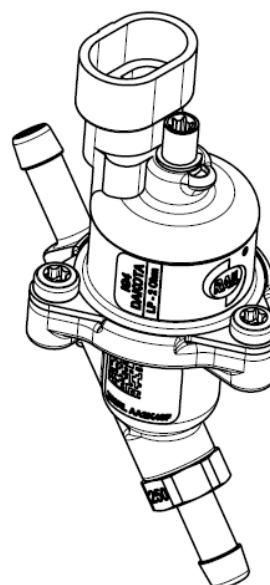


TECHNICAL INSTALLATION, OPERATION AND MAINTENANCE MANUAL

LPG/CNG GAS INJECTOR

IG4 Dakota LP AM

IG4 Dakota LHF AM



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<i>Rev N.</i>	<i>Date</i>	<i>Description of the changes</i>
00	04/09/2025	First emission

1. INTRODUCTION

This manual provides technical and safety information for the correct installation, usage, and maintenance of the IG4 Dakota LP AM, IG4 Dakota LHF AM injectors.

2. TECHNICAL DATA

For detailed technical information about Ecomotive Solutions products, please visit the company's website using the QR code below:

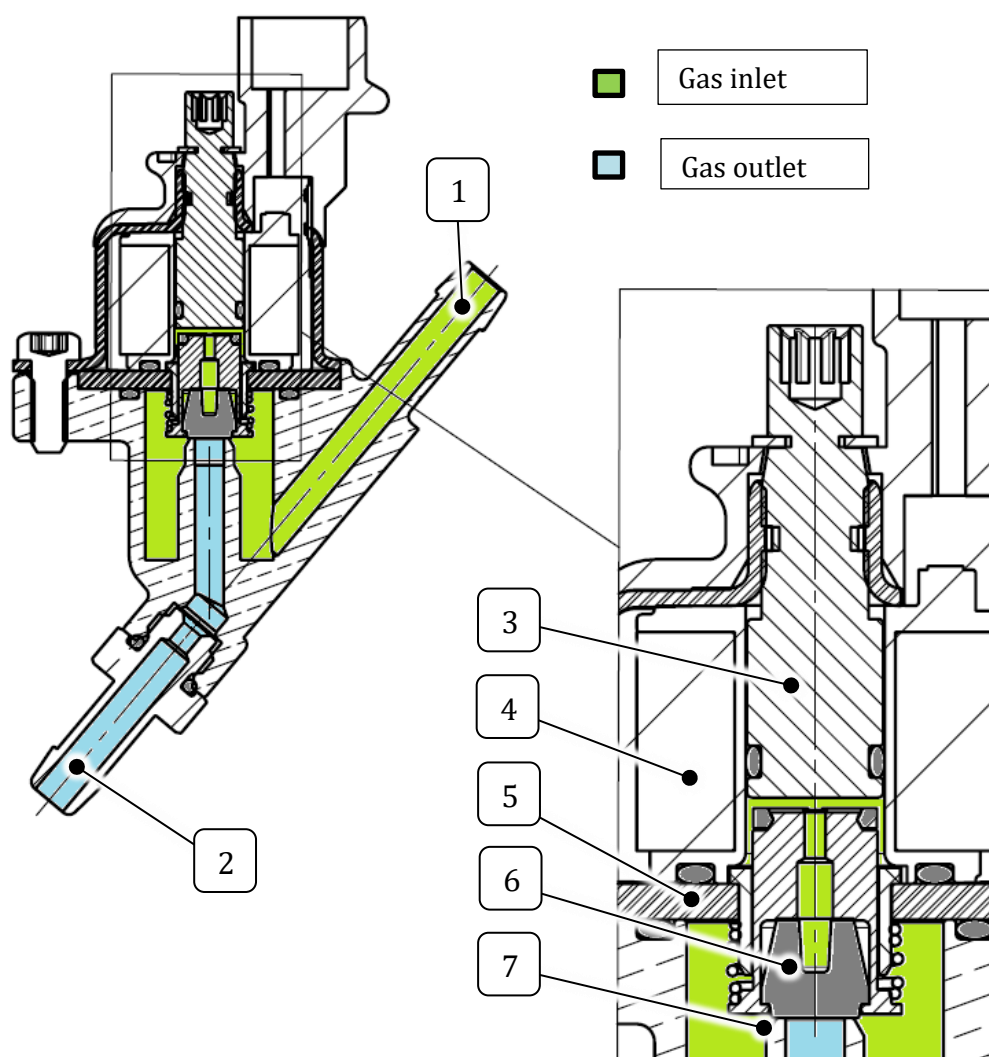


3. OPERATING PRINCIPLE

The IG4 injectors regulates the fuel to each cylinder of the engine by opening/closing a passage by means of a solenoid, this solenoid is piloted by an electronic signal from the Electronic Control Unit. The electronic signal must be a peak&hold current wave, and its main parameter (Voltage, Peak time, Holding current) are indicated on the specific "Technical data sheet" of the installed injector.





The stroke of the mobile plunger (6) determines the flow rate and performance of the injector: the stroke is adjusted by acting on the fixed core (3).

1. Gas inlet
2. Gas outlets
3. Fixed core
4. Solenoid
5. Armature
6. Mobile plunger
7. Valve seat



4. VERSIONS

The IG4 injector series includes the following versions:

<p>IG4 Dakota LP AM</p> 		<p>Best compromise for working pressure up to 3 bar. High performance in speed and durability. High stability and repetitiveness of internal flows. Power handling up to 40 HP /cylinder for LPG, 35 HP /cylinder for CNG.</p>
<p>IG4 Dakota LHF AM</p> 		<p>Increase of internal sections to achieve higher flows. Power handling up to 60 HP /cylinder for LPG, 50 HP /cylinder for CNG.</p>

For each version different customer customizations are available, such as: coil resistance, outlet nozzles, injector stroke, and more.

5. INSTALLATION GUIDELINES

- Follow the requirements and suggestion indicated on injector “Technical data sheet”
- Choose the correct nozzle diameter. In order to verify the Nozzle diameter, check the minimum injection time at idle and the engine behaviour at full throttle
- Before the injector it's suggested to install a dedicated Filter (e.g. Rail FG3 or Rail FG4)
- Don't install the injector closer to Exhaust Manifold
- Fasten the injector with vibration damping
- We suggest to install the injector in vertical position (coil upside, outlet nozzle downside)
- Screw Manifold Nozzle with Tightening Torque from 2.5 to 3.0 Nm using locking and sealing glue
- Do not place the injector or its cables near the spark and spark cables

6. MAINTENANCE

The Maintenance Process consist in several phases:

– Preventive actions

It's suggested to install a dedicated Filter (e.g. FG3 – FG4) before the injector inlet. Use only RAIL injector cleaning (also to clean intake ducts, intake valves, combustion chamber) especially in areas where there are impurities in the gas distribution (dirt gas). Other cleaners contain aggressive chemicals that could damage/corrode internal parts of the injectors, do not use it.

– Visual inspection

If the injector shows signs of overheating check the ECU parameters (peak time, holding currents ...) and the wiring harness. The injector coil impedance is controlled on 100% production: the cause of the overheating must be found in the control command of the injector (and not in the injector itself).

If the injector has signs of tampering (body damaged or warped, bent plunger housing, stroke modified) it's out of warranty and should not be repaired.

– Functional check

Injector not open: verify that all the injector seat opens by connection the inlet fitting to compressed dry air at working pressure (e.g. 2 bar) and running the injectors¹. If one of the seats do not open, check the coil impedance (solenoid interrupted?) and eventually change the coil if parameters aren't within limits. If the impedance is correct, disassemble the stuck seat and clean it with RAIL injector cleaning; reassemble the parts and clean the injector by running it for 2 minutes with dry air at max working pressure.

Noise check: if one or more injector makes a strange metallic sound, replace the internal moving parts (mobile plunger, spring, O-rings) with the appropriate spare parts kits.

ATTENTION: do not contaminate with dust or dirt (risk of malfunction). After replacement, clean the inside of the injector by running it for 2 minutes with dry compressed air at max injector working pressure¹ (e.g. 2 bar).

Coil impedance check: verify that coil resistance is within the range prescribed on technical data sheet. It is mandatory to use a calibrated multimeter with tolerance less than 0,1 Ω . Use short cables and of adequate cross-section to avoid increasing the impedance measurement. Measure only coils at ambient temperature (20 °C \pm 5°C) that have not been running for several hours (the temperature increases the coil's resistance, risk of incorrect measurement).

Leak check: verify at min and max working pressure (indicated on specific injector "Technical data sheet") any gas leakage: pressurized the injector inlet by compressed air and check with gas leak detector -or similar- for any bubbles at injector outlets, near the fixed core, between plunger housing and main body.

– Repair

6.4.1. Mobile plunger replacement

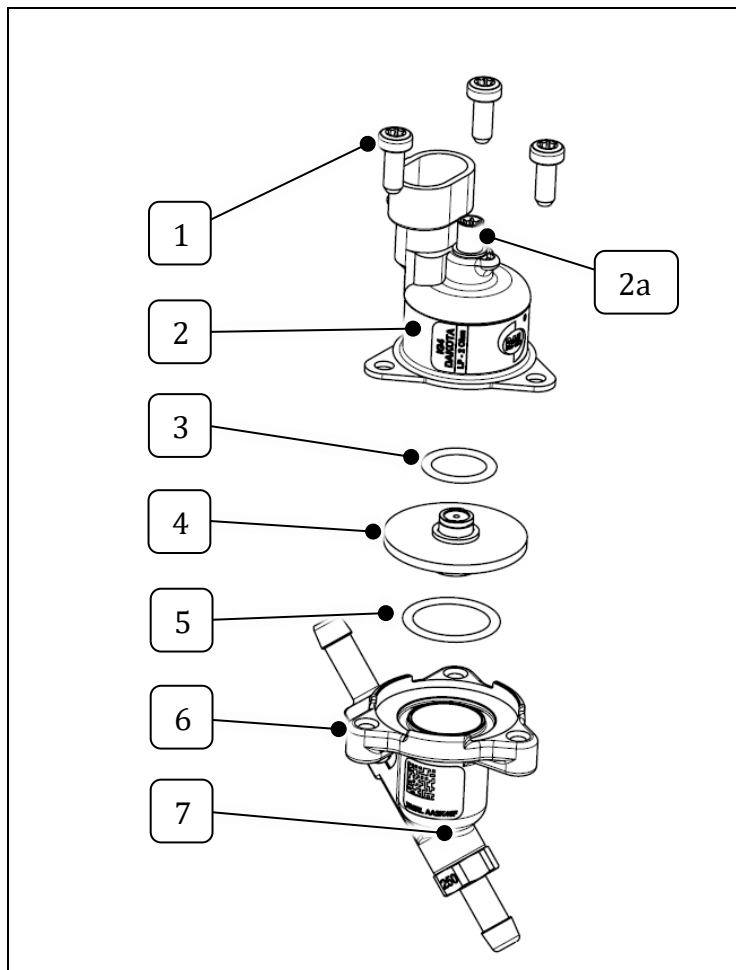
Repair kit	code: KT1.01.IG4.RL1.4	O-ring 12.50x1.50 (3) - 4pc mobile plunger group (4)- 4 pc O-ring 17.00x1.50 (5)- 4 pc
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- Remove the screws (1) that hold the coil group (2) of the injector that need the inspection. ATTENTION: do not modify the fix core regulation (2a) to avoid injector malfunction/ incorrect performance.
- Remove the coil O-ring 12.50x1.50 (3), the mobile plunger group (4), and the body O-ring 17.00x1.50 (5).
- Clean the internal parts if needed: use only RAIL injector cleaning fluid or white petrol. ATTENTION: do not use alcohol, water, gasoline or other solvent (risk of damaged for rubber parts).
- Reassemble all the parts (included in spare parts kit): first the body O-ring 17.00x1.50 (5), then the mobile core group (4), in the end the coil O-ring

¹ Max working pressure and injector control parameters must comply with what is indicated on the specific "Technical data sheet"

12.50x1.50 (3). ATTENTION: do not contaminate with dust or dirt (risk of blockage). Lubricated the O-ring with silicon oil or PTFE grease only.

- e) Reassemble the coil group (2) with their screws (1). Tightening torque = 2.7 Nm $\pm 15\%$.
- f) In these injector models (IG4) is not possible to check the injector stroke after the assembly



7. SAFETY WARNINGS

- Do not tamper with sealed components
- Never perform maintenance with the engine running
- Do not use high-pressure water on injector or electrical parts
- Ensure only certified personnel perform installations
- Keep away from the vehicle with any open flames (e.g., cigarettes) or spark-generating devices

8. WARRANTY CONDITIONS

The warranty is void if the injector is disassembled or if the stroke is modified by the installer.

See *MOD.CQ.024 / WARRANTY CONDITIONS* for other warranty conditions.

Disclaimer: Ecomotive Solutions reserves the right to make changes to this manual and the warranty conditions without prior notice, unless required for safety reasons or to ensure the proper functioning of the injectors.



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