Information and Control Systems (TIACS)

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ABSTRACT

Electronic sub-systems are being developed for heavy duty trucks. However, these sub-systems are being developed as individual entities i.e., information, monitoring, recording, control systems etc. This paper identifies the current, near term, and long range system requirements and suggests ideas for a fully integrated Truck Information And

commercial vehicles in all phases of its life including; manufacturing in the basic product or as a part of fleet operations is no longer a debate of "if" but "how fast" it will happen. The earlier set backs experienced with electronic skid controls in the early 70's are now behind us with the industry moving forward with cost effective and reliable electronic products. It is incumbent upon the electronic designer to continue to provide products and services which enhance the

1977 (1)* the number of microprocessor controlled functions has increased to thirty (Figure 1). This trend over the past decade is expected to be experienced by the truck industry during the balance of this decade. The need for electronics to withstand more harsh environments and to demonstrate positive cost effectiveness will result in a somewhat slower truck introduction than that experienced with passenger cars.

that control truck road speed, engine speed and PTO speed have been introduced and are in production. In one example (Fig. 2), a solenoid valve controls fuel pressure to the injectors for accurate speed control. A vehicle speed sensor and an engine speed sensor transmit speed data to the electronic control unit (Fig. 3) (3). This unit controls, with extreme accuracy, functions such as: cruise control, variable engine speed governing, torque

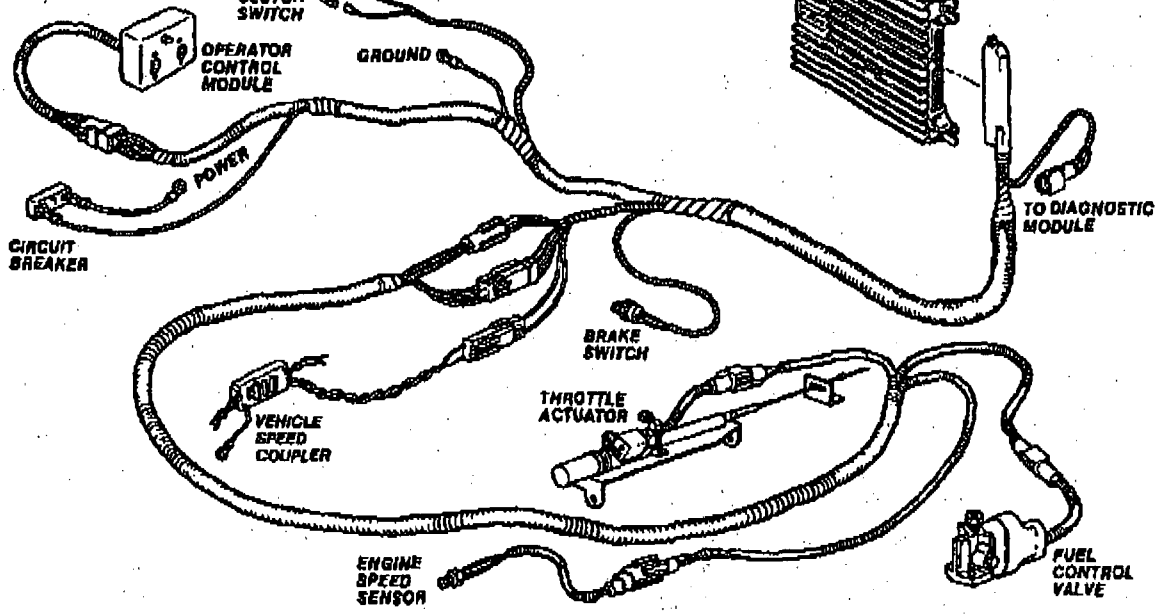

Fig. 2 - Electronic cruise and speed control components (TRW ETEC™ System)(3)

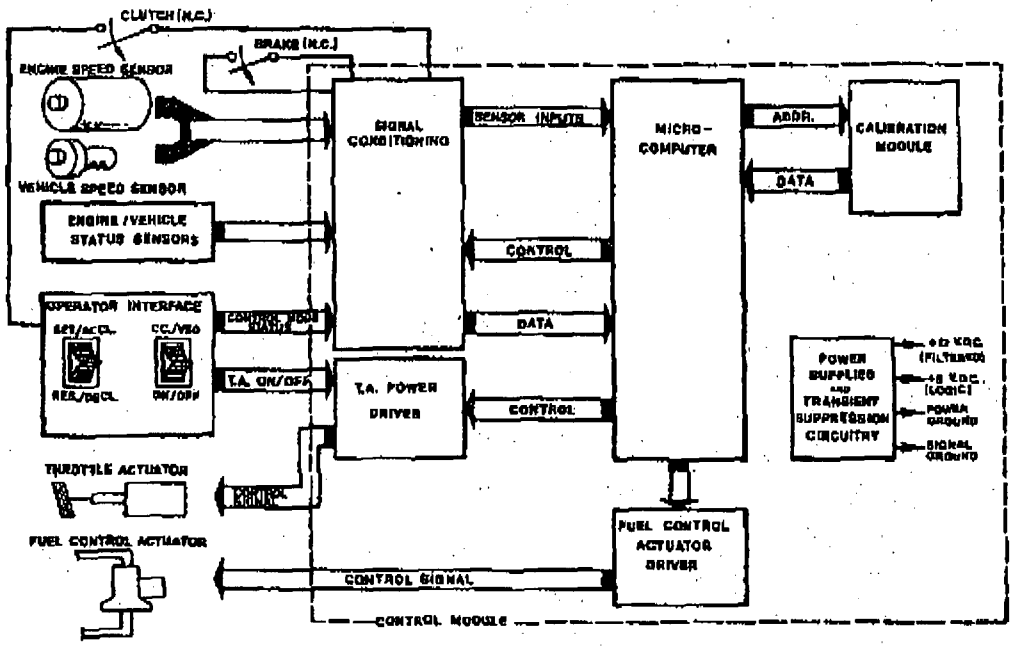

Fig. 3 - Electronic Control Module and System Schematic

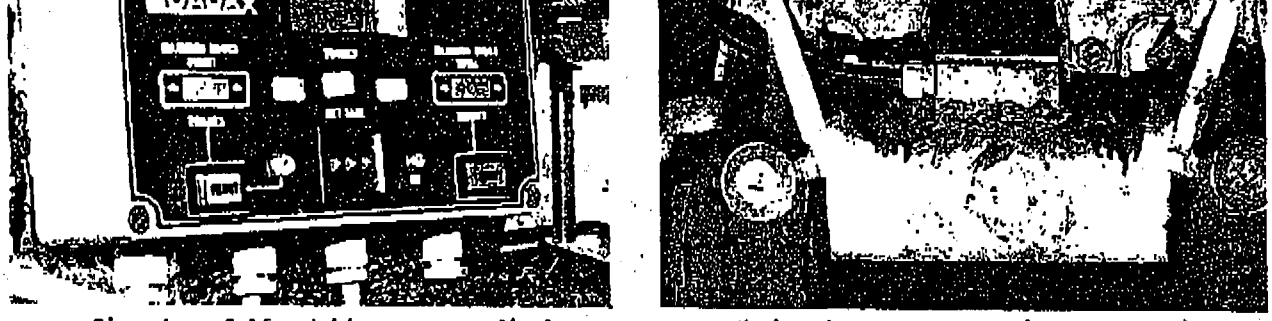

Fig. 4 - Self-weighing system displays are mounted in the truck cab, (on the left) providing digital readouts of axle housings and payload weights. Strain sensors are located on the appropriate axles of the trailer and the tractor (right) (TRW Loadax System)(4)

TRIP RECORDERS - An electronic trip recorder such as the unit shown in Fig. 5, is a product used to keep a log on the vehicle's activity. Data such as engine speed and vehicle speed are recorded and can be produced as histograms (Fig. 6) at the vehicle terminal, to show the amount and percent of time of vehicle operation under different conditions (idle, over 55 MPH, at governed RPM, etc.). The recorder provides a means of reviewing the operator's driving profile and permits the fleet operator to optimize vehicle utilization and scheduling.

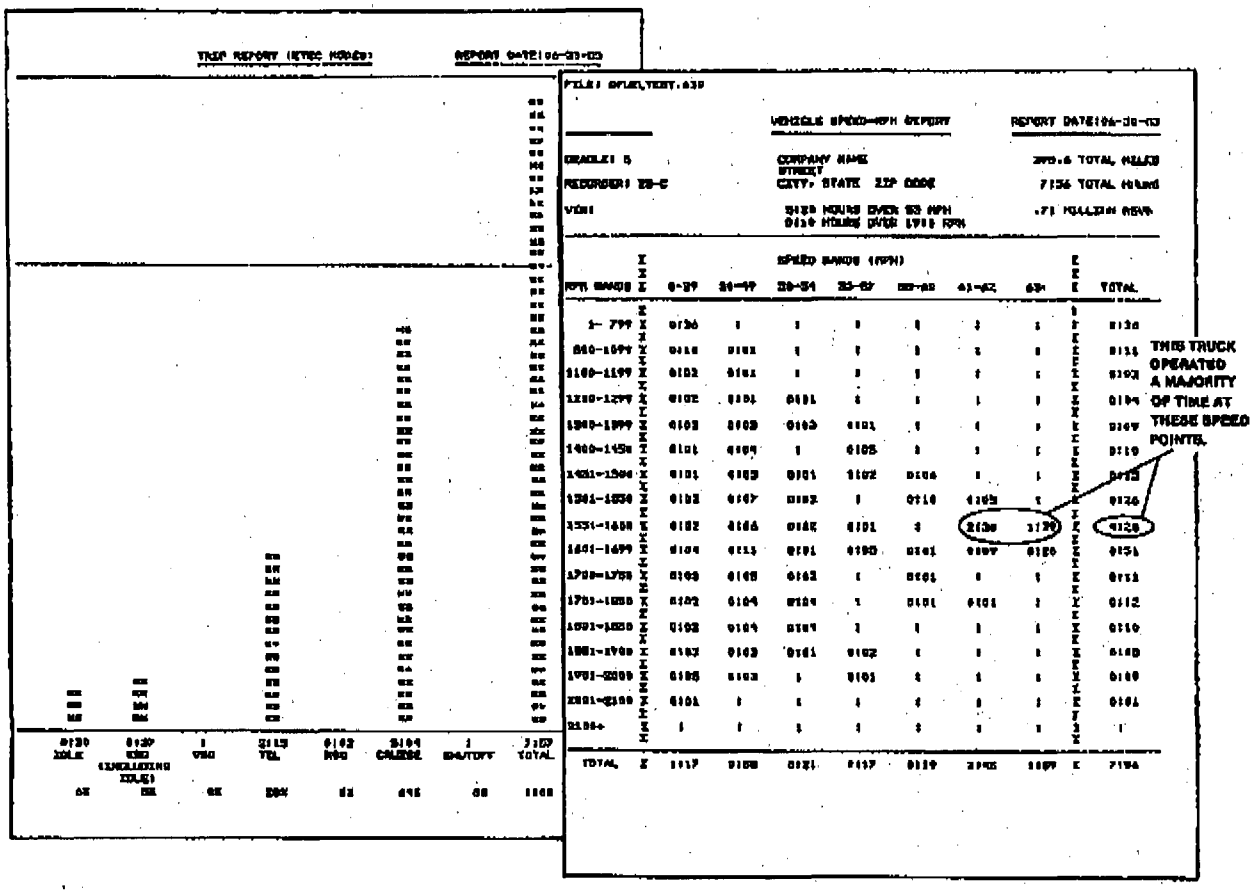

Fig. 6 - Print-out from a truck trip recorder. The left page is a histogram indicating the percent of time the vehicle spent in each driving mode (6% idle, 64% cruise, etc.); the right print-out indicates total time in each rpm band and each mph band

transmissions (5). In manual applica-

ions the driver manually changes gears

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