

## Title (en)

System and methods for electronic control of an accumulator fuel system.

## Title (de)

Verfahren und Vorrichtung zur elektronischen Steuerung eines Speicherkraftstoffsystems.

## Title (fr)

Système et méthode de commande électronique pour système accumulateur de carburant.

## Publication

**EP 0681100 A2 19951108 (EN)**

## Application

**EP 95106632 A 19950503**

## Priority

US 23885994 A 19940506

## Abstract (en)

An electronic digital control system monitors and controls the operation of an engine fueling system. Signals activating injection for a plurality of cylinders are transmitted through a single line to a driving circuit for a single injector solenoid valve, while signals controlling accumulator fuel pumps are transmitted to pumping control solenoids. Injection signals are controlled to vary fuel delivery rate during an injection event. A back EMF sensing circuit measures valve opening delay and the control system compensates for valve delay. Variable cylinder-specific delays in the injection solenoid output signal pulses are programmed to compensate for a varying fuel line length to each injector nozzle. At startup, the control system pulses the pumping control solenoids to begin pressurizing the accumulator before engine angular position sensors provide an accurate indication of engine angular position to allow precise timed control of the pump. Pressure variations in the high pressure accumulator are monitored by the control system in conjunction with injection events, and pump equipment failures or weaknesses are detected based on the pressure variations. In alternative embodiments of the invention, a pre-biasing current using battery voltage is provided to the injection control valve prior to the desired time of an injection event, and the current is increased at the desired time of opening. An input allows signaling the control system when a load is to be applied to cause an immediate change in fueling levels, to prepare for load increases in electrical generation and other non-motive-power applications.

<IMAGE>

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## Cited by

EP0986708A4; EP2336533A3; EP3379062A4; EP0896145A3; EP1134384A3; CN104895716A; EP2551510A4; CN113266487A; EP2538061A3; GB2329525A; FR2767866A1; GB2329525B; US6142124A; CN115573965A; WO9934268A1; US12000504B1; US9347393B2; US10082117B2; US10859047B2

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