What does the NFPA say about apparatus safety features and operating capabilities.

D.3 Upgrading or Refurbishing Fire Apparatus:
Any apparatus, whether in first line or reserve service, should be upgraded as necessary to ensure the following features are included as a minimum:

1. Fully enclosed seating is provided for all members riding on the fire apparatus
2. Warning lights meet the current standard
3. Reflective striping meets the current standard
4. Slip resistance of walking surfaces and handrails meets the current standard
5. A low voltage electrical system load manager is installed if the total continuous load exceeds the alternator output
6. Where the GVWR is 36,000 pounds or more, an auxiliary braking system is installed and operating correctly
7. Ground and step lights meet the current standard
8. Noise levels in the driving and crew compartment(s) meet the current standard
9. Engine belts, fuel lines, and filters have been replaced in accordance with the manufacturers maintenance schedule(s)
10. Brakes, brake lines and wheel seals have been replaced or serviced in accordance with the manufacturers’ maintenance schedule
11. Tires and suspension are in serviceable condition
12. All horns and sirens are relocated from the roof to a position as low and far forward as possible
13. Seat belts are available for every seat and are new or in serviceable condition
14. Sign plates are present stating no riding on open areas
15. A complete weight analysis shows the fire apparatus is not over individual axle or total GVW ratings
16. The fire pump meets or exceeds its original pump rating
17. Alternator output meets its rating
18. Water tank and baffles are not corroded or distorted
19. A transmission shift pump interlock is present and working properly on vehicles equipped with an automatic transmission
20. All loose equipment in the driving and crew areas is securely mounted to prevent its movement in case of an accident
21. The radiator has been serviced in accordance with the manufacturers’ maintenance schedule and all cooling system hoses are new or in serviceable condition
22. If equipped with an aerial device, a complete test to original specifications has been conducted and certified by a certified testing laboratory

Fire department administrators and fire chiefs should exercise special care when evaluating the cost of refurbishing or updating an apparatus versus the cost of a new fire apparatus. A thorough cost/benefit analysis of the “value” of upgrading or refurbishing a fire apparatus should be conducted. In many instances it will be found that refurbishing costs will greatly exceed the current value of similar apparatus.

Apparatus not built to NFPA apparatus standards or manufactured prior to 1979 (over 24 years old) should be considered for upgrading or replacement.
NFPA 1901
Annex D
Guidelines for First Line and Reserve Apparatus

D.1 Brief Summary: In order to maximize firefighter capabilities and minimize their risk of injuries, it is most important that fire apparatus be equipped with the latest safety features and operating capabilities. In the last 10-15 years, much progress has been made in upgrading functional capabilities and improving the safety features of fire apparatus. Apparatus built prior to 1991 might have a few of the safety upgrades required by the 1991 and subsequent editions of the NFPA fire department apparatus standard or the equivalent Underwriters’ Laboratories of Canada (ULC) standards. Because the changes, upgrades and fine tuning to NFPA 1901 since 1991 have been truly significant, especially in the area of safety, fire departments should seriously consider the value (or risk) to firefighters by keeping pre-1991 fire apparatus in first line service.

The 1991 edition of the NFPA fire department apparatus standards included among many other things, requirements for fully enclosed riding areas, stronger aerial ladders, auxiliary braking systems, reflective striping, improved warning lights and no roof mounted audible warning devices. This edition has been recognized as the current “benchmark” from which the new, improved apparatus have evolved. It is recommended that only apparatus that meets the 1991 or later editions of NFPA apparatus standards or that is refurbished in accordance with NFPA 1912, be permitted to operate in first line service to ensure that the latest improvements and upgrades are available for the firefighters.

The completely revised 1991 edition was the result of the efforts of many task groups and the full committee’s strong desire to make the automotive fire apparatus standards more “safety oriented and user friendly.” In 1991, actually four standards were issued; they were Pump and Fire Apparatus (NFPA 1901), Initial Attack Fire Apparatus (NFPA 1902), Mobile Water Supply Fire Apparatus (NFPA 1903) and Aerial Ladder and Elevating Platform Fire Apparatus (NFPA 1904).

Contained within the 1991 editions of the fire department apparatus standards were requirements for such items as increased battery capacity to ensure starting under most conditions, intersection lights for increased visibility, removal of all roof mounted audible warning devices to reduce hearing problems, a flashing light in cab to warn if a cab or body door is open, a back up alarm, an automatic transmission to make it easier to drive (unless the purchaser had a specific reason for a manual transmission), fully enclosed riding areas with reduced noise (dba) levels to keep the crew members safe, warm (or cool) and informed as to what is happening, seat belts and seats for all crew members riding on the apparatus, fail safe door handles so the sleeve of a coat will not inadvertently catch a handle and open a door, and signs requiring everyone to be seated and belted.

In the pump area, the standard specified that 3” or larger valves be “slow close”, caps be tested to 500 psi, an intake relief valve be provided to help manage incoming pressure, 30 degree sweep elbows be provided on the discharges to eliminate hose kinking, and all 3” and larger discharges be eliminated from the pump panel to reduce the possibility of injuries to the pump operator.

In the body area, the minimum step surface size and load carrying capabilities were increased, handrails were required to be slip resistant and reflective striping was required on all sides of the apparatus. Electrical system requirements for line voltage were upgraded to require the use of “listed” components that are grounded.

Many requirements were added to increase the operating capabilities of all aerial devices. For aerial ladders, the minimum design strength of the rungs was increased, a height requirement for the hand rails was specified, a minimum load carrying requirement for folding steps was specified and the aerial ladder had to have a minimum carrying capacity of 250 pounds at the tip at 0 degrees elevation at maximum extension. Where a water tower was equipped with a ladder, the same requirements as applied to an aerial ladder were required of the ladder on the water tower.