Trip Fuel Cons. Volume (b)	0.32	l	ave Soot	0.00006	mg/m3	BS Soot	0.00000	g/kWh
Trip Fuel Cons. Volume (a,b)	0.32	l	ave PN	n/a	#/cm3	BS Soot meas	0.00000	g/kWh
Trip Fuel Cons. Volume EU (a,c)	0.31	l	tot THC	0.00000	g	BS PM	0.00000	g/kWh
Trip Fuel Cons. Volume US (a,c)	0.33	l	tot NMHC	0.00000	g	BS PN	n/a	#/kWh
Trip Fuel Economy (b)	4.06	l/km100	tot CH4	0.00000	g	DS CO2	109.25156	g/km
Trip Fuel Economy (a,b)	4.06	l/km100	tot CO	0.06544	g	DS CO	0.00810	g/km
Trip Fuel Economy EU (a,c)	3.95	l/km100	tot CO2	882.7526	g	DS THC	0.00000	g/km
Trip Fuel Economy US (a,c)	4.14	l/km100	tot NO (d)	1.70552	g	DS NMHC	0.00000	g/km
Trip Av. Eng. Speed	1346.68	rpm	tot NO2	0.32598	g	DS CH4	0.00000	g/km
Trip Av. Torque	17.64	Nm	tot NOx	2.03150	g	DS NO (d)	0.21108	g/km
Trip Av. Power	2.96	kW	tot Soot	0.00000	g	DS NO2	0.04034	g/km
Trip Work	0.90	kWh	tot Soot meas	0.00000	g	DS NOx	0.25142	g/km
Trip Av. Eng. Speed (a)	1346.68	rpm	tot PM	0.00000	g	DS Soot	0.00000	g/km
Trip Av. Torque (a)	17.64	Nm	tot PN	n/a	#	DS Soot meas	0.00000	g/km
Trip Av. Power (a)	2.96	kW	PM measurement type	0.00000	-	DS PM	0.00000	g/km
Trip Work (a)	0.90	kWh	PM correction type	1.00000	alpha(HC)	DS PN	n/a	#/km
Trip Av. Humidity	60.07	%	tot Soot on PM filter (estim.)	0.00000	mg	FS CO2	3395.20230	g/kg
Trip Av. Temperature	16.25	degC	Soot --> PM simple scaling factor	1.00000	-	FS CO	0.25169	g/kg
Trip Av. Humidity (a)	60.07	%	Soot --> PM alpha scaling factor	0.00000	-	FS THC	0.00000	g/kg
Trip Av. Temperature (a)	16.25	degC	Trip Av. Veh. Speed	26.60153	km/h	FS NMHC	0.00000	g/kg
			Trip Distance Share Urban	70.66538	% distance	FS NO (d)	0.00000	g/kg
			Trip Distance Share Rural	29.33462	% distance	FS NO2	1.25376	g/kg
			Trip Distance Share Motorway	0.00000	% distance	FS NOx	7.81346	g/kg
						FS Soot	0.00000	g/kg
						FS Soot meas	0.00000	g/kg
						FS PM	0.00000	g/kg
						FS PN	n/a	#/kg

(a) GAS PEMS measurement state only, (b) based on fuel rate input (ECU, Fuel Meter), (c) calculated from carbon balance  
(d) NO calculated using molecular weight of NO2

PEMS Current Case: D:\AVL Concerto\WorkEnvironment\PEMS\_Rel5\_B135\PEMS\Nardo\_Lancia846\_SDE\_95cv\_MTS\_E5+\_jef6 Vehicle: Lancia 846 MJet E5+ / ZLA31200005174617 Version: Rel5\_B135  
 PEMS Result Filename: D:\AVL Concerto\MyData\TransportFiles\846\_Nardo\_020217\_Nedc70\_Hct.ctf  
 NOx Ambient Condition Corr.: 8 - NONE  
 Dry / Wet Corr.: 4 - NONE  
 Engine: SDE\_95cv / Diesel 020217.pms\_c

Handwritten signature and date: 2/2/17

Case: Nedc\_Hot\_020217

Page: Engine (1)

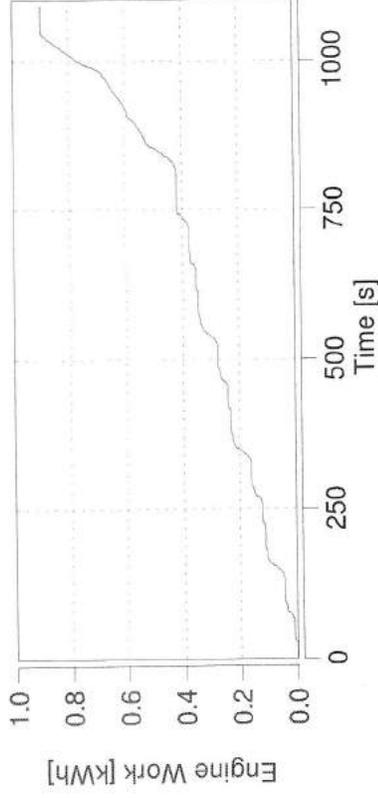
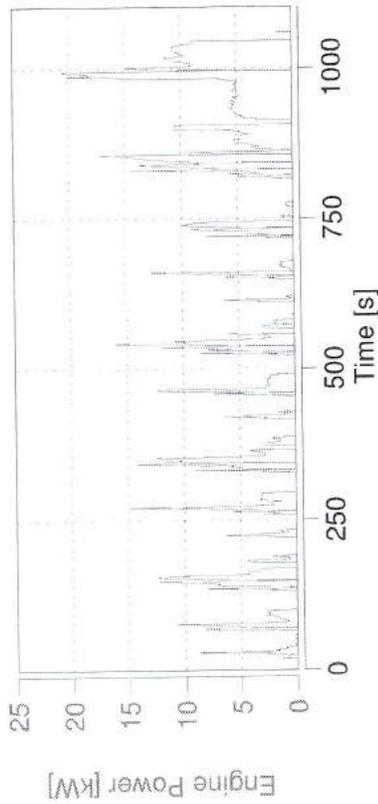
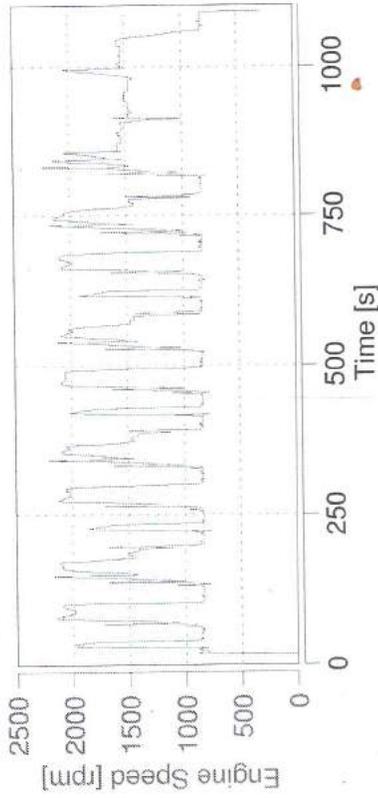
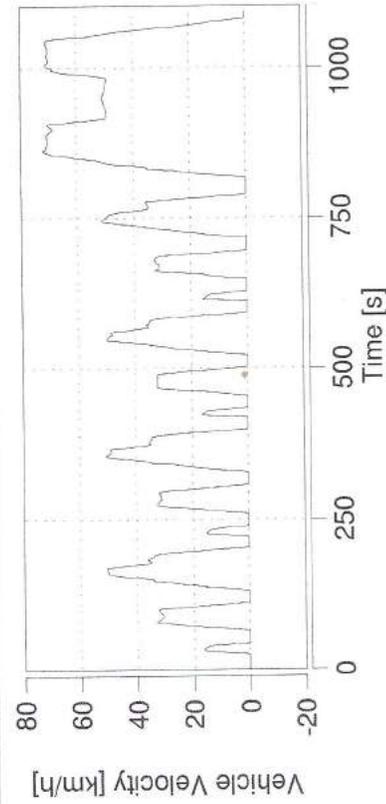
'NTC Track'

Start Date: 02/02/2017

Start Time: 12:23:50.0



Concerto M.O.V.E., 2016



PEMS Current Case:  
 D:\AVL Concerto\Work\Environments\PEMS\_Rel5\_B135\PEMS\Nardo\_Lancia846\_SDE\_95cv\_MTS\_E5+\_tel6\_020217.pms\_c  
 PEMS Result Filename:  
 D:\AVL Concerto\MyData\TransportFiles\846\_Nardo\_020217\_Nedc70\_Hot.cif

Vehicle: Lancia 846 MJet E5+ / ZLA31200005174617      Version: Rel5\_B135  
 Engine: SDE\_95cv / Diesel      020217.pms\_c  
 NOx Ambient Condition Corr.: 8 - NONE  
 Dry / Wet Corr.: 4 - NONE

*Handwritten signature and date:*  
 [Signature] 2/2/17

17. FIAT 500L 1.6 MJET .....



# Ministero delle Infrastrutture e dei Trasporti

DIPARTIMENTO PER I TRASPORTI, LA NAVIGAZIONE ED I SISTEMI INFORMATIVI E STATISTICI

Direzione Generale Territoriale del Nord-Ovest

**CENTRO PROVA AUTOVEICOLI TORINO**

Rapporto di prova del 02/05/2016 - 30/06/2016 - 13/07/2016 - 17/02/2017  
Test report on

Pagina (Page) 1/1

**OGGETTO**  
**SUBJECT**

Verifiche e prove per quanto riguarda:  
PROGRAMMA DI PROVE PER LA VALUTAZIONE DEL COMPORTAMENTO EMISSIVO  
DI VETTURE DIESEL EURO 5 COMMERCIALIZZATE IN ITALIA CON PROVE IN  
LABORATORIO E SU PISTA

*Checks and tests about:*  
TEST PLAN FOR MARKETED IN ITALY EURO 5 DIESEL VEHICLES EMISSIONS  
BEHAVIOR ASSESSMENT WITH LABORATORY AND TRACK TESTING

Veicolo / Vehicle	Fiat 500L 1.6 Mjet	Data / Date [dd/mm/yy]	02/05/2016 - 17/02/2017
VIN	ZFA1990005206533	Prova / Test n.	S.07.????2017 (*)
Tipo motore / Engine Type	1598 cm3	Autista / Driver	Catanzaro / Albertino / Melis
Marcatura motore / Engine Code	199B5000	Odometro / Odometer km)	34522
Cambio / Gear shift	Manuale / Manual M6	Note / Notes	
Start & Stop	SI / YES		
Pneumatici / Tyres	2,2 bar		

Inerzia / Inertia [kg] 1470

**Protocollo di prova**  
**Test Protocol**

Conforme alle specifiche dell'Istituto Motori di Napoli (C.N.R.)  
Compliant to the specification of Istituto Motori di Naples

**Nome e indirizzo del Laboratorio di prove**  
**Name and address of the test laboratory**

FIAT POWERTRAIN TECHNOLOGIES, Strada del Drosso 145, TORINO (TO)

**RISULTATI DELLE PROVE**  
**TESTS RESULTS**

Riportati nei seguenti allegati:  
Reported in the annexes listed here below

(\*) Prova / Test n.

NEDC cold al banco (report S.08.0752.2016 del 02/05/2016)  
NEDC hot al banco (report S.08.0753.2016 del 02/05/2016)  
NEDC cold back al banco (report S.08.1201.2016 del 30/06/2016)  
NEDC hot back al banco (report S.09.0310.2017 del 17/02/2017)  
NEDC cold su pista lim. 70km/h (report NEDC\_Cold70\_130716 del 13/07/2016 + profilo vel.)  
NEDC hot su pista lim. 70km/h (report NEDC\_Hot70\_130716 del 13/07/2016 + profilo vel.)

I FUNZIONARI DEL CENTRO PROVA AUTOVEICOLI TORINO



VISTO  
IL DIRETTORE

Gott. Ing. Pietro GERACI

I risultati di misura riportati nel presente rapporto sono stati ottenuti applicando le norme/procedure/protocolli/regolamenti/direttive indicati e riferiscono ai soli oggetti provati. Le incertezze di misura, quando indicate, sono espresse come incertezza estesa con fattore di copertura k=2, che per una distribuzione normale corrisponde ad un livello di confidenza di circa il 95%.

The measurement results reported in this document were obtained following the standards / procedures / protocols / regulation / directives reported and them refer to the tested objects only. The uncertainties of measurement stated in this report are calculated as a standard uncertainty multiplied by a coverage factor k=2, corresponding, in the case of a normal distribution, to a confidence level of about 95%.

È vietato riprodurre il presente documento, ed i relativi allegati, senza l'autorizzazione scritta del Laboratorio.

It is forbidden to reproduce the present document and relative enclosures, without written authorization of the Laboratory.

Il testo ufficiale del presente verbale è in lingua italiana. Quello in lingua inglese è da considerarsi solo come fonte di consultazione.

The official text of this test report is only in Italian. The English version is for reference only.

Department --- OMOLOGAZIONE

Test date : 02.05.2016

**Vehicle data**

Vehicle ID ----- 330.12  
 Vehicle model ----- 500L S&S E5  
 Transmission type ----- M6  
 Odometer (before Test) ----- 34522 km  
 Tire pressure ----- 2.2 bar  
 VIN ----- 5206533  
 CVS flow ----- 9,0 m3/min

*(Targa EY 939 FC)*

**Fuel data**

Fuel type ----- GASOLIO EURO 5  
 Batch No. ----- 202  
 Calculation instruction ----- DIESEL  
 Density ----- 0,835 g/cm3 [15°C]  
 Carbon percentage ----- 86,6 %  
 NHV ----- 16438,9 btu/lb

**Dyno data**

Inertia ----- 1470 kg  
 Dyno load ----- F0/F1/F2 -1,0 / 0,310 / 0,0378

**Add. data**

Driver ----- catanzaro  
 Operator ----- SBOP  
 aux table ----- NO\_AUX  
 Range switch table -----  
 Fan speed polynom ----- EU

**Reference**

Regulatory frame ----- EU  
 Ref. temp. ----- 273,15 K  
 Ref. Pressure ----- 1013,3 mbar  
 Calculation Regulatory ----- EU5

**Test reference data:**

GECOM Request No. -----  
 Richiedente ----- DARGENIO

**Remarks**

Test rem. -----  
 Customer ----- MARCE DALLA 1 ALLA 5 POMERIGGIO OMOLOGAZIONE CICLO FREDDO  
 Operator ----- /

**Phase Results**

	HC	CO	CO2	NOx	NO2	N2O	NMHC	CH4	Fuel cons.	Particulate
	[mg/km]	[mg/km]	[g/km]	[mg/km]	[mg/km]	[mg/km]	[mg/km]	[mg/km]	[l/100km]	[mg/km]
Phase 1										
Bag	89,000	359,000	159,142	198,000					6,07	
Modal										
Phase 2										
Bag	0,000	2,000	120,838	123,000					4,58	
Modal										
Bag										
Modal										
Bag										
Modal										
Phase 1										
Pre cat avg	HC [ppm]	CO [ppm]	CO2 [%]	NOx [ppm]	O2 [%]	CH4 [ppm]				
Post cat avg										
Cat. efficiency										
Raw/Bag										
Phase 2										
Pre cat avg										
Post cat avg										
Cat. efficiency										
Raw/Bag										
Pre cat avg										
Post cat avg										
Cat. efficiency										
Raw/Bag										
Pre cat avg										
Post cat avg										
Cat. efficiency										
Raw/Bag										

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**Total Results**

Bag	HC	CO	CO2	NOx	NO2	N2O	NMHC	HC + NOx	Fuel econ	Particulate
	[mg/km]	[mg/km]	[g/km]	[mg/km]	[mg/km]	[mg/km]	[mg/km]	[mg/km]	[l/100km]	[mg/km]
	32,890	133,188	134,95	150,540				183,430	5,13	

**Time Control**

Test Date: 02.05.2016      Start of test 3:29:36 PM      Start of trace 3:41:19 PM  
 End of test 4:10:41 PM      End of trace 4:00:59 PM

Department --- OMOLOGAZIONE

Test date : 02.05.2016

**Vehicle data**

Vehicle ID ----- 330.12  
 Vehicle model ----- 500L S&S E5  
 Transmission type ----- M6  
 Odometer (before Test) ----- 34522 km  
 Tire pressure ----- 2.2 bar  
 VIN ----- 5206533  
 CVS flow ----- 9,0 m3/min

**Fuel data**

Fuel type ----- GASOLIO EURO 5  
 Batch No.----- 202  
 Calculation instruction ----- DIESEL  
 Density ----- 0,835 g/cm3 [15 °C]  
 Carbon percentage ----- 86,6 %  
 NHV ----- 16438,9 btu/lb

**Dyno data**

Inertia ----- 1470 kg  
 Dyno load ----- F0/F1/F2 -1,0 / 0,310 / 0,0378

**Add. data**

Driver ----- catanzaro  
 Operator ----- S8OP  
 aux table ----- NO\_AUX  
 Range switch table -----  
 Fan speed polynom ----- EU

**Reference**

Regulatory frame ----- EU  
 Ref. temp. ----- 273,15 K  
 Ref. Pressure ----- 1013,3 mbar  
 Calculation Regulatory ----- EU5

**Test reference data:**

GECOM Request No.-----  
 Richiedente----- DARGENIO

**Remarks**

Test rem. -----  
 Customer ----- MARCE DALLA 1 ALLA 5 POMERIGGIO OMOLOGAZIONE CICLO FREDDO  
 Operator ----- /

**Phase Results**

	HC	CO	CO2	NOx	NO2	N2O	NMHC	CH4	Fuel cons.	Particulate
	[mg/km]	[mg/km]	[g/km]	[mg/km]	[mg/km]	[mg/km]	[mg/km]	[mg/km]	[l/100km]	[mg/km]
<i>Phase 1</i>										
<b>Bag</b>	89,000	359,000	159,142	198,000					6,07	0,4783
<b>Modal</b>										
<i>Phase 2</i>										
<b>Bag</b>	0,000	2,000	120,838	123,000					4,58	
<b>Modal</b>										
<b>Bag</b>										
<b>Modal</b>										
<i>Phase 1</i>										
<b>Pre cat avg</b>	HC [ppm]	CO [ppm]	CO2 [%]	NOx [ppm]	O2 [%]	CH4 [ppm]				
<b>Post cat avg</b>										
<b>Cat. efficiency</b>										
<b>Raw/Bag</b>										
<i>Phase 2</i>										
<b>Pre cat avg</b>										
<b>Post cat avg</b>										
<b>Cat. efficiency</b>										
<b>Raw/Bag</b>										
<b>Pre cat avg</b>										
<b>Post cat avg</b>										
<b>Cat. efficiency</b>										
<b>Raw/Bag</b>										
<b>Pre cat avg</b>										
<b>Post cat avg</b>										
<b>Cat. efficiency</b>										
<b>Raw/Bag</b>										

**Total Results**

Bag	HC	CO	CO2	NOx	NO2	N2O	NMHC	HC + NOx	Fuel ecor	Particulate
	[mg/km]	[mg/km]	[g/km]	[mg/km]	[mg/km]	[mg/km]	[mg/km]	[mg/km]	[l/100km]	[mg/km]
	<b>32,890</b>	<b>133,188</b>	<b>134,95</b>	<b>150,540</b>				<b>183,430</b>	<b>5,13</b>	<b>0,4783</b>

**Time Control**

Test Date: 02.05.2016      Start of test 3:29:36 PM      Start of trace 3:41:19 PM  
 End of test 4:10:41 PM      End of trace 4:00:59 PM

Department --- OMOLOGAZIONE

Test date : 02.05.2016

**Vehicle data**

Vehicle ID ----- 330.12  
Vehicle model ----- 500L S&S E5  
Transmission type ----- M6  
Odometer (before Test) ----- 34522 km  
Tire pressure ----- 2.2 bar  
VIN ----- 5206533  
CVS flow ----- 9,0 m3/min

**Fuel data**

Fuel type ----- GASOLIO EURO 5  
Batch No. ----- 202  
Calculation instruction ----- DIESEL  
Density ----- 0,835 g/cm3 [15°C]  
Carbon percentage ----- 86,6 %  
NHV ----- 16438,9 btu/lb

**Dyno data**

Inertia ----- 1470 kg  
Dyno load ----- F0/F1/F2 -1,0 / 0,310 / 0,0378

**Add. data**

Driver ----- catanzaro  
Operator ----- S8OP  
AUX table ----- NO\_AUX  
Range switch table -----  
Fan speed polynom ----- EU

**Reference**

Regulatory frame ----- EU  
Ref. temp. ----- 273,15 K  
Ref. Pressure ----- 1013,3 mbar  
Calculation Regulatory ----- EU5

**Test reference data:**

GECOM Request No. -----  
Richiedente ----- DARGENIO

**Remarks**

Test rem. -----  
Customer ----- MARCE DALLA 1 ALLA 5 POMERIGGIO OMOLOGAZIONE CICLO FREDDO  
Operator ----- /

**Phase Results**

	1	2		Phase
Barometric pressure	98,43	98,43		kPa
Ambient air temperature	21,78	23,08		°C
Relative humidity	43,78	40,42		%
NOx correction factor	0,8991	0,8991		
Dilution factor	39,428	16,419		
CVS volume corrected (273,15K)	104,973	53,784		m <sup>3</sup>
Average CVS temperature	39,8	39,8		°C
Average CVS pressure PV	96,1	96,0		kPa
DLS volume corrected (273,15K)	0,6503	0,3331		m <sup>3</sup>
Average force at dyno	23,1	201,9		N
Minimum oil temperature				°C
Distance	4,056	6,951		km
Drivers violation	0,3	0,0		sec

**Baq Analysis**

	1	2		Phase
Concentration sample THC	7,797	2,098		ppmC1
Concentration ambient THC	2,320	2,245		ppmC1
Emission THC	0,362	0,000		g/Phase
Emission THC	89,000	0,000		mg/km
Concentration sample CH4				ppm
Concentration ambient CH4				ppm
Emission CH4				g/Phase
Emission CH4				mg/km
Concentration sample NMHC				ppmC1
Concentration ambient NMHC				ppmC1
Emission NMHC				g/Phase
Emission NMHC				mg/km
Concentration sample CO	11,200	0,307		ppm
Concentration ambient CO	0,112	0,148		ppm
Emission CO	1,455	0,011		g/Phase
Emission CO	359,000	2,000		mg/km
Concentration sample NOx	4,210	8,691		ppm
Concentration ambient NOx	0,065	0,067		ppm
Emission NOx	0,802	0,855		g/Phase
Emission NOx	198,000	123,000		mg/km
Concentration sample NO2				ppm
Concentration ambient NO2				ppm
Emission NO2				g/Phase
Emission NO2				mg/km
Concentration sample N2O				ppm
Concentration ambient N2O				ppm
Emission N2O				g/Phase
Emission N2O				mg/km
Concentration sample CO2	0,341	0,822		%
Concentration ambient CO2	0,028	0,029		%
Emission CO2	645,478	839,942		g/Phase
Emission CO2	159,142	120,838		g/km
Fuel consumption	6,07	4,58		l/100km

**Total Results**

Emission per	HC	CO	CO2	NOx	NMHC	HC + Nox
total distance [mg/km]	32,890	133,188	134,952	150,540		183,430

Fuel consumption [l/100km]	5,13			NO2	N2O
----------------------------	------	--	--	-----	-----

Department --- OMOLOGAZIONE

Test date : 02.05.2016

**Vehicle data**

Vehicle ID ----- 330.12  
 Vehicle model ----- 500L S&S E5  
 Transmission type ----- M6  
 Odometer (before Test) ----- 34533 km  
 Tire pressure ----- 2.2 bar  
 VIN ----- 5206533 (targa EY 939 FC)  
 CVS flow ----- 9,0 m3/min

**Fuel data**

Fuel type ----- GASOLIO EURO 5  
 Batch No. ----- 202  
 Calculation instruction ----- DIESEL  
 Density ----- 0,835 g/cm3 [15°C]  
 Carbon percentage ----- 86,6 %  
 NHV ----- 16438,9 btu/lb

**Dyno data**

Inertia ----- 1470 kg  
 Dyno load ----- F0/F1/F2 -1,0 / 0,310 / 0,0378

**Add. data**

Driver ----- dangelo  
 Operator ----- S8OP  
 aux table ----- NO\_AUX  
 Range switch table -----  
 Fan speed polynom ----- EU

**Reference**

Regulatory frame ----- EU  
 Ref. temp. ----- 273,15 K  
 Ref. Pressure ----- 1013,3 mbar  
 Calculation Regulatory ----- EU5

**Test reference data:**

GECOM Request No. -----  
 Richiedente ----- DARGENIO

**Remarks**

Test rem. ----- 0  
 Customer ----- MARCE DALLA 1 ALLA 5 POMERIGGIO OMOLOGAZIONE CICLO CALDO  
 Operator ----- /

**Phase Results**

	HC [mg/km]	CO [mg/km]	CO2 [g/km]	NOx [mg/km]	NO2 [mg/km]	N2O [mg/km]	NMHC [mg/km]	CH4 [mg/km]	Fuel cons. [l/100km]	Particulate [mg/km]
Phase 1										
Bag	22,000	41,000	134,770	524,000					5,12	
Modal										
Phase 2										
Bag	3,000	0,000	109,970	512,000					4,17	
Modal										
Bag										
Modal										
Bag										
Modal										
Phase 1	HC [ppm]	CO [ppm]	CO2 [%]	NOx [ppm]	O2 [%]	CH4 [ppm]				
Pre cat avg										
Post cat avg										
Cat. efficiency										
Raw/Bag										
Phase 2										
Pre cat avg										
Post cat avg										
Cat. efficiency										
Raw/Bag										
Pre cat avg										
Post cat avg										
Cat. efficiency										
Raw/Bag										
Pre cat avg										
Post cat avg										
Cat. efficiency										
Raw/Bag										

**Total Results**

Bag	HC [mg/km]	CO [mg/km]	CO2 [g/km]	NOx [mg/km]	NO2 [mg/km]	N2O [mg/km]	NMHC [mg/km]	HC + NOx [mg/km]	Fuel econ [l/100km]	Particulate [mg/km]
	10,120	14,955	119,06	516,320				526,440	4,52	

**Time Control**

Test Date: 02.05.2016      Start of test 4:14:26 PM      Start of trace 4:31:24 PM  
 End of test 4:54:44 PM      End of trace 4:51:04 PM

Department --- OMOLOGAZIONE

Test date : 02.05.2016

**Vehicle data**

Vehicle ID ----- 330.12  
 Vehicle model ----- 500L S&S E5  
 Transmission type ----- M6  
 Odometer (before Test) ----- 34533 km  
 Tire pressure ----- 2.2 bar  
 VIN ----- 5206533  
 CVS flow ----- 9,0 m3/min

**Fuel data**

Fuel type ----- GASOLIO EURO 5  
 Batch No.----- 202  
 Calculation instruction ----- DIESEL  
 Density ----- 0,835 g/cm3 [15 °C]  
 Carbon percentage ----- 86,6 %  
 NHV ----- 16438,9 btu/lb

**Dyno data**

Inertia ----- 1470 kg  
 Dyno load ----- F0/F1/F2 -1,0 / 0,310 / 0,0378

**Add. data**

Driver ----- dangelo  
 Operator ----- S8OP  
 aux table ----- NO\_AUX  
 Range switch table -----  
 Fan speed polynom ----- EU

**Reference**

Regulatory frame ----- EU  
 Ref. temp. ----- 273,15 K  
 Ref. Pressure ----- 1013,3 mbar  
 Calculation Regulatory ----- EU5

**Test reference data:**

GECOM Request No.-----  
 Richiedente----- DARGENIO

**Remarks**

Test rem. ----- 0  
 Customer ----- MARCE DALLA 1 ALLA 5 POMERIGGIO OMOLOGAZIONE CICLO CALDO  
 Operator ----- /

**Phase Results**

	HC	CO	CO2	NOx	NO2	N2O	NMHC	CH4	Fuel cons.	Particulate
	[mg/km]	[mg/km]	[g/km]	[mg/km]	[mg/km]	[mg/km]	[mg/km]	[mg/km]	[l/100km]	[mg/km]
<i>Phase 1</i>										
<b>Bag</b>	22,000	41,000	134,770	524,000					5,12	0,6325
<b>Modal</b>										
<i>Phase 2</i>										
<b>Bag</b>	3,000	0,000	109,970	512,000					4,17	
<b>Modal</b>										
<b>Bag</b>										
<b>Modal</b>										
<b>Bag</b>										
<b>Modal</b>										
<i>Phase 1</i>										
<b>Pre cat avg</b>	HC [ppm]	CO [ppm]	CO2 [%]	NOx [ppm]	O2 [%]	CH4 [ppm]				
<b>Post cat avg</b>										
<b>Cat. efficiency</b>										
<b>Raw/Bag</b>										
<i>Phase 2</i>										
<b>Pre cat avg</b>										
<b>Post cat avg</b>										
<b>Cat. efficiency</b>										
<b>Raw/Bag</b>										
<b>Pre cat avg</b>										
<b>Post cat avg</b>										
<b>Cat. efficiency</b>										
<b>Raw/Bag</b>										
<b>Pre cat avg</b>										
<b>Post cat avg</b>										
<b>Cat. efficiency</b>										
<b>Raw/Bag</b>										

**Total Results**

Bag	HC	CO	CO2	NOx	NO2	N2O	NMHC	HC + NOx	Fuel ecor	Particulate
	[mg/km]	[mg/km]	[g/km]	[mg/km]	[mg/km]	[mg/km]	[mg/km]	[mg/km]	[l/100km]	[mg/km]
	<b>10,120</b>	<b>14,955</b>	<b>119,06</b>	<b>516,320</b>				<b>526,440</b>	<b>4,52</b>	<b>0,6325</b>

**Time Control**

Test Date: 02.05.2016      Start of test 4:14:26 PM      Start of trace 4:31:24 PM  
 End of test 4:54:44 PM      End of trace 4:51:04 PM

Department --- OMOLOGAZIONE

Test date : 02.05.2016

**Vehicle data**

Vehicle ID ----- 330.12  
 Vehicle model ----- 500L S&S E5  
 Transmission type ----- M6  
 Odometer (before Test) ----- 34533 km  
 Tire pressure ----- 2.2 bar  
 VIN ----- 5206533  
 CVS flow ----- 9,0 m3/min

**Fuel data**

Fuel type ----- GASOLIO EURO 5  
 Batch No. ----- 202  
 Calculation instruction ----- DIESEL  
 Density ----- 0,835 g/cm3 [15°C]  
 Carbon percentage ----- 86,6 %  
 NHV ----- 16438,9 btu/lb

**Dyno data**

Inertia ----- 1470 kg  
 Dyno load ----- F0/F1/F2 -1,0 / 0,310 / 0,0378

**Add. data**

Driver ----- dangelo  
 Operator ----- S8OP  
 AUX table ----- NO\_AUX  
 Range switch table -----  
 Fan speed polynom ----- EU

**Reference**

Regulatory frame ----- EU  
 Ref. temp. ----- 273,15 K  
 Ref. Pressure ----- 1013,3 mbar  
 Calculation Regulatory ----- EU5

**Test reference data:**

GECOM Request No. -----  
 Richiedente ----- DARGENIO

**Remarks**

Test rem. ----- 0  
 Customer ----- MARCE DALLA 1 ALLA 5 POMERIGGIO OMOLOGAZIONE CICLO CALDO  
 Operator ----- /

**Phase Results**

	1	2		Phase
Barometric pressure	98,44	98,45		kPa
Ambient air temperature	26,01	27,22		°C
Relative humidity	40,50	40,34		%
NOx correction factor	0,9388	0,9569		
Dilution factor	46,434	17,991		
CVS volume corrected (273,15K)	104,822	53,736		m <sup>3</sup>
Average CVS temperature	39,8	39,9		°C
Average CVS pressure PV	96,1	96,1		kPa
DLS volume corrected (273,15K)	0,6501	0,3332		m <sup>3</sup>
Average force at dyno	22,1	201,9		N
Minimum oil temperature				°C
Distance	4,021	6,945		km
Drivers violation	0,0	0,0		sec

**Baq Analysis**

	1	2		Phase
Concentration sample THC	3,559	2,784		ppmC1
Concentration ambient THC	2,279	2,176		ppmC1
Emission THC	0,087	0,024		g/Phase
Emission THC	22,000	3,000		mg/km
Concentration sample CH4				ppm
Concentration ambient CH4				ppm
Emission CH4				g/Phase
Emission CH4				mg/km
Concentration sample NMHC				ppmC1
Concentration ambient NMHC				ppmC1
Emission NMHC				g/Phase
Emission NMHC				mg/km
Concentration sample CO	1,777	0,166		ppm
Concentration ambient CO	0,533	0,579		ppm
Emission CO	0,164	0,000		g/Phase
Emission CO	41,000	0,000		mg/km
Concentration sample NOx	10,480	33,720		ppm
Concentration ambient NOx	0,035	0,003		ppm
Emission NOx	2,107	3,555		g/Phase
Emission NOx	524,000	512,000		mg/km
Concentration sample NO2				ppm
Concentration ambient NO2				ppm
Emission NO2				g/Phase
Emission NO2				mg/km
Concentration sample N2O				ppm
Concentration ambient N2O				ppm
Emission N2O				g/Phase
Emission N2O				mg/km
Concentration sample CO2	0,290	0,750		%
Concentration ambient CO2	0,028	0,028		%
Emission CO2	541,910	763,745		g/Phase
Emission CO2	134,770	109,970		g/km
Fuel consumption	5,12	4,17		l/100km

**Total Results**

Emission per total distance [mg/km]	HC	CO	CO2	NOx	NMHC	HC + Nox
	10,120	14,955	119,064	516,320		526,440
Fuel consumption [l/100km]	4,52			NO2	N2O	

Department --- OMOLOGAZIONE

Test date : 30.06.2016

**Vehicle data**

Vehicle ID ----- 330.12  
Vehicle model ----- 500L S&S E5  
Transmission type ----- M6  
Odometer (before Test) ----- 34828 km  
Tire pressure ----- 2.2 bar  
VIN ----- 5206533  
CVS flow ----- 9,0 m3/min

**Fuel data**

Fuel type ----- GASOLIO EURO 5  
Batch No. ----- 202  
Calculation instruction ----- DIESEL  
Density ----- 0,835 g/cm3 [15°C]  
Carbon percentage ----- 86,6 %  
NHV ----- 16438,9 btu/lb

**Dyno data**

Inertia ----- 1470 kg  
Dyno load ----- FD/F1/F2 -1,0 / 0,310 / 0,0378

**Add. data**

Driver ----- albertino  
Operator ----- S8OP  
aux table ----- NO AUX  
Range switch table ----- STANDARD  
Fan speed polynom ----- EU

**Reference**

Regulatory frame ----- EU  
Ref. temp. ----- 273,15 K  
Ref. Pressure ----- 1013,3 mbar  
Calculation Regulatory ----- EUS

**Test reference data:**

GECOM Request No. -----  
Richiedente -----

**Remarks**

Test rem. -----  
Customer ----- freddo cicla marce I-V omologazione apsettare ministeriale  
Operator ----- /

**Phase Results**

	HC [mg/km]	CO [mg/km]	CO2 [g/km]	NOx [mg/km]	NO2 [mg/km]	N2O [mg/km]	NMHC [mg/km]	CH4 [mg/km]	Fuel cons. [l/100km]	Particulate [mg/km]
<b>Phase 1</b>										
Bag	16,000	81,000	129,899	327,000					4,93	
Modal										
<b>Phase 2</b>										
Bag	0,000	74,000	130,017	215,000					4,94	
Modal										
Bag										
Modal										
Bag										
Modal										
<b>Phase 1</b>	HC [ppm]	CO [ppm]	CO2 [%]	NOx [ppm]	O2 [%]	CH4 [ppm]				
Pre cat avg										
Post cat avg										
Cat. efficiency										
Raw/Bag										
<b>Phase 2</b>										
Pre cat avg										
Post cat avg										
Cat. efficiency										
Raw/Bag										
Pre cat avg										
Post cat avg										
Cat. efficiency										
Raw/Bag										
Pre cat avg										
Post cat avg										
Cat. efficiency										
Raw/Bag										

**Total Results**

Bag	HC [mg/km]	CO [mg/km]	CO2 [g/km]	NOx [mg/km]	NO2 [mg/km]	N2O [mg/km]	NMHC [mg/km]	HC + NOx [mg/km]	Fuel econ [l/100km]	Particulate [mg/km]
	10,300	78,229	129,94	285,370				295,670	4,93	

**Time Control**

Test Date: 30.06.2016      Start of test 10:52:57 AM      Start of trace 11:06:33 AM  
End of test 11:35:55 AM      End of trace 11:26:13 AM

Department --- OMOLOGAZIONE

Test date : 30.06.2016

**Vehicle data**

Vehicle ID ----- 330.12  
 Vehicle model ----- 500L S&S E5  
 Transmission type ----- M6  
 Odometer (before Test) ----- 34828 km  
 Tire pressure ----- 2.2 bar  
 VIN ----- 5206533  
 CVS flow ----- 9,0 m3/min

**Fuel data**

Fuel type ----- GASOLIO EURO 5  
 Batch No.----- 202  
 Calculation instruction ----- DIESEL  
 Density ----- 0,835 g/cm3 [15 °C]  
 Carbon percentage ----- 86,6 %  
 NHV ----- 16438,9 btu/lb

**Dyno data**

Inertia ----- 1470 kg  
 Dyno load ----- F0/F1/F2 -1,0 / 0,310 / 0,0378

**Add. data**

Driver ----- albertino  
 Operator ----- S8OP  
 aux table ----- NO\_AUX  
 Range switch table ----- STANDARD  
 Fan speed polynom ----- EU

**Reference**

Regulatory frame ----- EU  
 Ref. temp. ----- 273,15 K  
 Ref. Pressure ----- 1013,3 mbar  
 Calculation Regulatory ----- EU5

**Test reference data:**

GECOM Request No.-----  
 Richiedente-----

**Remarks**

Test rem. -----  
 Customer ----- freddo cicla marce I-V omologazione apsettare ministeriale  
 Operator ----- /

**Phase Results**

	HC	CO	CO2	NOx	NO2	N2O	NMHC	CH4	Fuel cons.	Particulate
	[mg/km]	[mg/km]	[g/km]	[mg/km]	[mg/km]	[mg/km]	[mg/km]	[mg/km]	[l/100km]	[mg/km]
<i>Phase 1</i>										
<b>Bag</b>	16,000	81,000	129,899	327,000					4,93	0,1258
<b>Modal</b>										
<i>Phase 2</i>										
<b>Bag</b>	0,000	74,000	130,017	215,000					4,94	
<b>Modal</b>										
<b>Bag</b>										
<b>Modal</b>										
<i>Phase 1</i>										
<b>Pre cat avg</b>	HC [ppm]	CO [ppm]	CO2 [%]	NOx [ppm]	O2 [%]	CH4 [ppm]				
<b>Post cat avg</b>										
<b>Cat. efficiency</b>										
<b>Raw/Bag</b>										
<i>Phase 2</i>										
<b>Pre cat avg</b>										
<b>Post cat avg</b>										
<b>Cat. efficiency</b>										
<b>Raw/Bag</b>										
<b>Pre cat avg</b>										
<b>Post cat avg</b>										
<b>Cat. efficiency</b>										
<b>Raw/Bag</b>										
<b>Pre cat avg</b>										
<b>Post cat avg</b>										
<b>Cat. efficiency</b>										
<b>Raw/Bag</b>										

**Total Results**

Bag	HC	CO	CO2	NOx	NO2	N2O	NMHC	HC + NOx	Fuel ecor	Particulate
	[mg/km]	[mg/km]	[g/km]	[mg/km]	[mg/km]	[mg/km]	[mg/km]	[mg/km]	[l/100km]	[mg/km]
	<b>10,300</b>	<b>78,229</b>	<b>129,94</b>	<b>285,370</b>				<b>295,670</b>	<b>4,93</b>	<b>0,1258</b>

**Time Control**

Test Date: 30.06.2016      Start of test 10:52:57 AM      Start of trace 11:06:33 AM  
 End of test 11:35:55 AM      End of trace 11:26:13 AM

Department -- OMOLOGAZIONE

Test date : 30.06.2016

**Vehicle data**

Vehicle ID ----- 330.12  
Vehicle model ----- 500L S&S E5  
Transmission type ----- M6  
Odometer (before Test) ----- 34828 km  
Tire pressure ----- 2.2 bar  
VIN ----- 5206533  
CVS flow ----- 9,0 m3/min

**Fuel data**

Fuel type ----- GASOLIO EURO 5  
Batch No. ----- 202  
Calculation instruction ----- DIESEL  
Density ----- 0,835 g/cm3 [15°C]  
Carbon percentage ----- 86,6 %  
NHV ----- 16438,9 btu/lb

**Dyno data**

Inertia ----- 1470 kg  
Dyno load ----- F0/F1/F2 -1,0 / 0,310 / 0,0378

**Add. data**

Driver ----- albertino  
Operator ----- S80P  
AUX table ----- NO AUX  
Range switch table ----- STANDARD  
Fan speed polynom ----- EU

**Reference**

Regulatory frame ----- EU  
Ref. temp. ----- 273,15 K  
Ref. Pressure ----- 1013,3 mbar  
Calculation Regulatory ----- EU5

**Test reference data:**

GECOM Request No. -----  
Richiedente -----

**Remarks**

Test rem. -----  
Customer ----- freddo cicla marce I-V omologazione aspettare ministeriale  
Operator ----- /

**Phase Results**

	1	2		Phase
Barometric pressure	98,68	98,70		kPa
Ambient air temperature	22,20	22,19		°C
Relative humidity	49,86	48,53		%
NOx correction factor	0,9330	0,9263		
Dilution factor	15,011	44,732		
CVS volume corrected (273,15K)	53,992	105,195		m <sup>3</sup>
Average CVS temperature	39,8	39,8		°C
Average CVS pressure PV	96,3	96,3		kPa
DLS volume corrected (273,15K)	0,3334	0,6499		m <sup>3</sup>
Average force at dyno	203,4	21,4		N
Minimum oil temperature				°C
Distance	6,980	4,090		km
Drivers violation	0,0	0,0		sec

**Bag Analysis**

	1	2		Phase
Concentration sample THC	6,044	2,574		ppmC1
Concentration ambient THC	2,831	2,775		ppmC1
Emission THC	0,114	0,000		g/Phase
Emission THC	16,000	0,000		mg/km
Concentration sample CH4				ppm
Concentration ambient CH4				ppm
Emission CH4				g/Phase
Emission CH4				mg/km
Concentration sample NMHC				ppmC1
Concentration ambient NMHC				ppmC1
Emission NMHC				g/Phase
Emission NMHC				mg/km
Concentration sample CO	9,430	3,376		ppm
Concentration ambient CO	1,158	1,108		ppm
Emission CO	0,564	0,302		g/Phase
Emission CO	81,000	74,000		mg/km
Concentration sample NOx	22,200	4,442		ppm
Concentration ambient NOx	0,148	0,036		ppm
Emission NOx	2,279	0,880		g/Phase
Emission NOx	327,000	215,000		mg/km
Concentration sample NO2				ppm
Concentration ambient NO2				ppm
Emission NO2				g/Phase
Emission NO2				mg/km
Concentration sample N2O				ppm
Concentration ambient N2O				ppm
Emission N2O				g/Phase
Emission N2O				mg/km
Concentration sample CO2	0,898	0,301		%
Concentration ambient CO2	0,048	0,045		%
Emission CO2	906,697	531,769		g/Phase
Emission CO2	129,899	130,017		g/km
Fuel consumption	4,93	4,94		l/100km

**Total Results**

Emission per total distance [mg/km]	HC	CO	CO2	NOx	NMHC	HC + Nox
	10,300	78,229	129,943	285,370		295,670

Fuel consumption [l/100km]	4,93	NO2	N2O

Department --- OMOLOGAZIONE

Test date : 30.06.2016

**Vehicle data**

Vehicle ID ----- 330.12  
Vehicle model ----- 500L S&S E5  
Transmission type ----- M6  
Odometer (before Test) ----- 34828 km  
Tire pressure ----- 2.2 bar  
VIN ----- 5206533  
CVS flow ----- 9,0 m3/min

**Fuel data**

Fuel type ----- GASOLIO EURO 5  
Batch No. ----- 202  
Calculation instruction ----- DIESEL  
Density ----- 0,835 g/cm3 [15°C]  
Carbon percentage ----- 86,6 %  
NHV ----- 16438,9 btu/lb

**Dyno data**

Inertia ----- 1470 kg  
Dyno load ----- F0/F1/F2 -1,0 / 0,310 / 0,0378

**Add. data**

Driver ----- albertino  
Operator ----- S8OP  
AUX table ----- NO\_AUX  
Range switch table ----- STANDARD  
Fan speed polynom ----- EU

**Reference**

Regulatory frame ----- EU  
Ref. temp. ----- 273,15 K  
Ref. Pressure ----- 1013,3 mbar  
Calculation Regulatory ----- EU5

**Test reference data:**

GECOM Request No. -----  
Richiedente -----

**Remarks**

Test rem. -----  
Customer ----- freddo cicla marce I-V omologazione apsettare ministeriale  
Operator ----- /

**Phase Results**

	1	2		Phase
Barometric pressure	98,68	98,70		kPa
Ambient air temperature	22,20	22,19		°C
Relative humidity	49,86	48,53		%
NOx correction factor	0,9330	0,9263		
Dilution factor	15,011	44,732		
CVS volume corrected (273,15K)	53,992	105,195		m <sup>3</sup>
Average CVS temperature	39,8	39,8		°C
Average CVS pressure PV	96,3	96,3		kPa
DLS volume corrected (273,15K)	0,3334	0,6499		m <sup>3</sup>
Average torque at dyno	203,4	21,4		N
Minimum oil temperature				°C
Distance	6,980	4,090		km
Drivers violation	0,0	0,0		sec

**Particulate results**

	1	2		Phase
Main filter before test	86,779			mg
Main filter after test	86,787			mg
Backup filter before test				mg
Backup filter after test				mg
Payload main filter	0,009			mg
Payload backup filter				mg
Efficiency of main filter				%
Calculated payload				mg
mass emission	0,0014			g
mass emission per distance	0,1258			mg/km

**TEOM results**

Payload				mg
TEOM mass emission				g
TEOM mass emission per distance				mg/km
Efficiency TEOM/gravimetric				%

**Particulate total results**

**Remarks**

Total emission 0,0014 g  
Total emission per total distance 0,1258 mg/km

**Particulate Counter total results**

Total counts: 8094424519  
Tot.counts/ 7,3120E+08 1/km  
Tot.distance

**Weighing chamber data**

Chamber temperature: 22,50 °C  
Chamber pressure: 983,20 kPa  
Buoyancy correction factor: 1,000357E+00

**Setup/Checks Particulate Counter**

CPCCFK 1,066 unity  
PND1 10 unity  
PND2 15 unity  
PCRF 167,39 unity  
System Ckeck O.K? YES  
Zero Count 0,01416 1/cm<sup>3</sup>

Department --- OMOLOGAZIONE

Test date : 17.02.2017

**Vehicle data**

Vehicle ID ----- 330.12  
 Vehicle model ----- 500L S&S E5  
 Transmission type ----- M6  
 Odometer (before Test) ----- 35005 km  
 Tire pressure ----- 2.2 bar  
 VIN ----- ZFA19900005206533  
 CVS flow ----- 9,0 m3/min

**Fuel data**

Fuel type ----- GASOLIO EURO 5  
 Batch No. ----- 202  
 Calculation instruction ----- DIESEL  
 Density ----- 0,835 g/cm3 [15°C]  
 Carbon percentage ----- 86,6 %  
 NHV ----- 16438,9 btu/lb

**Dyno data**

Inertia ----- 1470 kg  
 Dyno load ----- F0/F1/F2 -1,0 / 0,310 / 0,0378

**Add. data**

Driver ----- MELIS  
 Operator ----- S9OP  
 aux table ----- NO AUX  
 Range switch table ----- STANDARD  
 Fan speed polynom ----- EU

**Reference**

Regulatory frame ----- EU  
 Ref. temp. ----- 273,15 K  
 Ref. Pressure ----- 1013,3 mbar  
 Calculation Regulatory ----- EU5

**Test reference data:**

GECOM Request No. -----  
 Richiedente -----

**Remarks**

Test rem. ----- Test HOT  
 Customer -----  
 Operator ----- /

**Phase Results**

	HC [mg/km]	CO [mg/km]	CO2 [g/km]	NOx [mg/km]	NO2 [mg/km]	N2O [mg/km]	NMHC [mg/km]	CH4 [mg/km]	Fuel cons. [l/100km]	Particulate [mg/km]
<b>Phase 1</b>										
Bag	1,000	7,000	114,028	255,000		0,000			4,33	
Modal										
<b>Phase 2</b>										
Bag	9,000	14,000	140,541	607,000		0,000			5,33	
Modal										
Bag										
Modal										
<b>Phase 1</b>										
Pre cat avg	HC [ppm]	CO [ppm]	CO2 [%]	NOx [ppm]	O2 [%]	CH4 [ppm]				
Post cat avg										
Cat. efficiency										
Raw/Bag										
<b>Phase 2</b>										
Pre cat avg										
Post cat avg										
Cat. efficiency										
Raw/Bag										
Pre cat avg										
Post cat avg										
Cat. efficiency										
Raw/Bag										
Pre cat avg										
Post cat avg										
Cat. efficiency										
Raw/Bag										

**Total Results**

Bag	HC [mg/km]	CO [mg/km]	CO2 [g/km]	NOx [mg/km]	NO2 [mg/km]	N2O [mg/km]	NMHC [mg/km]	HC + NOx [mg/km]	Fuel econ [l/100km]	Particulate [mg/km]
	4,270	9,732	123,86	385,360		0,000		389,630	4,70	

**Time Control**

Test Date: 17.02.2017      Start of test 9:58:10 AM      Start of trace 10:13:35 AM  
 End of test 10:38:39 AM      End of trace 10:33:15 AM

*Handwritten signature and date: 17/2/17*

Department --- OMOLOGAZIONE

Test date : 17.02.2017

**Vehicle data**

Vehicle ID ----- 330.12  
 Vehicle model ----- 500L S&S E5  
 Transmission type ----- M5  
 Odometer (before Test) ----- 35005 km  
 Tire pressure ----- 2.2 bar  
 VIN ----- ZFA199D0005206533  
 CVS flow ----- 9,0 m3/min

**Fuel data**

Fuel type ----- GASOLIO EURO 5  
 Batch No. ----- 202  
 Calculation instruction ----- DIESEL  
 Density ----- 0,835 g/cm3 (15°C)  
 Carbon percentage ----- 86,6 %  
 NHV ----- 16438,9 btu/lb

**Dyno data**

Inertia ----- 1470 kg  
 Dyno load ----- F0/F1/F2 -1,0 / 0,310 / 0,0378

**Add. data**

Driver ----- MELIS  
 Operator ----- S9OP  
 AUX table ----- NO AUX  
 Range switch table ----- STANDARD  
 Fan speed polymon ----- EU

**Reference**

Regulatory frame ----- EU  
 Ref. temp. ----- 273,15 K  
 Ref. Pressure ----- 1013,3 mbar  
 Calculation Regulatory ----- EUS

**Test reference data:**

GECOM Request No. -----  
 Richiedente -----

**Remarks**

Test rem. ----- Test HOT  
 Customer -----  
 Operator ----- /

**Phase Results**

	1	2		Phase
Barometric pressure	99,57	99,56		kPa
Ambient air temperature	26,02	24,15		°C
Relative humidity	47,20	47,57		%
NOx correction factor	0,9799	0,9491		
Dilution factor	16,968	38,611		
CVS volume corrected (273,15K)	55,881	108,688		m <sup>3</sup>
Average CVS temperature	27,2	27,7		°C
Average CVS pressure PV	97,8	97,8		kPa
DLS volume corrected (273,15K)	0,3332	0,6461		m <sup>3</sup>
Average force at dyno	202,0	29,6		N
Minimum oil temperature				°C
Distance	6,917	4,078		km
Drivers violation	0,0	0,0		sec

**Bag Analysis**

	1	2		Phase
Concentration sample THC	3,598	4,133		ppmC1
Concentration ambient THC	3,504	3,680		ppmC1
Emission THC	0,010	0,037		g/Phase
Emission THC	1,000	9,000		mg/km
Concentration sample CH4				ppm
Concentration ambient CH4				ppm
Emission CH4				g/Phase
Emission CH4				mg/km
Concentration sample NMHC				ppmC1
Concentration ambient NMHC				ppmC1
Emission NMHC				g/Phase
Emission NMHC				mg/km
Concentration sample CO	2,587	2,274		ppm
Concentration ambient CO	1,961	1,904		ppm
Emission CO	0,050	0,057		g/Phase
Emission CO	7,000	14,000		mg/km
Concentration sample NOx	16,040	12,020		ppm
Concentration ambient NOx	0,361	0,329		ppm
Emission NOx	1,763	2,474		g/Phase
Emission NOx	255,000	607,000		mg/km
Concentration sample NO2	2,466	2,466		ppm
Concentration ambient NO2				ppm
Emission NO2				g/Phase
Emission NO2				mg/km
Concentration sample N2O	0,023	0,165		ppm
Concentration ambient N2O	0,138	0,171		ppm
Emission N2O	0,000	0,000		g/Phase
Emission N2O	0,000	0,000		mg/km
Concentration sample CO2	0,795	0,349		%
Concentration ambient CO2	0,081	0,083		%
Emission CO2	788,763	573,062		g/Phase
Emission CO2	114,028	140,541		g/km
Fuel consumption	4,33	5,33		l/100km

**Total Results**

Emission per total distance [mg/km]	HC	CO	CO2	NOx	NMHC	HC + Nox
	4,270	9,732	123,861	385,360		389,630
Fuel consumption [l/100km]	4,70			NO2	N2O	
					0,000	

Department -- OMOLOGAZIONE

Test date : 17.02.2017

**Vehicle data**

Vehicle ID ----- 330.12  
Vehicle model ----- 500L S&S E5  
Transmission type ----- M8  
Odometer (before Test) ----- 35005 km  
Tire pressure ----- 2.2 bar  
VIN ----- ZFA19900005206533  
CVS flow ----- 9.0 m3/min

**Fuel data**

Fuel type ----- GASOLIO EURO 5  
Batch No. ----- 202  
Calculation instruction ----- DIESEL  
Density ----- 0.835 g/cm3 [15°C]  
Carbon percentage ----- 86.6 %  
NHV ----- 18438.9 btu/lb

**Dyno data**

Inertia ----- 1470 kg  
Dyno load ----- F0/F1/F2 -1,0 / 0,310 / 0,0378

**Reference**

Regulatory frame ----- EU  
Ref. temp. ----- 273,15 K  
Ref. Pressure ----- 1013,3 mbar  
Calculation Regulatory ----- EU5

**Remarks**

Test rem. ----- Test HOT  
Customer -----  
Operator ----- /

**Add. data**

Driver ----- MELIS  
Operator ----- S90P  
aux table ----- NO\_AUX  
Range switch table ----- STANDARD  
Fan speed polynom ----- EU

**Test reference data:**

GECOM Request No. -----  
Richiedente -----

**Phase Results**

	HC [mg/km]	CO [mg/km]	CO2 [g/km]	NOx [mg/km]	NO2 [mg/km]	N2O [mg/km]	NMHC [mg/km]	CH4 [mg/km]	Fuel cons. [l/100km]	Particulate [mg/km]
Phase 1										
Bag	1,000	7,000	114,028	255,000		0,000			4,33	0,2884
Modal										
Phase 2										
Bag	9,000	14,000	140,541	607,000		0,000			5,33	
Modal										
Bag										
Modal										
Bag										
Modal										
Phase 1										
Pre cat avg	HC [ppm]	CO [ppm]	CO2 [%]	NOx [ppm]	O2 [%]	CH4 [ppm]				
Post cat avg										
Cat. efficiency										
Raw/Bag										
Phase 2										
Pre cat avg										
Post cat avg										
Cat. efficiency										
Raw/Bag										
Pre cat avg										
Post cat avg										
Cat. efficiency										
Raw/Bag										
Pre cat avg										
Post cat avg										
Cat. efficiency										
Raw/Bag										

**Total Results**

Bag	HC [mg/km]	CO [mg/km]	CO2 [g/km]	NOx [mg/km]	NO2 [mg/km]	N2O [mg/km]	NMHC [mg/km]	HC + NOx [mg/km]	Fuel econ [l/100km]	Particulate [mg/km]
	4,270	9,732	123,86	385,360		0,000		389,630	4,70	0,2884

**Time Control**

Test Date: 17.02.2017      Start of test 9:58:10 AM      Start of trace 10:13:36 AM  
End of test 10:38:39 AM      End of trace 10:33:16 AM

Department — OMOLOGAZIONE

Test date : 17.02.2017

**Vehicle data**

Vehicle ID ————— 330.12  
 Vehicle model ————— 500L S&S E5  
 Transmission type ————— M6  
 Odometer (before Test) ——— 35005 km  
 Tire pressure ————— 2.2 bar  
 VIN ————— ZFA19900005206533  
 CVS flow ————— 9.0 m3/min

**Fuel data**

Fuel type ————— GASOLIO EURO 5  
 Batch No. ————— 202  
 Calculation instruction ——— DIESEL  
 Density ————— 0.835 g/cm3 [15°C]  
 Carbon percentage ————— 88.6 %  
 NHV ————— 16438,9 btu/lb

**Dyno data**

Inertia ————— 1470 kg  
 Dyno load ——— F0/F1/F2 — -1,0 / 0,310 / 0,0378

**Add. data**

Driver ————— MELIS  
 Operator ————— S90P  
 AUX table ————— NO\_AUX  
 Range switch table ————— STANDARD  
 Fan speed polynom ————— EU

**Reference**

Regulatory frame ——— EU  
 Ref. temp. ————— 273,15 K  
 Ref. Pressure ————— 1013,3 mbar  
 Calculation Regulatory ——— EU5

**Test reference data:**

GECOM Request No. —————  
 Richiedente —————

**Remarks**

Test rem. ——— Test HOT  
 Customer ———  
 Operator ——— /

**Phase Results**

	1	2		Phase
Barometric pressure	99,57	99,56		kPa
Ambient air temperature	26,02	24,15		°C
Relative humidity	47,20	47,57		%
NOx correction factor	0,9799	0,9491		
Dilution factor	16,968	38,611		
CVS volume corrected (273,15K)	55,881	108,688		m <sup>3</sup>
Average CVS temperature	27,2	27,7		°C
Average CVS pressure PV	97,8	97,8		kPa
DLS volume corrected (273,15K)	0,3332	0,6481		m <sup>3</sup>
Average torque at dyno	202,0	29,6		N
Minimum oil temperature				°C
Distance	6,917	4,078		km
Drivers violation	0,0	0,0		sec

**Particulate results**

	1	2		Phase
Main filter before test	87,137			mg
Main filter after test	87,156			mg
Backup filter before test				mg
Backup filter after test				mg
Payload main filter	0,019			mg
Payload backup filter				mg
Efficiency of main filter				%
Calculated payload				mg
mass emission	0,0032			g
mass emission per distance	0,2884			mg/km

**TEOM results**

Payload				mg
TEOM mass emission				g
TEOM mass emission per distance				mg/km
Efficiency TEOM/gravimetric				%

**Particulate total results**

Remarks  
 Total emission 0,0032 g  
 Total emission per total distance 0,2884 mg/km

**Particulate Counter total results**

Total counts: 1,3112E+10  
 Tot.counts/ 1,1925E+09 1/km  
 Tot.distance

**Weighing chamber data**

Chamber temperature: 22,10 °C  
 Chamber pressure: 994,00 kPa  
 Buoyancy correction factor: 1,000362E+00

**Setup/Checks Particulate Counter**

CPCCFK 1,0434 unity  
 PND1 10 unity  
 PND2 15 unity  
 PCRF 168,74 unity  
 System Check O.K? YES  
 Zero Count 0,02179 1/cm<sup>3</sup>

Case: NEDC\_Cold70\_130716

Page: Trip Summary

'Balocco Track'  
Start Date: 07/13/2016  
Start Time: 07:43:43.0



Concerto M.O.V.E., 2016

Trip Duration	1087.00	s
Trip Duration (a)	1087.00	s
Trip Distance	8.08	km
Trip Distance (a)	8.08	km
Trip Fuel Cons. (b)	0.39	kg
Trip Fuel Cons. (a,b)	0.39	kg
Trip Fuel Cons. EU (a,c)	n/a	kg
Trip Fuel Cons. US (a,c)	n/a	kg
Trip Fuel Cons. Volume (b)	0.46	l
Trip Fuel Cons. Volume (a,b)	0.46	l
Trip Fuel Cons. Volume EU (a,c)	n/a	l
Trip Fuel Cons. Volume US (a,c)	n/a	l
Trip Fuel Economy (b)	5.74	l/km100
Trip Fuel Economy (a,b)	5.74	l/km100
Trip Fuel Economy EU (a,c)	n/a	l/km100
Trip Fuel Economy US (a,c)	n/a	l/km100
Trip Av. Eng. Speed	1202.36	rpm
Trip Av. Torque	28.76	Nm
Trip Av. Power	4.78	kW
Trip Work	1.43	kWh
Trip Av. Eng. Speed (a)	1202.36	rpm
Trip Av. Torque (a)	28.76	Nm
Trip Av. Power (a)	4.78	kW
Trip Work (a)	1.43	kWh
Trip Av. Humidity	73.18	%
Trip Av. Amb. Temperature	28.41	degC
Trip Av. Humidity (a)	73.18	%
Trip Av. Amb. Temperature (a)	28.41	degC

ave THC	0.00000	ppm
ave NMHC	0.00000	ppm
ave CH4	0.00000	ppm
ave CO	120.09616	ppm
ave CO2	4.26443	%
ave NOx	94.43905	ppm
ave PM	0.00739	mg/m3
ave Soot meas	0.00000	mg/m3
ave Soot	0.00739	mg/m3
ave PN	n/a	#/cm3
tot THC	0.00000	g
tot NMHC	0.00000	g
tot CH4	0.00000	g
tot CO	1.27235	g
tot CO2	1051.59543	g
tot NO (d)	1.20755	g
tot NO2	0.56612	g
tot NOx	1.79367	g
tot Soot	0.00000	g
tot Soot meas	0.00000	g
tot PM	0.00000	g
tot PN	n/a	#
PM measurement type	0.00000	-
PM correction type	1.00000	alpha(HC)
tot Soot on PM filter (esfm.)	0.00000	mg
Soot -> PM simple scaling factor	1.00000	-
Soot -> PM alpha scaling factor	0.00000	-
Trip Av. Veh. Speed	27.06817	km/h
Trip Distance Share Urban	71.00134	% distance
Trip Distance Share Rural	28.99866	% distance
Trip Distance Share Motorway	0.00000	% distance

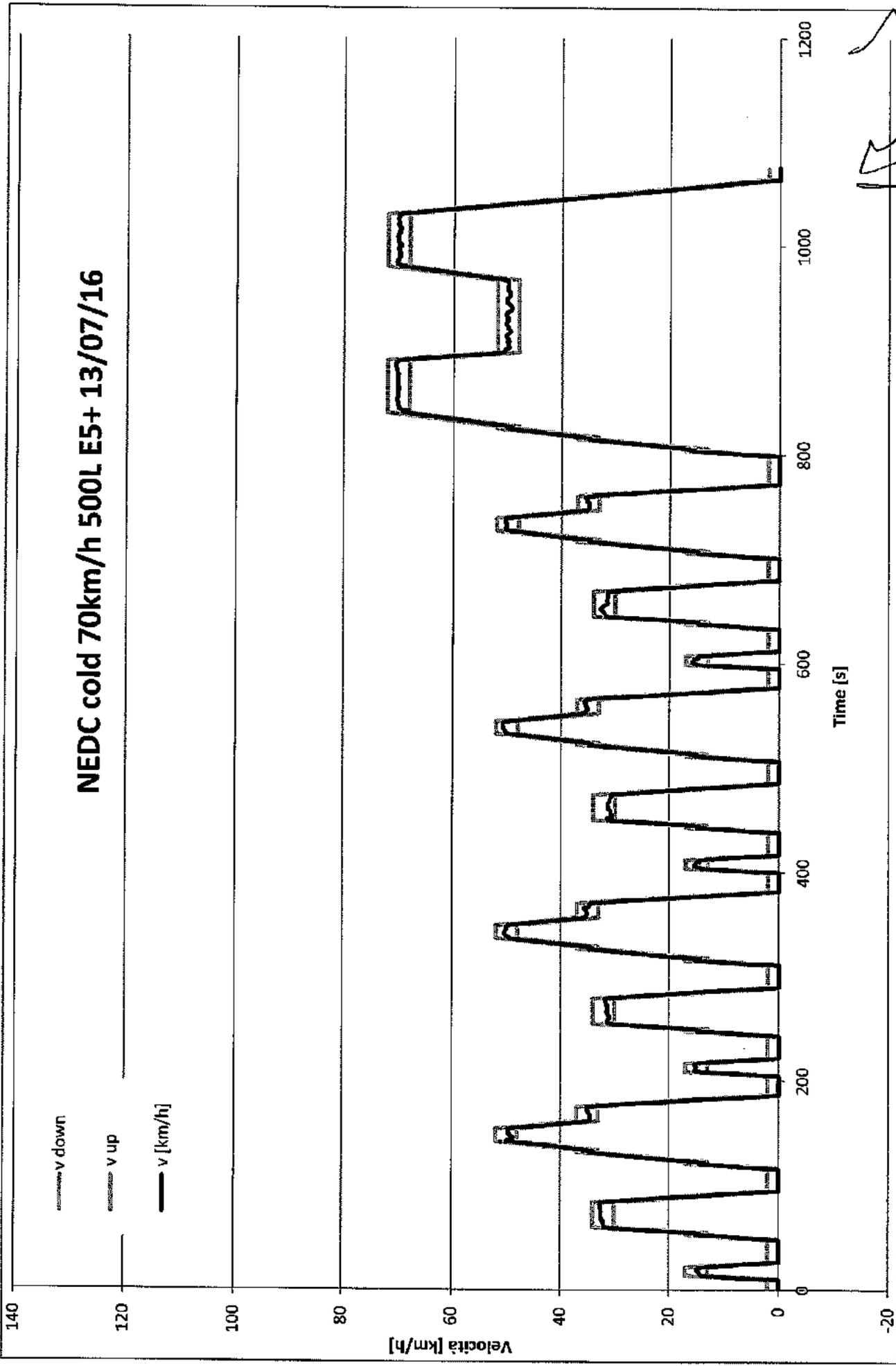
BS CO2	730.27460	g/kWh
BS CO	0.88357	g/kWh
BS THC	0.00000	g/kWh
BS NMHC	0.00000	g/kWh
BS CH4	0.00000	g/kWh
BS NO (d)	0.83857	g/kWh
BS NO2	0.40702	g/kWh
BS NOx	1.24559	g/kWh
BS Soot	0.00000	g/kWh
BS Soot meas	0.00000	g/kWh
BS PM	0.00000	g/kWh
BS PN	n/a	#/kWh
DS CO2	130.14795	g/km
DS CO	0.15747	g/km
DS THC	0.00000	g/km
DS NMHC	0.00000	g/km
DS CH4	0.00000	g/km
DS NO (d)	0.14945	g/km
DS NO2	0.07254	g/km
DS NOx	0.21199	g/km
DS Soot	0.00000	g/km
DS Soot meas	0.00000	g/km
DS PM	0.00000	g/km
DS PN	n/a	#/km
FS CO2	3286.23571	g/kg
FS CO	3.97609	g/kg
FS THC	0.00000	g/kg
FS NMHC	0.00000	g/kg
FS CH4	0.00000	g/kg
FS NO (d)	3.77359	g/kg
FS NO2	1.83162	g/kg
FS NOx	5.60521	g/kg
FS Soot	0.00000	g/kg
FS Soot meas	0.00000	g/kg
FS PM	0.00000	g/kg
FS PN	n/a	#/kg

(a) GAS PEMS measurement state only, (b) based on fuel rate input (ECU, Fuel Meter), (c) calculated from carbon balance  
(d) NO calculated using molecular weight of NO2

PEMS Current Case: Version: Rel5\_B135  
 D:\AVL Concerto\Work\Environment\PEMS\_Rel5\_B135\PEMS330\_MDE\_105cv\_M16\_E5+\_tel533\_Ministero\_E5+\_tel533 / MT6 E5+\_tel533  
 PEMS\_Cold70\_130716.pms\_c Engine: MDE\_105cv / Diesel  
 D:\AVL Concerto\MyData\TransportFiles NOx Ambient Condition Corr.: 5 - CFR40 §86.1342-94 SI  
 \500L\_MDE\_105cv\_E5+\_tel533\_Balocco\_NEDC70\_Cold\_130716.ctf Dry / Wet Corr.: 1 - ISO16183 [Default]

03.07.16

# NEDC cold 70km/h 500L E5+ 13/07/16



1307-16

Case: NEDC\_Hot70\_130716

Page: Trip Summary

'Balocco Track'

Start Date: 07/13/2016

Start Time: 08:16:24.0



Concerto M.O.V.E. 2016

Trip Duration	1085.00	s	ave THC	0.00000	ppm	BS CO2	833.07163	g/kWh
Trip Duration (a)	1085.00	s	ave NMHC	0.00000	ppm	BS CO	0.19137	g/kWh
Trip Distance	8.08	km	ave CH4	0.00000	ppm	BS THC	0.00000	g/kWh
Trip Distance (a)	8.08	km	ave CO	12.74198	ppm	BS NMHC	0.00000	g/kWh
Trip Fuel Cons. (b)	0.31	kg	ave CO2	3.18549	%	BS CH4	0.00000	g/kWh
Trip Fuel Cons. (a,b)	0.31	kg	ave NOx	138.53558	ppm	BS NO (d)	1.62560	g/kWh
Trip Fuel Cons. EU (a,c)	n/a	kg	ave PM	0.00032	mg/m3	BS NO2	1.31008	g/kWh
Trip Fuel Cons. US (a,c)	n/a	kg	ave Soot meas	0.00000	mg/m3	BS NOx	2.93568	g/kWh
Trip Fuel Cons. Volume (b)	0.38	l	ave Soot	0.00032	mg/m3	BS Soot	0.00000	g/kWh
Trip Fuel Cons. Volume (a,b)	0.38	l	ave PN	n/a	#/cm3	BS Soot meas	0.00000	g/kWh
Trip Fuel Cons. Volume EU (a,c)	n/a	l	tot THC	0.00000	g	BS PM	0.00000	g/kWh
Trip Fuel Cons. Volume US (a,c)	n/a	l	tot NMHC	0.00000	g	BS PN	n/a	#/kWh
Trip Fuel Economy (b)	4.76	l/km100	tot CH4	0.00000	g	DS CO2	125.78557	g/km
Trip Fuel Economy (a,b)	4.76	l/km100	tot CO2	0.06035	g	DS CO	0.02868	g/km
Trip Fuel Economy EU (a,c)	n/a	l/km100	tot CO	1016.34741	g	DS THC	0.00000	g/km
Trip Fuel Economy US (a,c)	n/a	l/km100	tot NO (d)	1.98324	g	DS NMHC	0.00000	g/km
Trip Av. Eng. Speed	1199.79	rpm	tot NO2	1.59830	g	DS CH4	0.00000	g/km
Trip Av. Torque	24.64	Nm	tot NOx	3.58154	g	DS NO (d)	0.24545	g/km
Trip Av. Power	4.06	KW	tot Soot	0.00000	g	DS NO2	0.19781	g/km
Trip Work	1.21	kWh	tot Soot meas	0.00000	g	DS NOx	0.44326	g/km
Trip Av. Eng. Speed (a)	1199.79	rpm	tot PM	0.00000	g	DS Soot	0.00000	g/km
Trip Av. Torque (a)	24.64	Nm	tot PN	n/a	#	DS Soot meas	0.00000	g/km
Trip Av. Power (a)	4.06	KW	PM measurement type	0.00000	-	DS PM	0.00000	g/km
Trip Work (a)	1.21	kWh	PM correction type	1.00000	alpha(HC)	DS PN	n/a	#/km
Trip Av. Humidity	51.66	%	tot Soot on PM filter (estim.)	0.00000	mg	FS CO2	3278.54156	g/kg
Trip Av. Amb. Temperature	25.10	degC	Soot --> PM simple scaling factor	1.00000	-	FS CO	0.19468	g/kg
Trip Av. Humidity (a)	51.66	%	Soot --> PM alpha scaling factor	0.00000	-	FS THC	0.00000	g/kg
Trip Av. Amb. Temperature (a)	25.10	degC	Trip Av. Veh. Speed	26.80921	km/h	FS NMHC	0.00000	g/kg
			Trip Distance Share Urban	70.71070	% distance	FS CH4	0.00000	g/kg
			Trip Distance Share Rural	29.28930	% distance	FS NO (d)	6.39754	g/kg
			Trip Distance Share Motorway	0.00000	% distance	FS NO2	5.15580	g/kg
						FS NOx	11.35335	g/kg
						FS Soot	0.00000	g/kg
						FS Soot meas	0.00000	g/kg
						FS PM	0.00000	g/kg
						FS PN	n/a	#/kg

(a) GAS PEMS measurement state only, (b) based on fuel rate input (ECU, Fuel Meter), (c) calculated from carbon balance  
(d) NO calculated using molecular weight of NO2

PEMS Current Case: D:\AVL Concerto\Work\Environments\PEMS\_Reli5\_B135\PEMS\330\_MDE\_105cv\_MTE\_E5+\_Jel533\_Ministero Engine: MDE\_105cv / Diesel  
 Version: Rel5\_B135  
 PEMS Result Filename: D:\AVL Concerto\MyData\TransportFiles\3500L\_MDE\_105cv\_E5+\_Jel533\_Balocco\_NEDC70\_Hot\_130716.ctf  
 NOx Ambient Condition Corr.: 5 - CFR40 §86.1342-94 SI  
 Dry / Wet Corr.: 1 - ISO16183 [Default]

Handwritten signature and date: 13-07-16

