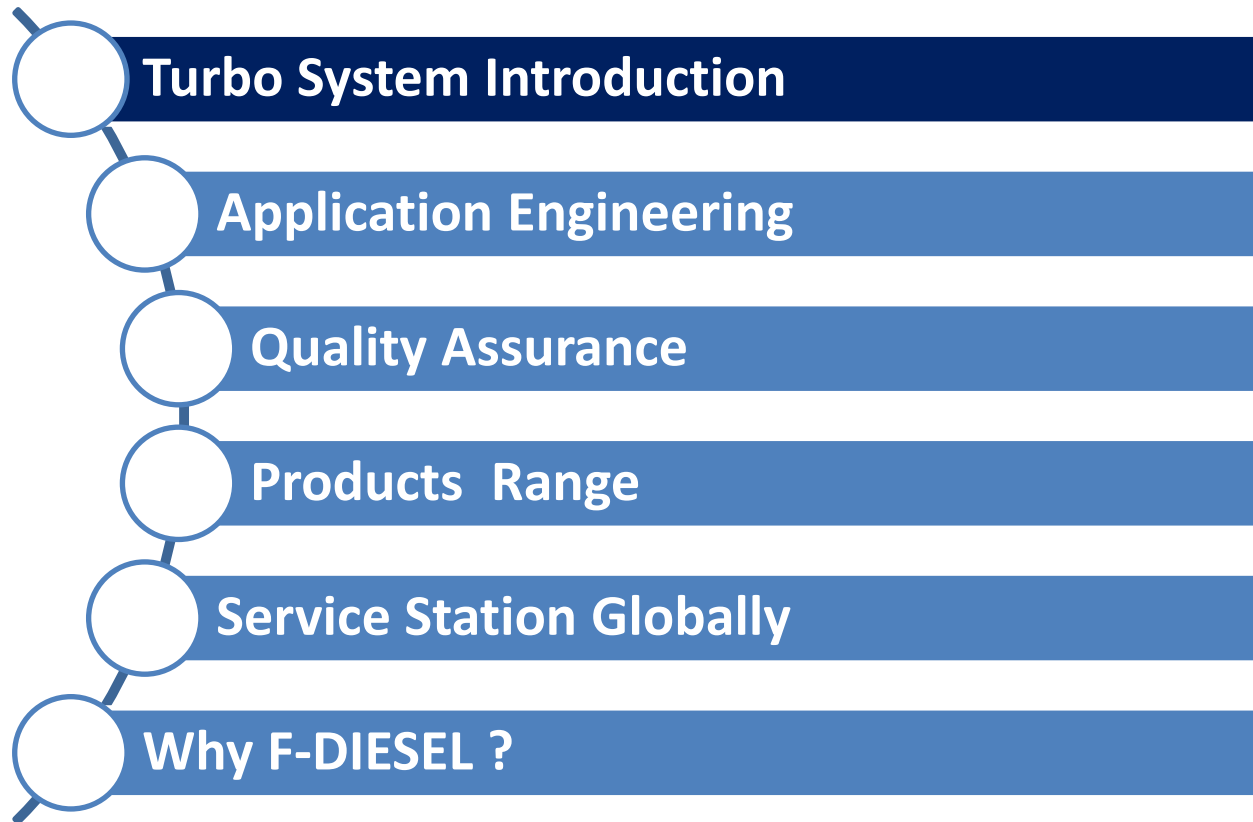


F-Diesel E-Actuator Solution

Presented by F-
DIESEL Apr., 2022

Version 3.0

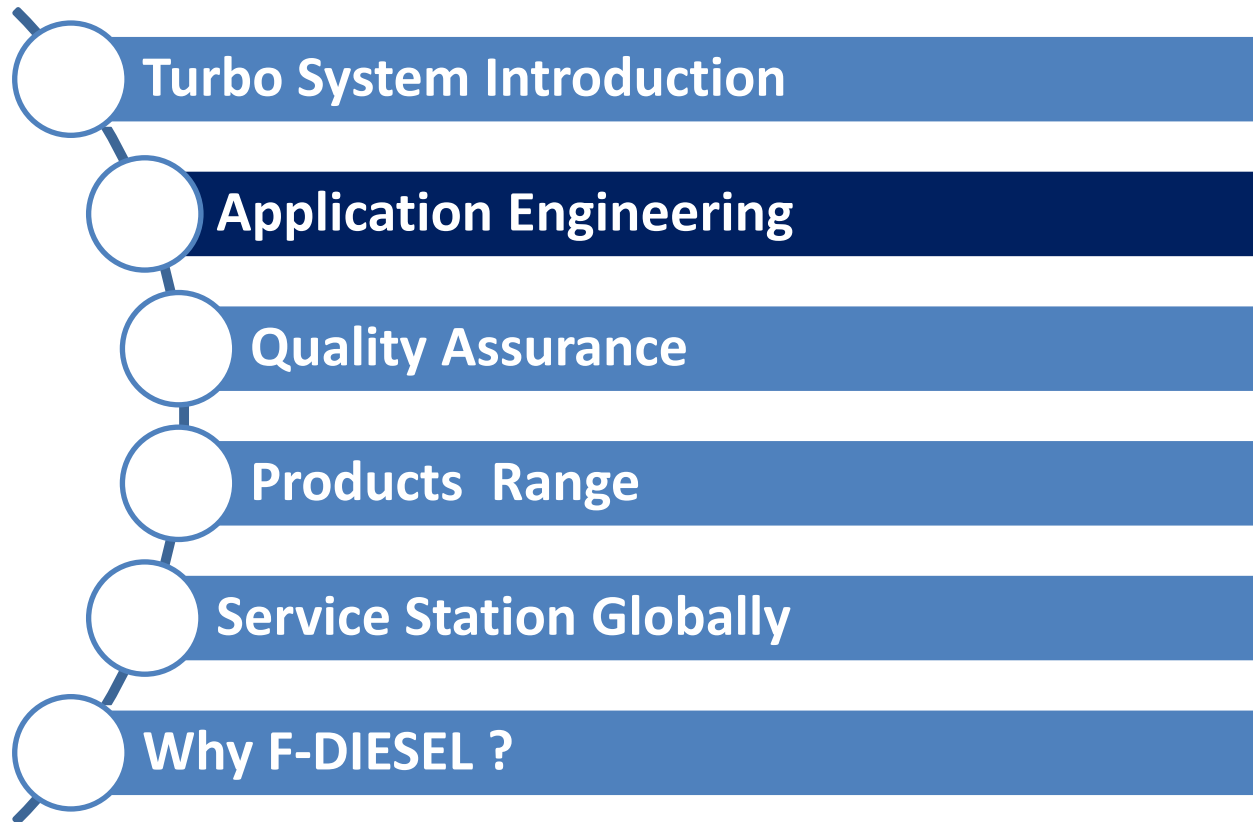


As part of F-Diesel Group, Turbo System Division can provide the solution to turbocharger actuator & components for both diesel and gasoline application.

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





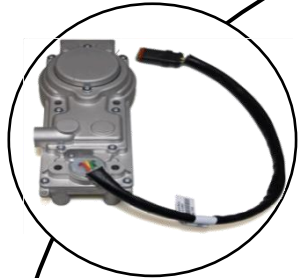
Turbo Application

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



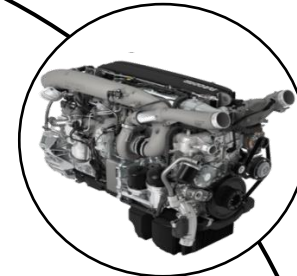
E-Actuator Structure

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



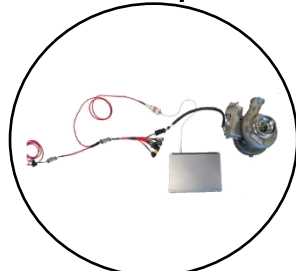
Engine Application

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



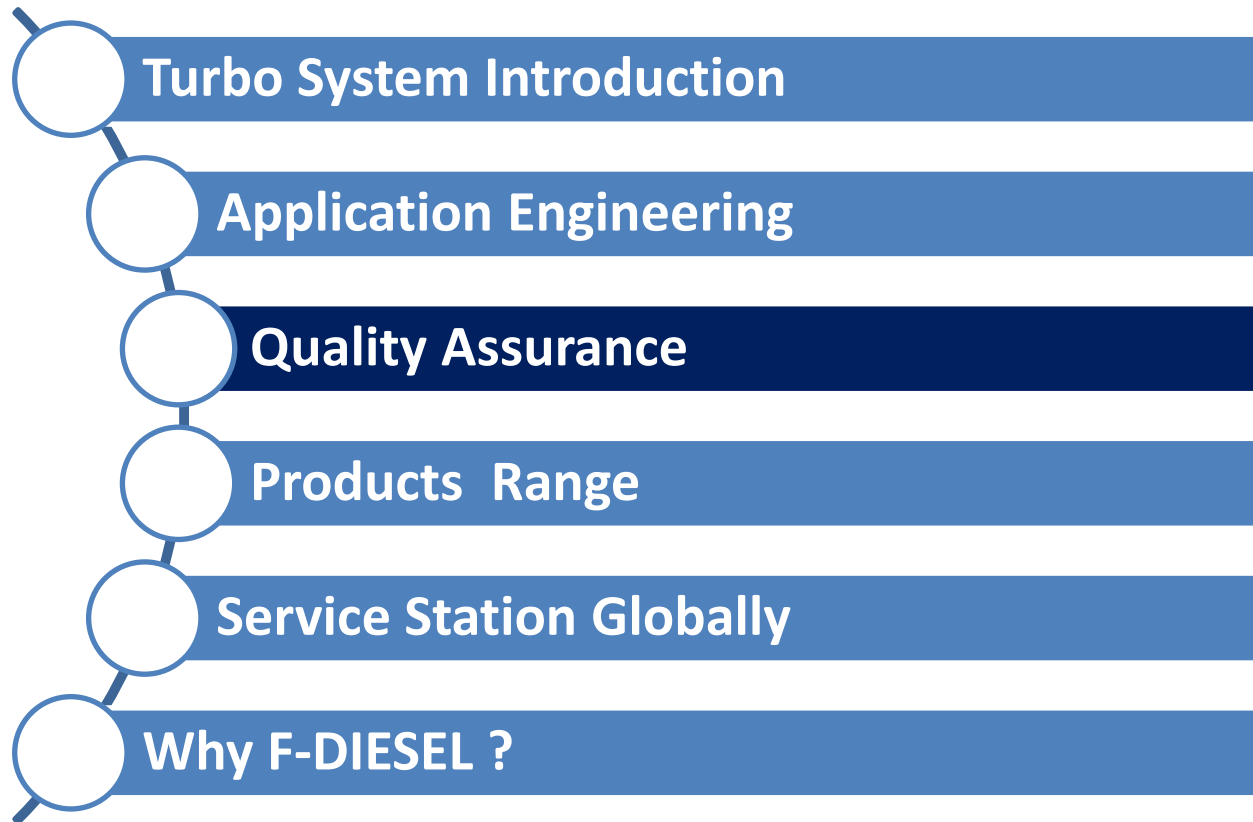
Truck Application

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

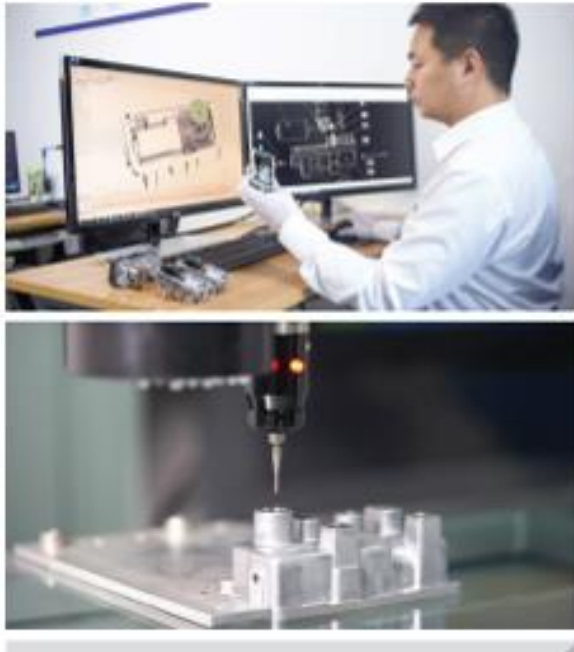


Calibration Testing Bench

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



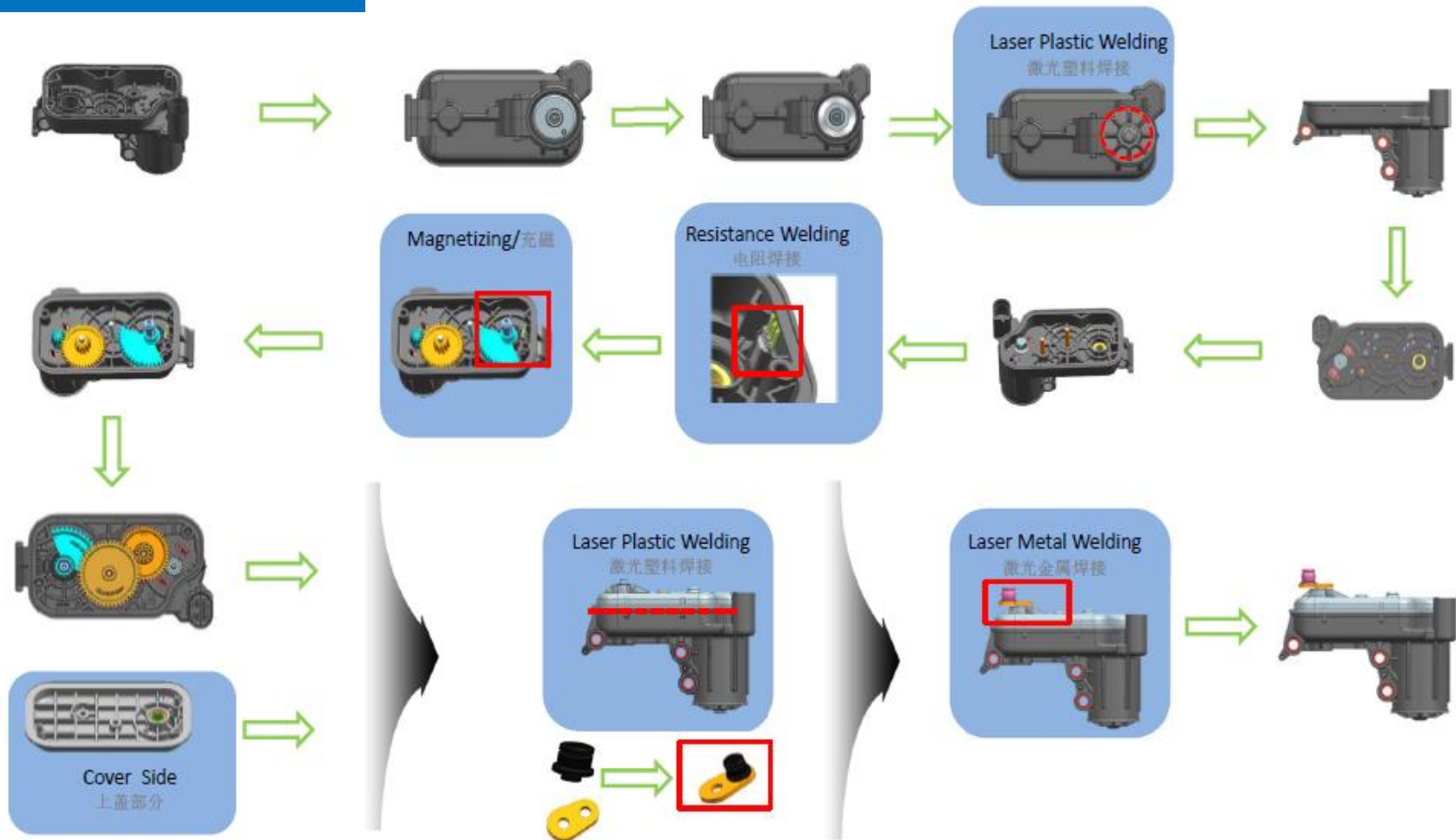
DESIGN AND VALIDATION CAPACITY



- ▶ 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

Assembly Process Control



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



Team & Procedure

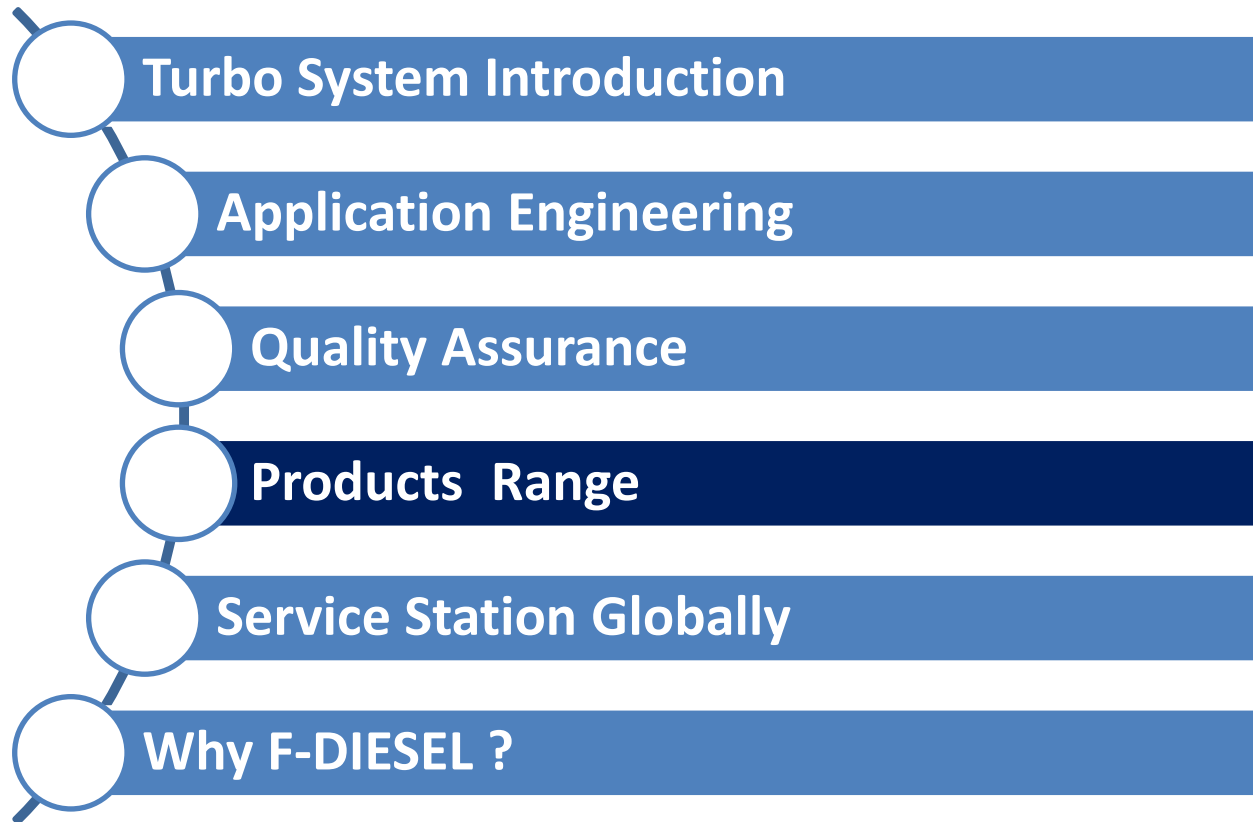
Over 100 specialists worldwide:

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



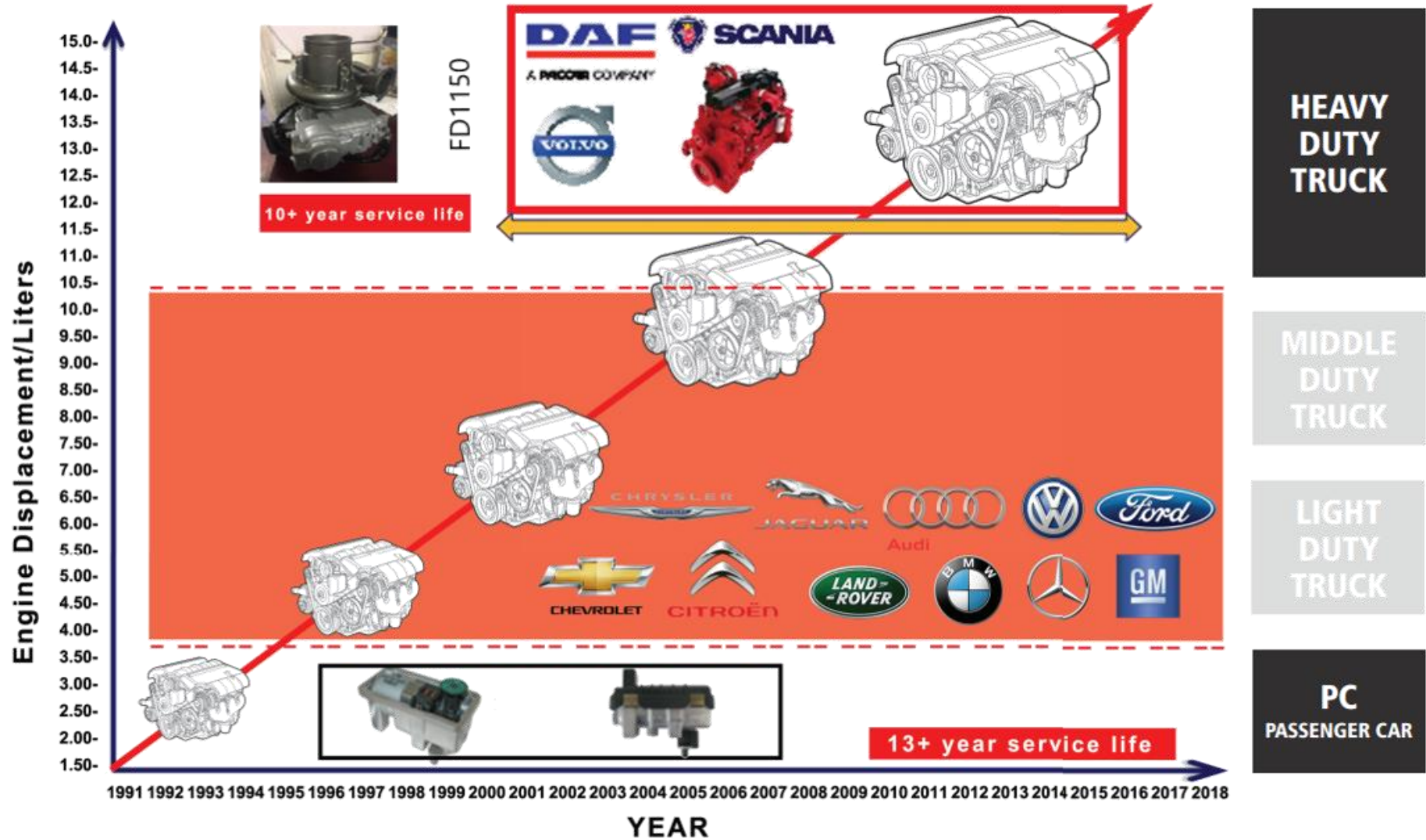
Complete R&D Procedure:

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

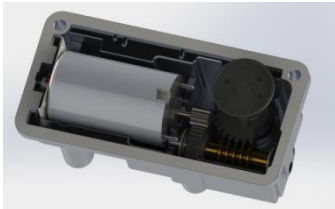


UTA

FD1141 UTA actuator



FD1142
UTA gearbox Reman Kit



FD1143
UTA component Reman Kit



REA/SREA

FD1130 Gearbox reman Kit

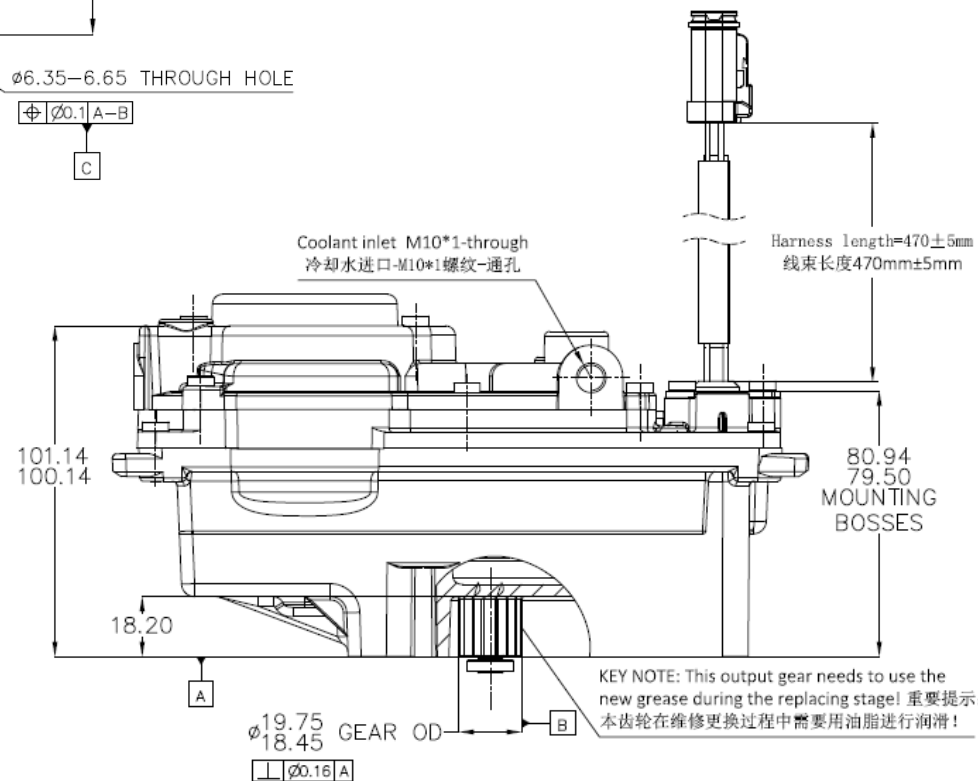
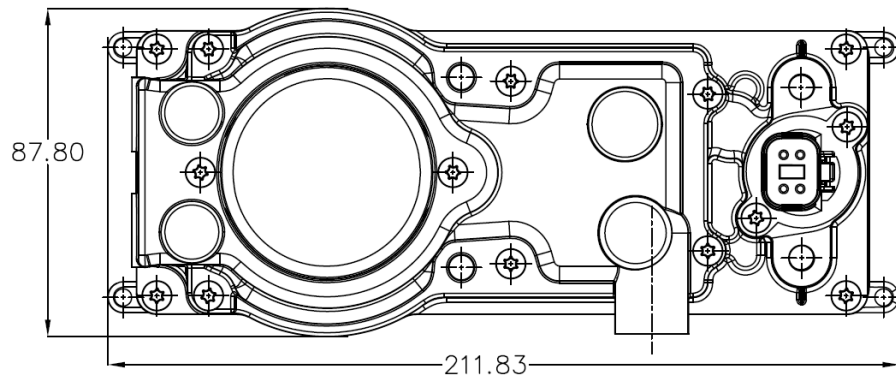
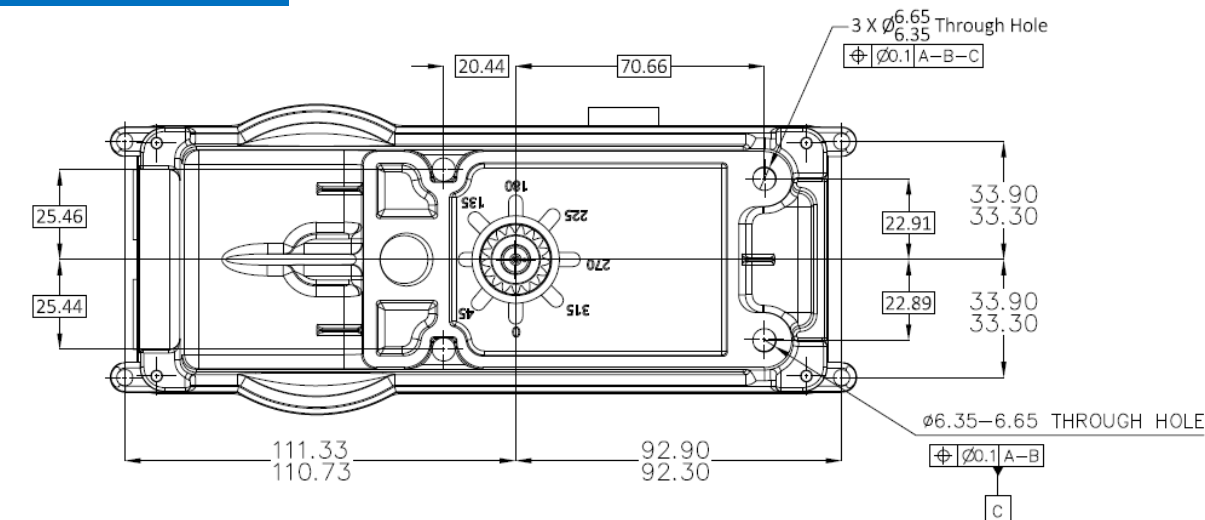


FD1131 REMAN Kit



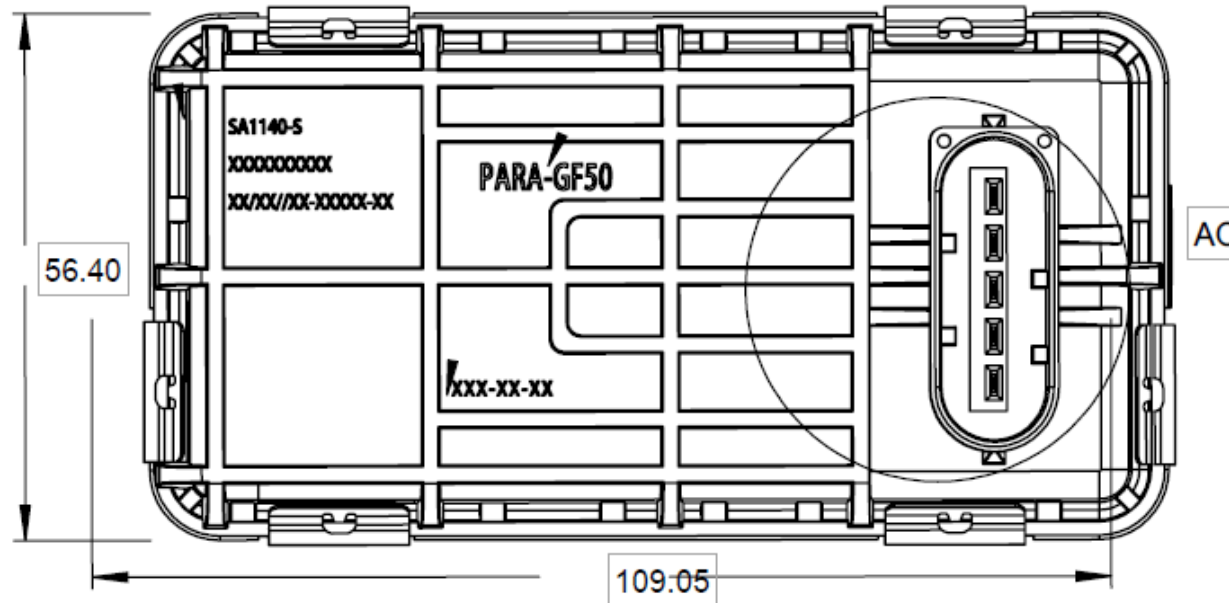
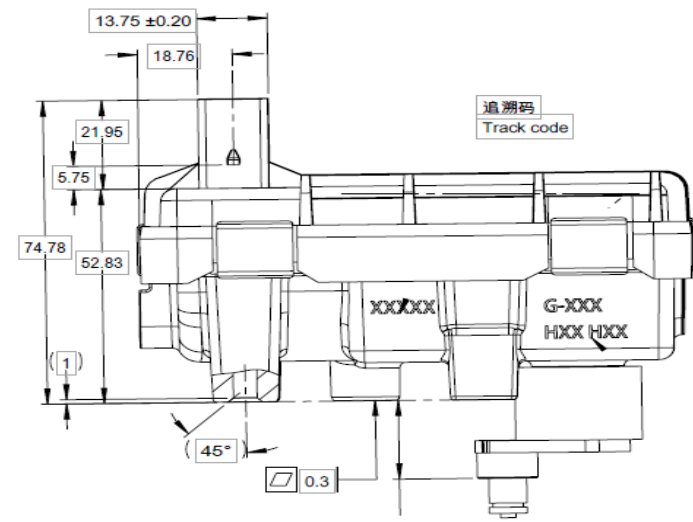
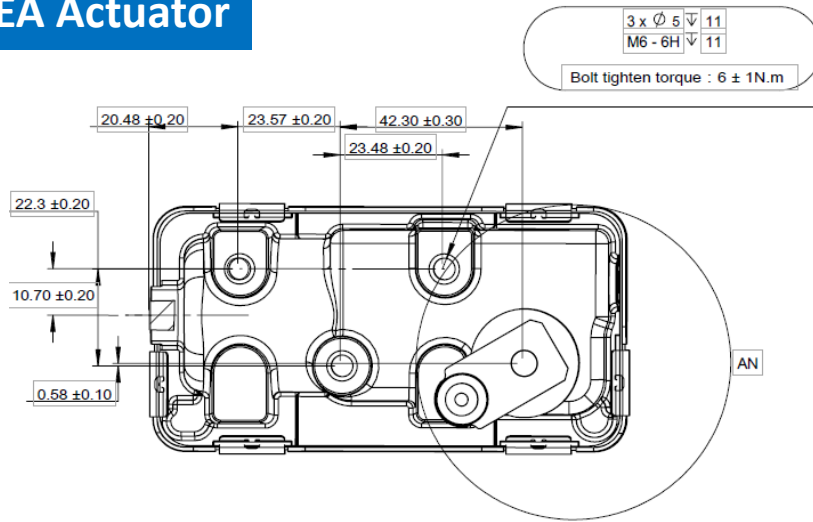
Products Range

VGT Actuator



Products Range

REA Actuator



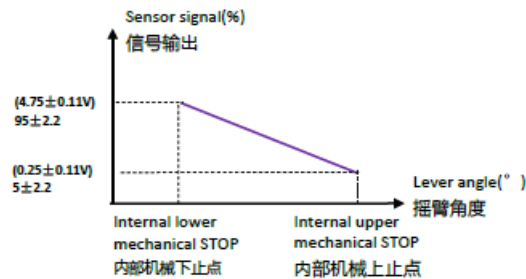
Products Range

Gasoline Application

Non Smart Actuator

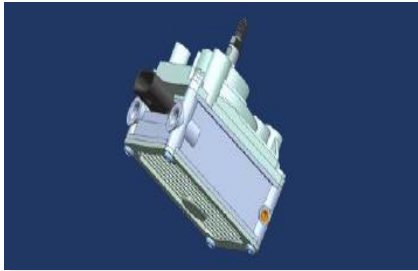


- Permanent Operating Torque - 0.925Nm(+160°C)
- Permanent Holding Torque - > 1.24Nm (+160°C)
- Weight -370g
- Communication -ANALOG/PWM/SENT

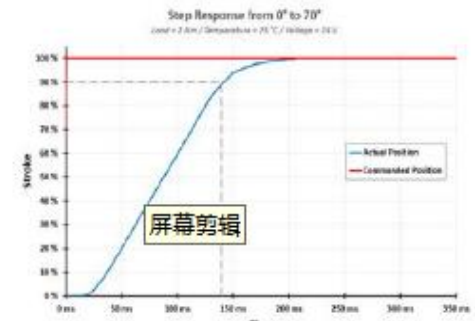


Sensor Voltage-Angle characteristic curve
传感器电压-角度特性曲线

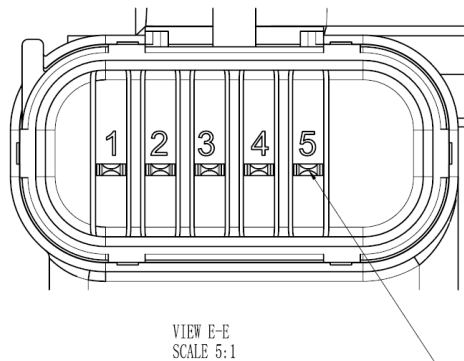
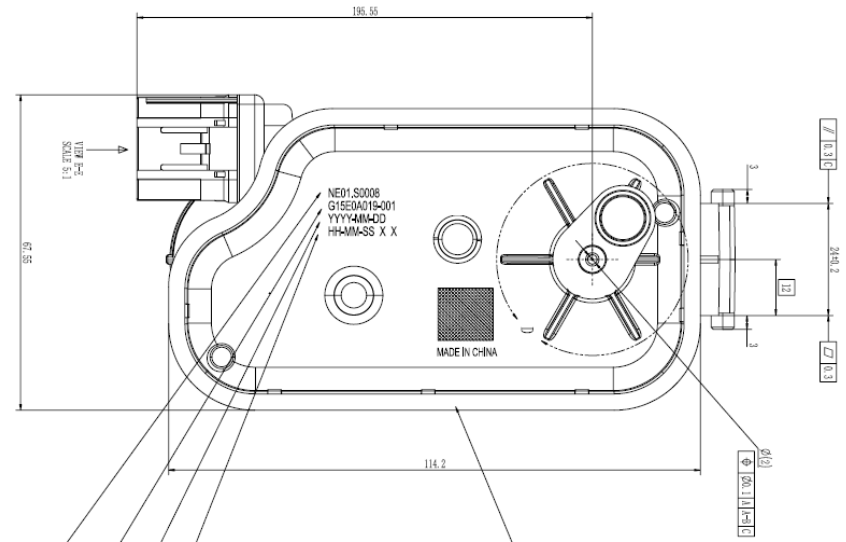
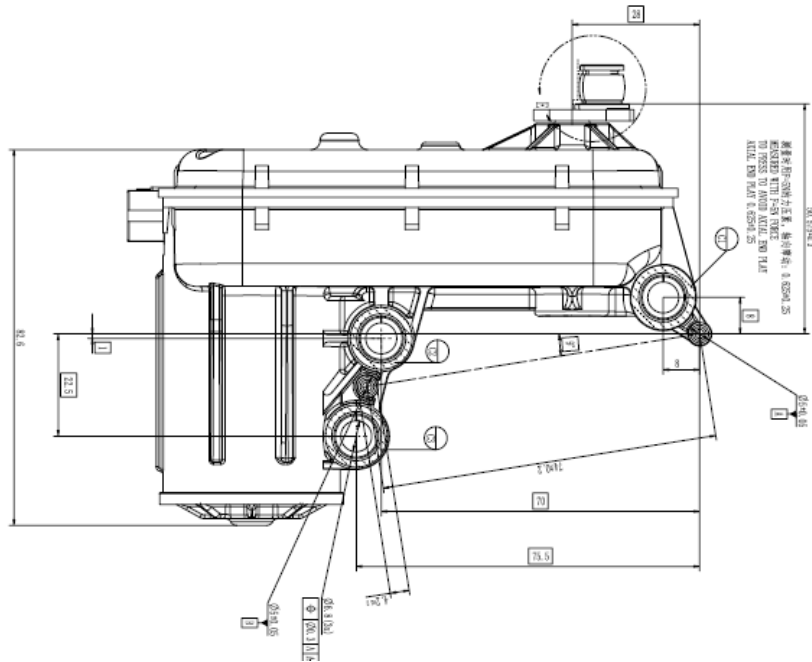
Smart Actuator



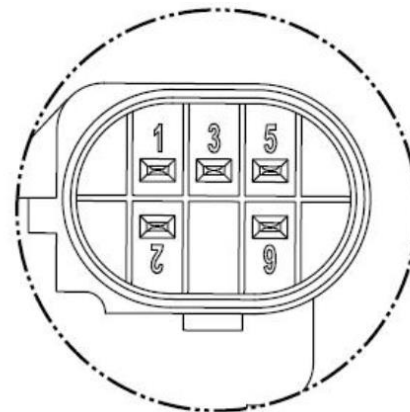
- Permanent Operating Torque - 9.5Nm
- Permanent Holding Torque - 5.4Nm
- Weight -1.0Kg
- Communication -CAN



Gasoline Actuator



PIN 针定义		
PIN ASSIGNMENT		
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	Sensor +5V
2	电机负极	Motor-
3	传感器接地	Sensor GND
4	空	Non-Connect
5	传感器信号输出	Sensor Signal
6	电机正极	Motor+

Products Range

HOLSET VGT actuator



A PACCAR COMPANY



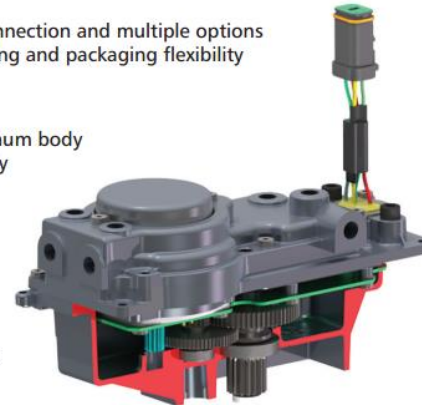
BENEFITS

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



Integrated electronics with position sensing provides enhanced accuracy resolution

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

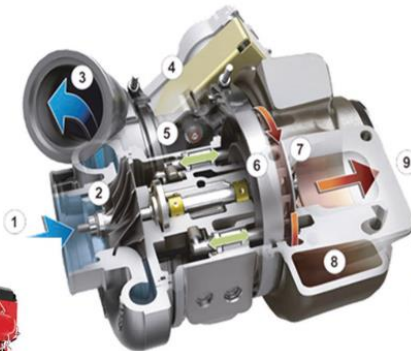
24V compatibility provides application flexibility

Holset VGT Turbocharger

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

For Both 24V & 12V

- 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调整盘
- 7-Exhaust Flow-废气流
- 8-Turbine vane-涡轮机流道
- 9-Turbine outlet-涡轮机出口



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.

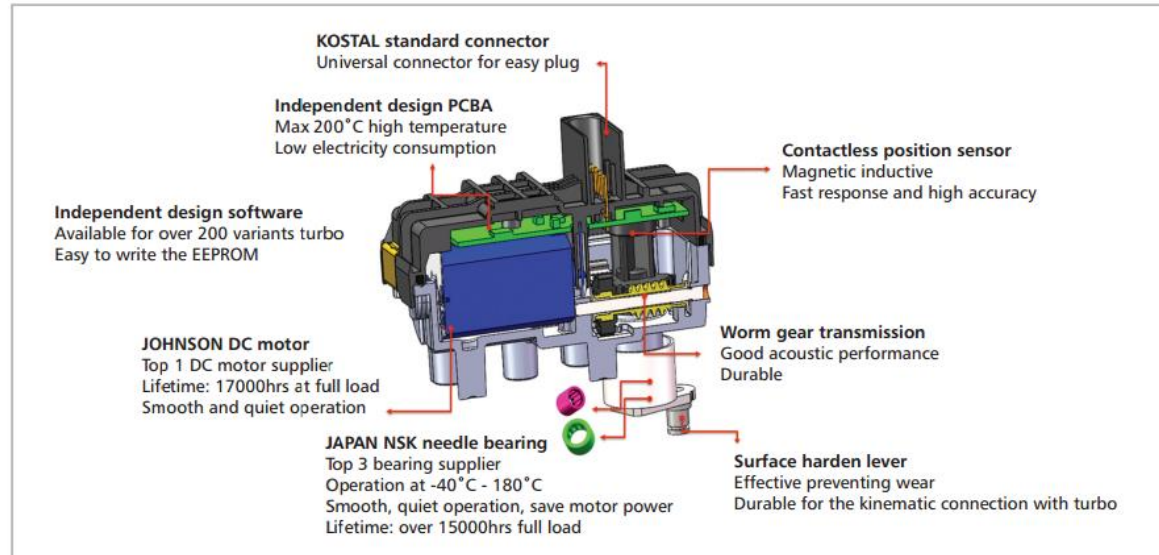
- For turbo application: Cummins Holset VGT turbocharger
- For Holset turbo models: HE400VG, HE451VE, HE500VG, HE561VE
- For engine models: see table.

Year	Engine brand	Displacement	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		QSX11.9	CM2250 ECF
		13		QSX13	CM2150 Z101 / CM2150 Z102
		15		QSX15	CM2250 ECF / CM2250 / CM2350 X105 / CM2350 X106 / CM570
2007-Now	Cummins			ISX 15	Volvo Truck
2010-Now	PACCAR	13		PACCAR MX13	DAF

Products Range

VNT Actuator

BENEFITS

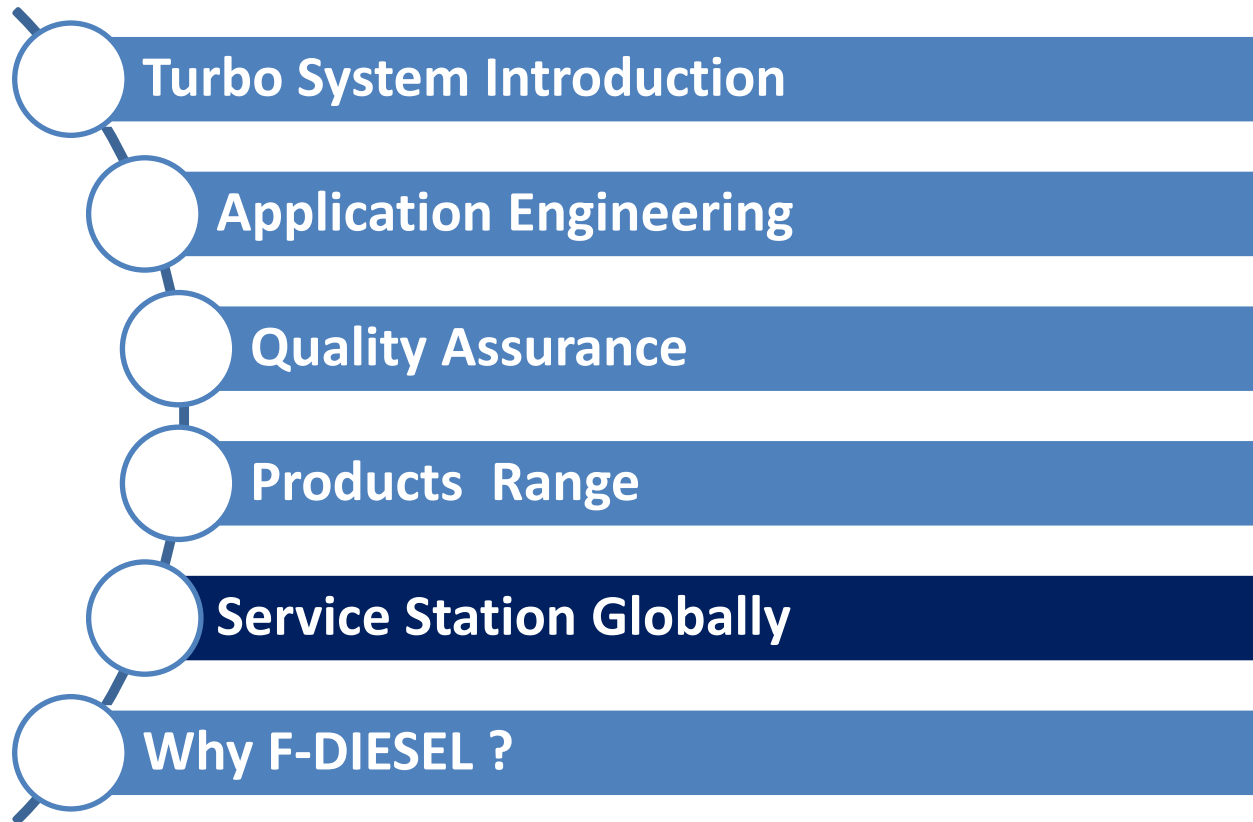


rs are typically used
ns such as passenger
help provide optimum
ance with current and
rds.

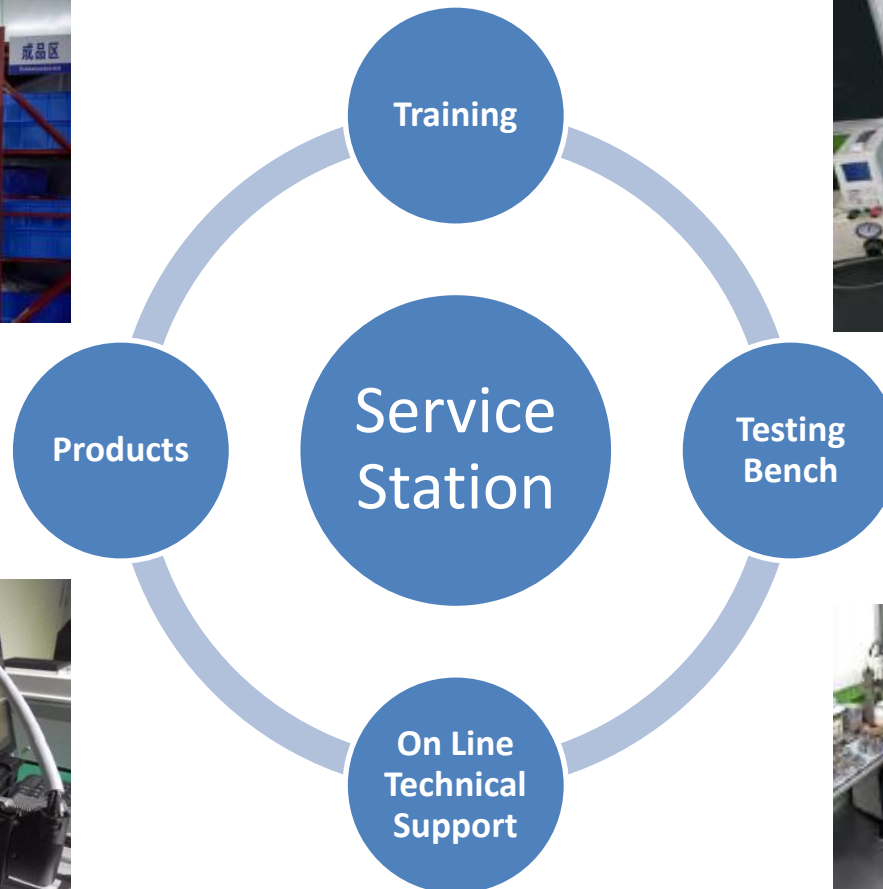
- ▶ For Turbo application: Honeywell Garrett VNT turbocharger / BorgWarner BV VTG turbo
- ▶ For Garrett VNT Turbo Model: GT20 / GT27

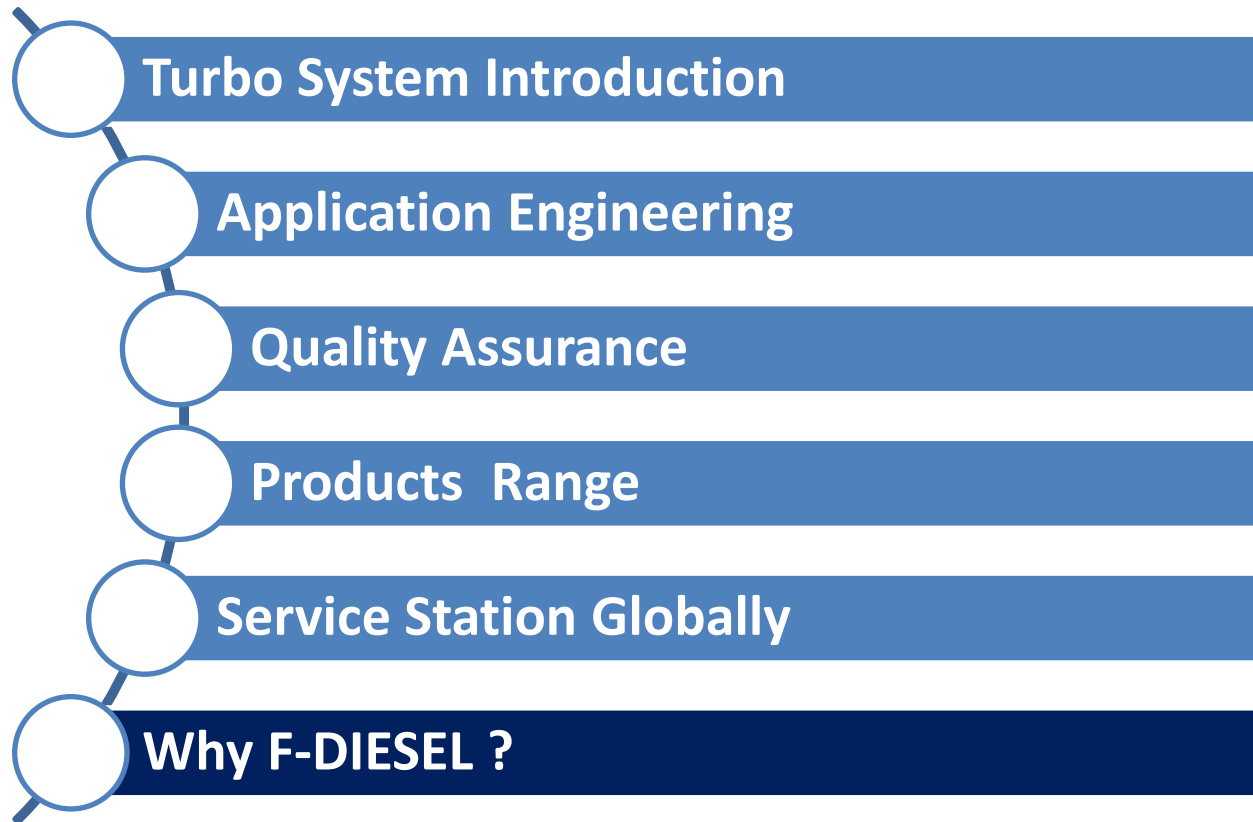
- ▶ For BorgWarner BV turbo: BV40 / BV43
- ▶ Application information:
Implemented for BMW / Audi / VW / Ford / Mercedes-Benz / GM / etc. popular diesel engine passenger cars





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: Mr. Bruce Li

Email: bruce.li@turbochargers.cn bruce.li@f-diesel.com

Mobile/ WhatsApp / Wechat: 0086-15221256058

LinkedIn: Bruce Li



WhatsApp



Wechat

Thanks