

81-02-582

PACCAR Inc

6559

June 9, 1981

Kenneth E. Feith  
Standards and Regulation Division  
Office of Air, Noise, and Radiation  
U.S. Environmental Agency  
Washington, D.C. 20460

n-96-01  
II-A-1092

Re: 1983, 80dB Heavy Truck Noise

Dear Mr. Feith:

The following is offered in response to yours of May 9, 1981 to Charles M. Pigott, President of PACCAR Inc. PACCAR Inc. has two heavy duty truck manufacturing divisions, Kenworth Truck Company and Peterbilt Motors Company. These two divisions maintain separate engineering departments and autonomous management. Therefore it is difficult, if not impossible, to make comparisons between the products for the two divisions.

1. "What are your projected per-vehicle costs due to quieting by model and engine configuration?" Tables I and II are based on our best engineering judgment of the componentry required to meet the 80dB limit. Table I shows the costs associated with general vehicle techniques that are not related to a specific engine. The costs are averaged; for example, the muffler cost is based on historical data that roughly one-half of the trucks built have dual exhausts. Therefore the cost is essentially based on 1.5 mufflers per truck. Table II shows the engine specific costs. Please note that at least three engine/model configurations will not be offered in 1983. Several more are potential additions to this list. Some deletions are based on economic considerations. The volume does not justify the expense of developing an 80dB package for the engine. In other cases, it is engineering judgement that we may not be able to quiet the engine sufficiently.

The column marked "LCF" is a Low Cab Forward that is marketed by Peterbilt and Kenworth. Peterbilt markets the vehicle under the model designation 310, and Kenworth markets it as the L700. This is a low volume vehicle and the two models are virtually identical. This is not true of the balance of the Peterbilt and Kenworth product line.

The requested cost by model and engine configuration can be found by adding the subtotal from Table I to the Table II cost for the desired engine. Please note that these are estimates of PACCAR's cost in 1981 dollars. List prices in 1983 dollars will be considerably higher. The costs are basically

Kenneth E. Feith

June 9, 1981

Page Two

hardware costs and do not consider engineering costs to design these components into specific configurations. In addition, we have not included user costs due to increased weight or increased repair time. Some of our customers estimate that each pound of additional weight costs them \$10 to \$12 per year. Further, repair times are increased when noise panels must be removed and re-installed. It is also conceivable that noise treatments will have a negative impact on repair frequency. These costs must be considered in any cost benefit analysis.

2. "What additional hardware or further modifications to the current production vehicles will be required for compliance with the 80dB regulation?" This information may be inferred from Table I.

Hood/Tunnel Blanket refers to a noise absorption panel which will line the inner surface of the hood on a conventional or the inner surface of the engine tunnel on a COE. Mufflers will probably increase in length and be modified internally. Transmissions are being redesigned. In fact, Fuller Transmission Division of Eaton Corporation just announced their new transmission series. Nonetheless, Peterbilt feels that noise enclosure type transmission shields will be necessary to meet the 80dB regulation.

The majority of the costs in Table II are associated with increased use of engine noise panels. Many of the apparent discrepancies arise from current usage of noise panels. For example, a high horsepower engine may currently be equipped with all available noise panels, and a lower horsepower version of the same engine may not. However, for 80dB the lower horsepower version will require the same treatment. Therefore, the future cost for the lower horsepower engine is greater than the future cost for the higher horsepower engine. In addition to noise panels, the following engine specific changes will probably be made.

Cummins NTC series engines will be redesigned with stiffer blocks and special sled runner pistons. Kenworth also feels that the 400 HP version will require a resonator when equipped with a single exhaust.

The Detroit Diesel V series engines will also undergo internal redesign for noise considerations. Again, Kenworth feels that a resonator will be required for single exhaust with the highest horsepower configuration, the 8-V92TA.

The Caterpillar engines will have block stiffener plates added. We do not know if the engine manufacturer will eventually redesign the engine to eliminate these add-on plates. Kenworth feels that the 400 HP version of the 3406 will require a resonator.

Kenneth E. Feith

June 9, 1981

Page Three

3. "What are the acoustical source levels of the various component elements before and after quieting as identified above?" As indicated above, engines and transmissions are undergoing internal changes. We have not tested production models which incorporate these changes. Therefore, we are reluctant to supply before and after data. As stated above, our anticipated needs and design are based on engineering judgement considering our experience to date.

PACCAR hopes that the above information will be useful to the EPA in reevaluating the 80dB regulations.

Very truly yours,

  
Dennis G. Opacki  
Counsel

DGO/cn

TABLE I  
GENERAL COSTS PER-TRUCK TO MEET AN 80dB STANDARD

<u>ITEM</u>	<u>LCF</u>	<u>PETERBILT</u>		<u>KENWORTH</u>	
		<u>CONV.</u>	<u>COE</u>	<u>CONV.</u>	<u>COE</u>
Hood/Tunnel Blanket	--	125	125	--	30
Mufflers	10	20	20	10	10
Transmissions	90	85	85	90	90
Transmission Shields	--	130	130	--	--
Stack Silencers	30	--	--	--	--
<b>SUBTOTAL</b>	<b>130</b>	<b>360</b>	<b>360</b>	<b>100</b>	<b>130</b>

TABLE II  
ENGINE SPECIFIC COSTS PER-TRUCK TO MEET AN 80dB STANDARD

<u>MANUFACTURER/ENGINE</u>	<u>LCF</u>	<u>PETERBILT</u>		<u>KENWORTH</u>	
		<u>CONV.</u>	<u>COE</u>	<u>CONV.</u>	<u>COE</u>
<b>Cummins</b>					
KT(A) Series	N/A	50	50	420	420
NTC (Formula Series)	195	200	200	195	195
(350 HP & Less @ 2100 RPM)	100	200	200	100	100
(400 HP @ 2100 RPM)	N/A	125	125	115	115
(475 HP @ 2100 RPM)	N/A	125	125	100	100
VT350 Series	N/A	DROP	DROP	0	0
<b>Detroit Diesel</b>					
6V & 8V Series (except 8V92TA)	150	175	175	150	150
(8V92TA)	N/A	175	175	170	170
6L71T (1950 RPM)	150	N/A	N/A	150	150
6L71T (2100 RPM)	270	N/A	N/A	270	270
<b>Caterpillar</b>					
3408 Series	N/A	350*	350*	DROP	80
3406 (1900 RPM)	N/A	265	265	260	260
3406 (2100 RPM, except 400 HP)	N/A	265	265	210	210
3406 (400 HP @ 2100 RPM)	N/A	95	95	225	225
3306 Series	230	0*	0*	230	230

\* May not be offered