1890-01

FUEL SYSTEM

GENERAL INFORMATION

1. SPECIFICATIONS

| | Category | Specifications | |
|----------------------------|-------------------------------------------------|--------------------------------------------------------------------------------|--|
| Fuel | | Gasoline | |
| Fuel tank | Capacity | 47 L | |
| | Material | Plastic | |
| Fuel filter | Туре | Micro paper type | |
| | Location | Built in the fuel pump | |
| | Service interval | Inspect every 30000 km (if using poor quality of fuel, replace every 50000 km) | |
| Low pressure fuel pump | Туре | Built in the tank, electric | |
| | Drive | Electric motor | |
| | Fuel pressure | 3.8 bar (110 L/H) | |
| | Current consumption | 6.5 A (12 V, 3.8 bar) | |
| Fuel pressure regulator | Туре | Built in the fuel pump | |
| | Fuel pressure | 3.8 ± 0.05 bar | |
| | Remaining pressure in 30 minutes after key OFF: | 2.1 bar or higher | |
| Injector | Injection holes | 4 holes | |
| | Component resistance | 12 Ω ± 5% | |
| | Rated operating mass flow | 2.60 g/sec | |
| | Injector type | Deka 7 | |

| Modification basis | |
|--------------------|--|
| Application basis | |
| Affected VIN | |

OVERVIEW AND OPERATING PROCESS

1. OVERVIEW

The fuel system consists of fuel tank, fuel pipe line, fuel filter, fuel pump, fuel pressure regulator, injectors, fuel rail. The fuel system is a returnless control type system in which the fuel pressure regulator is built in the fuel pump. This system is controlled by the engine ECU and each injector of the system injects the fuel. The system also has a fuel evaporative control system which forces or blocks the vapor gas stored in the canister to the combustion chamber using the operation of purge control solenoid valve based on the engine load condition.

2. COMPONENTS



| FUEL SYSTEM | Modification basis | |
|----------------|--------------------|--|
| TIVOLI 2015.03 | Application basis | |
| | Affected VIN | |
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3. OPERATING PROCESS

The ECU determines fuel injection volume and injection timing based on the engine condition and optimizes the engine operating conditions to reduce the emissions.

| Input | | Control | Output |
|-------------------------------|-------------------------------------------------------------|---------|-----------------------------|
| Crankshaft position sensor | Engine rpm (engine load) | | Fuel pump relay control |
| T-MAP sensor | Measures air volume to compensate injection volume | | Fuel pump |
| Front oxygen sensor | Calibrates fuel injection volume | | drive Fuel pump |
| Electronic throttle body | Compensates injection volume according to TPS | ECU | |
| Camshaft position sensor | Determines injection timing | | Injector |
| Coolant temperature sensor | Compensates by coolant temperature | | injection volume control |
| Knock sensor | Detects engine vibration | | |
| Accelerator pedal | Driver's acceleration will | | |

| Modification basis | |
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| Application basis | |
| Affected VIN | |

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INTAKE SYSTEM

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Basic mapping

Stepped control

The ECU calculates proper injection volume and timing by considering various parameters to achieve the optimal combustion at each stage of operation.

Starting injection volume control

The fuel injection volume during initial starting is calculated by considering the temperature and engine cranking speed. The starting injection means the injection during the period from when the ignition switch is turned ON until when the engine rpm reaches to the allowable minimum speed. **Driving mode control**

- The fuel injection volume during normal driving is calculated based on the accelerator pedal travel and engine rpm and the drive map is used to match the drivers inputs with optimal engine power.



| FUEL SYSTEM | Modification basis | |
|----------------|--------------------|--|
| TIVOLI 2015.03 | Application basis | |
| | Affected VIN | |
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4. SYSTEM DIAGRAM



| Modification basis | |
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| Application basis | |
| Affected VIN | |

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5. FUEL EVAP CONTROL SYSTEM

The fuel evaporative control system stores the evaporative gas in the canister to prevent the evaporated fuel being released into the atmosphere. This system diagnoses the internal system and checks for abnormalities in the system by using the pressure sensor and canister shut-off valve installed to the fuel tank. The purge control solenoid valve (PCSV) is operated by the engine ECU control according to the engine load condition. The fuel evaporative gas, stored in the canister, is drawn into the engine due to vacuum condition (negative pressure) of the engine when the PCSV is open while the fuel evaporative gas in the fuel system is sucked and stored in the canister when the PCSV is closed.



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|----------------|--------------------|--|
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| | Affected VIN | |
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