serious injuries to LTV occupants in side crashes. That is, the agency believed that the barrier simulating the striking vehicle and the simulated injury-producing event should reflect attributes of a vehicle larger than a passenger car in terms of its weight and front end profile.

NHTSA also noted in the NPRM that data indicated that many current LTVs, especially the heavier ones, already meet the criteria specified for passenger cars. NHTSA conducted two series of LTV side impact tests similar to the dynamic Standard 214 passenger car test. In the first test series, the agency tested seven LTVs using an MDB that was modified to make it more representative of side crash conditions causing fatalities and serious injuries in light trucks. The weight of the MDB was increased to 4,000 pounds, and the height of the barrier face was raised between 4 and 10 inches. In the second test series, NHTSA tested three small LTVs (1991 Toyota pickup, 1991 Suzuki Sidekick, and 1989 Dodge Ram D–50) and a fourth vehicle representative of a small van (1989 Colt Vista-2WD), using the current dynamic test procedure, including the 3,000 pound MDB specified in Standard 214 for passenger cars. (The Colt Vista was a passenger car version of a vehicle that was then marketed in a four-wheel drive version as an LTV. The agency believes that both versions of the vehicle provide similar side impact protection.) NHTSA believed the four represented ''at risk'' vehicles, i.e., LTVs in the fleet that are most likely to require modifications to meet the passenger car standard. The TTI(d) and pelvic g's for the four vehicles were as follows: Toyota pickup-55/53 g's; Suzuki Sidekick-54/104 g's; Dodge Ram-83/72 g's; Colt Vista-108/69 g's (driver dummy), 111/108 g's (passenger dummy). The Toyota and Suzuki both readily met the requirements. The Dodge marginally passed the thoracic requirement, but readily passed the pelvic requirement. The Colt, which is no longer sold in the United States, failed the thoracic requirement, but readily met the pelvic requirement.

a. Raising the Height and Weight of the Moving Deformable Barrier (MDB)

NHTSA proposed in the NPRM to set the height of the MDB within a range of 33 inches to 45 inches, as measured from the ground to the top edge of the barrier face. This represented an increase of up to 12 inches in MDB height as compared to the height specified for passenger car testing (33 inches).

Within the proposed 33 inch to 45 inch range, NHTSA proposed two alternative methods for specifying MDB height. Under the first method, the MDB height would be raised to match the driver H-point of the tested vehicle. This approach focused on attributes of the struck vehicle. Unlike passenger cars, for which the seating heights are very similar, the height of LTV seating positions vary considerably. The agency tentatively concluded that impacting a vehicle at the driver H-point would ensure that LTVs provide thoracic side impact protection when they are struck in the side by another LTV at a height that allows the side door interior to intrude inward at a relatively high velocity toward the chest area of adjacent occupants. Thus, the struck vehicle's side impact safety performance is evaluated at a specific height matching the front end profile of the striking vehicle that has the potential to cause serious chest injuries.

Under the second method, the MDB height would be at the same level for all LTVs, or at the same level for all LTVs within a particular sub-group, e.g., small and large pickups, vans and utility vehicles, with different levels specified for different sub-groups. This approach only focuses on attributes of the striking vehicles, taking into account only the average seating heights of a group of LTVs. Since the heights of the front ends of LTVs vary, specifying a single height that is equally representative of all LTVs would be very difficult. Moreover, specifying a single height raised possible practicability concerns, since a test procedure that specifies a single MDB height that is representative of large pickup trucks might simulate crashes in which compact LTVs could not comply since they have much lower seating heights than the front end heights of large pickup trucks.

NHTSA also proposed to increase the weight of the MDB for LTV testing. As noted above, NHTSA derived the weight of the barrier for passenger car testing from the median curb weight of passenger cars (3,181 pounds in 1989) and light trucks (3,958 pounds in 1989). This resulted in a weighted average of 3,423 pounds, which the agency adjusted downward to account for the then-projected lower weight of vehicles in the 1990's. Based on these considerations, NHTSA derived a nominal barrier weight of 3,000 pounds.

The agency proposed to specify the MDB's weight within a range of 3,000 pounds to 3,800 pounds. The lower end of the range is the current weight of the MDB specified for passenger car testing. The upper end of the range is based on the average weight of striking vehicles in LTV crashes where an LTV occupant had an AIS ≥ 3 torso injury, as observed in 1988–91 NASS data. NHTSA did not propose an MDB weight above 3,800 pounds because of concerns about practicability. In particular, the agency believed that as MDB weight is increased much above 3,600 pounds, there are increasing concerns about the feasibility of smaller LTVs meeting the dynamic test requirements with such a barrier.

Cognizant that it had proposed a wide range of possible modifications to the MDB, NHTSA sought to ''facilitate more focused comments'' with respect to the selection of a single height and weight for the MDB. The agency narrowed the focus by stating that it believed:

> That the combination of raising the MDB to a height in the middle portion of the proposed range, e.g., seven to nine inches above the passenger car barrier height, and increasing its weight to 3,600 pounds would be sufficient to create a dynamic event that is representative of the ones likely to cause serious chest injuries to occupants in the most vulnerable LTVs in real world crashes. 59 FR at 30762.

b. Response to the NPRM

The agency received 19 comments on the NPRM. Commenters included vehicle manufacturers (General Motors, Chrysler, Ford, Mazda, Isuzu, Mitsubishi, Toyota, Volkswagen, Nissan and Rover Group), multistage vehicle manufacturers (Starcraft, Flexsteel Industries, and Bornemann Products), and consumer and industry groups (Advocates for Highway and Auto Safety, American Automobile Manufacturers Association, Insurance Institute for Highway Safety, National Association of Independent Insurers, National Truck Equipment Association, and Recreation Vehicle Industry Association).

Of all the commenters, only Advocates for Highway and Auto Safety (Advocates) and the National Association of Independent Insurers (NAII) supported modifying the height and weight of the MDB. Advocates suggested that the MDB weigh 3,800 pounds, have a bumper, and be designed so that the distance from the top of the bumper to the ground is 33 inches and the distance from the top of the barrier face to the ground is 45 inches. Advocates said that such a barrier would represent the weight and height of a larger LTV as the striking vehicle. NAII said the MDB weight should be 3,400 pounds since ''the sales weighted average curb weight of new passenger cars and LTV fleets * * * now averages approximately 3400 pounds.''