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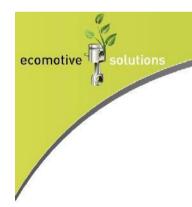
The ICOM Dynamic Dual Fuel Engine System CNG/RNG/LNG And Diesel

(Powered By Ecomotive)

The Path Forward For Natural Gas Vehicles

TECHNOLOGIES TO SUPPO L-_,(_._(_0.Y__

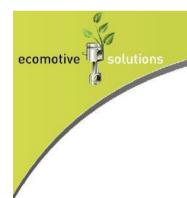




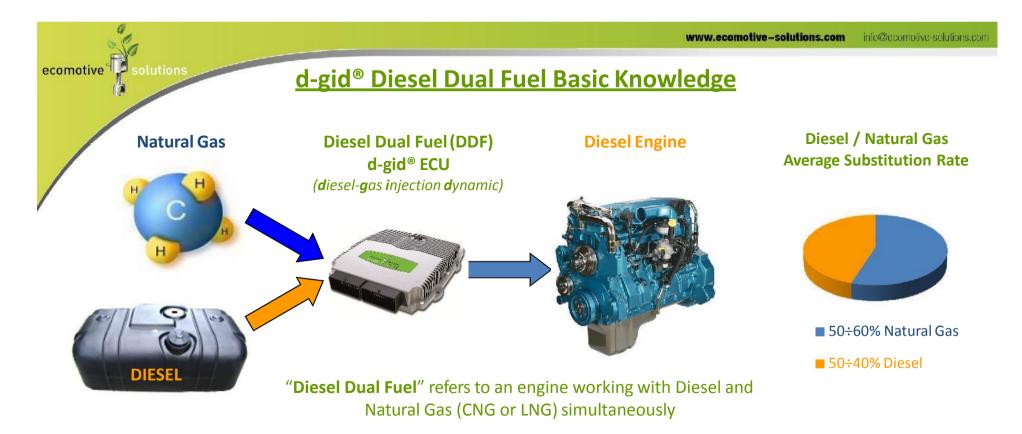
ECOMOTIVE SOLUTIONSan Holdim Group Company



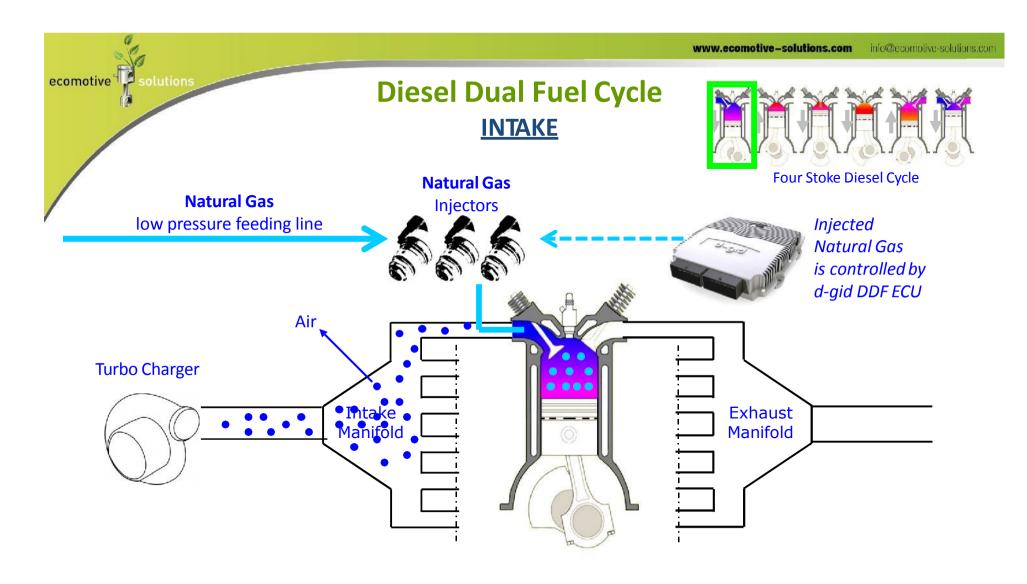
Group Headquarter - Serralunga di Crea (AL) - ITALY

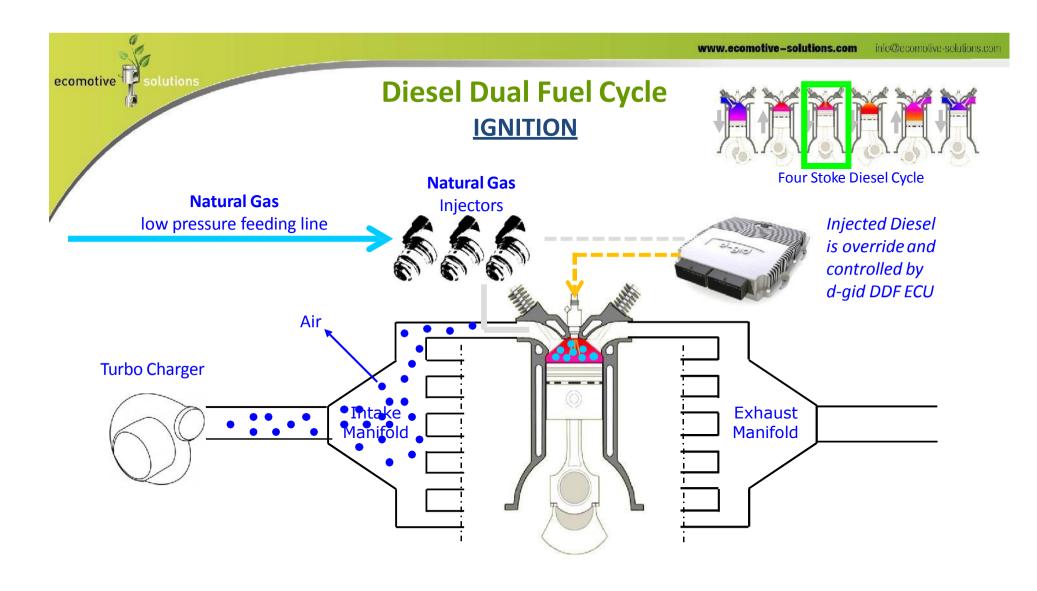


d-gid® Diesel Dual Fuel Technology



d-gid system allowing to fuel diesel engines with a mixture of diesel oil and natural gas (CNG compressed natural gas, LNG liquefied natural gas, Biomethane, Syngas, etc.), d-gid Control Unit determines the amount of diesel fuel injected and air/gas mixture dosage dynamically, modifying it in real time according to the feedback provided by the engine to guarantee perfect operational conditions.







Case Histories

ecomotive solutions

Spark Ignition Otto Cycle Engines for Industrial and Genset applications



Conversion of Diesel engines to 100%

Natural Gas spark ignited Otto cycle with phased ignition

Natural Gas / LPG / Syngas / Biogas

Omnivorous Engine Program







Diesel Dual Fuel for Industrial and Genset applications



d-gid® Genset
conversion of a gensets with
d-gid Dual Fuel technology



Cylinders Temperature
Active Controlc





d-gid® Dual Fuel Natural
Gas Mixer



ecomotive solutions

Diesel Dual Fuel for Industrial and Genset applications



d-gid® Genset
conversion of a gensets with
d-gid Dual Fuel technology

Natural Gas gastrain installation and complete system configuration

ecomotive solutions



Piacenza ITALY LNG station

Dual Fuel ECOMOTIVE SOLUTIONS truck is refueling











Santo Domingo DDF Fleet











Chile private and public transportation DDF



Brazil DDF Long Distance Bus





Turkey long distance bus





ecomotive





Turkey some of our conversions



Case Histories

Our Experience Works



Turkey some of our conversions



Case Histories

Our Experience Works

Τα τεχνικά στοιχεία της μετατροπής

KOI TO KIT ≪d-gid» To uneavoritorivid ellapsiquata pros perasponins nesperitoriosivin-tripo as dual-fuel, siver romá pe ensibilifuel (Benjivin-CNS), binha-

ενεύμανα δε, είναι καινά και με το γνώριμα του LPS. έντα που αλλάζει τελείνει είναι το πλεκτρικά/ολεκτρανικό μέ ρος. Ο εγκέφαλος (ECU) d-gid επικοινωνεί με το πατεναιόμετρο του πεντάδ του γκοζού αλδό και με την CAN BUS του ακόμοτος. ούτως ώστε να μπορέσει να μειώσει την έγκυση του πετρεδοίου

TEXNONOTIA DUAL FUEL: DIESEL + CNG

ΜΕΤΑΤΡΟΠΗ ΤΡΑΚΤΟΡΑ ΣΕ ΟΧΗΜΑ ΔΙΠΛΟΥ ΚΑΥΣΙΜΟΥ





stospeig NGT - Natural Gas Technologies, triv onoig yvwoidays attny requests 6x8cm tou T&T «Transport Show», No υπενθυμίσουμε στους αναγνώστες μας ότι έχει όδη επιτροπεί η μετατροπή οχημότων σε δεπήού κουσίμου βενζίνης – φυσικού σερίου. Λέγοντας διπλού καυαίμου σημαίνει ότι κινούνται ερυτάχρονα και με το δύο κούσιμο σε συγκεκριμένη αναθογία το καθένα ενώ είναι δυνατή και η κίνηση του ανέφατος με το ένα μόνο καύσιμο. Ακόμη υπενθυμίζουμε όο το CHS είναι ο υδρογονάνθροκας μεθάνιο και επειδή (το μεθάνιο), δεν αποτεθεί προϊόν διάλισης, λέγεται φυσικό σέρια, όταν δε, αποθηκεύεται υπό πίεση παίρνει τη γνωστή σε μας ανομασία CNG.

Κατανάλωση

Για τα αποτελέσματα στην καταγάλωση, το κάστος της μετατρο πής και τα βασικά στοιχεία που πρέπει να γνωρίζει ο ενδιαφερόμενος, μελόει στο ΤΕΤ ο τεχνικός υπεύθυνος της ΝΕΤ κ. Γκώργος Aunataišns kai anavtā atis courhacis uas.

Όπως αναφέρθηκε, η μετατροπή σε όκημα δεπλού καυοίμου (dual fuel) και πρώτη σε βαρύ όκημα, έγηνε σε τρόκτορο μάρικα: DAF XF 105 460 idioxtnoias tou quiñou FHL KIRIARROIS A.E. evili στον παρακότω πίνακα, όπου λομβάνεται ως δεδομένο σύγκρι-σπε, ότι για έναν αντίστοικο μικτά κύκλο διαδρομών, το συγκεκριμένο DAF θα είκε κατανάλωση σε πετρέλοιο 40 Λίτρα για το 100 mhhuman.

		DAF XF 10:	460		
Euro S, povs.	2012, 460 5	p.			
Diesel tank	400It (opaquitines n Zn SeEquevh rury 1200 its)				
CNG tanks	8x70x (péyan nitipuan ~70kg)				
Autovopia:	(oc dual-fuel mode) - 600km				
Tipov		Mesi			
Diesel		Diesel		CNS	
Lt/100km	E/Lt	Lt/100km	6/11	Kg/100km	E/kg
40	1.07	22	1.07	12	0.75
-		23.54 €		96	
42.8 €		32.54 €			
		-23,971			

πάνω πίνακα είναι η αναθοχία μίξης των δύο κουσίμων που είναι 30 προς 70 (πετρέθοια προς φυσικό αέριο) και το γεγονός ότι το μεν πετρέλοιο πωλείται όπως γνωρίζουμε σε λίτρα, ενώ το φυσι κό σέριο πωθείται σε κυθά.



THE ARE SO RESOLUTION THE SIX BUILDING WELL SO TO CHARGE DAVID δοκιμών από το παθικά ΥΜΕ.

Ασφάθεια-κόστος-φθορές

Γιο την ροφάθεια της εγκατάστραης, το κόστος και τυκόν φθο-

«Η ασφάθεια της εγκατάστασης είναι δεδομένη θέγω της από δυτης συμμόρφωσης των εξορτημάτων και των κανόνων της διασκευής βάσει του R110. Οι συνεργοζόμεναι εγκαταστάτες μας δε, έχουν εκπαιδευθεί στην Ιταθία πάνω στο συγκεκριμένο αντικεί-

Το κόσειες της εγκατάστασης σε ένα επαφού επ άχημα κυμαίνεται απά 3.000 έως 4.000 € + ΦΠΑ. Για ένα βορύ άχημα από 10.000 έως 12.000. Σε κάθε περίπτωση η διακύμαι ση οφείθεται στην επιθογή περισσότερων ή δηγότερων φιαδώ





Johannesburg Converts 30 Buses to Natural Gas

September 4, 2015 | South Africa, Johannesburg and Italy, Serralunga di Crea



Italy's Ecomotive Solutions, a Holdim Group company and engine calibration specialist, has supported the conversion of 30 buses from the Johannesburg (South Africa) Metrobus fleet into Dual Fuel CNG (compressed natural gas) through its South African partner, Vehicle Gas Solutions. The recent conversion to natural gas is a part of a "Going Green" approach aimed at promoting and incentivizing the use of methane by the urban public transport system in Johannesburg.



Mayor Parks Tau, addressing people during the unveiling of the new Metro busses.



Delegates and commuters who were there to witness a new chapter in the Johannesburg Metro transport system.



The Mayor officially unveils the new busses.



Case Histories

Our Experience Works

Russia DDF on Iveco









Russia DDF on Uralaz





Case Histories

Our Experience Works

Dual Fuel LNG for Fishing Boats Project





Case Histories

Our Experience Works

GreeleCrales

GREENCRANES DEMONSTRATION DAY

Port of Livorno, January the 16th, 2014













d-gid® Genset
conversion of a gensets with
d-gid Dual Fuel technology



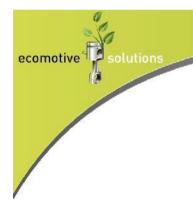
Cylinders Temperature
Active Controlc





d-gid® Dual Fuel Natural
Gas Mixer





Our Services & Know-How

ecomotive solution

Emission Test in Real-World Driving with PEMS System



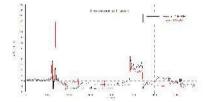






Portable Emission Measurement System, lightweight laboratory which purpose is to test and assess emissions on mobile sources during on-the-road tests or in dynamometer sessions. This service can be offered also on site by our specialized technicians.







Rolling Road Dynamometers Test and OEM Production









Thanks to the technologies available at the Holdim group, our chassis dynamometers have been provided with a hydraulic link supporting realistic road simulations in all the engine working conditions while testing cars/light vehicles, heavy duty trucks and buses, tractors and motorbikes.

Not only we support tests specifically conceived for a wide range of purposes, but we also develop special tools and solutions based on our clients' needs.



Alternative Fuels Engine Development









Our structure, together with a wide partners network, offers a comprehensive range of services focused on the development of the engine working with alternative fuels. Our power bench testers/chassis dynamometers and the engineering support provided by our companies assure the highest features in testing and for the development of reliable performances.



Special Developments & Partnership for EU Calls









Development of special products and projects according to the EU call requirements in partnership with Universities, Public Entities and OEM or any company which needs to obtain validation and certification concerning the alternative fuels and new technologies application.



The Icom Dynamic CNG/LNG/RNG Diesel Dual Fuel System Advantages

The Icom Dynamic Dual Fuel CNG/Diesel System has the following industry leading attributes:

- 1. ICOM Electronic Control Unit (ECU) Powered by Ecomotive Solutions
- 2. ICOM Dynamic works direct on the OEM Can Bus Network (which is transparent)
- 3. ICOM Dynamic while in dual fuel mode ICOM ECU controls OEM diesel injection and our CNG injection for maximum diesel displacement and performance.



The Icom Dynamic CNG/LNG/RNG Diesel Dual Fuel System Advantages

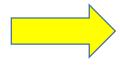
- Icom Dynamic has numerous fail-safes in place to protect the engine:
 - 1. Monitors coolant temperature and if it exceeds temperature Icom System is shutoff and reverts to just diesel.
 - 2. Monitors Air Intake Temperature if normal operation is going to be exceeded Icom System is shutoff and reverts to just diesel.
 - 3. Monitors Oil Temperature and if normal temperature is going to be exceeded Icom system is shutoff reverts to just diesel.
 - 4. Monitors Exhaust Gas Temperature and if normal temperature is going to be exceeded Icom System is shutoff and reverts to just diesel.



The Icom Dynamic CNG/LNG/RNG Diesel Dual Fuel System Advantages



Engine light safety: If any derate engine code is on the Icom Dynamic System will shut off until the engine light is back off.



Leak monitor based on High pressure and low pressure sensors and if any leak is detected on either side the lcom system will shut off until the leak is repaired.



The Icom Dynamic CNG/LNG/RNG Diesel Dual Fuel System Advantages

Icom Dynamic only injects CNG if all the above are met. If any are exceeded Icom Dynamic System will shutoff and revert to just diesel.

Further the Icom dynamic System will not change-over to natural gas/diesel on initial start until all the above are in normal operating range.

All these fail-safes protect the engines and have contributed to global success.

No driver input is necessary on any of the above.



The Icom Dynamic CNG/LNG/RNG Diesel Dual Fuel System Advantages

- If the truck is equipped with a Regen system, EGR system or such the Icom Dynamic System will turn-off on CNG while in the Regen type mode.
- Icom Dynamic ECU can see this thru the Can Bus Network. (This avoids many-many issues.)
- Icom Dynamic System is being utilized on the latest 2018 engines including Cummins, Paccar, Detroit Diesel, Mercedes and Volvo as well as engines back to the 1980's.
- Icom Dynamic system can do both automatic and manual transmissions.
- Under 100% load you will achieve the most displacement (all other CNG/Diesel Dual Fuel systems turn-off at 80% load or add a de-rate switch which relies on driver turning on and off manually).



The Icom Dynamic CNG/LNG/RNG Diesel Dual Fuel System Advantages

The Icom Dynamic Systems Pneumatic Components:

The Icom Dynamic System utilizes cutting edge componentry from Icom and Blackstone

- The Regulator meets the latest standards and is best able to meet fuel demands.
- The Mixing Ring allows for a very precise air/fuel ratio.
- Sensors are state of the art.



The Icom Dynamic CNG/LNG/RNG Diesel Dual Fuel

The Icom Dynamic System injects natural gas post turbo! allowing for a more precise timing of injection for the engine (most other systems inject pre-turbo which can-and often haslead to them having timing issues which causes the engine to over-fuel and can lead to engine damage.

Additionally, fumigating pre turbo can cause turbo temperature to heat-up and possibly blow the intercooler and the turbo by applying too much pressure).

The Icom Dynamic System avoids all these issues.



The Icom Dynamic CNG/LNG/RNG Diesel Dual Fuel

Clearly the Icom Dynamic System allows for the:

- Most displacement of diesel
- Best performance
- Reduced emissions

We can successfully convert and achieve approval on most any diesel engine.

• Over 5000 trucks and HD equipment -- Ports (UTR's, Cranes, Generators etc.) worldwide with zero engine issues.

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Thank You for your interest!

With the proper use of alternative fuels, we can enjoy increased energy security, increased employment in an emerging sector, and decreased emissions.



www.icomnorthamerica.com

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Or by email: info@icomnorthamerica.com



