3. EVALUATION OF FRICTION MATERIAL PERFORMANCE

3.1 Section Summary

The performance of friction materials, as applied to automotive brake systems, is reviewed in this section along with the pertinent friction material testing devices and relevant testing procedures and standards. Main points presented are:

- Friction materials are expected to perform satisfactorily over a wide range of operating and environmental conditions as an important element of the total brake system.
- Many critical performance considerations, such as fade and fade recovery, are sensitive both to the friction material and to the brake system in which it is tested. Therefore, full-system testing is required for proper evaluation.
- Friction stability can vary with both thermal and mechanical history. Therefore, short-term evaluations and those with narrow ranges of brake temperatures can produce incomplete data leading to erroneous conclusions on brake compatibility and performance.
- Laboratory specimen test machines, such as FAST and FMTM, may be appropriate for quality control tests and material screening, but they are not able to determine the acceptability of substitute friction materials or to compare different friction materials.
- Full brake inertial dynamometers, properly instrumented and utilized, can be used to screen friction materials and determine some component performance behavior. Typically, these large and expensive devices do not adequately simulate the airflow over the brake and the environmental conditions of vehicle service.
- Good brakes are those with few minor faults. Brake development testing therefore is time consuming and costly, since a wide range of conditions must be evaluated in the process of brake development.