

Figure to § 92.130

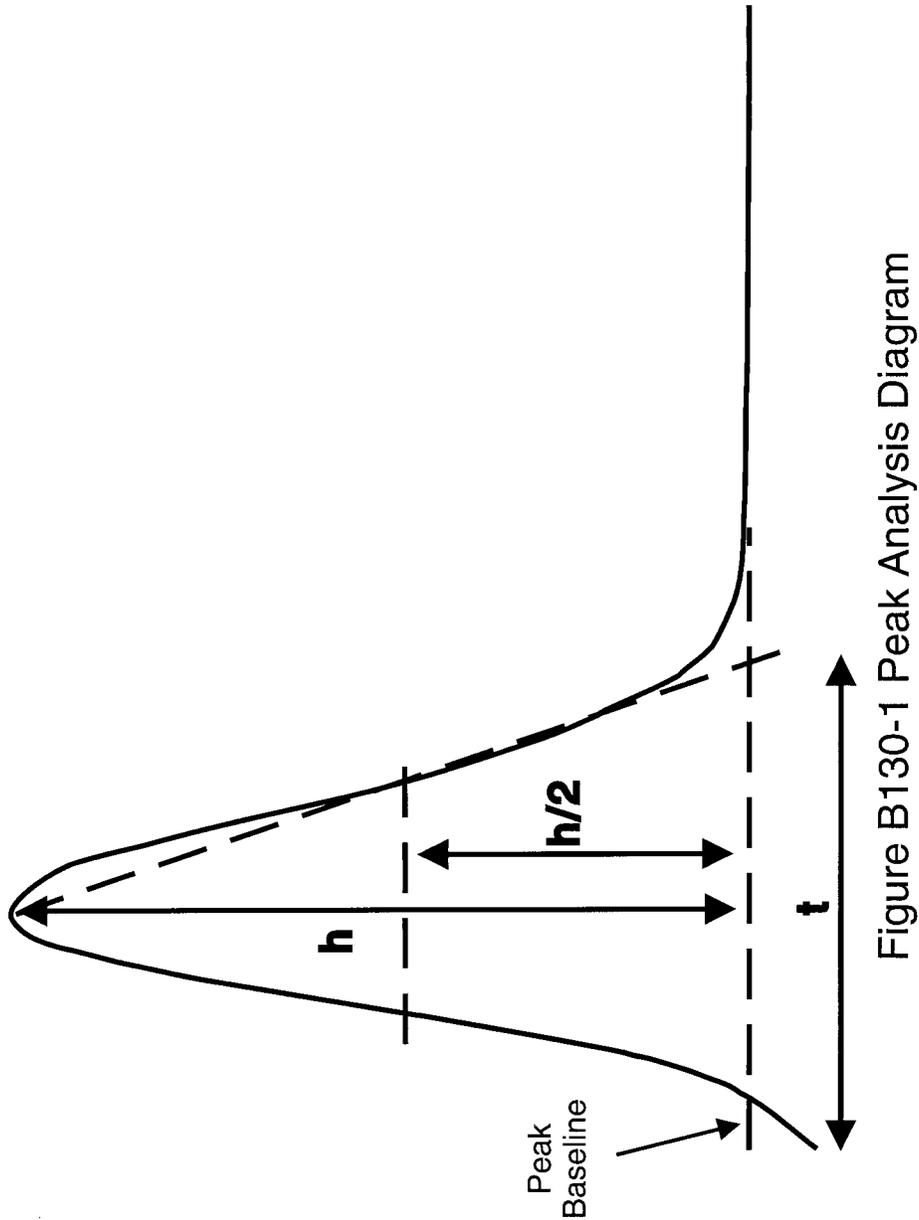


Figure B130-1 Peak Analysis Diagram

**§ 92.131 Smoke, data analysis.**

The following procedure shall be used to analyze the smoke test data:

- (a) Locate each throttle notch test mode, or percent rated power setting test mode. Each test mode starts when

the throttle is placed in the mode and ends when the throttle is moved to the succeeding mode. The start of the first idle mode corresponds to the start of the test sequence.

(b) Analyze the smoke trace by means of the following procedure:

(1) Locate the highest reading, and integrate the highest 3-second average reading around it.

(2) Locate and integrate the highest 30-second average reading.

(3) The highest reading occurring more than two minutes after the notch change (excluding peaks lasting less than 5 seconds, caused by such random events as the cycling of an air compressor) is the "steady-state" value.

(c)(1) The values determined in paragraph (b) of this section shall be normalized by the following equation:

$$N_n = 100 \times \left[ 1 - \left[ 1 - \frac{N_m}{100} \right]^{1/L} \right]$$

Where:

$N_n$  is the normalized percent opacity,  $N_m$  is the average measured percent opacity (peak or steady-state), and  $L$  is actual distance in meters from the point at which the light beam enters the exhaust plume to the point at which the light beam leaves the exhaust plume.

(2) The normalized opacity values determined in paragraph (c)(1) of this section are the values that are compared to the standards of subpart A of this part for determination of compliance.

(d) This smoke trace analysis may be performed by direct analysis of the recorder traces, or by computer analysis of data collected by automatic data collection equipment.

**§ 92.132 Calculations.**

(a) *Duty-cycle emissions.* This section describes the calculation of duty-cycle emissions, in terms of grams per brake

horsepower hour (g/bhp-hr). The calculation involves the weighted summing of the product of the throttle notch mass emission rates and dividing by the weighted sum of the brake horsepower. The final reported duty-cycle emission test results are calculated as follows:

$$(1)(i) E_{idc} = (\sum (M_{ij}) (F_j)) / (\sum (BHP_j) (F_j))$$

Where:

$E_{idc}$ =Duty-cycle weighted, brake-specific mass emission rate of pollutant  $i$  (i.e., HC, CO, NO<sub>x</sub> or PM and, if appropriate, THCE or NMHC) in grams per brake horsepower-hour;

$M_{ij}$ =the mass emission rate pollutant  $i$  for mode  $j$ ;

$F_j$ =the applicable weighting factor listed in Table B132-1 for mode  $j$ ;

$BHP_j$ =the measured brake horsepower for mode  $j$ .

(ii) Table B132-1 follows:

TABLE B132-1—WEIGHTING FACTORS FOR CALCULATING EMISSION RATES

Throttle notch setting	Test mode	Locomotive not equipped with multiple idle notches		Locomotive equipped with multiple idle notches	
		Line-haul	Switch	Line-haul	Switch
Low Idle .....	1a	NA	NA	0.190	0.299
Normal Idle .....	1	0.380	0.598	0.190	0.299
Dynamic Brake .....	2	0.125	0.000	0.125	0.000
Notch 1 .....	3	0.065	0.124	0.065	0.124
Notch 2 .....	4	0.065	0.123	0.065	0.123
Notch 3 .....	5	0.052	0.058	0.052	0.058
Notch 4 .....	6	0.044	0.036	0.044	0.036
Notch 5 .....	7	0.038	0.036	0.038	0.036
Notch 6 .....	8	0.039	0.015	0.039	0.015
Notch 7 .....	9	0.030	0.002	0.030	0.002
Notch 8 .....	10	0.162	0.008	0.162	0.008