

[54] AUTOMOTIVE ENGINE CONTROL SYSTEM CAPABLE OF DETECTING SPECIFIC ENGINE OPERATING CONDITIONS AND PROJECTING SUBSEQUENT ENGINE OPERATING PATTERNS

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[51] Int. Cl.⁴ F02M 51/00

[52] U.S. Cl. 123/478; 123/480; 123/486; 123/339

[58] Field of Search 123/440, 478, 486, 349, 123/339, 395,417,489,479,480

[56] References Cited

U.S. PATENT DOCUMENTS

Re. 31,582	5/1984	Hosaka et al.	364/431.04
4,130,095	12/1978	Bowler et al.	123/440
4,235,234	11/1980	Rice	123/486
4,319,327	3/1982	Higashiyama et al.	364/431.05
4,344,398	8/1982	Ikeura	123/339
4,345,557	8/1982	Ikeura	123/339
4,376,428	3/1983	Hata et al.	123/417
4,402,217	9/1983	Higashiyama et al.	73/117.3
4,402,289	9/1983	Ikeura	123/339
4,406,261	9/1983	Ikeura	123/339
4,406,262	9/1983	Ikeura	123/339
4,459,670	7/1984	Yamaguchi et al.	364/431.10

FOREIGN PATENT DOCUMENTS

0058826	9/1982	European Pat. Off.
0081648	6/1983	European Pat. Off.
0084116	7/1983	European Pat. Off.
0085909	8/1983	European Pat. Off.
2949988	7/1980	Fed. Rep. of Germany

3333392	3/1984	Fed. Rep. of Germany
49-40886	11/1974	Japan
2125578	3/1984	United Kingdom

OTHER PUBLICATIONS

SAE Technical Paper Series, 800825, Digital Engine Controller (date unavailable).

Ser. No. 655,554 filed 9/28/84, by Hara.

Ser. No. 445,552 filed 11/30/82, by Ito.

SAE Paper 800056 of Feb. '80, "Microprocessor Control Brings About Better Fuel Economy With Good Drivability".

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[57] ABSTRACT

An engine control system monitors engine operation by periodically sampling engine operating parameters and records variation patterns of the engine operating parameters as engine operation pattern data whenever any of a number of preselected specific engine operating conditions occur, such as engine stalling, acceleration, or deceleration. The control system normally controls the engine according to conventional engine control procedures and adjusts the control procedures in response to preselected engine operating conditions in accordance with a projected engine operation pattern derived from prerecorded engine operation pattern data and the detected specific engine operating condition. The engine operation pattern data may be repeatedly updated and/or accumulated during engine operation and may be held in a memory of the control system even after the engine is turned off. The engine operating parameters may include the operation state of one or more vehicle components influencing engine operation, such as an air conditioner with a compressor driver by the engine and so acting as an additional load on the engine, or a transmission, the gear position of which can change engine operation significantly.

27 Claims, 26 Drawing Figures

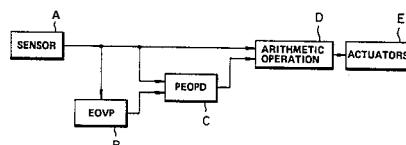


FIG. 1

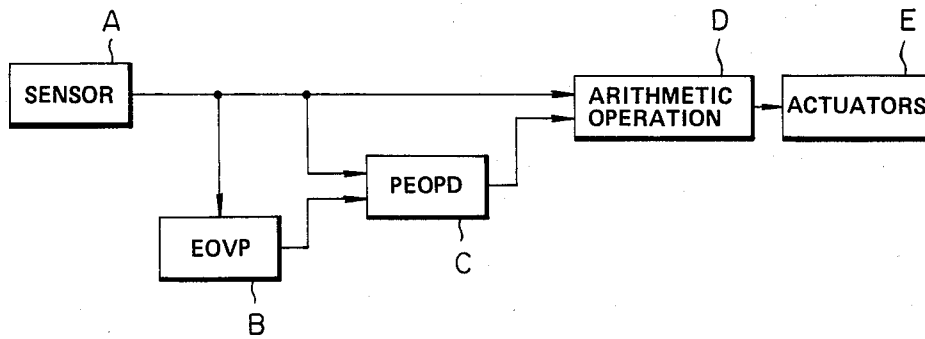


FIG. 2

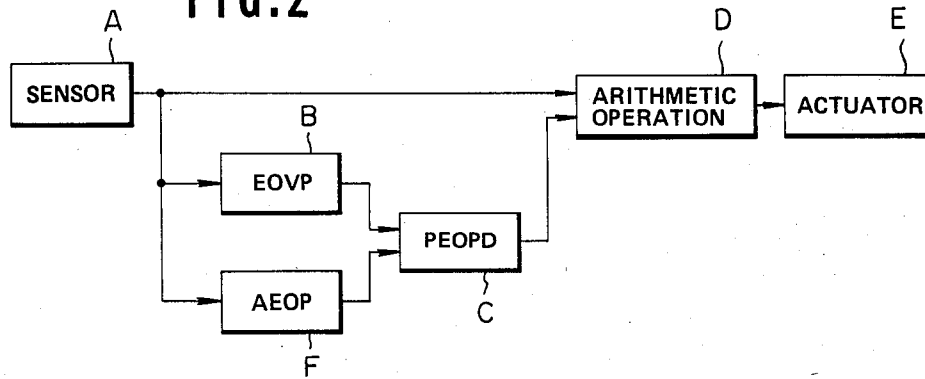


FIG. 3

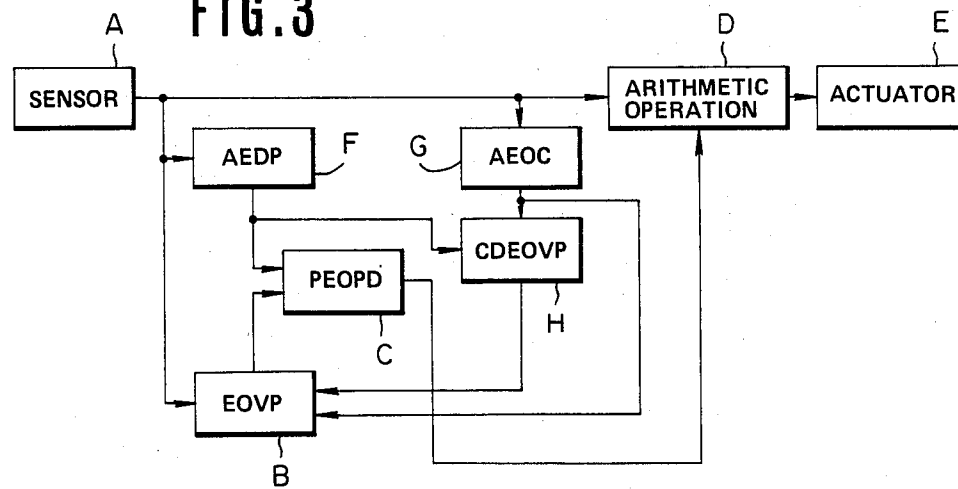


FIG. 4

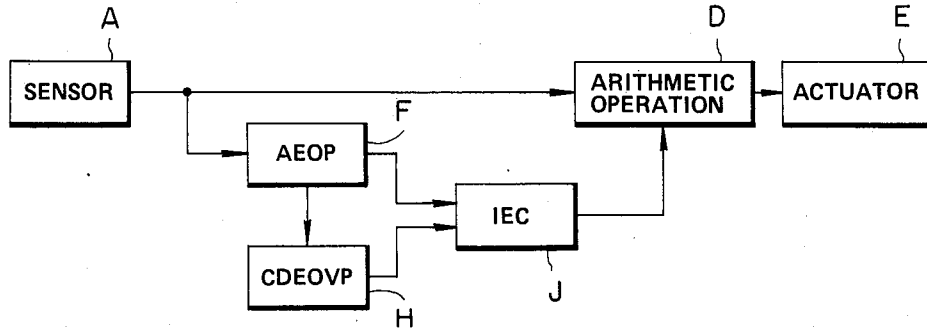


FIG. 5

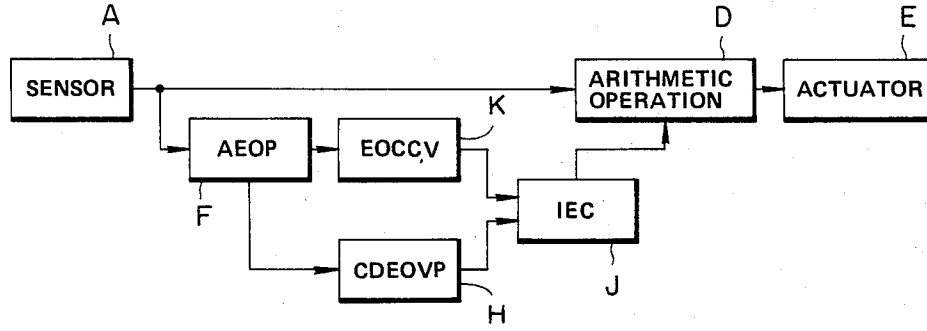


FIG. 6

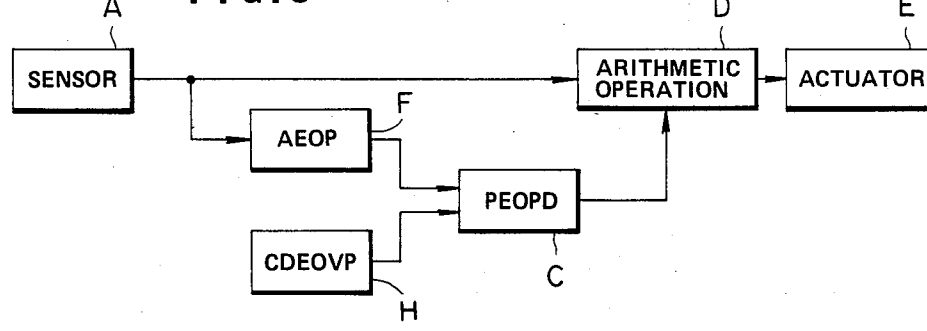
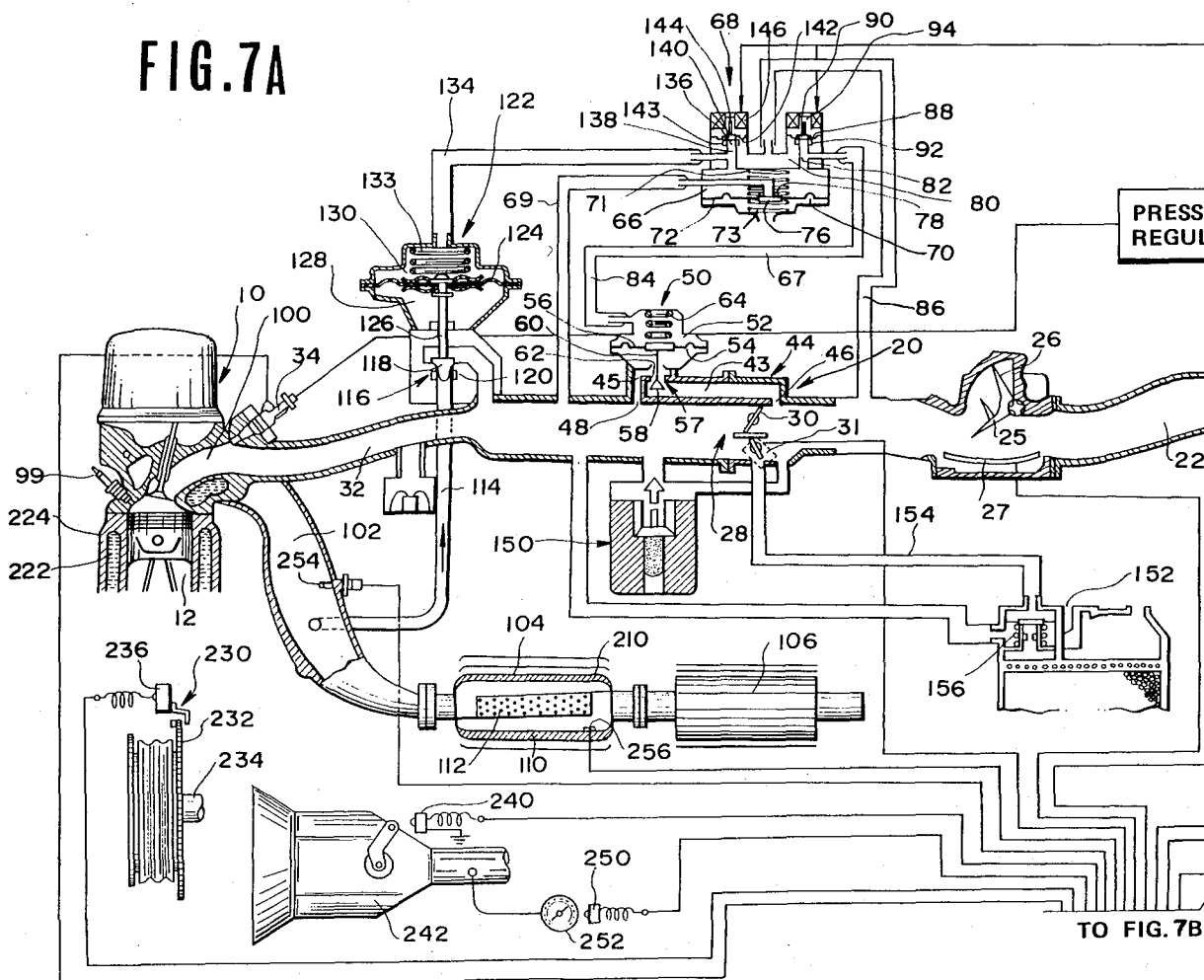
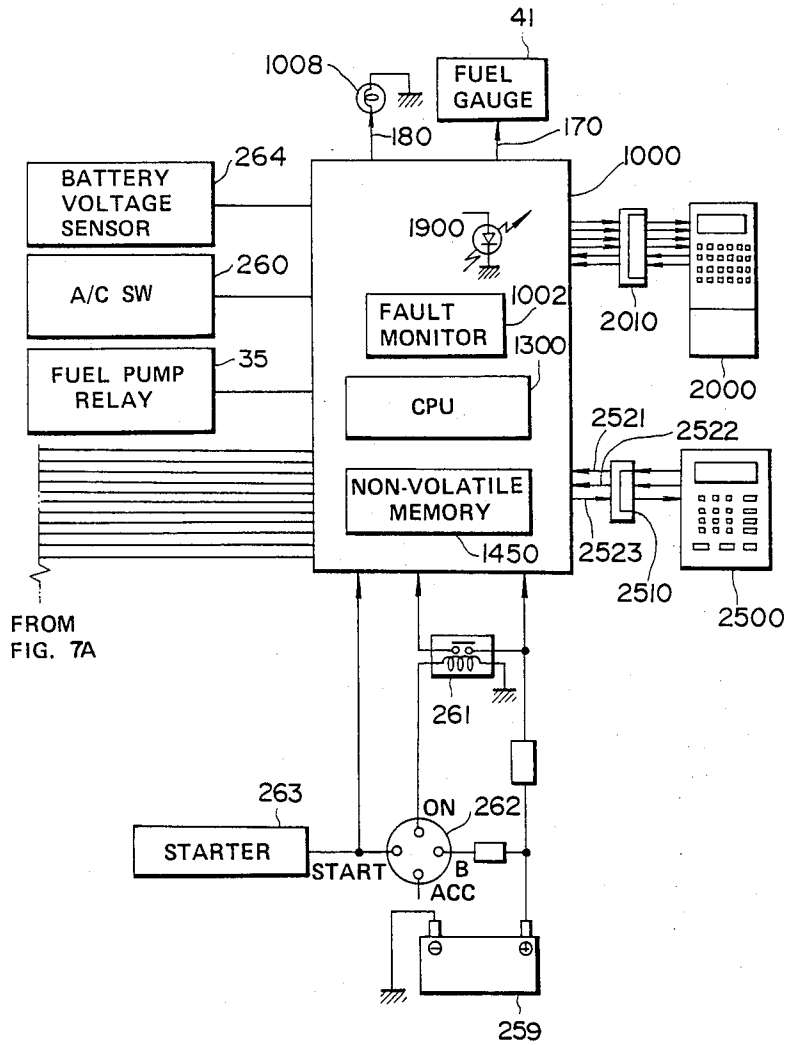


FIG. 7A



TO FIG. 7B

FIG. 7B



FROM FIG. 7A

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