

F. Effects of Differences Between European and American Automobiles on Testing Procedures

By: Thomas Turbell, National Swedish Road and Traffic Research Institute

I will start to say a few words about the European Committee for Standardization (CEN) work in Europe. The scope of this group so far is to propose a standard on longitudinal barriers and crash cushions. This scope is not finally confirmed. It will be discussed in London next week. But this is what we are working with so far. The schedule for this group is that we have had only one session in Paris; we will have the next session in Rome in a couple of weeks, and then two more sessions this year. The first draft will be ready by the end of 1991. The final standards will be ready in the middle of next year. That is the intention of the group, at least. In the past meeting, we were 10 countries with 25 delegates present, but this is a rather large group now.

Typical European Automobile

Then I will go on to the subject for today. That is: What is a typical European automobile? As far as I understand the CEN group, we are not looking for the smallest automobile like John Viner described. We are looking for the typical European automobile to use in the crash test. So, what is the typical European automobile? We can also remember that the proposed test vehicles in the NCHRP Report 230 update are the 860-kg (1,900 lb) automobile and the large passenger automobile or the pickup truck of 2,040 kg (4,500 lb).

Best-Selling Automobiles

If we look at the different countries in Europe, there is a difference in the best-selling models, as shown in Table 9. The range is 850 to 1,390 kg in the best-selling models. We can remember that the NCHRP Report 230 update is talking about 860 kg for the small automobile, that is. We can look a little closer at some of the countries.

Differences in European Automobiles

In my country, Sweden, 50 percent of the most-sold automobiles are shown in Table 10, and the weighted mean curb weight is 1,244 kg. Maybe a typical Swedish automobile would be 1,200 kg. Then, if we can compare this to Italy (Table 11), where they have the smallest

TABLE 9 BEST SELLING MODELS 1989

Austria	VW Golf 1020 kg
Belgium	VW Golf 1020 kg
Denmark	Toyota Corolla 1040 kg
France	Renault R5 900 kg
Greece	Lada 1090 kg
Italy	Fiat Uno 850 kg
Netherlands	GM Opel Kadett 990 kg
Norway	Toyota Corolla 1040 kg
Portugal	Fiat Uno 850 kg
Spain	Renault R19 1080 kg
Eire	Ford Fiesta 930 kg
Finland	Toyota Corolla 1040 kg
Sweden	Volvo 700 1390 kg
Switzerland	VW Golf 1020 kg
United Kingdom	Ford Escort 1100 kg
West Germany	VW Golf 1020 kg
Western Europe	VW Golf 1020 kg
Range	850 - 1390 kg
NCHRP 230 Update 1900 lb	860 kg

automobiles in Europe, where 50 percent of the automobiles have a weighted mean curb weight of 918 kg, and then compare it to Sweden, 1,244 kg. This is 36 percent more in weight. So there we have a problem—What is the typical European automobile? What automobile should we use in Europe for the crash test?

We can also look at the total best-selling models in Europe (Table 12). If we compare this out of 50 percent of the passenger automobiles sold in Europe, there is a weighted mean curb weight for all these automobiles of 989 kg. The, we have some problems we didn't settle. Several of the CEN countries want to test with a specific automobile because of historical and other reasons, because all of their old tests have been made with a certain type of automobile. Of course, then we have problems with the different masses, different geometries, wheel sizes, center of gravity, moments of inertia, and all this. The question is, "Can we stick to this scheme in Europe, to have different automobiles in different countries, because then we would have different guardrails, etc." What is the aim of the CEN work if we don't stick to one type of automobile?

**TABLE 10 BEST SELLING MODELS 1989
(SWEDEN)**

Volvo 700	13.2%
SAAB 9000	4.7%
Volvo 200	3.9%
Volvo 400	3.9%
GM Opel Kadett	3.8%
VW Golf	3.7%
SAAB 900	3.7%
Ford Sierra	3.6%
Toyota Corolla	3.3%
Audi 100	3.1%
Mazda 626	2.8%
Ford Escort	2.6%
Total	52.3%
Weighted Mean Curb Wt	1244 kg

TABLE 11 BEST SELLING MODELS 1989 (ITALY)

Fiat Uno	16.2%
Fiat Tipo	11.1%
Fiat Panda	9.5%
Lancia Y10	5.3%
VW Golf	3.6%
Renault R5	3.2%
Peugeot 205	2.9%
Total:	51.8 kg
Weighted Mean Curb Wt	918 kg
Sweden:	
Total	52.3%
Weighted Mean Curb Wt (36% more than Italy)	1244 kg

**TABLE 12 WESTERN EUROPE BEST SELLING
MODELS 1989**

VW Golf	5.4%
GM Opel Kadett	4.7%
Fiat Uno	4.4%
Peugeot 205	3.6%
Renault R5	3.6%
Ford Fiesta	3.5%
Ford Escort	3.3%
Renault R19	3.3%
Fiat Tipo	3.1%
Ford Sierra	2.9%
GM Opel Vectra	2.7%
Citroen AX	2.4%
GM Opel Corsa	2.4%
Peugeot 405	2.4%
Fiat Panda	2.4%
Total	50.0%
Weighted Mean Curb Wt	989 kg

Suggested Prescription for the Test Automobile

If we are going to use one test vehicle in Europe, maybe we have to for something like this: that we take the most-sold passenger automobile in the CEN countries 5 years before the year of the test. The 5 years is to get the reasonable price of the automobile, and a 5-year-old automobile would be a good thing to use in the tests. With a scheme like that, we would also have, if the automobiles are getting smaller, we would get the test vehicles also smaller in the future, and that can be a sort of running progress. If we look at the present situation, if we are going to make a test in 1993, then we would use a 1988 Volkswagen Golf, which the Americans know as the Volkswagen Rabbit. The same thing, a test in 1994 would also be the same automobile because that is the most-sold automobile in 1989. I don't know how this list would look in the future if it would go up and down, but I will bring this up in CEN. We could do for a thing like that—some sort of automatic change of automobile depending on the outcome of the sales of the automobiles in Europe.