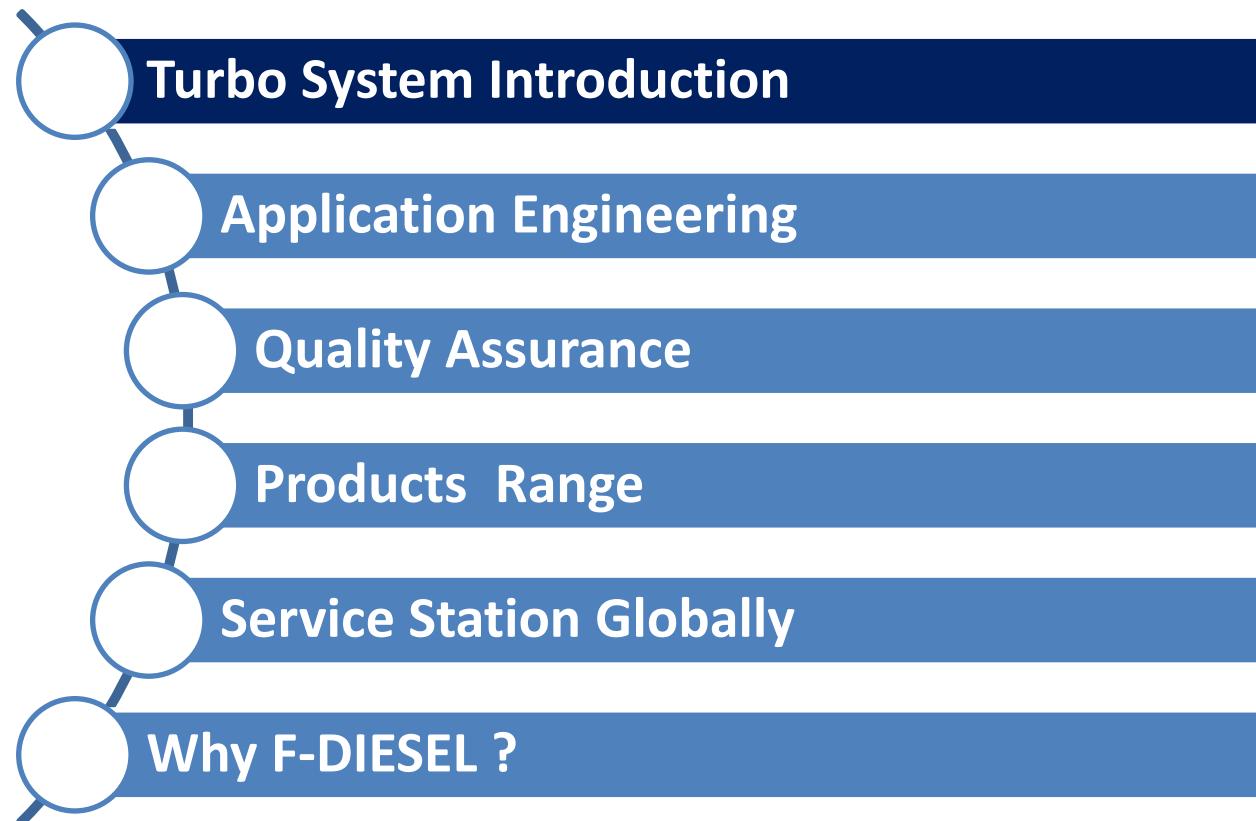


F-Diesel E-Actuator Solution

Presented by F-
DIESEL Apr., 2022

Version 3.0



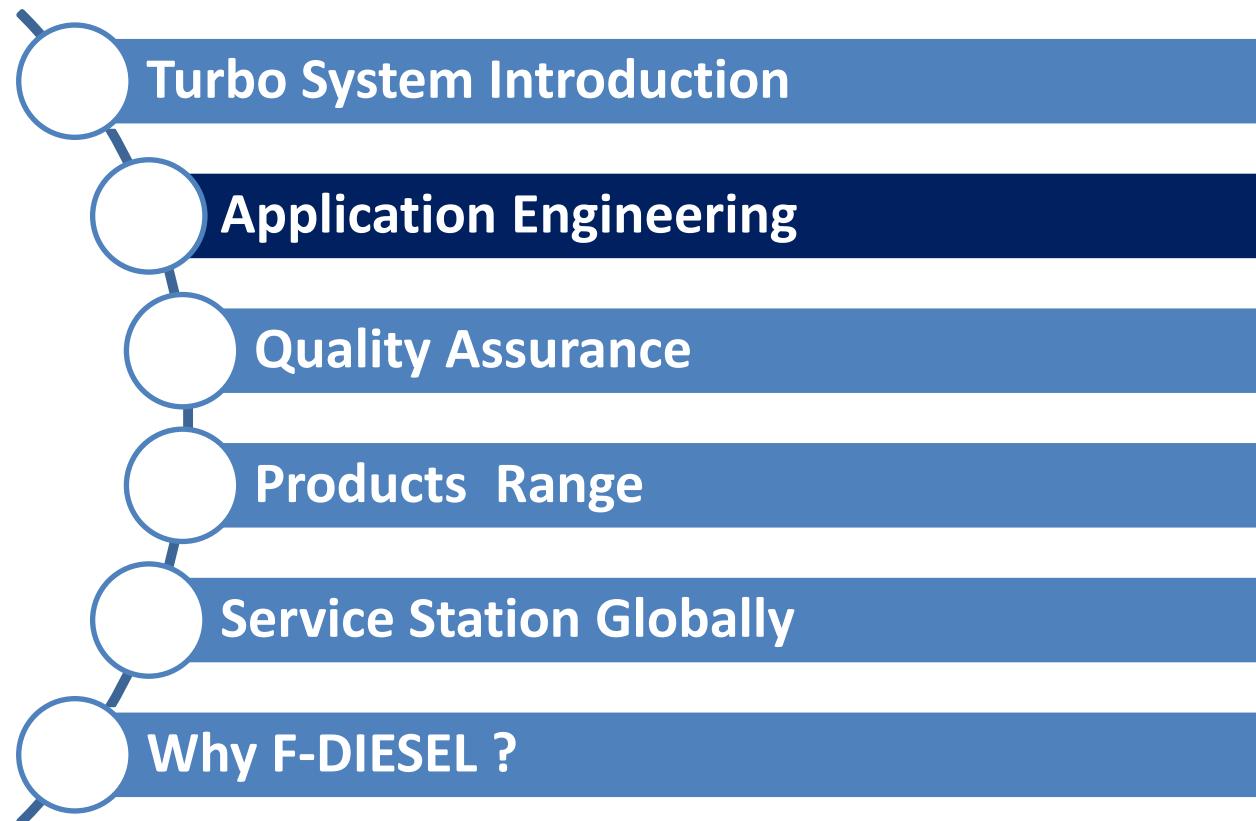
Turbo System Introduction

As part of F-Diesel Group, Turbo System Division can provide the solution to turbocharger actuator & components for both diesel and gasoline application.

As a steady growing manufacturer on automotive engine control system , diverse technical options can be provided :



- OEM Simultaneous Engineering analysis and development
- Aftermarket actuator and components
- Specific technical application available to meet customers' needs



E-Actuator Structure

full solution on products range, big size and small size structure, both 12V and 24V for input voltage.



Turbo Application

Current actuator can apply to HE400VE/HE500VE/HE510VE/HE561VE/H E400VG/HE500VG, etc.



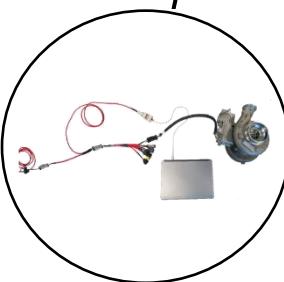
Engine Application

Mainly focus on engines whose replacement 12L & 15L, like X12, X15 and Iveco Cursor series. More LD models like Ram truck are under development



Calibration Testing Bench

100% calibration through E-tools to ensure the fitting and matching with original turbo



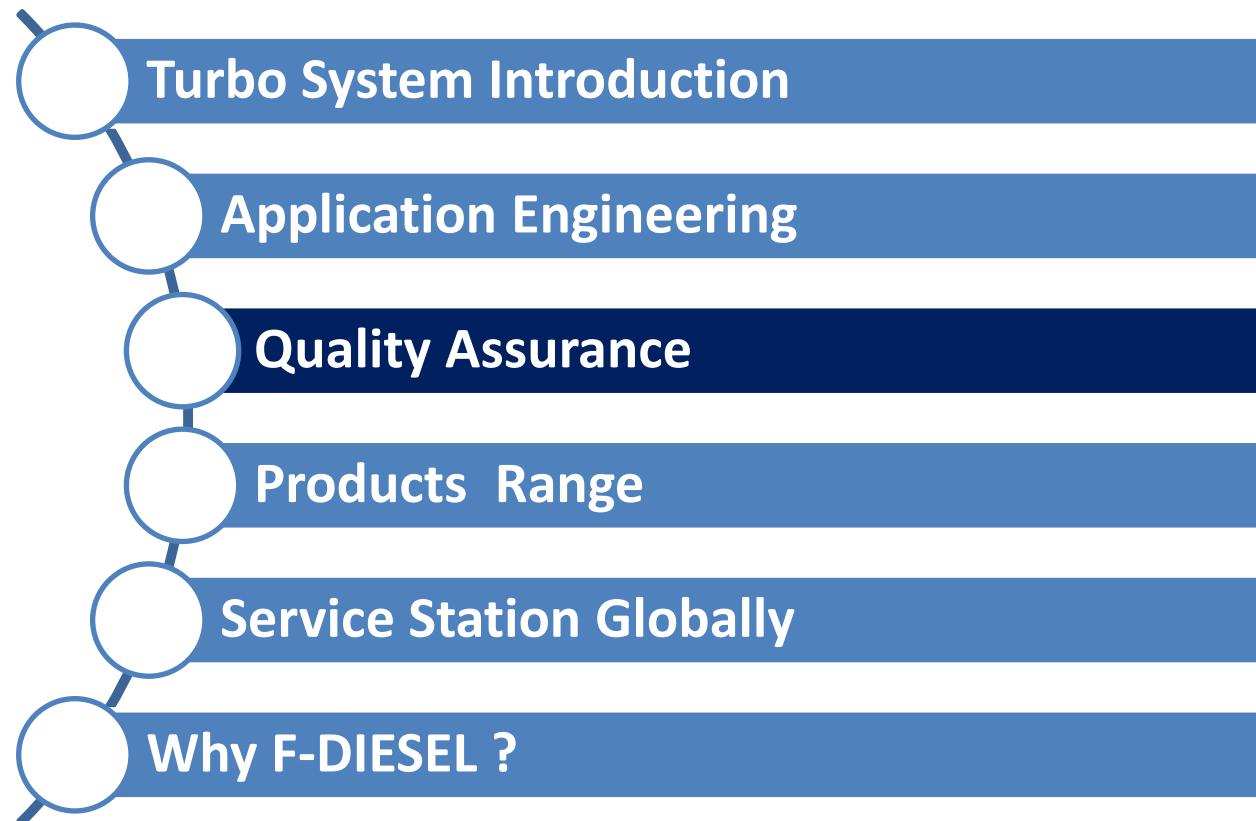
Truck Application

Heavy duty and middle duty application like Cummins, Volvo, Scania, DAF and IVECO installed VGT turbo engines.



F-DIESEL
F-DIESEL TURBO SYSTEM

Content



Quality Assurance

Design & Validation

DESIGN AND VALIDATION CAPACITY

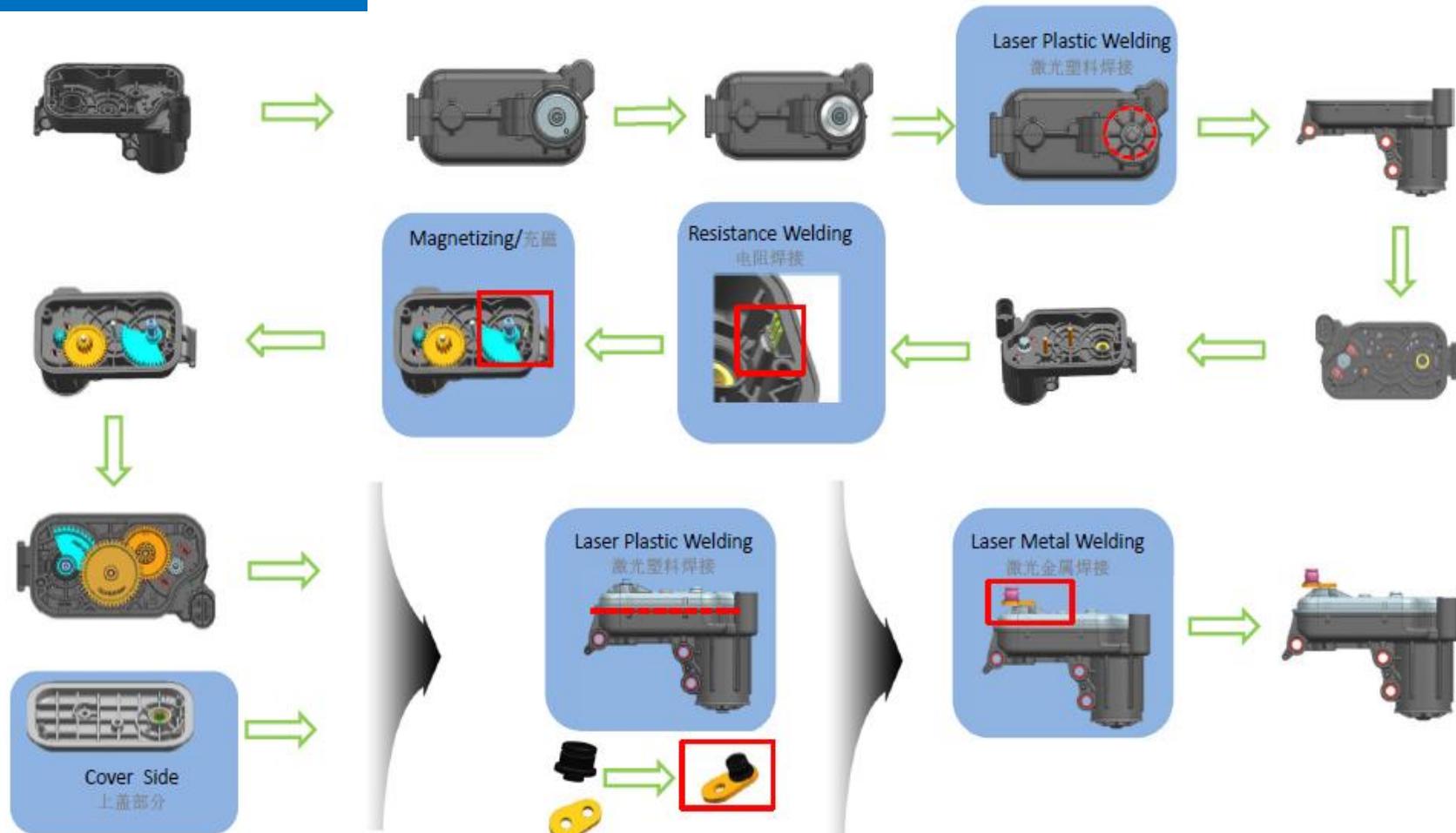


- ▶ Design department is responsible for 3D/2D design of the e-Actuators and components
- ▶ Collaboration with PE and CAE to ensure technical optimisation proposal can achieve the certain target
- ▶ Modular Design / Customized interface
- ▶ Standardised PCBA design configuration
- ▶ FEA - Finite Element Analysis
- ▶ Housing TMF
- ▶ Parts heat distribution & transforming
- ▶ Support vibration fatigue
- ▶ Machine model & harmonic response
- ▶ 360° analysis of all risks. Provide durable engineering validation testing methods to guarantee performance and lifetime

- ◆ IATF 16949 Certification
- ◆ ISO 9001
- ◆ VDA6.3
- ◆ APQP/PPAP/SPC/FMEA

Quality Assurance

Assembly Process Control



Quality Assurance

Testing Capability

Durability testing bench:

- >3pcs temperature ageing testing oven.
- >Can do the low temperature ageing and high temperature ageing testing

Normal electronic R&D device

- >More than 30 types electronic testing device which can ensure the e-design in good assurance

Temperature ageing testing oven
-40° C to +150° C



Heating testing oven



oscilloscope



LCR meter



Quality Assurance

Team & Procedure

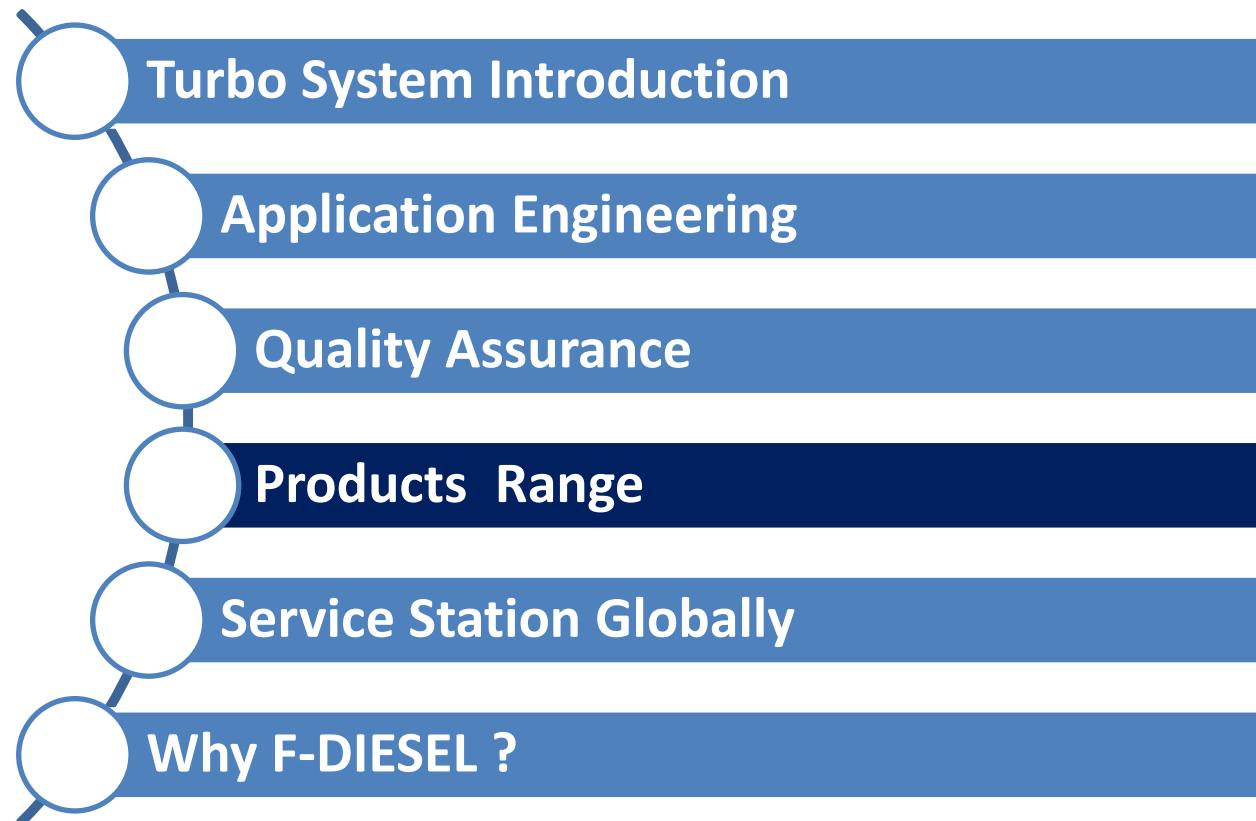
Over 100 specialists worldwide:

Each of them thrives a restless perfectionism and the passion to push technology to its limits, and beyond.



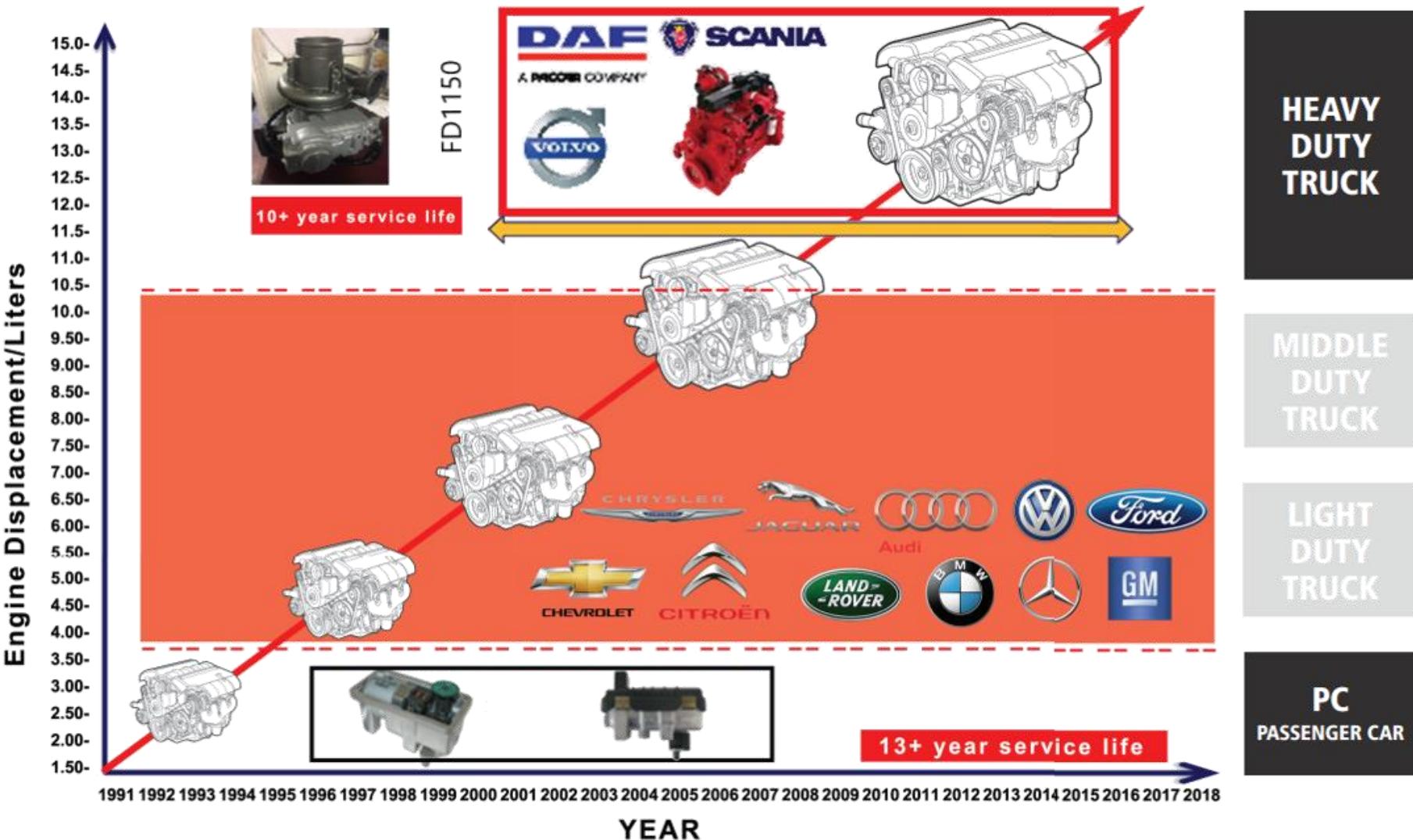
Complete R&D Procedure:

Starting from the design plan, DV verification standards, endurance experiments, to mass productions, the APQP development process in IATF16949 is strictly followed.



Products Range

Application



Products Range

Diesel Application

Holset Actuator

FD1150 Holset VGT actuator

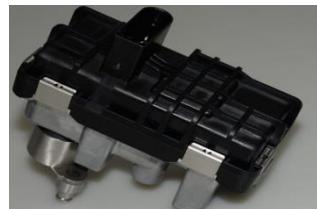


FD1151 series Reman KIT

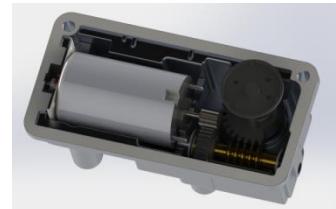


UTA

FD1141 UTA actuator



FD1142
UTA gearbox Reman Kit



FD1143
UTA component Reman Kit



REA/SREA

FD1130 Gearbox reman Kit

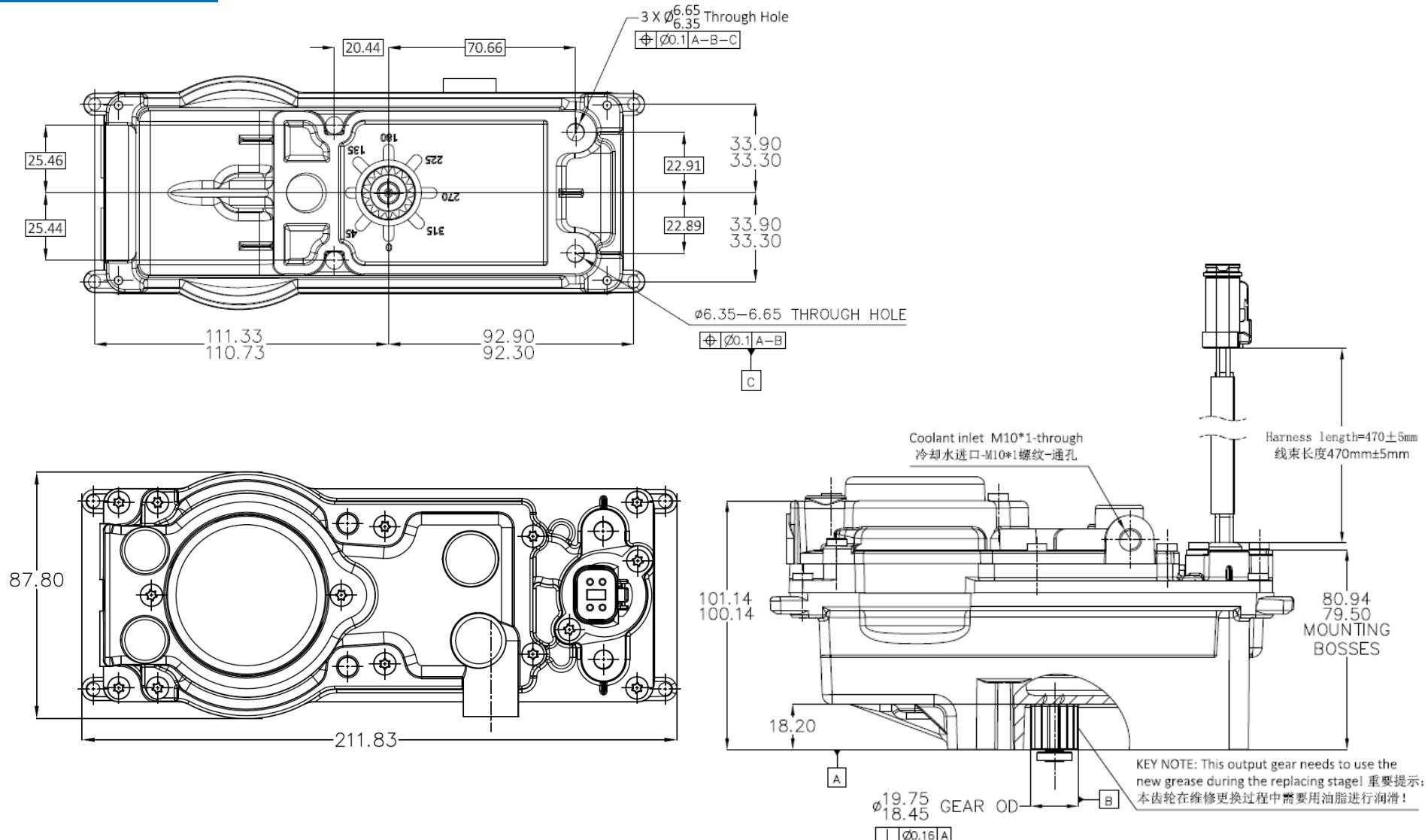


FD1131 REMAN Kit



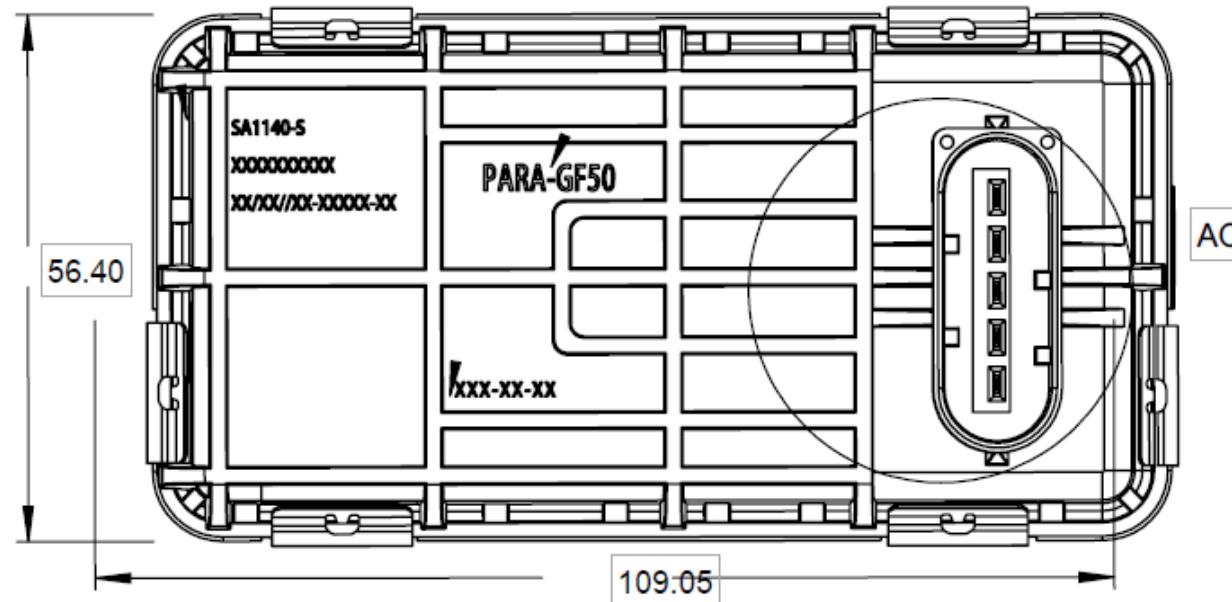
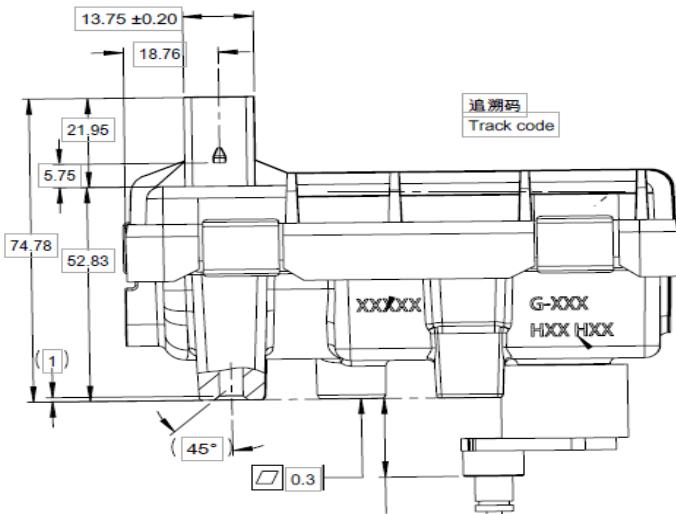
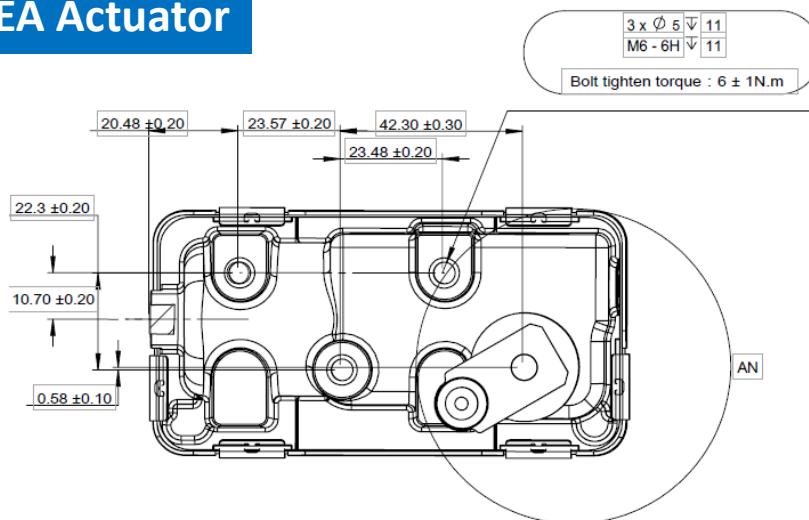
Products Range

VGT Actuator



Products Range

REA Actuator



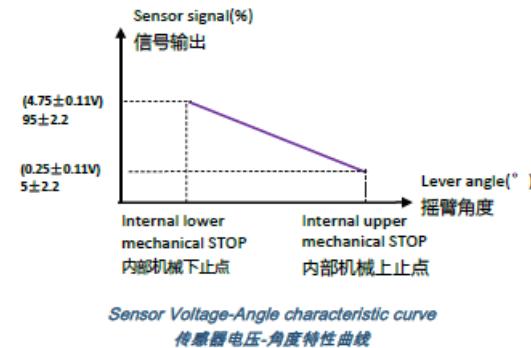
Products Range

Gasoline Application

Non Smart Actuator



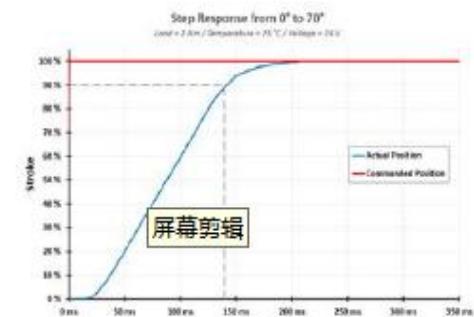
- Permanent Operating Torque - 0.925Nm(+160°C)
- Permanent Holding Torque - >1.24Nm (+160°C)
- Weight -370g
- Communication -ANALOG/PWM/SENT



Smart Actuator

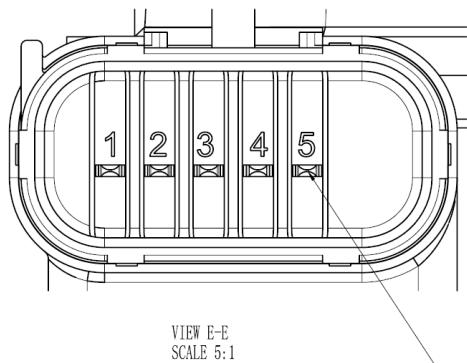
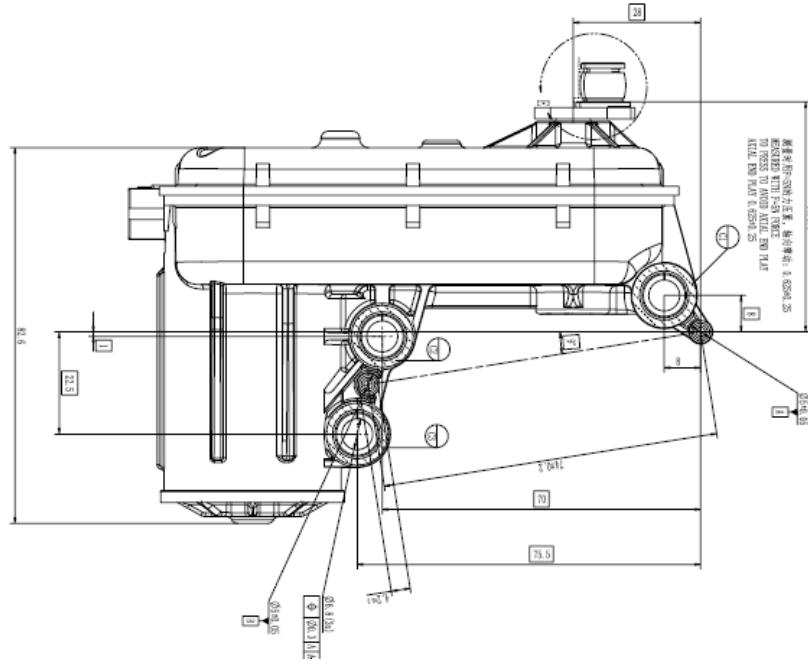


- Permanent Operating Torque - 9.5Nm
- Permanent Holding Torque - 5.4Nm
- Weight -1.0Kg
- Communication -CAN



Products Range

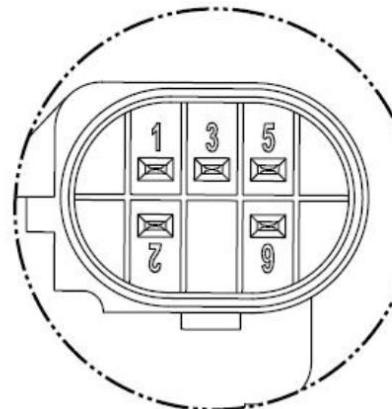
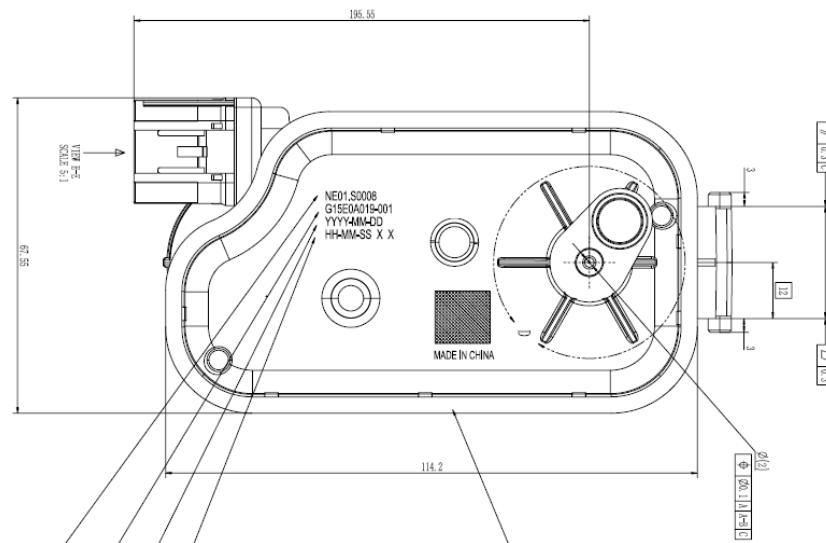
Gasoline Actuator



PIN 针定义

PIN ASSINGMENT

PIN 5	电机正极	MOTOR POSITIVE	M+
PIN 4	电机负极	MOTOR NEGATIVE	M-
PIN 3	传感器供电	SENSOR SUPPLIER	VCC
PIN 2	信号输出 (模拟量)	SENSOR OUTPUT(ANALOG)	OUT
PIN 1	传感器接地	SENSOR GROUND	GND



针脚定义 (Pin Assignment)	
1	传感器供电
2	Sensor +5V
2	电机负极
3	Motor -
3	传感器接地
4	Sensor GND
4	空
5	Non-Connect
5	传感器信号输出
6	Sensor Signal
6	电机正极
	Motor +

Products Range



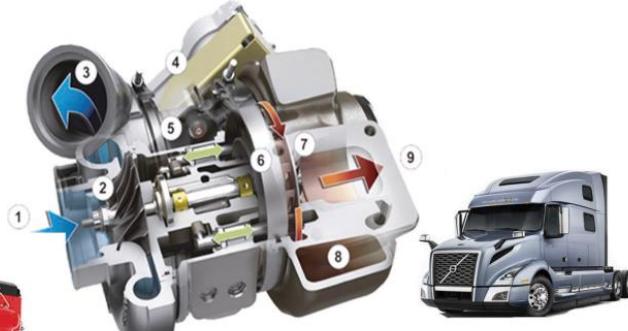
HOLSET VGT actuator



Holset VGT Turbocharger

VGT=Variable-Geometry Turbocharger
可变截面涡轮增压器

1-Fresh air-新鲜空气
2-Compressor wheel-压气机
3-Compressed air-压缩空气
4-Turbo actuator-增压器执行器
5-VGT mechanism-VGT执行机构
6-VGT vane-VGT调整叶片
7-Exhaust flow-废气流
8-Turbine vane-涡轮机通道
9-Turbine outlet-涡轮机出口



BENEFITS

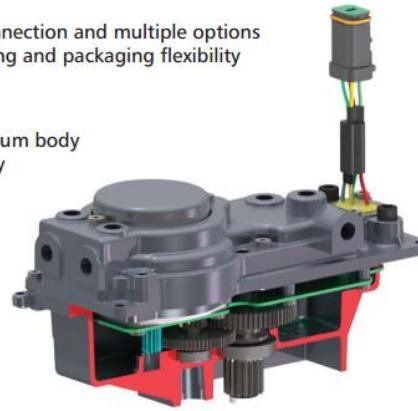
Compact unit design with a single connection and multiple options (integrated or pigtail) enables mounting and packaging flexibility

DC brushless motor metal gears and aluminum body provide high torque and extended durability

Configurable mechanical default position and multiple mounting options enable various custom mounting options

Industry standard connector, multiple options from variant cable, easy plug

For Both 24V & 12V



Integrated electronics with position sensing provides enhanced accuracy resolution

Industry standard J1939 CAN communication for integration with the engine control unit

24V compatibility provides application flexibility



SPECIFICATIONS

Peak torque output	Up to 5.0Nm
Continuous torque output	Up to 4.5Nm
Resolution	0.26°
Response time	<120ms
Rotation travel	up to 120°
Operating temperature range	-40°C to 125°C
Communication	CAN J1939
Power input	24V
Cooling system	Water-cooling

TYPICAL APPLICATIONS

SACER Smart Electronic Actuators are typically used for Holset VGT turbo (vane) applications, such as medium duty and heavy duty diesel engines to help provide optimum performance and enable compliance with current and future exhaust emissions standards.

- For turbo application: Cummins Holset VGT turbocharger
- For Holset turbo models: HE400VG, HE451VE, HE500VG, HE561VE
- For engine models: see table.

Year	Engine brand	Displace- ment	Engine type	Engine Family	Engine Version
2005- 2015	Cummins	6.7	Diesel	ISX07	Dodge Ram series
		15		ISX15	CM2250 SN / CM2250 / CM2350 X101 / CM2350 X114 / CM570 / CM870 / CM871 E / CM871
		13		ISZ13	CM2150 SN
		11.9		QSK11.9	CM2250 ECF
		13		QSZ13	CM2250 Z101 / CM2150 Z102
		15		QSX15	CM2250 ECF / CM2250 / CM2350 X105 / CM2350 X106 / CM570
2007- Now				ISX 15	Volvo Truck
2010- Now	PACCAR	13		PACCAR MX13	DAF

Products Range

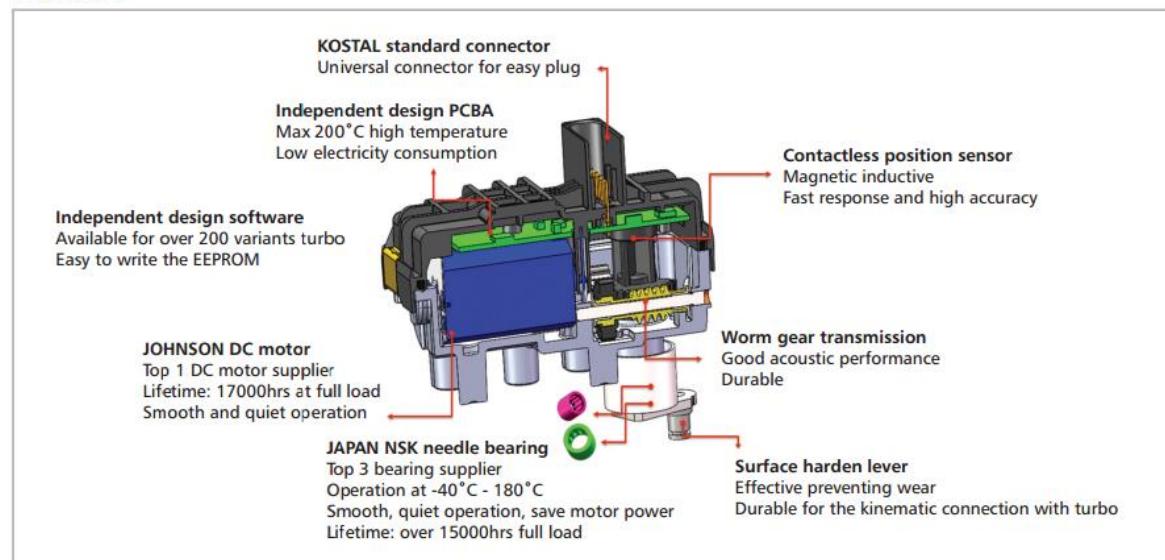
VNT Actuator



rs are typically used
ons such as passenger
help provide optimum
ance with current and
rds.

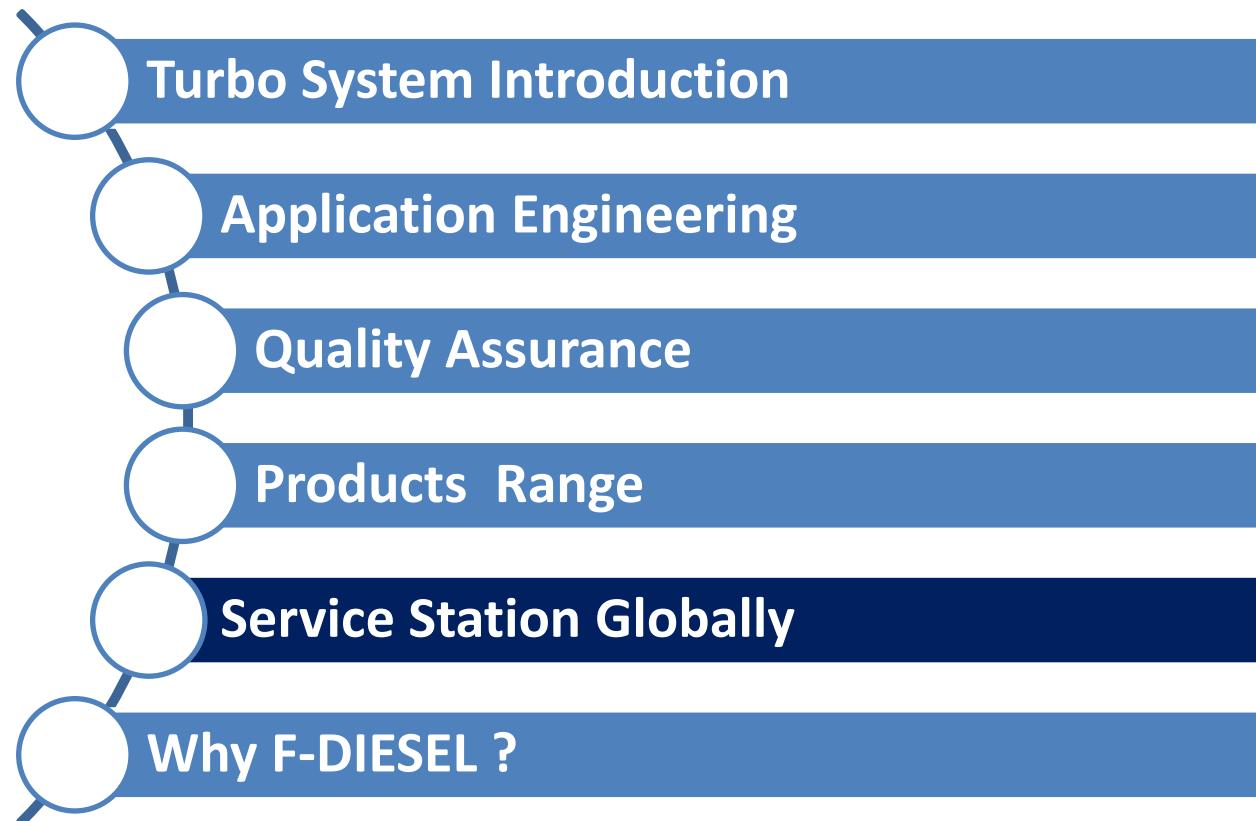
- ▶ For Turbo application: Honeywell Garrett VNT
turbocharger / BorgWarner BV VTG turbo
- ▶ For Garrett VNT Turbo Model: GT20 / GT27

BENEFITS



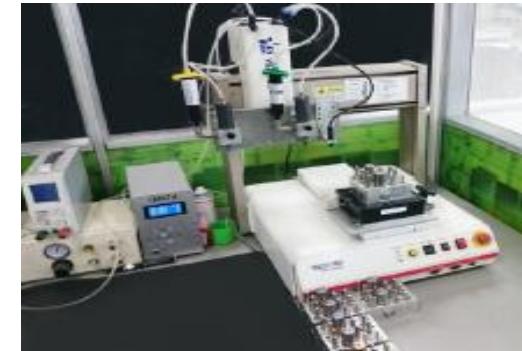
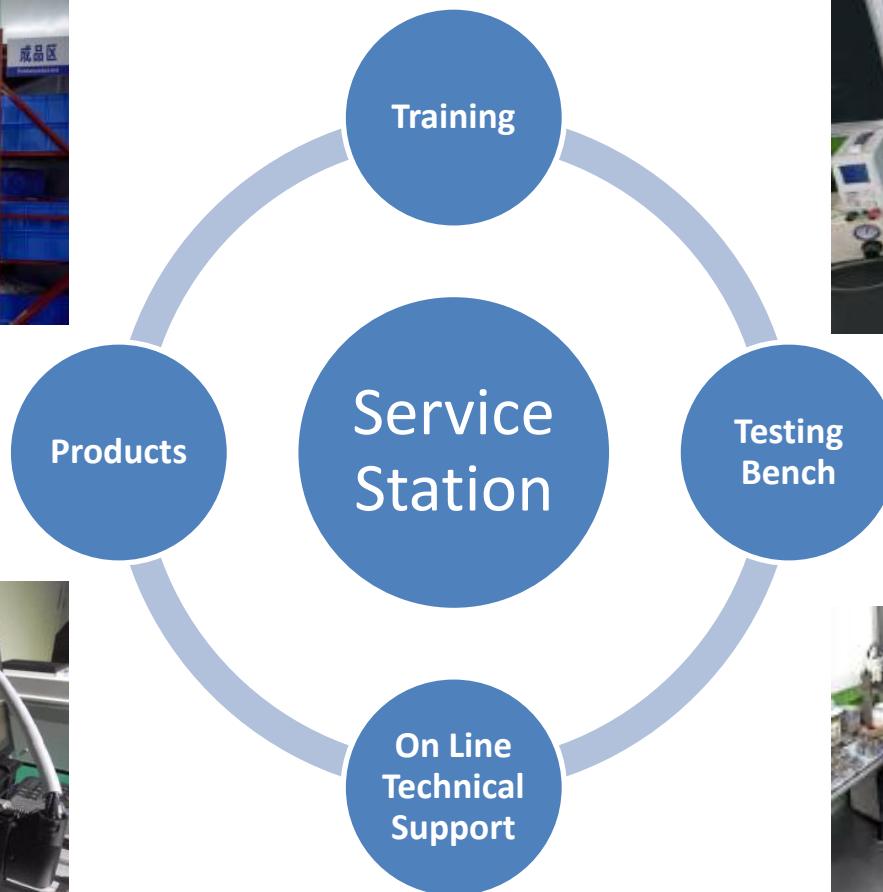
- ▶ For BorgWarner BV
turbo: BV40 / BV43
- ▶ Application information:
Implemented for BMW
/ Audi / VW / Ford /
Mercedes-Benz / GM /
etc. popular diesel
engine passenger cars

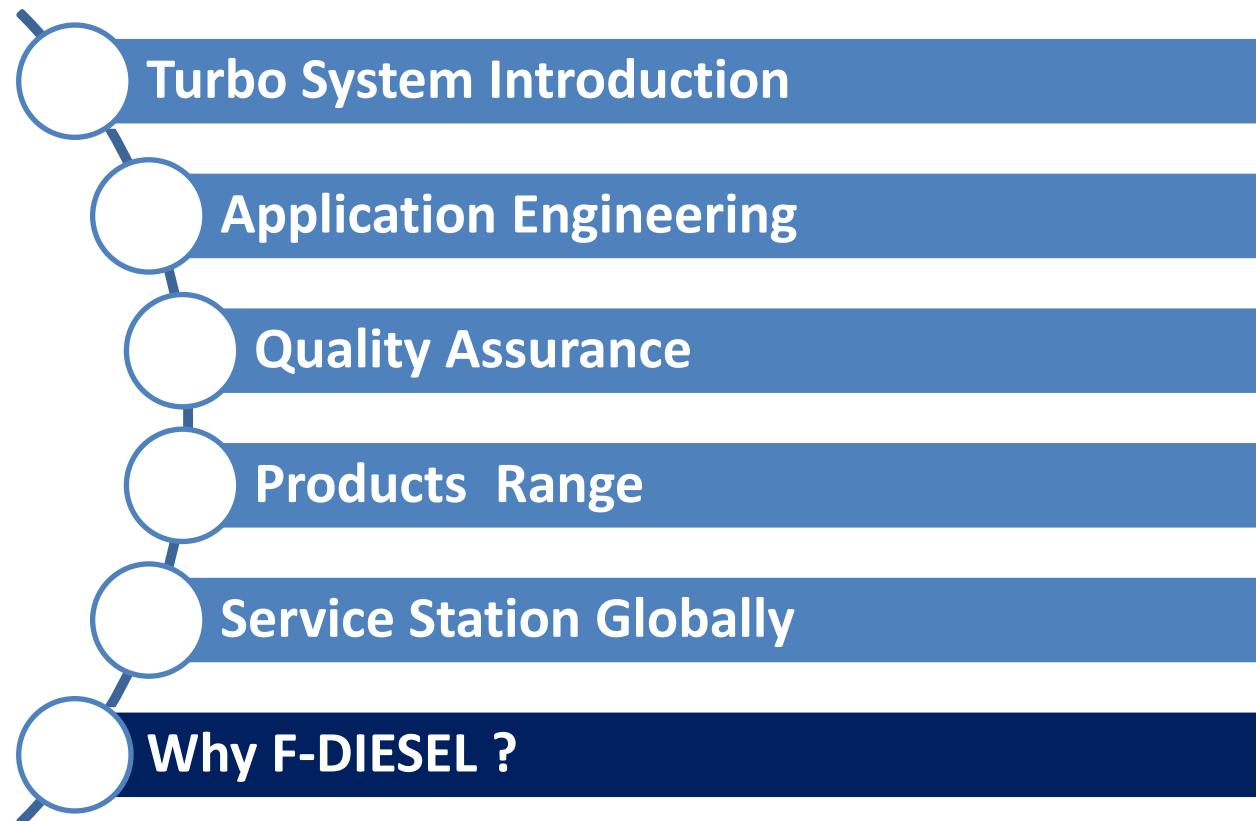




Service Station Globally

Cooperate with the partner to provide local service around the world through training, technical support and customize test bench.





1. Independently R&D and Manufacturing

2. Aftermarket Interchangeability

3. Good Performance and Economics

4. Quick Response

Contact

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LinkedIn: Bruce Li



WhatsApp



Wechat

Thanks