NHTSA disagrees with GM's comment that the cold effectiveness stopping distance requirements are 27 percent more stringent due to lower allowable pedal force, because cold effectiveness stops are usually not pedal force limited. In other words, despite the maximum allowable pedal force of 150 lbs in FMVSS No. 105, vehicles rarely needed to be braked with such a pedal force to pass the stopping distance requirement. In fact, pedal forces rarely exceeded the 112.4 lbs (500 N) permitted in FMVSS No. 135. Therefore, the agency does not believe that the lower maximum pedal force allowed in the new standard will result in increasing the stringency of the cold effectiveness requirements in comparison with FMVSS No. 105.

Toyota commented that the minimum initial brake temperature should be raised from 50 °C to 65 °C, but did not give any reasons for the request.

Based on testing conducted at VRTC, NHTSA believes that the present minimum initial brake temperature, which was proposed in the NPRM and the two SNPRMs, represents an appropriate temperature at which to begin the cold effectiveness test runs, and has no information indicating it should be changed. Therefore, the agency is retaining the initial brake temperature requirement as proposed.

7. High Speed Effectiveness

In the 1991 SNPRM (Notice 5), NHTSA proposed a high speed effectiveness test because cars are sometimes driven at higher speeds than provided for in the cold effectiveness test that is conducted at 100 km/h (62.1 mph). The agency proposed that under the high speed effectiveness test for vehicles capable of a maximum speed over 125 km/h, a vehicle would be tested at a speed representing 80 percent of its maximum speed, with a maximum limit of 160 km/h (99.4 mph). The upper speed limit was specified due to facility limitations and safety concerns during testing. The agency proposed that the high speed test would only be conducted for vehicles with a maximum speed greater than 125 km/h. The agency proposed a new equation to reflect the change in system reaction time from 0.07V to 0.10V. The agency stated that while the SNPRM proposal is more stringent than the latest GRRF proposal, the agency's test data indicated that all test cars would be able to meet the proposed requirement.

The GRRF generally accepted the high speed effectiveness formula, and the maximum test speed limit. Nevertheless, it requested that NHTSA delete the lower speed limit proposed in the 1991 SNPRM, since R13 does not specify a lower limit. GRRF further stated that the cold effectiveness test and high speed effectiveness tests are qualitatively different because the former is run with the engine in neutral, while the latter is run with the engine in gear.

ŇHTSA is pleased that the GRRF has agreed to incorporate the proposed high speed test in R13H. Nevertheless, the agency believes that it is necessary to include the lower limit test speed. Accordingly, NHTSA has decided not to conduct the high speed test for vehicles with a maximum speed under 125 km/ h, since it would be illogical and would provide no safety benefits to conduct a high speed test at a lower speed than the speed required by the cold effectiveness test. The agency notes that 80 percent of the lowest maximum speed for the high speed effectiveness test is 100 km/h. The agency does not believe that running a high speed test at a speed lower than 100 km/h, the cold effectiveness test speed, is worthwhile, regardless of engine drive position.

Ford commented that the test should be run only at GVWR, but gave no reason for deleting the LLVW run.

NHTSA has decided that it is consistent with the interests of motor vehicle safety to test at both GVWR and LLVW since vehicles are used at both weights. Similarly, it is in the interest of international harmonization to test at both load conditions, since R13 does so. Accordingly, in FMVSS No. 135's high speed effectiveness test, a vehicle will be tested at both LLVW and GVWR. The test will be conducted at a pedal force between 65 and 500 N (14.6 to 112.4 lbs).

JAMA and Toyota recommended specifying only four runs at high speeds instead of the six proposed in the 1991 SNPRM.

NHTSA previously addressed this issue in the 1987 SNPRM in which the agency proposed increasing the number of test runs from four to six. In that notice, NHTSA explained that such a change would minimize driver effects and decrease test variability, because the prescribed performance would have to be achieved on only one stop in the six runs. Even though reducing the number of runs to four might nominally decrease the expense of the test, such a change could increase the test's stringency.

8. System Failure

In previous notices, NHTSA proposed stopping distance requirements for situations involving the engine being off, antilock functional failure, variable proportioning valve failure, hydraulic circuit failure, and the power assist unit being inoperative. Aside from the engine off requirement, FMVSS No. 105 includes similar requirements which are crucial if part of the service brake system or engine should fail or become inoperative. These requirements ensure that the vehicle's brake system will still be able to bring the vehicle to a controlled stop within a reasonable distance.

a. Stops with engine off.—In the NPRM and two SNPRMs, NHTSA proposed requirements to address stops with the engine off. The agency explained that the proposed requirement was reasonable since engine stalling is a relatively common occurrence, even though FMVSS No. 105 does not include a comparable requirement. The proposal to require vehicles to stop within 73 m after engine failure was slightly less stringent than the 1987 SNPRM's proposed requirement for stops within 70 m. The agency stated that the proposal was consistent with the latest proposal by GRRF and thus will promote harmonization.

Advocates and CAS were concerned that the longer permissible stopping distance of 73 m in the engine failure condition would increase crashes. The GRRF recommended that the vehicle be able to stop after engine failure within 70 m rather than the proposed 73 m. The GRRF stated that the requirements of R13 and R13H should be easily met, provided that there is an adequate reservoir in the braking system and a non-return valve is fitted to the brakes. This equipment should ensure that the brakes can operate even without the engine running.

NHTSA has decided to adopt the engine failure test with a stopping distance of 70 m. Throughout the rulemaking, the agency has attempted to make the engine failure stopping distance consistent with GRRF and consistent with the stopping distance requirement in the cold effectiveness test. In the 1991 SNPRM, the agency stated that its proposal was consistent with the GRRF. This was true when the stopping distance was 73 m for both the cold effectiveness and engine off tests. Since the cold effectiveness stopping distance is now 70 m, the agency is adopting a stopping distance of 70 m for the engine off test. The engine off test will be performed at GVWR, with six stops from 100 km/h, using a pedal force between 65 N and 500 N.

b. Antilock functional failure.—In the two SNPRMs, NHTSA proposed separating the antilock and variable proportioning valve failure requirements into different sections to