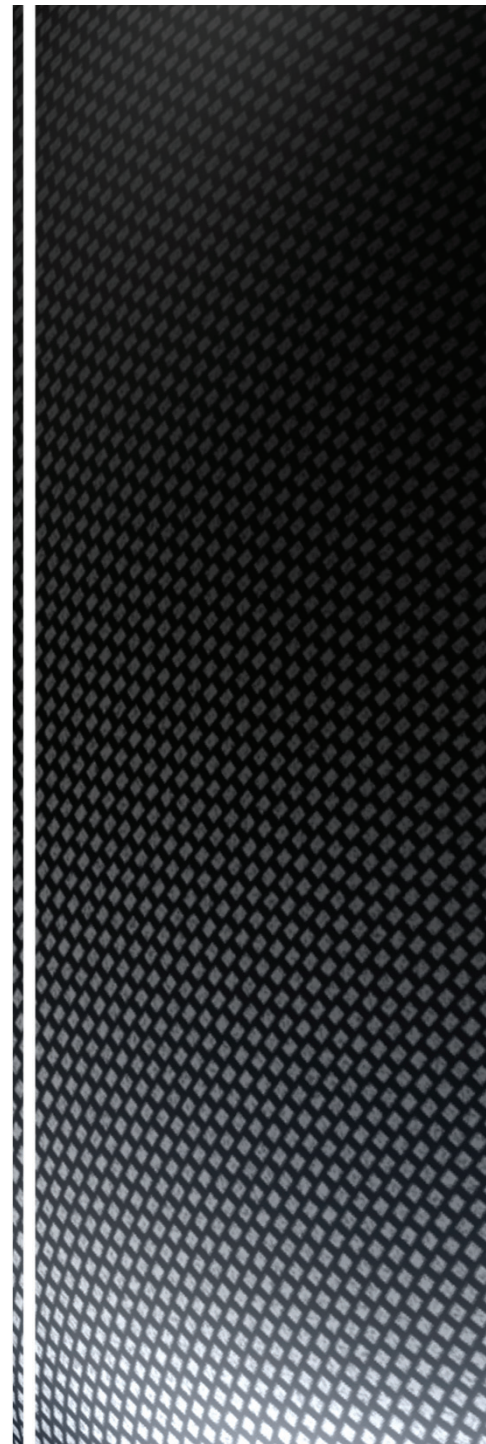


NEW RAIL GAS INJECTOR GENERATION IG7 NAVAJO For CNG & LPG



IG7 Navajo injector

- Introduction
- Development
- Performance
- Installation
- Noise
- Technical specifications
- Maintenance

The new IG7 NAVAJO is a new high-performance injector, designed in two different version:

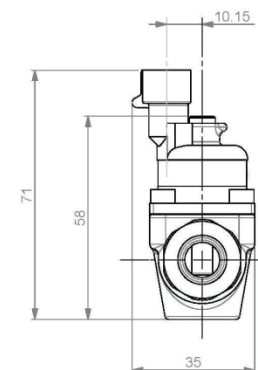
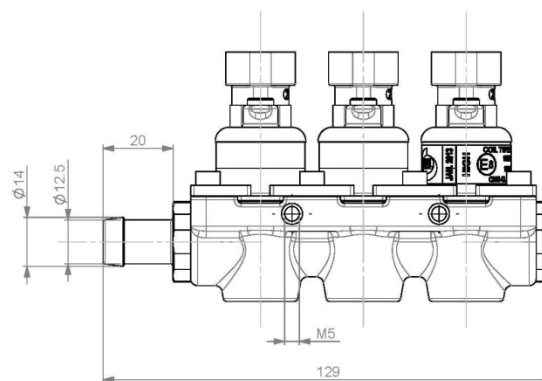
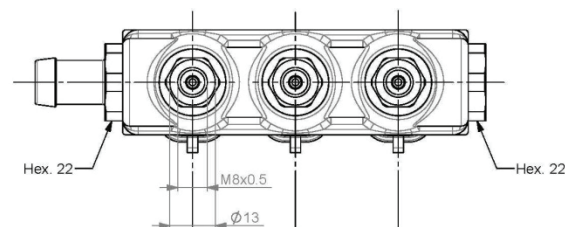
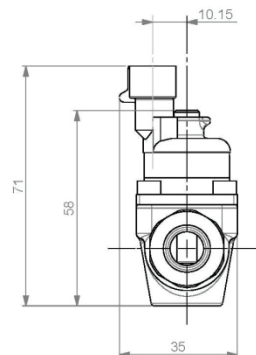
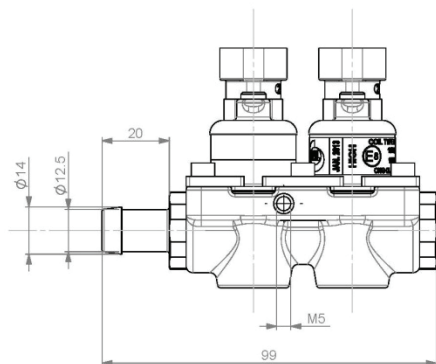
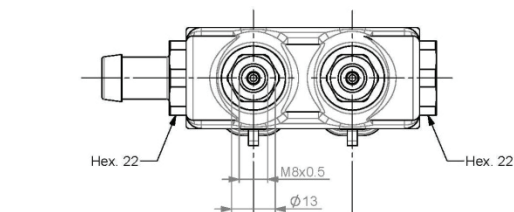
- ❑ IG7 NAVAJO LP: for LPG/CNG working, from 1 bar (100 kPa) to 3 bar (300 kPa) working pressure; 4,5 bar (450 kPa) max pressure. Neutral coloured body
- ❑ IG7 NAVAJO HP: for CNG working, for 7 bar (700 kPa) working pressure; 9 bar (900 kPa) max pressure. Black coloured body

The new IG7 NAVAJO injector is available in two version, 2 and 3 cylinders, in order to facilitate the installation for every type of engine (from 2 cyl. to V8 cyl.)



Dimensions

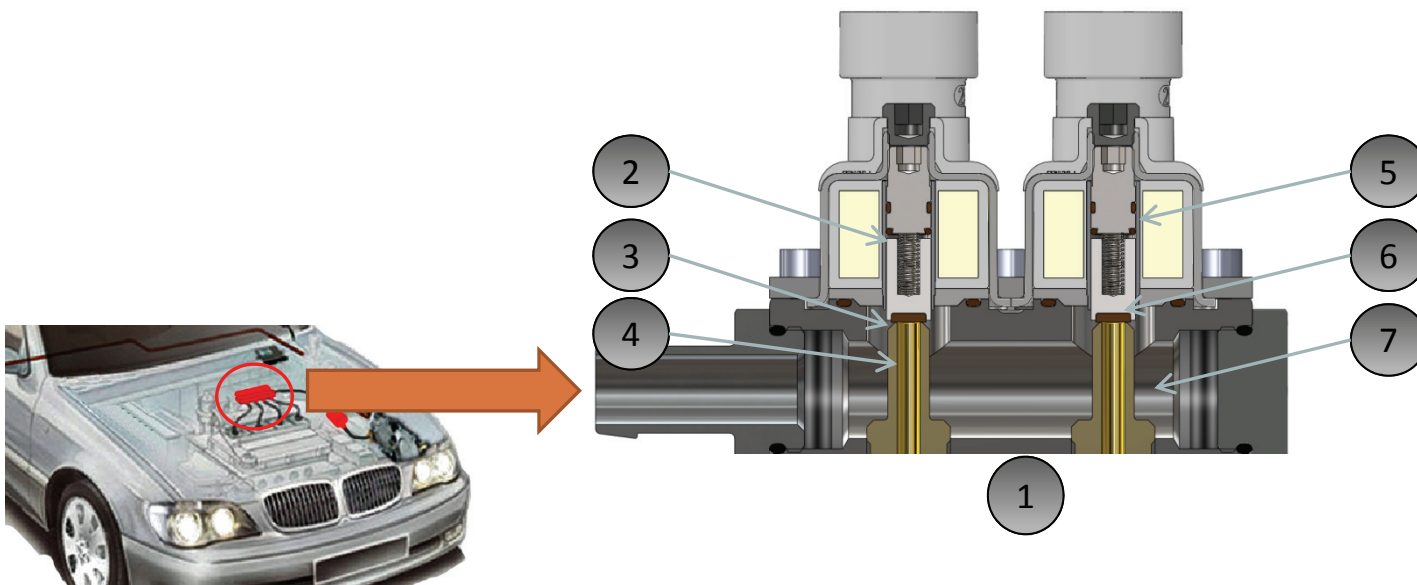
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Development

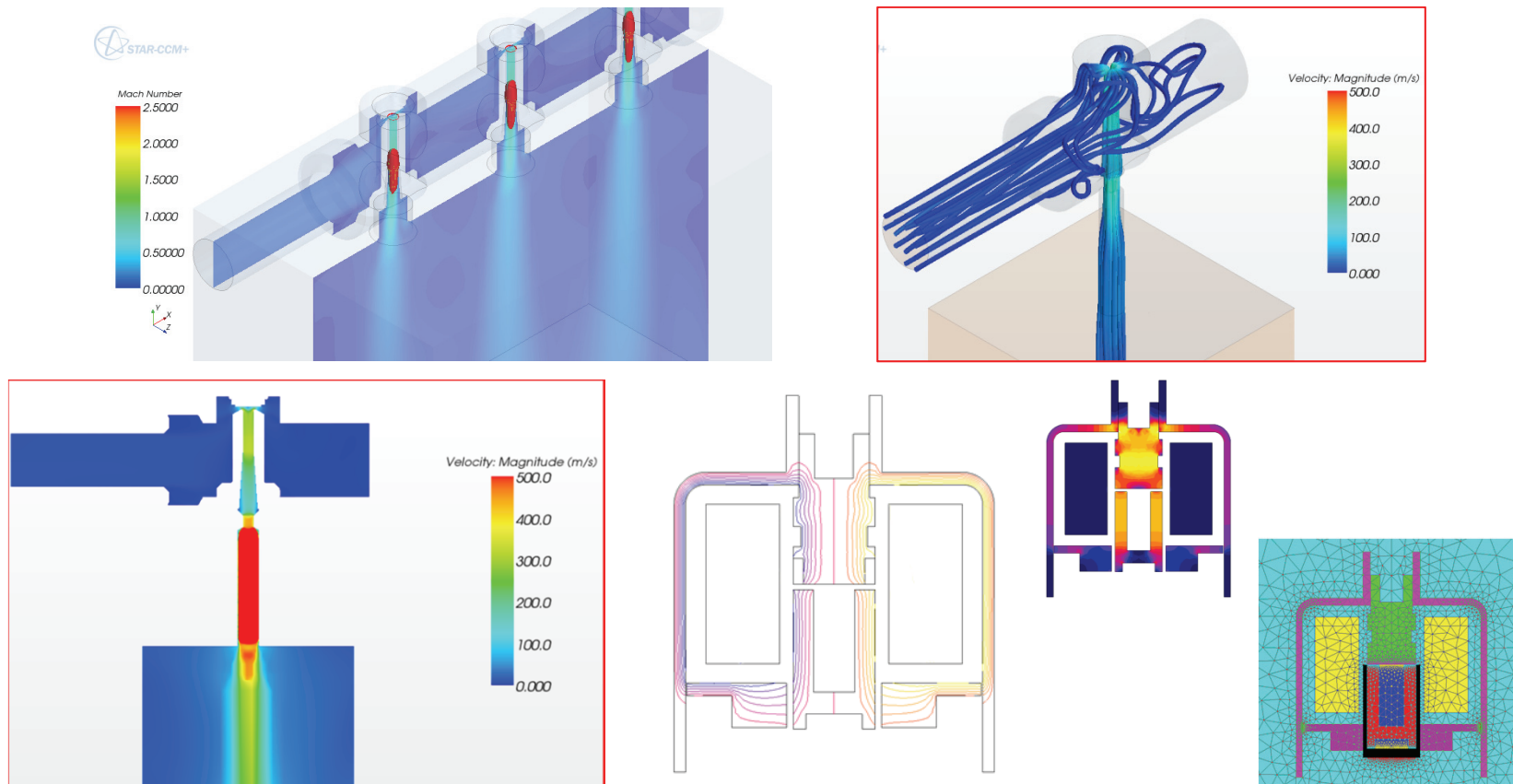
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1. Developed for gaseous fuel: LPG & CNG (until 3 bar) – CNG (7 bar)
2. Special internal treatments for long operation and reliability; internal damper for quiet operation
3. Advanced design, for good working with high-speed engines
4. High flow capacity, for both versions
5. Steels realized for specific application
6. Optimized compounds in order to improve the mechanical and chemical resistance
7. Deep and meticulous study of the flows and internal turbulences



Development

- Introduction
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- ✓ Very good fluidynamic performance, based on Computational Fluid Dynamics analysis
- ✓ Specific electromagnetic studies, in order to improve piloting parameters

Basic Performance



IG7 NAVAJO - LP



IG7 NAVAJO - HP

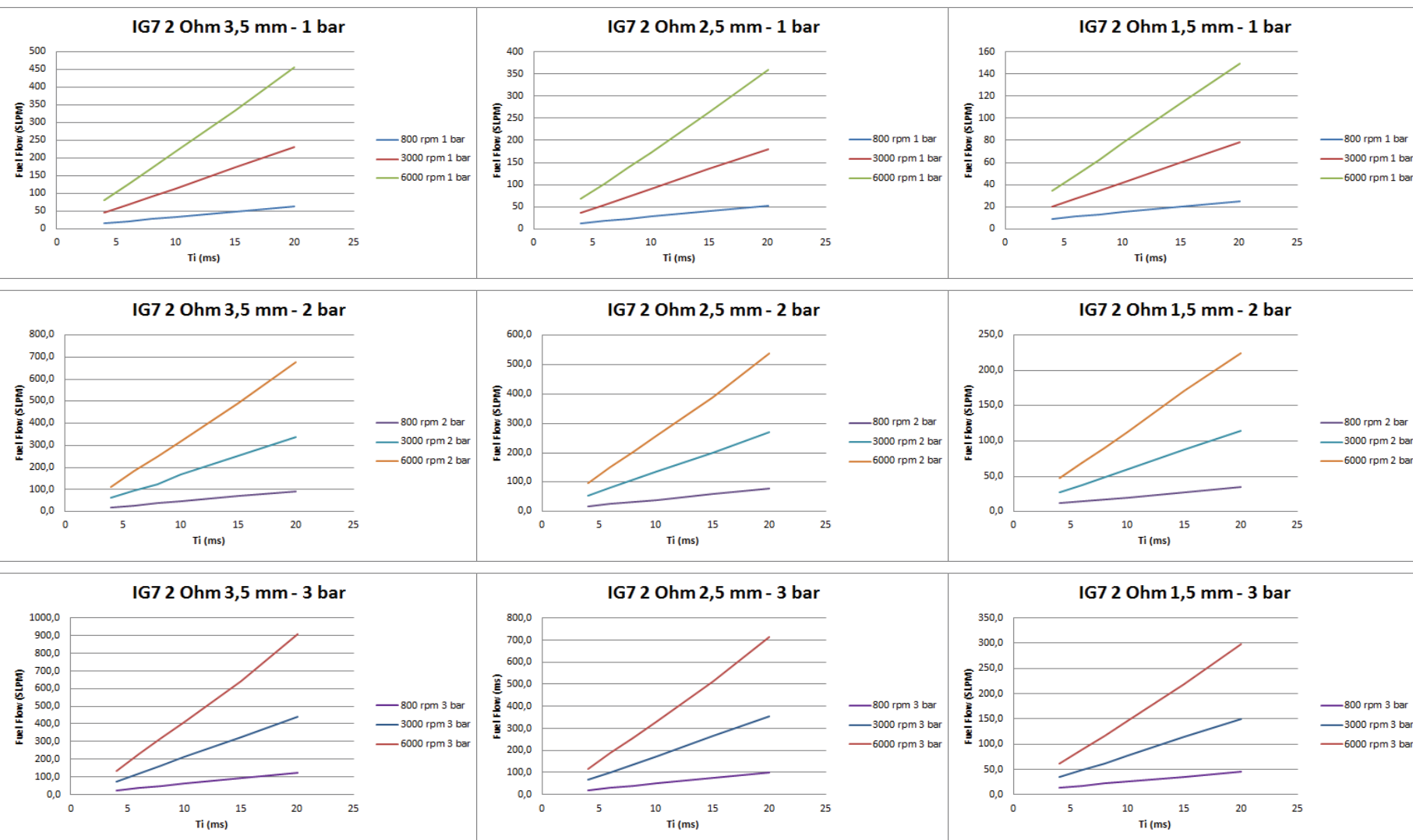
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Characteristics	Unit	Value		Value		Remarks
Injector Rail Version	N° of cylinders	2		←		For 4 cylinders engine 2+2 configuration
		3		←		For 6 cylinders engine 3+3 configuration
Pressure	Bar	3 max		7		Working pressure
		4,5		9		Max pressure
Rated voltage (at coil)	Volt	10,8 – 14,4		←		
Minimum copper wire section for coil connection	mm²	0,75		←		
Resistance	Ω	2		←		± 15% @ T=25°C
Suggested peak current time (duration)	ms	3		←		
Suggested holding current (±10%)	A	1,6		←		
Cold Starting Requirements		Increase up to 20% the "peak current time" for first cycles when gas temperature is <10°C		←		
Complete Opening/ Closing Response Time	ms	1,85	1,4	2,1	1,3	± 5%
Minimum injection pulse	ms	2,6		←		Tested on new injector with max nozzle Ø @14 / Δp = 7 bar T = 25°C
Static flow rate with max nozzle Ø	SLPM (sL/min)	120,0 @ 1bar inlet P 180,0 @ 2bar inlet P 240,0 @ 3bar inlet P		230,0 @ 7bar inlet P		Max flow for 1 single injector @ 25°C (with air)
Leakage (with air)	cc/h	=< 15		←		(according to ECE 110R-00 and ECE 67R-01)
Noise level	dBa	67		←		± 1dB Rail Test Condition
Compatibility with gas		LPG, CNG		CNG		
Driver Stage		Peak and Hold (PWM)		←		
Coil Connector type		2 way Amp/Delphi super seal female connector with tab contacts		←		
		IP 54		←		
Inlet gas fitting		Rubber Ø 10 mm / Ø 12 mm		←		
Outlet gas fitting		Calibrated nozzles M8x1 for rubber hose Ø 6 mm		←		
Calibrated hole Ø range (for nozzles)		From 1,00 to 3,50 mm (0,25 mm step)		From 1,00 to 2,00 mm (0,25 mm step)		
Approvals		67R-01: -20° / +120° C temperature range 110R-00: -40° / +120° C temperature range		110R-00: -40° / +120° C temperature range		
Operating Ambient Temp Range	°C	-20 / 120		←		
Injector rail assembly weight	Gr.	246 (for 2 cyl.)		←		
		336 (for 3 cyl.)		←		

Flow Curves

- Introduction
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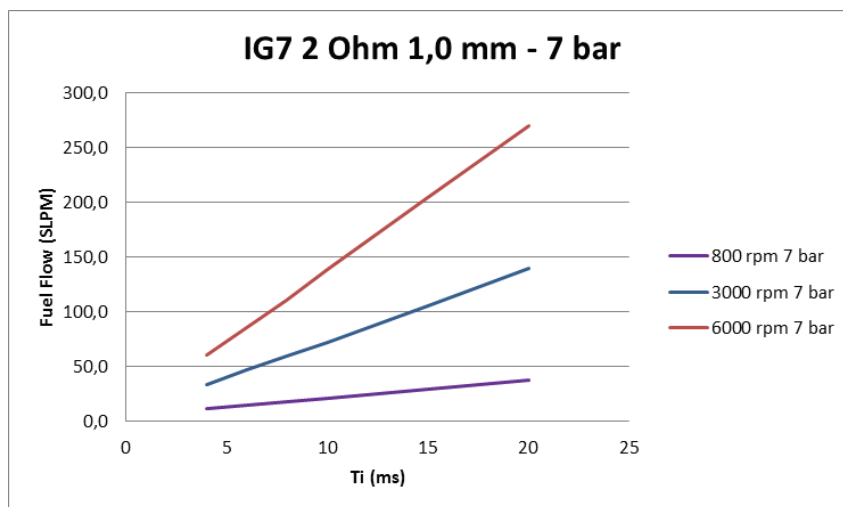
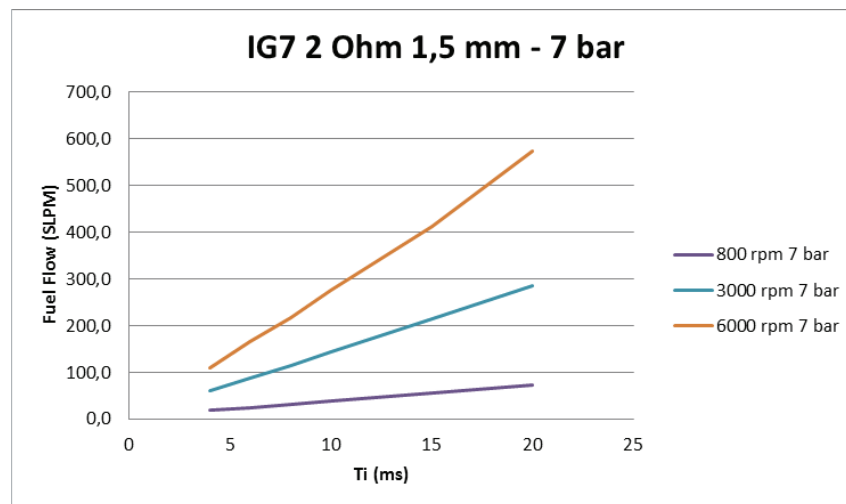
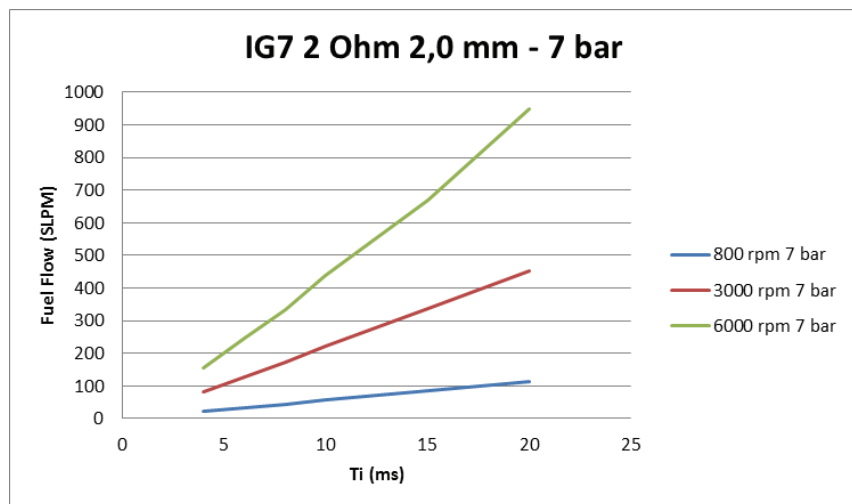
IG7 NAVAJO LP – 4 cyl. working



Flow Curves

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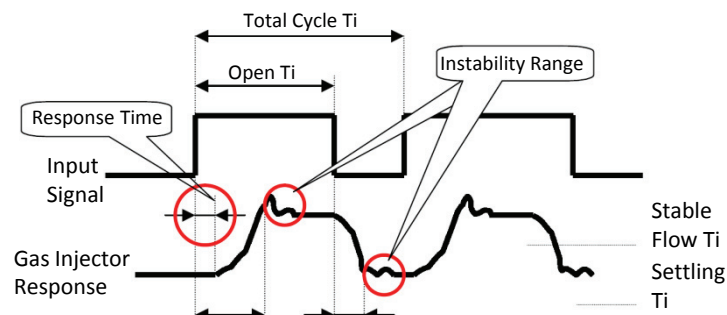
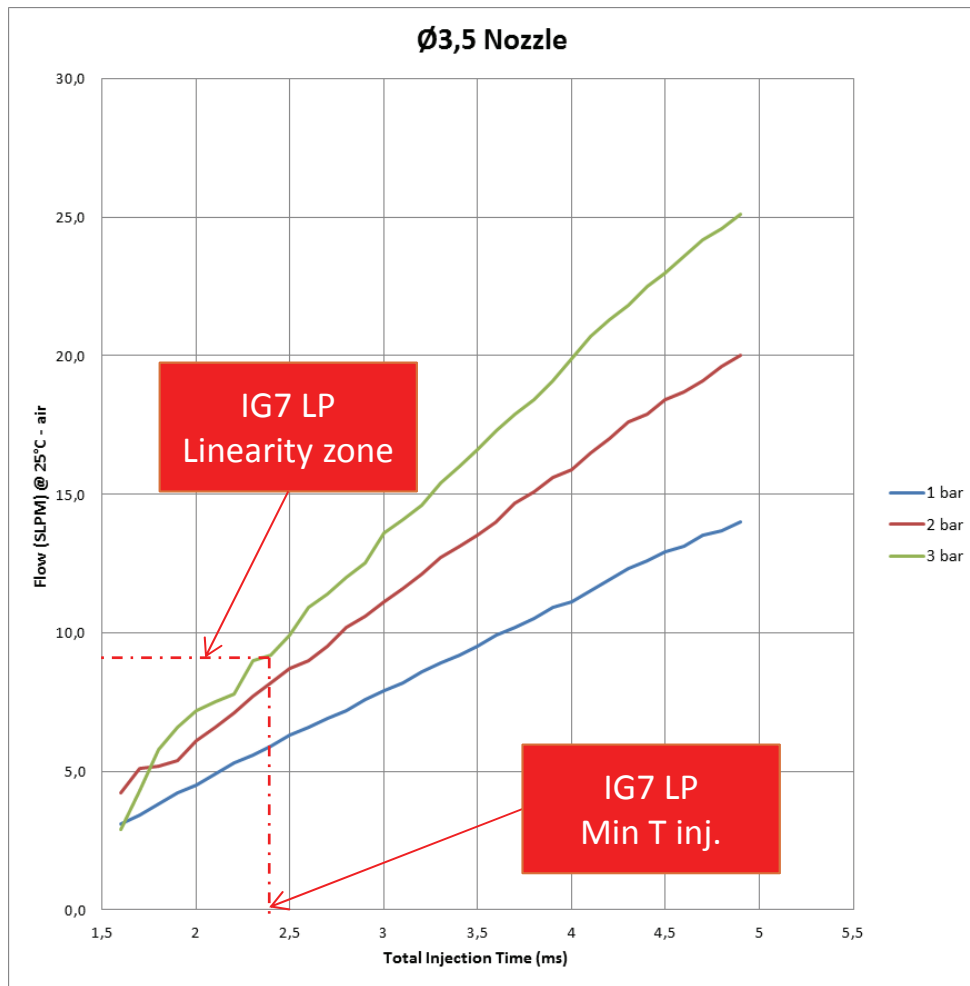
IG7 NAVAJO HP – 4 cyl. working



Linearity Performance

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- Technical specifications
- Maintenance

IG7 NAVAJO LP – 4 cyl. working

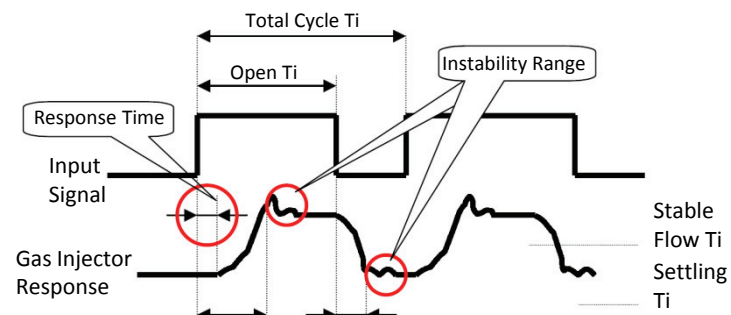
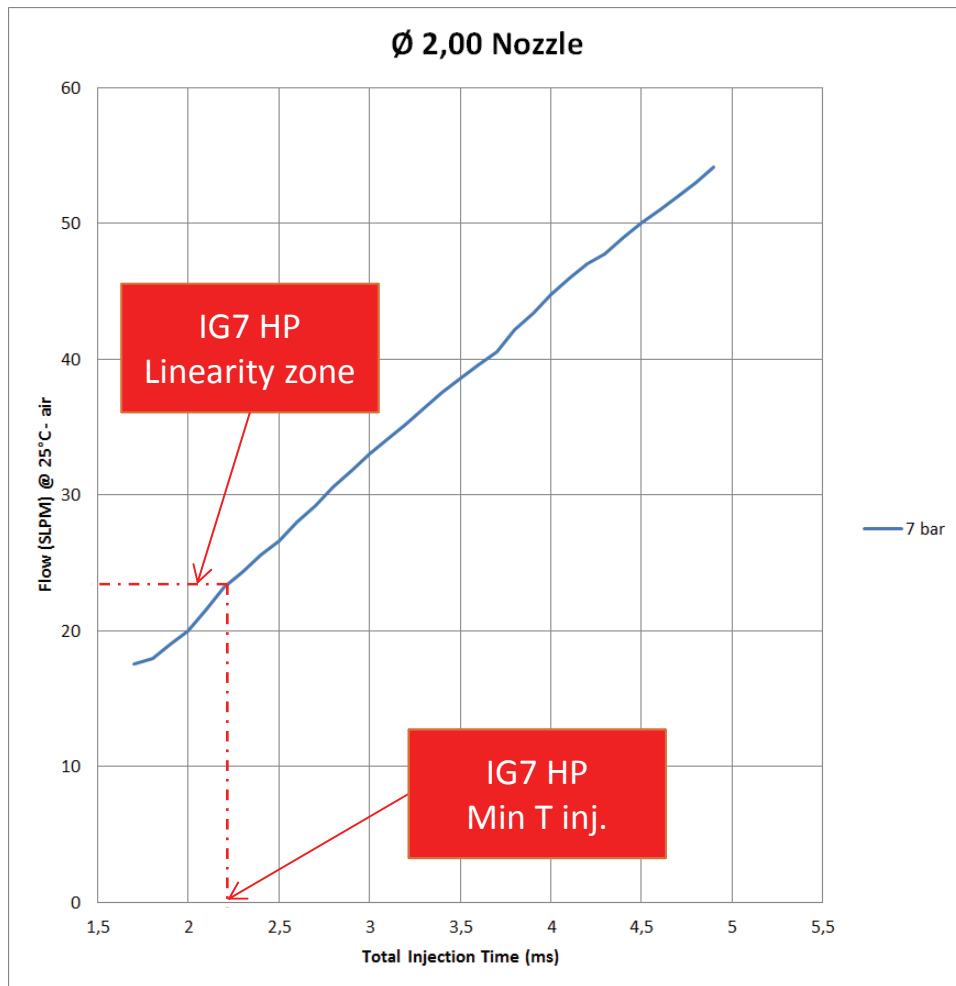


Linear flow range (LFR) is a very important performance characteristic for emissions and running quality. The new IG7 NAVAJO grants fast response time and high range of linearity, from 1 to 3 bar.

Linearity Performance

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- Development
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- Noise
- Technical specifications
- Maintenance

IG7 NAVAJO HP – 4 cyl. working

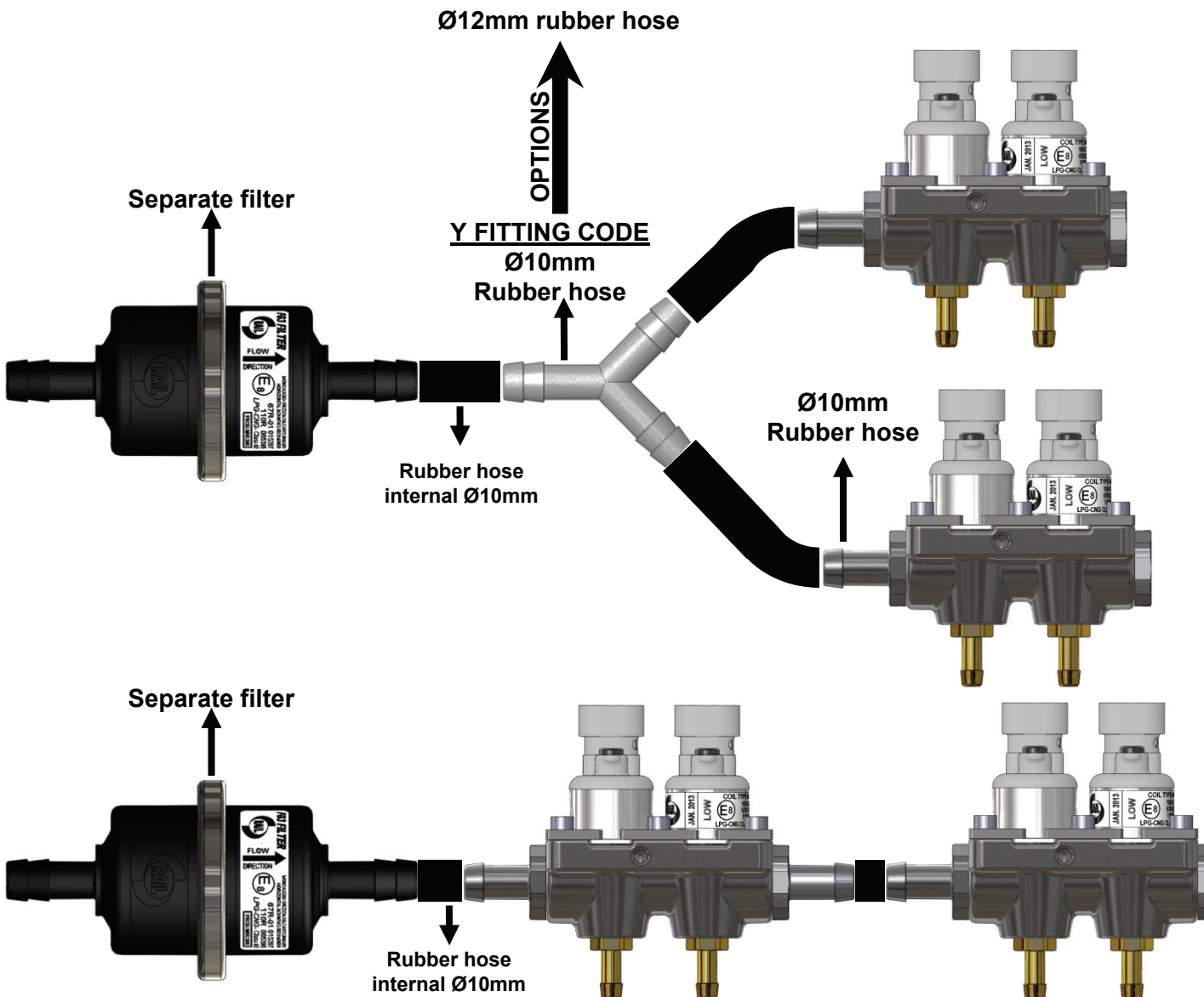
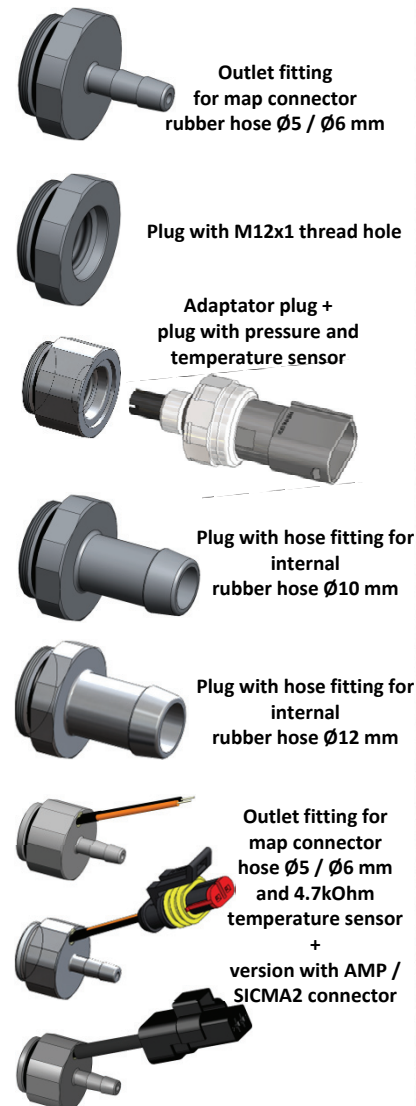


Linear flow range (LFR) is a very important performance characteristic for emissions and running quality. The new IG7 NAVAJO grants fast response time and high range of linearity at 7 bar.

Injector installation

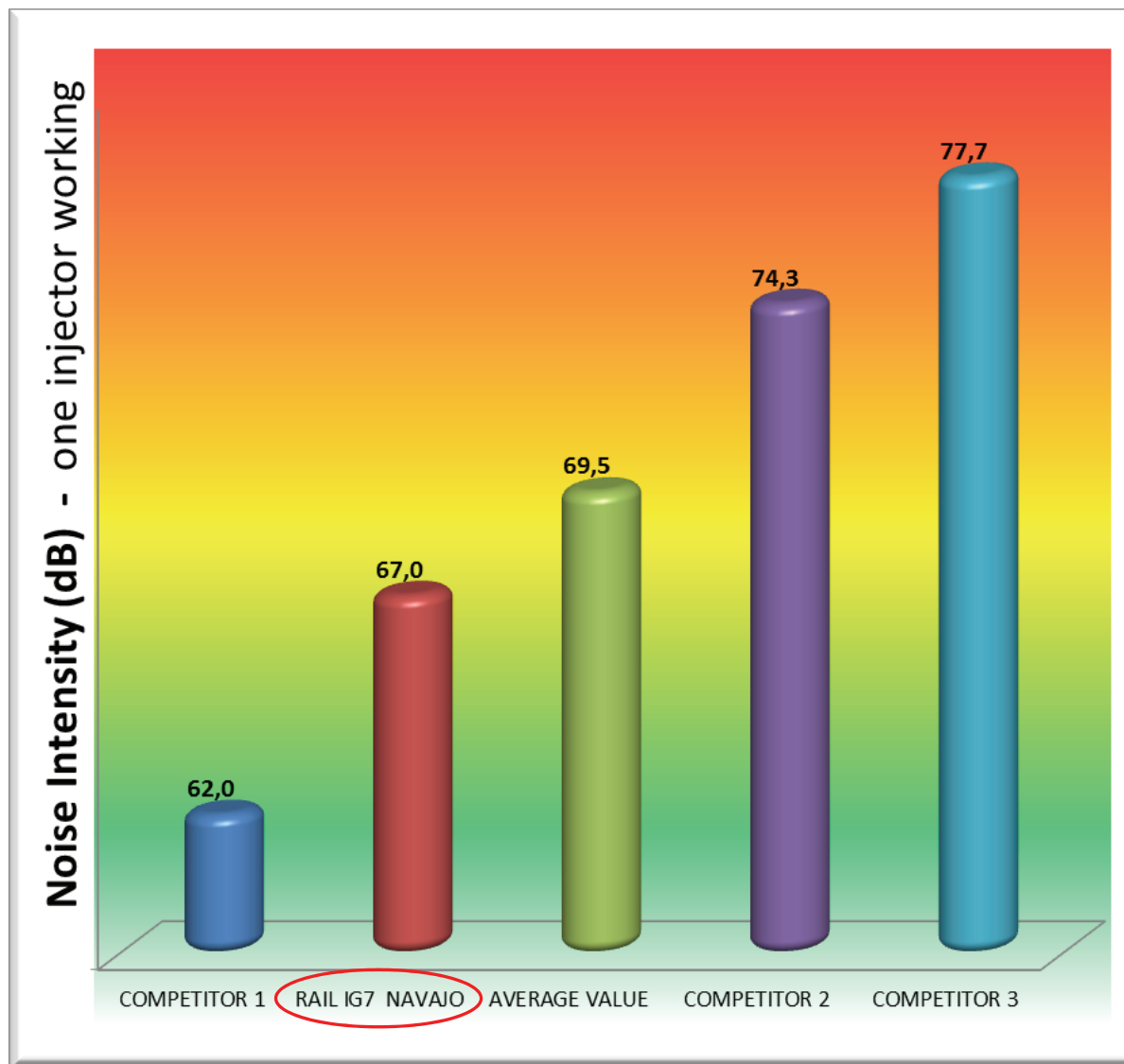
- Introduction
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- **Installation**
- Noise
- Technical specifications
- Maintenance

SEPARATE PLUGS:



Quiet operation

- Introduction
- Development
- Performance
- Installation
- **Noise**
- Technical specifications
- Maintenance



(Comparison of three different Gas injectors)

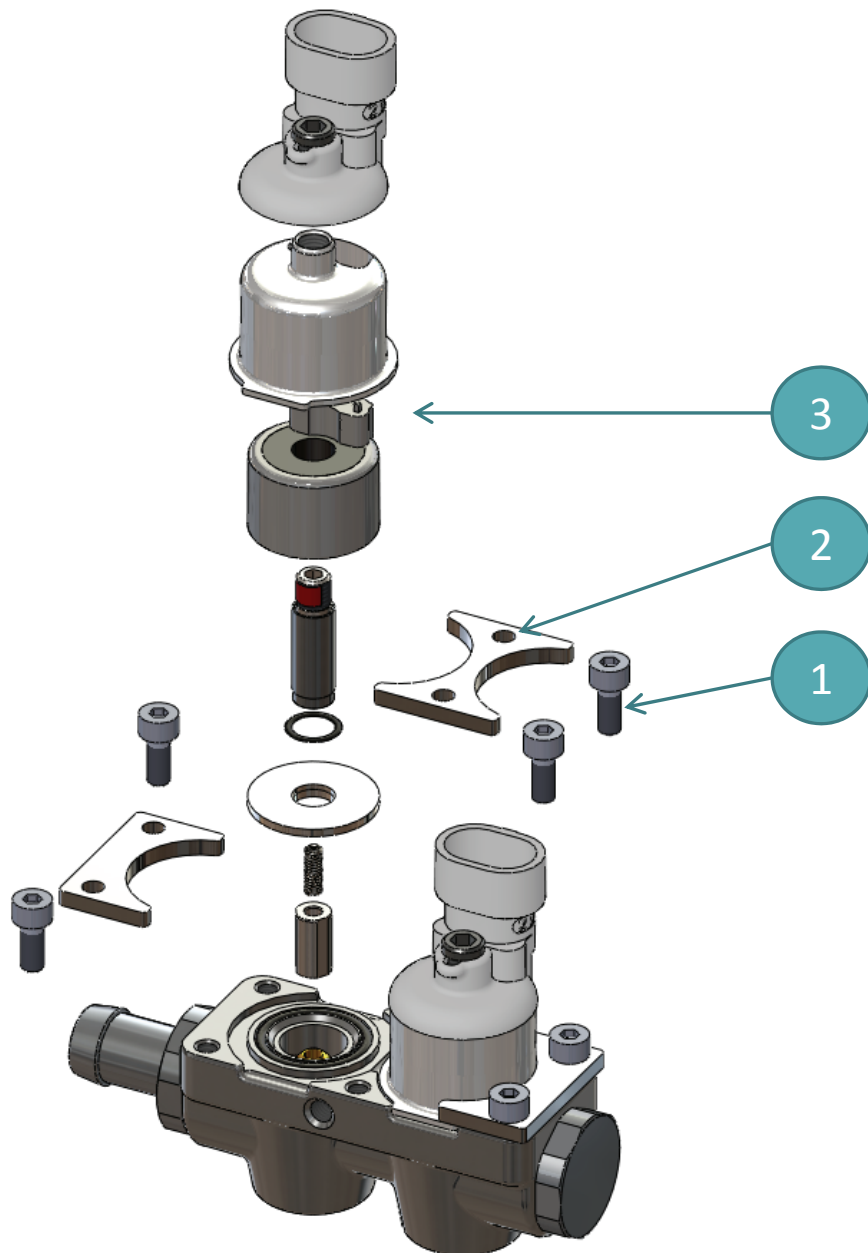
Technical Specifications

- Introduction
- Development
- Performance
- Installation
- Noise
- **Technical specifications**
- Maintenance

ITEM	SPECIFICATIONS	
Mounting Position	Vertical recommended	
Approvals Temperature	-40°C / +120°C	
Working Temperature	-20°C / +120°C	
Fuel Type	CNG, LPG	
Fuel Pressure	Until 3 bar (4,5 bar max) for LP model	7 bar (9 bar max) for HP model
Voltage	10,8 – 14,4 Volts	
Normal Operating Current	6 A (Peak) 1,5 A (hold)	
Coil Resistance	2,00 ± 15% at 25°C	
Rail Injector Assembly Weight	246 g (2 cyl.), 336 g (3 cyl.)	

Maintenance

- Introduction
- Development
- Performance
- Installation
- Noise
- Technical specifications
- **Maintenance**



1. Removing the fixing screws
2. Removing the brackets
3. Inspect/Clean/Replace the internal of the injector and every single component

IG7 NAVAJO injector is not very sensitive to dirt accumulation, but in case of maintenance to be done for any reason, it grants easy disassembly and easy cleaning.

Conclusion

- Exchangeable, not very sensitive to dirt accumulation, easy maintenance and easy to clean
- Robustness
- Good reliability and durability
- Compact dimensions
- Big flow rate
- Low instability range
- High installation flexibility on vehicle