Acceleration Control Circuit (30)

Moving **light-gate** (9) of figure (3-9) <u>in direct relationship to</u> the physical placement of **optical circuits** (8a xxx 8n), sets up a **time variable** (14a xxx 14n) of Figure (3-7) from **optical circuits** (8x) to another **optical circuit** (8xx) and/ or (8xxx) or to (8n) since the triggered **low logic state** (12) of Figure (3-7) and (3-8) moves <u>in direct relationship to</u> the displaced **light-gate** (9), as illustrated in Figure (3-12).
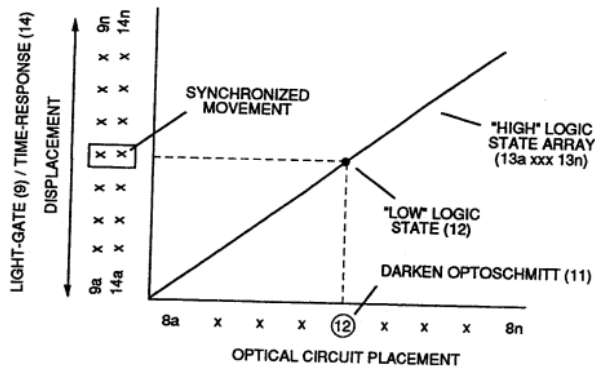

Figure (3-7)

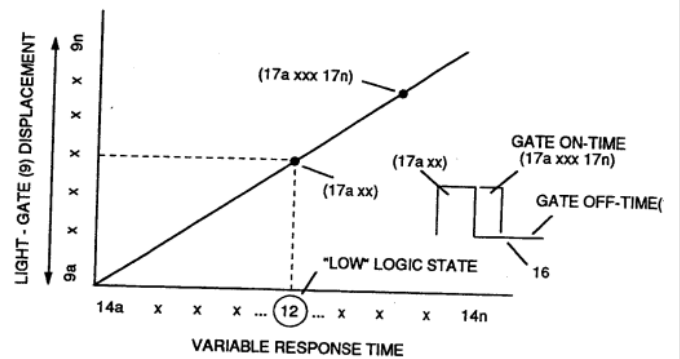FIGURE 3-7: LASER ACCELERATOR CONTROL FUNCTION

Figure (3-8)

FIGURE 3-8: VARIABLE PULSE WIDTH

Figure (3-9)

FIGURE 3-9: LED PICKUP CIRCUIT

Figure (3-12)

PULSE LOGIC CIRCUIT (10)

FIGURE 3-12: ACCELERATION CONTROL

Deflecting (moving) the **light-gate** (9) to **position** (8n) takes longer in **response-time** (14n) than deflecting the light-gate to position (8x) and/or (8xx) or (8xxxx).

This variable **response-time** (14axx ... 12 ... xxl4n) or **signal output** (15) of Figure (3-5) is, now, electrically transmitted to **Acceleration Control Circuit** (30) of Figure (3-5) since **Laser Accelerator Assembly** (20) of figure (3-10) converts **mechanical displacement** (9a xxx 9n) to **electrical time-response** (14a xxx 14n) of Figure (3-7) by linearly moving (forward and/or reverse direction) "low" **logic state signal** (12) in a array of "high" logic state **output signals** (13a xxx 13n), as further illustrated in Figure (3-8) and Figure (3-12).
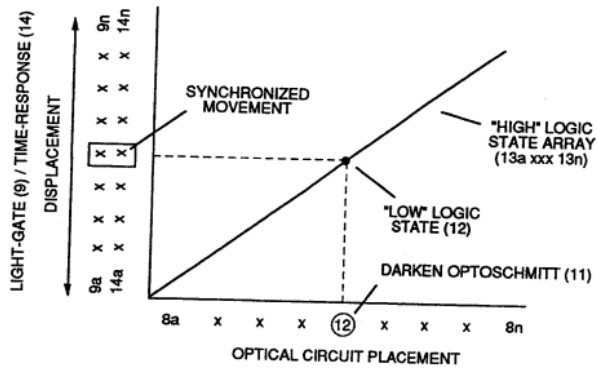
Figure (3-7)

FIGURE 3-7: LASER ACCELERATOR CONTROL FUNCTION
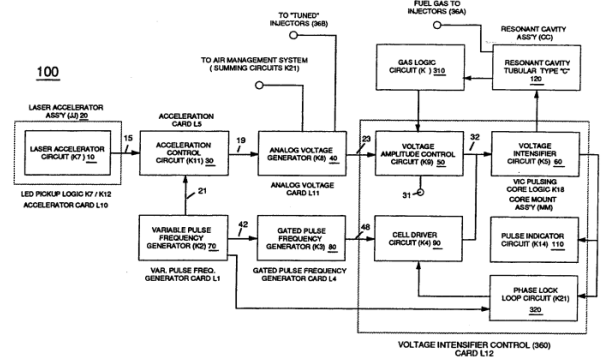
Figure (3-5)

FIGURE 3-5: HYDROGEN GAS CONTROL CIRCUIT
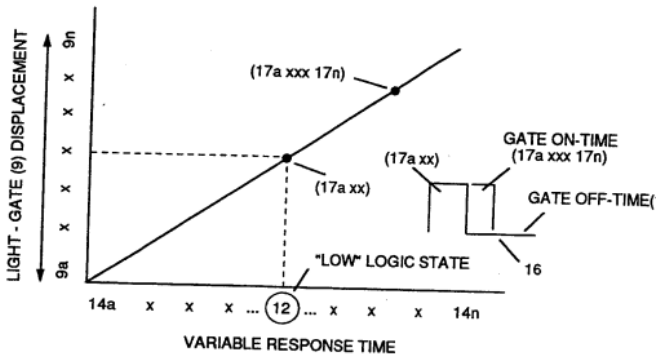
Figure (3-8)

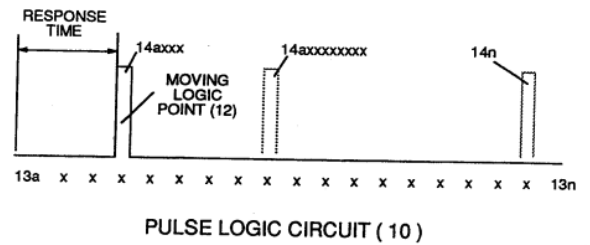FIGURE 3-8: VARIABLE PULSE WIDTH

Figure (3-12)

FIGURE 3-12: ACCELERATION CONTROL

In some cases **reverse signal-logic** (12a xxx ... 13 ... xxx 12n) is applicable by using **SDP 8601 Optoschmitt** which switches logic state from **Quiescent state** ("low" to "high" logic state) when de-energized.
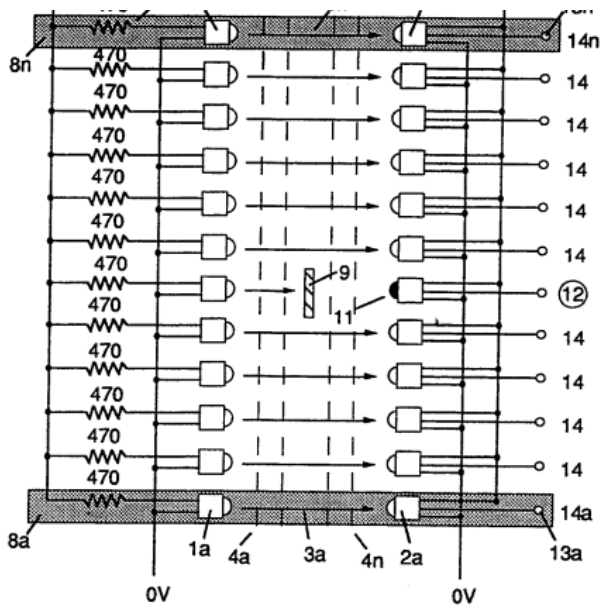
FIGURE 3-9: LED PICKUP CIRCUIT

Since **Led Pickup Circuit** (10) of Figure (3-9)

operates up to <u>100 kHz range or above</u>, **electrical sensitivity** of **Opto-circuit** (8) provides a <u>instantaneous response</u> to Driver's acceleration, de-acceleration, or cruise control demands.

As signal **output** (15) of figure (4) (14a xxx ... 12 ... xx14n) is being received by **acceleration control circuit** (30) of Figure (3-5) as to Figure (3-12), **circuit** (30) converts incoming **time-response signal** (14a xxx ... 12 ... xx14n) into a **variable time-base unipolar pulse** (16), as shown in Figure (3-8).
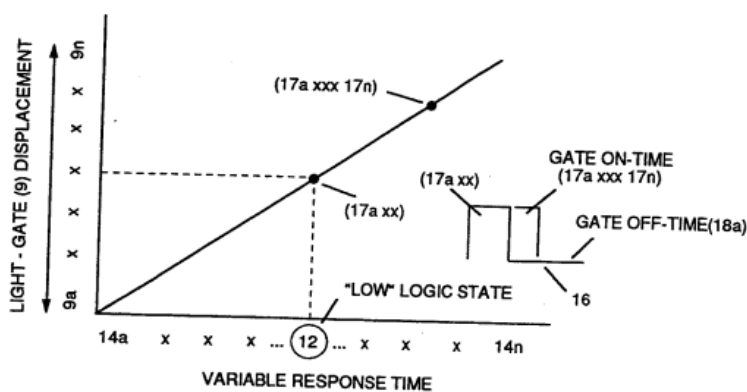

FIGURE 3-8: VARIABLE PULSE WIDTH

Circuit (30) electronically and automatically scans **output signal-array** (14axxx ... 12 ... xx14n) (15) until **circuit** (30) locates, **momentarily registers**, and <u>translates</u> **response-**

The sweeping action of the **scanning circuit** (30) always starts from **position** (9a) and moves **point** (8ax) to **point** (8axxx) of Figure (3-9) (3-12) until **logic-point** (12) is detected.

Once **logic signal** (12) is detected, the sweeping action <u>toggles and recycles back</u> to **start-position** (9a).

This toggling (*flip back*) action electronically determines **variable time-response** (14a xxx) regardless of wherever logic point (12) is being momentarily displaced within **circuit array** (13a x)
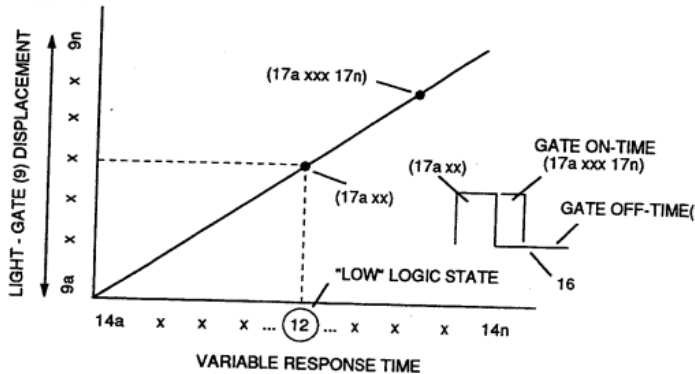

FIGURE 3-8: VARIABLE PULSE WIDTH

Toggling action at full-scale **deflection** (13a

xxx 13n) occurs <u>in the range of (10) kHz or above</u> and thus, allows instant response to driver's acceleration demands.

Toggling-time (scanning-time) is directly synchronized to **light gate** (9) displacement which, in turns, **circuit** (30) further sets up and establishes a given **pulse shape** (16) of Figure (3-8).

Circuit (30) continues to increase **pulse width** (17axxxx) of Figure (3-8) as the monitored (*detected by < scanning*) **toggling-time** (14a xxxx ... 12) increases when **logic-point** (12) moves farther away from **start-position** (9a) to **stop-position** (9n), as further shown in Figure (3-13) as to Figure (3-12).

Pulse width (17a xxx 17n) diminishes when **logic-point** (12) reverses direction to start .. **position** (9a).
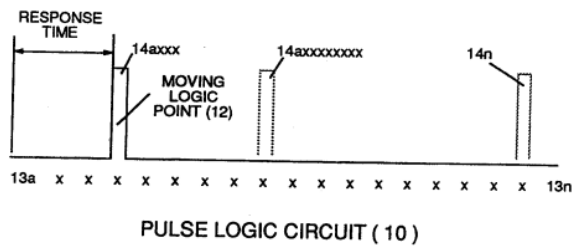
Figure (3-12)

FIGURE 3-12: ACCELERATION CONTROL
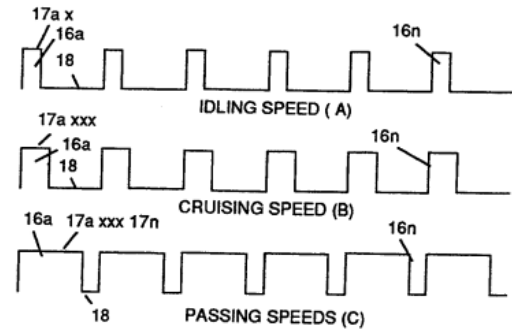

Figure (3-13)

FIGURE 3-13: SPEED CONTROL

Finally, **circuit** (30) reproduces the **variable controlled pulse-shape** (16) in a continuous **repetitive manner** (16a xxx 16n) of Figure (3-13) and electrically transmits the resultant **pulse-train signal** (19) to **Analog Voltage Circuit** (40), as shown in Figure (3-5).
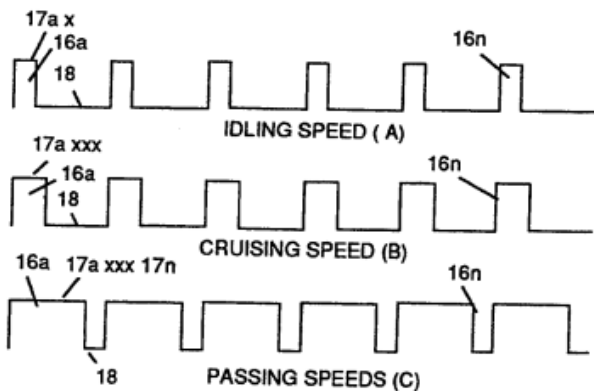

Figure (3-13)

FIGURE 3-13: SPEED CONTROL

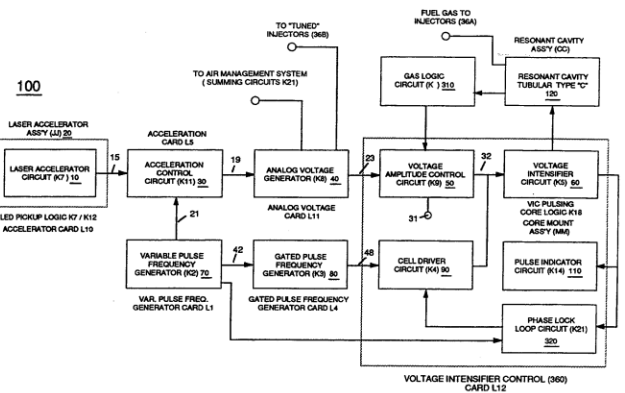**Analog Voltage Circuit** (40), as shown in Figure (3-5)

FIGURE 3-5: HYDROGEN GAS CONTROL CIRCUIT

In retrospect to **engine performance** (*gas pedal attenuation*) (21) of Figure (3-10), a wider **pulse width** (17a xxx) of Figure (3-13C) increases (*accelerates*) engine R.P.M.;

whereas, smaller **pulse-width** (17ax) reduces (de-accelerates) engine R.P.M .. Cruising speed (3-13B) of Figure (3-13) is simply accomplished when pulse width remains constant.

Incoming **clock pulse** (21a xxx 21n) of Figure (3-16) originating from **Pulse Frequency Generator** (70) of

Figure (3-16)

(21a xxx 21n)
(41a xxx 41n)
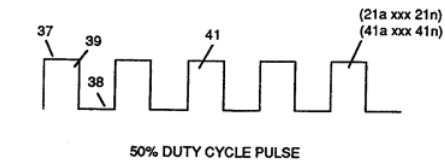
50% DUTY CYCLE PULSE

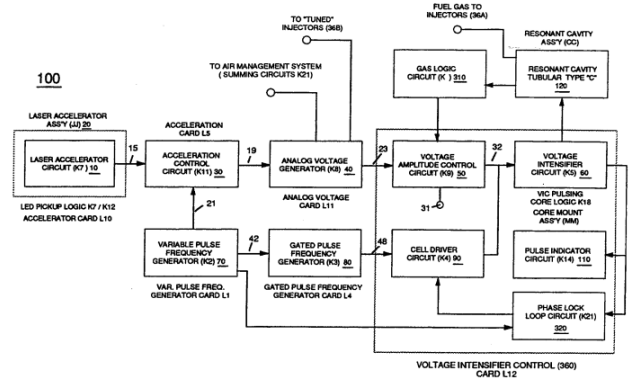FIGURE 3-16: VARIABLE CLOCK PULSE TRAIN

Figure (3-5)

FIGURE 3-5: HYDROGEN GAS CONTROL CIRCUIT

sets up the **scan-rate** (toggling) by which **signal input** (15) of Figure (3-5) is electronically scanned by **circuit** (30).

> The resultant **clock pulse** (21) of Figure (3-16) as to Figure (3-5) is always adjusted to exceed driver's response time to allow for instant acceleration control.

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