

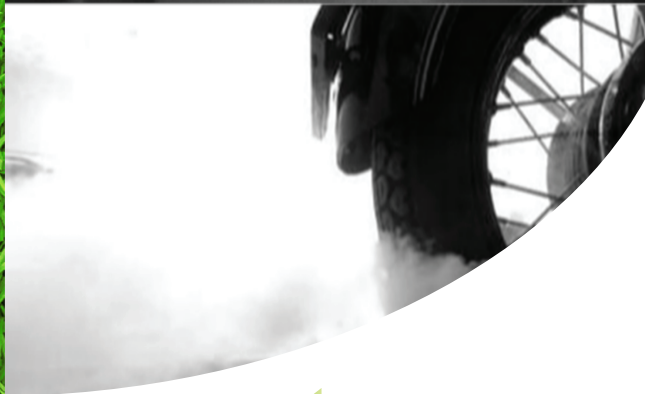
Smoke · Fume · Particulate Matter Reduction Device

EP EID

Smoke reduction device

Smoke Reduction Device Catalog

Green Environment Blue Planet



SOLUTION

Green Environment Blue Planet
Smoke reduction device

SAMSUNG 삼성화재

KRW 100 million Product Liability Insurance

10년 연속 정비센터

<https://www.car1023.com/>

IDENTITY

Green Environment, Blue Planet

It is a solution company that leads the green environment and the planet based on corporate missions and core values.





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EP EID product



Type	Diameter of Muffler	Targets	Sales Price
Small	45mm~62mm	cars and vans	450,000(KRW)
Medium	63mm~90mm	cargo trucks	600,000(KRW)
Large	91mm~130mm	large buses	750,000(KRW)
Extra Large	130mm~	vessels · heavy equipment	Contact Seller

EID

Exhaust Induction Device for improvement of energy efficiency of combustion engines and rapid emission of exhaust gases.

Exhaust Induction Device for Improvement of combustion efficiency of internal combustion Engine

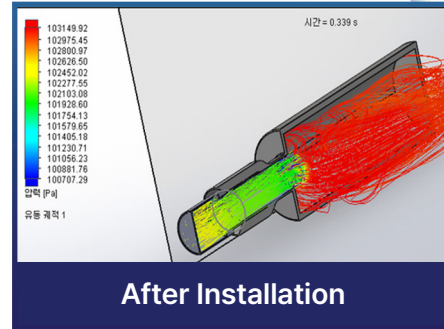
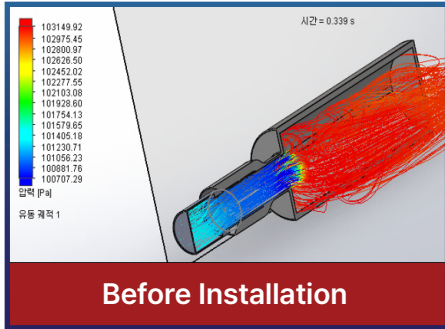
What is EID Technology?

The Exhaust Induction Device technology uses aerodynamics to improve the energy efficiency of combustion engines without using electrochemical devices. It preemptively prevents exhaust emissions such as gases and fine dust, while it can easily be installed within 10 minutes on the tip of exhaust pipes without reconfiguration of the system.



EP EID How it works

Improving unsteady flow in muffler pipes



BEFORE

Back pressure occurs at the exhaust tip

Problem occurs

Turbulence

Measures

AFTER

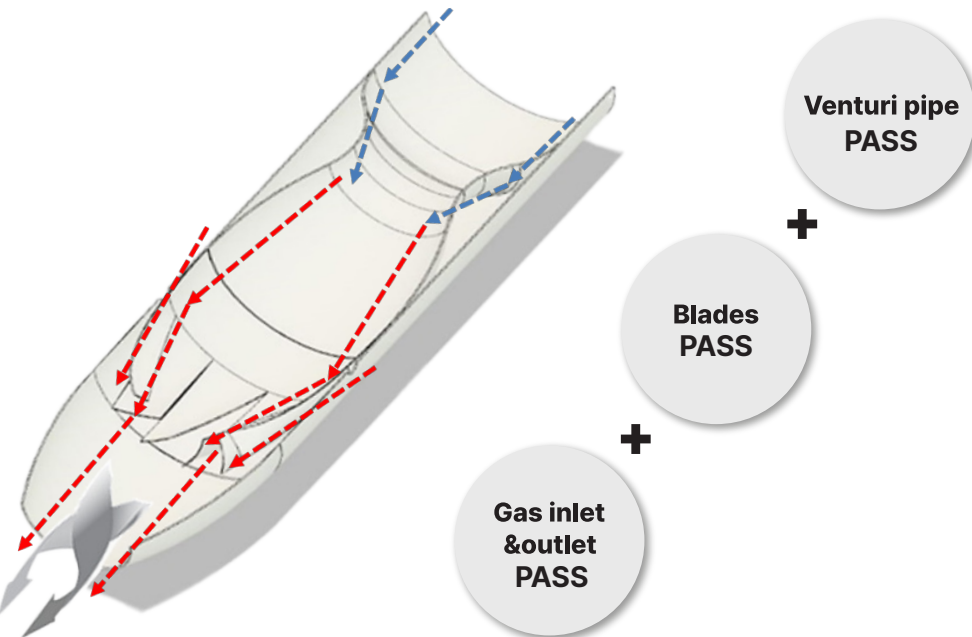
AFTER Reduced Back Pressure

Improve exhaust flow

Install Vortex Generator

EP EID Amplified Exhaust Function

Vortex. Amplification of flow velocity and self-regulation of back pressure



Self-Regulating back pressure at the tip of the muffler

Induce rapid exhaust

Induce improvement in engine efficiency

CFD Analysis of the Car Muffler with EID

Organization Industry-Academic Cooperation Foundation, Ajou Motor College

Analysis Period 16 July, 2018 - 16 August, 2018

Fuel : diesel

	Category	BEFORE	AFTER	Increased	Reduced
Vehicles	Santa Fe 2016	HC (Unburned Hydrocarbon)	0.009 g/km	0.004 g/km	55% Down
Displacement	1955CC	CO (Carbon Monoxide)	0.619 g/km	0.015 g/km	97% Down
Max output	186HP	NOX (Nitrogen Oxide)	0.003 g/km	0 g/km	drastically reduced
Fuel Efficiency	Auto 13.1 km/L	CO2 (Carbon Dioxide)	155.55 g/km	117.71 g/km	24% Down
Transmission	Auto 6 layers	Mileage per liter	17.20km/L	22.90 km/L	33% Up

When installing an exhaust pipe attachment

- It greatly reduces emissions including NOx and CO2, which also gives a positive influence on fuel efficiency
- Secondary effects: Increased fuel efficiency Reduced engine vibrations Reduced Engine noises increased Torque Extended Engine Life

Test Equipment and method : IM240 test



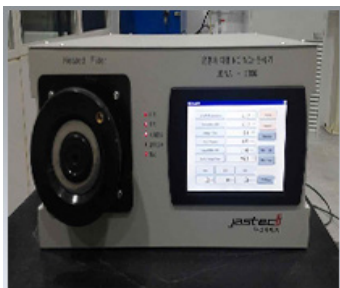
Santa Fe Diesel Vehicles



Install on exhaust pipe



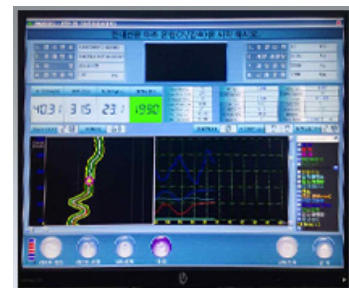
eight analyzer



Diesel NOX Analyzer



Display of the chassis dynamometer (For drivers)



Display device of the chassis dynamometer (For operation)

A comprehensive opinion

When the device is installed on the exhaust pipe, it greatly reduces emissions including NOx and CO2, which also gives a positive influence on fuel efficiency.



Key Features of the EP EID



Aimed at improving energy efficiency of combustion engines without electrochemical devices



Non-powered and filter-free smoke reduction technology



Preemptive prevention of smoke and fine dust generations and their causes



Exhaust Induction Device utilizing aerodynamics



Simple installation on the tip of exhaust pipes within 10 minutes without having to reconfigure the exhaust system

Differentiation of EID

Competitive advantages to DPF companies

Ultra-low cost



- Only 10% of DPF product cost
- No filter chemicals
- No electrical or power supply needed
- No other parts needed than the main product

Simple installment



- Takes less than 10 minutes to install
- No additional devices needed
- No need to secure extra space for installation
- No need to disassemble or remove existing devices
- No need to reconfigure and receive approval

Broad applicability



- Applicable regardless of fuel type
- Applicable regardless of vehicle output, displacement, and vehicle type
- No worries to cause malfunction of the vehicle
- Applicable to all vehicles including new and used vehicles
- increases max output when installed on vehicles with DPF

Simple follow-up care



- No regular cleaning
- Trouble-free
- Semi-permanent use
- No periodic regeneration

How to install EP EID

STEP 1 | Measure the inner diameter of the muffler.



STEP 2 | Make the EID slightly smaller than the inner diameter of the muffler pipe.



STEP 3 | Push the product in with the IN mark facing the muffler.



STEP 4 | Cut the cable after installing.



STEP 5 | Placing a wooden board on the product, gently hammer the board to make sure the EID is securely installed inside the muffler.



STEP 6 | Then, the installation is completed. If necessary, you may fix the product using a rivet to prevent detachment or theft.



User Precautions

- The EID must be correctly and tightly fitted to prevent removal accidents.
- The EID cannot be less than the regulation.
- If the shape of the muffler is not a typical round shape, take more care when mounting it.

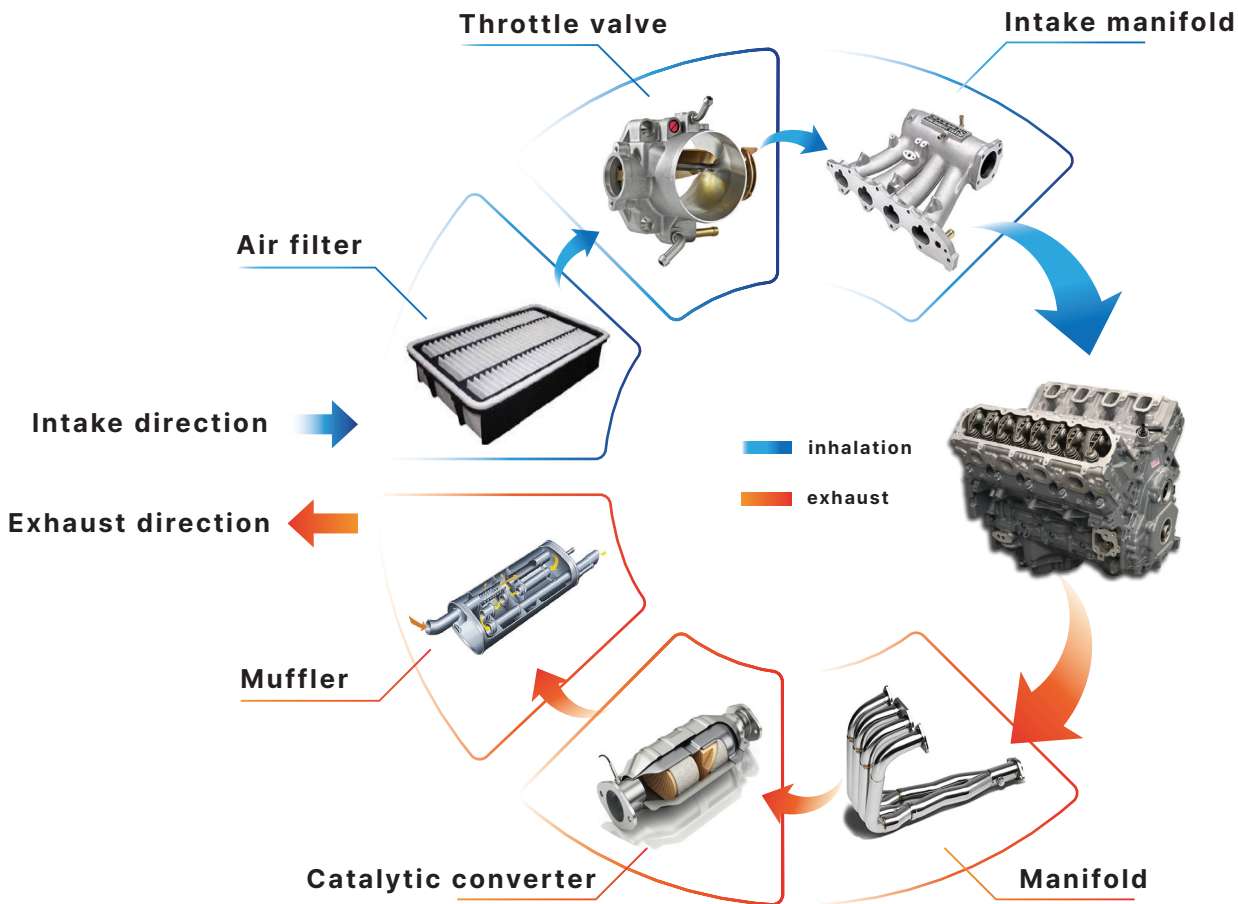


Must be mounted at the end of the exhaust vent

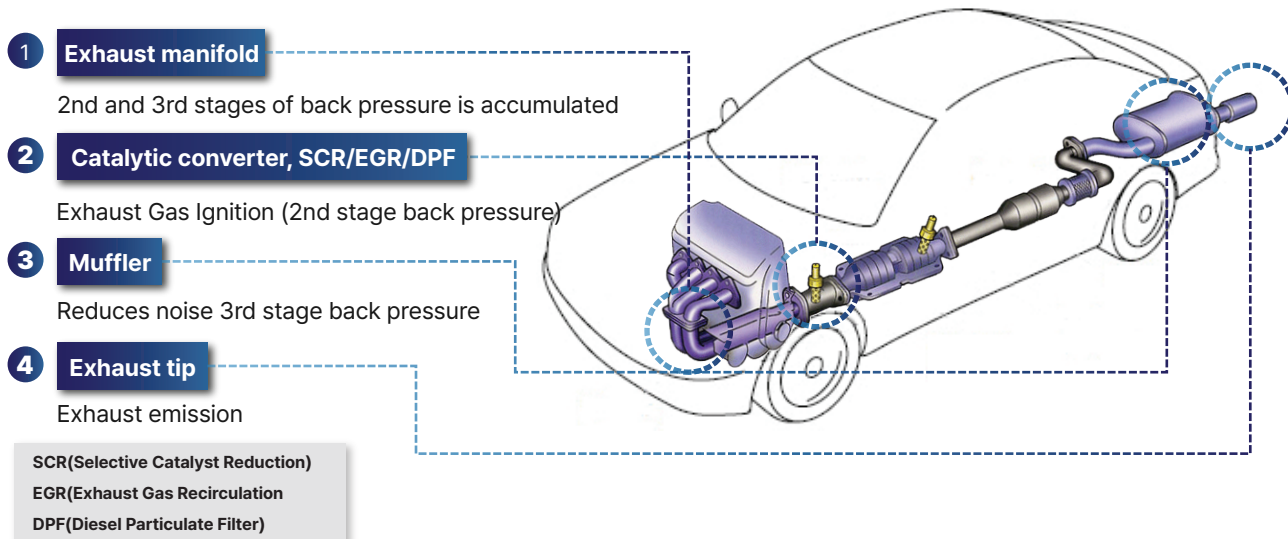
Pay attention to the installation direction, open slightly, and insert.
Be sure to mount the product upwards.



Intake-Exhaust System for Internal Combustion Engine



Exhaust flow of internal combustion engine

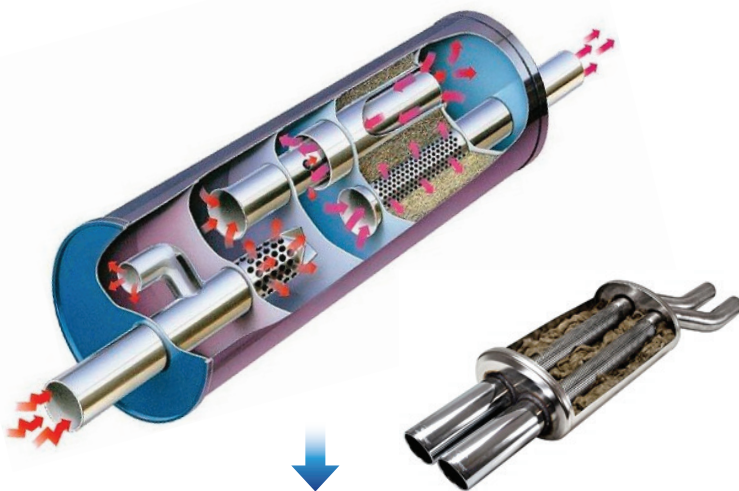


Structure of Catalytic converter



Honeycomb structure increases the resistance of exhaust gas flow

Structure of silencer [Muffler]



Sports/high performance vehicles

Straight line structure improves exhaust flow



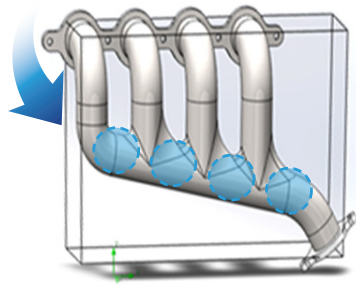
Regular vehicles

Complex structure increases resistance in exhaust flow

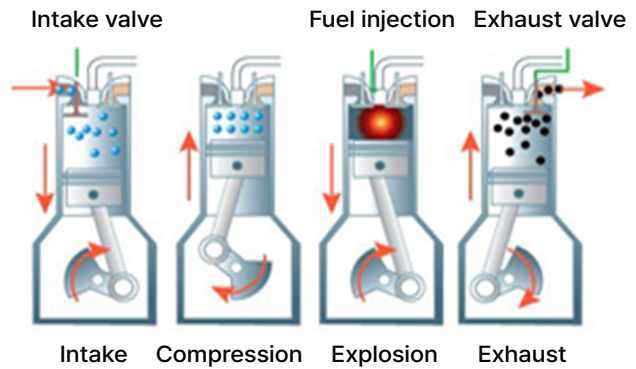


Back Pressure and Incomplete Combustion

All Back Pressure are accumulated



Exhaust Manifold



The compressed back pressure hinders the exhaust flow during the exhaust stroke

The combustion gas remains inside the cylinder

Reduces in-cylinder fresh air intake due to residual gases

Incomplete combustion occurs due to lack of quality air flow during explosion

Pressure loss results in



Smoke



Reduced fuel efficiency



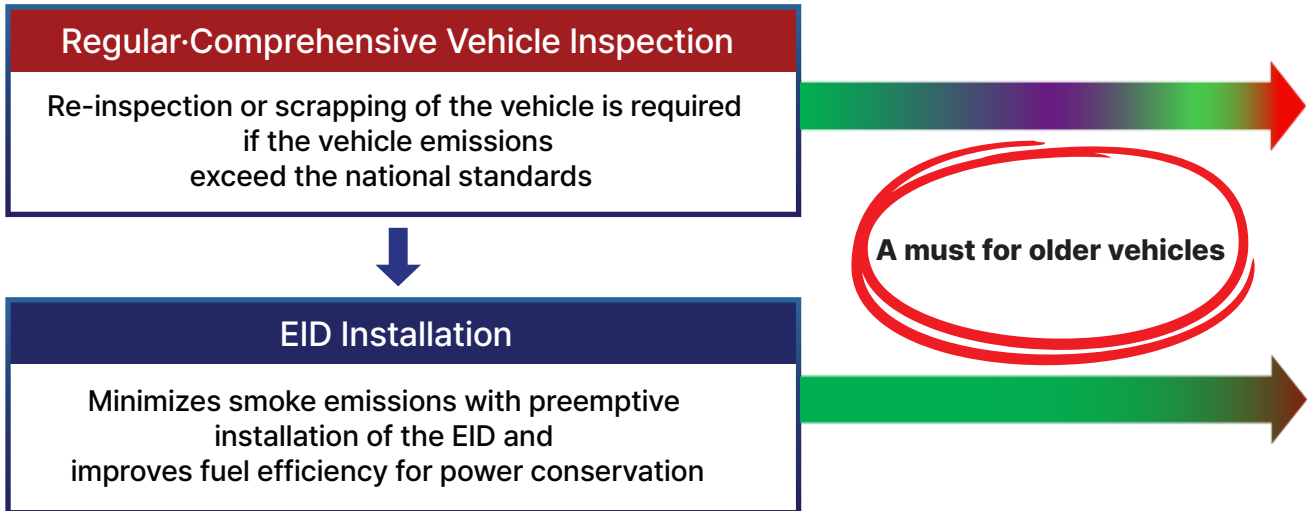
Vibration of engine



Reduced output

EID Benefits of EID installation

Benefits of early installation



Approved Modifications

THEME

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Noise Silencer >>>



Exhaust tip

example




Only when the silencer is not changed
Reference Attached file 1.
Regulations on Motor Vehicle Tuning (Silencer)

Minor unit: Exhaust tip installed at the exhaust end


Notes

- Approved when the tip is welded and installed without changing the silencer.
- Approved when a separate tip welded to the existing exhaust pipe.

THEME



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Fuel devices and electrical electronic devices >>>



Fuel saving devices

example

Reference Attached file 1.
Regulations on Motor Vehicle Tuning
(Fuel devices and electrical-electronic devices)

Minor unit: Equipment installed for fuel saving (mechanical / electronic)

Notes: Fuel saver installation has to be installed without any changes to the existing fuel system.



No legal regulation when fitted

Regulations on Automobile Tuning
Ministry of Land, Infrastructure and Transport Notice No. 2020 407
(Self-tuning applicable item #26 #37 Excerpt)

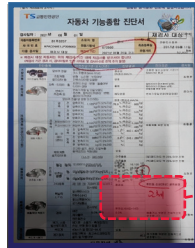


Examples of EID Installation and Market Expansion

I Smoke testing after installation



81주 0207



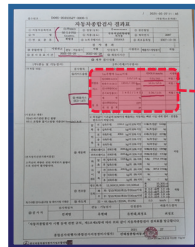
2021.06.01
Measured by vehicle inspection stations

배출가스	경유	검사방법	부하검사(KD-147)
배출가스	배출가스	배출가스	배출가스
배출가스	배출가스	배출가스	배출가스
배출가스	배출가스	배출가스	배출가스

Diesel vehicles with a 2017 52,800 km drive



61주 9663



2021.06.04
Measured by vehicle inspection stations

배출가스	기준값	측정값	판정
일산화탄소(CO)	1.0 / 1.0 %	0.00 / 0.00 %	합격
탄화수소(HC)	1.00 / 1.00 ppm	16.0 / 57.0	적합 / 적당
질소산화물(NOx)	1.00 / 1.00 ppm	1.04 / 1.01	적합 / 적당
공기과잉률(O ₂)	0.90 ~ 1.10	1.10 / 1.02	합격

Gasoline vehicles with a 2007 model of 250,643 km



57저 7611



2021.03.09
Measured by vehicle inspection stations

배출가스	기준값	측정값	판정
일산화탄소(CO)	1.00 / 1.00 %	0.00 / 0.00 %	합격
탄화수소(HC)	1.00 / 1.00 ppm	29 / 29	적합
질소산화물(NOx)	1.00 / 1.00 ppm	1.10 / 1.02	합격
공기과잉률(O ₂)	0.90 ~ 1.10	1.10 / 1.02	합격

Gasoline vehicles with a 2017 model of 79,455 km



17조 1156



2021.06.04
Measured by vehicle inspection stations

배출가스	기준값	측정값	판정
일산화탄소(CO)	1.00 / 1.00 %	0.00 / 0.00 %	합격
탄화수소(HC)	1.00 / 1.00 ppm	29 / 29	적합
질소산화물(NOx)	1.00 / 1.00 ppm	1.10 / 1.02	합격
공기과잉률(O ₂)	0.90 ~ 1.10	1.10 / 1.02	합격

Diesel vehicles with a 2015 74,931 km drive



22서 1344



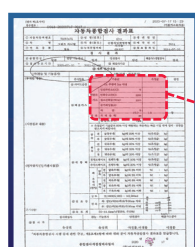
2021.07.01
Measured by vehicle inspection stations

배출가스	기준값	측정값	판정
일산화탄소(CO)	1.00 / 1.00 %	0.21 / 0.0 %	합격
탄화수소(HC)	1.00 / 1.00 ppm	1 / 2	합격
질소산화물(NOx)	1.00 / 1.00 ppm	1.00	합격
공기과잉률(O ₂)	0.90 ~ 1.10	1.00	합격

Gasoline vehicles with a 2015 model of 82,129 km



70우 7475



2020.07.17
Measured by vehicle inspection stations

배출가스	기준값	측정값	판정
일산화탄소(CO)	1.00 / 1.00 %	0.21 / 0.0 %	합격
탄화수소(HC)	1.00 / 1.00 ppm	1 / 2	합격
질소산화물(NOx)	1.00 / 1.00 ppm	1.00	합격
공기과잉률(O ₂)	0.90 ~ 1.10	1.00	합격

Diesel vehicles with a 2014 69,937 km drive

Examples of EID Installation and Market Expansion

Smoke Test Results measured by the vehicle inspection station

Fuel: Light oil

Vehicle	Registration number	Fuel	Age	Inspection items permissible standard smoke	before installation	after installation	mileage	inspection date
Porter Extra-long axle Double Cab	80다 6952	diesel	2002	20%	21%	8%	259,406km	20.11.02
Grand Starex	70다 9460	diesel	2008	15%	43%	14%	67,489km	20.09.22
Grand Starex	78노 7166	diesel	2017	15%	7%	0%	23,787km	20.09.22
Cerato	70소 7912	diesel	2007	15%	14%	3%	245,981km	19.06.08
Porter II	95나 0549	diesel	2010	15%	15%	2%	173,093km	19.06.03
Grand Starex	73수 2421	diesel	2010	15%	32%	9%	237,852km	19.06.20
Sorento	31조 3729	diesel	2004	20%	6%	1%	161,194km	19.06.04
Porter 2	82더 4929	diesel	2015	15%	75%	6%	193,339km	18.10.29
Santa Fe	49오 8866	diesel	2002	25%	99%	9%	240,380km	19.10.18
Porter 2	85도 7616	diesel	2012	15%	10%	4%	300,808km	18.10.06
Bongo Frontier	인천83다 2203	diesel	2001	20%	15%	7%	251,781km	17.08.24

Source:Sung Gwang Smog Control Korea Ltd.All rights reserved

Potential markets for EID



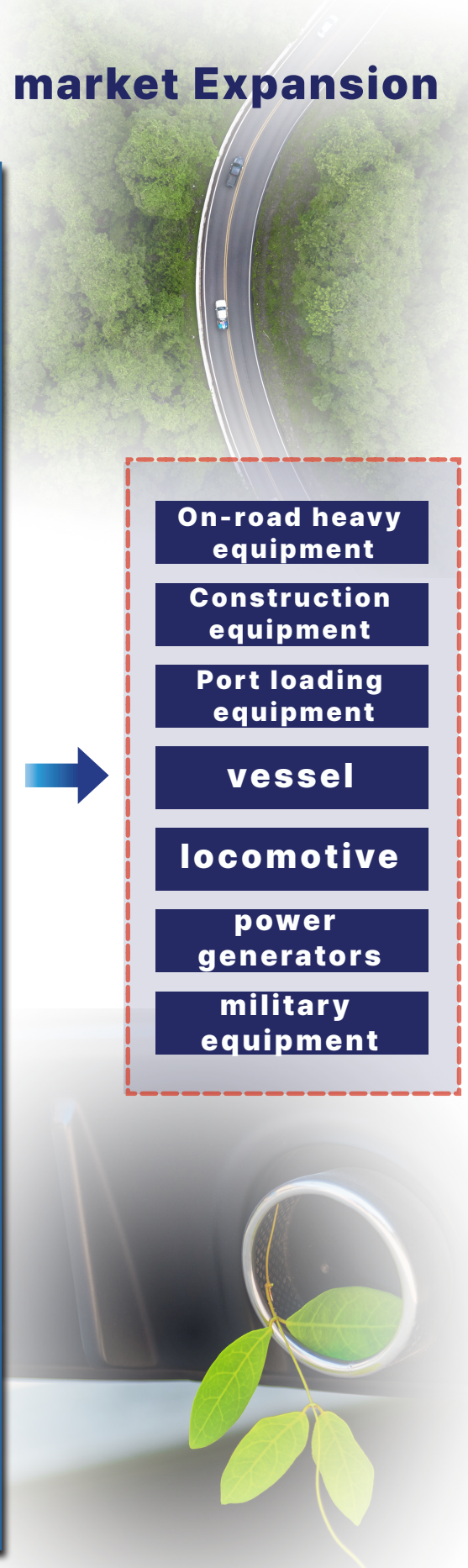
- Motorcycle
- Mini van
- Sedan
- RV
- SUV
- Truck
- Bus



Potential markets for EID and market Expansion



- On-road heavy equipment
- Construction equipment
- Port loading equipment
- vessel
- locomotive
- power generators
- military equipment



Test Installment of EID

Targets

Internal Combustion Engine Vehicles
(Passenger car·Bus·Truck· Vessel etc. Preferably vehicles equipped with diesel cars)

Expected effects

Reduced emissions (NOX.SOX.PM2.5-PM10.HC.CO. CO2 and others)
Secondary effects: Increased fuel efficiency Reduced engine vibrations
Reduced Engine noises Increased Torque Extended Engine Life

Process



EID installed vehicles

All types of internal combustion engine vehicles including gasoline·diesel, LPG vehicles and others



Passenger car



van



truck



bus



vessel



heavy equipment

On-site installation

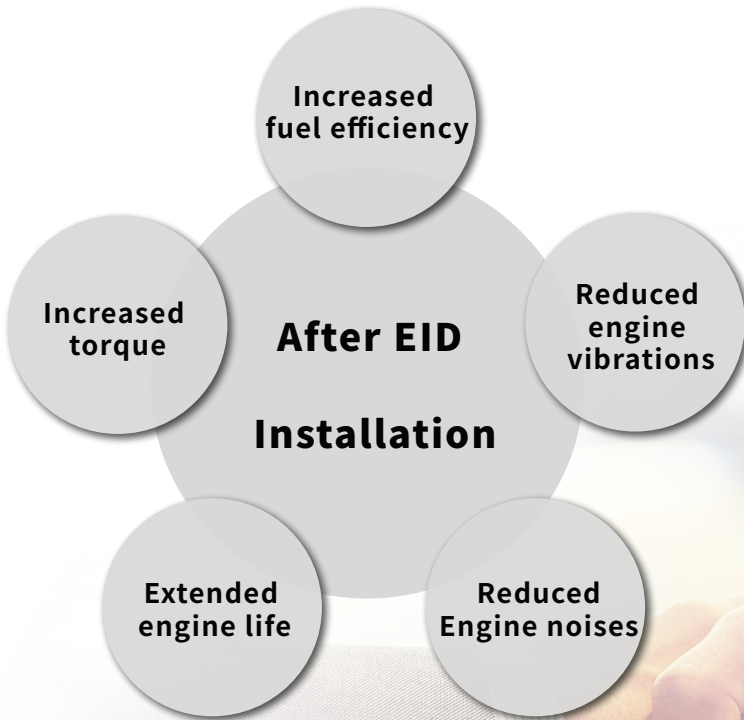
Device material ALL STS304

Takes less than 10 minutes



Expected secondary effects of EID

Unique advantages of the NON FILTER EID technology



The EID technology does not aim to filter and reprocess exhaust fumes like other commercialized emission reduction technologies.

It aims to improve the incomplete combustion of an engine.

It has various secondary effects including improvement of incomplete combustion.

Product images



Social Effects of EID & Vision

Preemptive preparation before installing DPF

Emits gases even if the vehicle is below the emission standard

- Pre-installation prior to DPF installation
- Individuals · local governments · transportation companies who want to reduce smoke emissions can install the device in advance to reduce exhaust fumes and have cost benefits.

DPF Assistance

Improvement of engine performance and prolonged lifespan of the engine

- When EID is installed on diesel vehicles with DPF, complete combustion occurs to the extent that clear water drops from the exhaust pipe.
- This means EID installation improves the driving performance of the vehicle. It can partially solve some of the power degradation problems that may occur after installing DPF, so that it is expected to soothe the complaints and objections of DPF users.

The economy of Creation and Sharing

Essential challenges to distribute emission reduction devices

- EID does not aim to take over or disrupt existing markets, but it aims to create a new market.
- EID is expected to spread rapidly in the market and contribute significantly to the health and well-being of the global population.

EP EID Conclusion and Suggestion

The economic cost of emissions is a burden for central·local governments and business owners

It is urgent to reduce emissions from trucks, buses, port facilities, and vessels.

Low-cost & high-efficiency emission reduction technology can reduce exhaustfumes and energy costs.



EP EID Size Guide for Vehicles

division	SIZE (mm)	Vehicles
small (mm)	32	쏘나타CL
	35	베라크루즈, K7(구형), 뉴SM3e디젤, 뉴스포터지, LF쏘나타(원형), 그랜저HG, SM7뉴아트, 스파크, 모닝
	40	그랜저XG, 그랜저TG, 그랜저IG, 제네시스DH, 제네시스EQ900, 에쿠스(신형), 스파크, 코란도C 원스톱, 스포티지(구형) K5, 뉴K7, SM7(구형), 푸조407, 다마스, 뉴SM3, 알페온, 마티즈, 뉴스타렉스, 아우디S6(구형), QM3, 벤츠S500
	44	쏘울, 뉴모닝, 레이, 아우디뉴A6, 갤로퍼VAN, 제네시스G80, 올뉴K5, 니로, 제네시스 GV80, 제네시스G90, 싼타페DM K9(구형), 싼타페CM, 티볼리, NF쏘나타, 벤츠CLS350, 오피러스GH270, 아우디A4, 싼타페MLX, 알티마(45) 그랜저 (45)
	47	LF쏘나타(구형), 싼렌토R(듀얼), SM5, NF쏘나타, 링컨MKX, 푸조200, 그레이스, 모닝(신형), 뉴스타렉스, NF쏘나타(구형) 미니쿠퍼, 뉴체어맨 뉴아반테, 그랜저HG, 벤츠B20, 투싼(구형), K5(구형), 무쏘, 싼타페CRDI, 티볼리, 기아차 1.2T 지게차 로제, 싼타페 MLX, 130, 제네시스 330(48) 아반떼(48), 에쿠스구형(48)
	50	싼타페(구형), 코란도스포츠, 무쏘스포츠, K7(신형), BMW120D, 트라젯XG, 포터2, 투싼IX, 그랜드스타렉스 프라이드(디젤) 옵티마리갈, 옵티마, 세라토(디젤), 뉴EF쏘나타, 이스타나, BMW320D (신형), 뉴K9, 봉고, 올란도LT, 뉴K5, 기아스토닉 뉴아반테, 로제, 체어맨CM700, 그랜저TG, 푸조, 싼타페VGT, BMW520D, 스포티지TLX, 마마렉시 K5, 그랜저Q270 그랜저HG240, 폭스바겐 T-ROC, 크라이슬러 티구안, 쏘나타Y20, 제네시스G80, XM3, 소나타하이브리드(50), 캠리하이브리드 렉서스ES300H, BMW740D, 오피러스GH330, 아우디Q320Tdi 싼렌토TLX(50), BMW 320i, 에쿠스구형(50) 에코100인디게이터, 베라크루즈, 벤츠GLA200D, QM6LP
	54	로제(구형), 포터2, 테라칸(구형), QM5, 봉고3(구형), 뉴SM6, 싼타페(구형VGT), 토스카 라세티, 프리미어, 뉴SM3 포드EXPLOPER, 벤츠SL400, 코나(디젤), 오피러스, K9, 벤츠E350(52변형)
	58	카니발2 오피러스(구형), 모하비 봉고3, 뉴LF쏘나타 YF쏘나타 그랜드카니발, 제네시스GV70, 그랜드스타렉스 올뉴카니발 재규어 F20, 펠리세이드, 말리브 제네시스GV80, 폭스바겐티구안, 렉서스ES330, 올뉴쏘렌토, 혼다CRV, 오피러스GH3300 포터탑차 (57) 올란도LTZ 쏘나타하이브리드, 투싼LX20, 스포티지(에코다이내믹), BMW528, 케딜락에스컬레이드(57) SM3LF, BMW520D, 아우디A645TFS(57)
	60	쏘렌토, 포터(구형), 지프랭글러, 링컨컨티넨탈(신형), 아우디G7, 벤츠E350, 아우디A6 45TFS, 아우디 55TDI, 스타리아 혼다 ACCORD VTEC, 액티언스포츠, BMW, 아우디A8, K8QM6, 스타렉스VGT, BMW730LD
	62	카이런, 포터2(신형), 테라칸, 액티언, 올뉴쏘렌토, 그랜드체로키SRT, 카니발R, 그랜드카니발, 봉고3, 코란도스포츠(신형) 시트로엥C4, 벤츠SL 세라토, 뉴렉스턴, 올뉴렉스턴, 포르쉐파나메라, 벤츠GLC, 렉스턴칸 스타리아 벤츠GLE350d
medium (mm)	66	솔라티, 카니발, 그랜드카니발(신형), 렉스턴, 리스터(25인승), 뉴쏘렌토 올뉴그랜드카니발(카니발4세대) 싼렌토R 마이티2.5T(구형), 올란도LTZ 랜드로버디스커버리, 싼렌토하이브리드, QM6 렉서스, BMW760L
	68	모하비, 카니발(68), 카니발(70) 시에나
	73	현대E카운티, 포드F-150, 마이티(신형), 현대2.5T
	80	아산크레인
	87	대우노브스 5T, 메가트럭, 관광버스
large (mm)	90	현대 25.5T
	100	대우프라마 25T, 노브스 11
	111	15~25T 실측확인, 벤츠 아크로스만트럭
	121	현대 엑시언트 15T
	124	스카니아 25.5T
126	볼보 25T, 스카니아 25T, 현대트라코엑시언트	

Make sure to measure the size of the inner diameter of the vehicle vessel's muffler (exhaust port) to purchase the right size.

EID Patents and Certificates



Patent Certificate for Smoke Reduction Devices



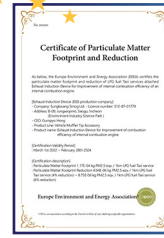
Patent pending in China and Europe



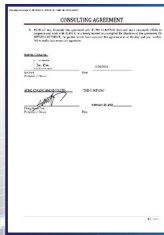
Patent Registered in the United States



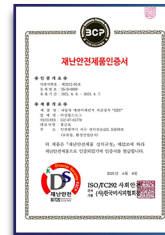
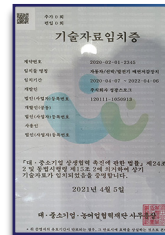
PCT-applied vehicles



Emission Reduction device for vessel's internal combustion engine



EPA USA - Consulting Agreement



Europe Environment and Energy Association Certificate of Particulate Matter Footprint and Reduction

Certificate of Technology Escrow

Certificate of Disaster Safety Product



Certificate of Related Design Registration



Memo



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Memo



SOLUTION

Green Environment Blue Planet

Smoke reduction device

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