TRT's analysis for MUI engines is broken down by engine model year to account for two new engine certification test procedures, each having particular emissions standards. The ''13 mode'' engine dynamometer test procedure was used for heavy-duty engine testing prior to the 1985 model year, and the ''transient'' engine dynamometer test procedure is used for 1985 and later model years. For certification under the urban bus program, TRT tested the 1977 model year 6V71N MUI engine using the ''transient'' procedure. While the ''13 mode'' test was used for new engine certification of the 1977 model year, the ''transient'' test is the current standard test procedure for heavy-duty engines and is generally recognized as more representative than the ''13-mode'' test. Therefore, the Agency believes that the NO_X increase measured by TRT using the ''transient'' test data is a relevant gauge of the impact of the candidate equipment. TRT's analysis applies the increase to the new engine certification data available for engines of 1984 and earlier model years. Prior to 1985, there was no federal emission standard for NO_X alone. The relevant emission standards (for engines that were certified using the ''13-mode'' procedure) are 16 g/bhp-hr for 1974 through 1978 model year engines and 10 g/bhp-hr for 1979 through 1984 model year engines, for the sum of HC emissions added to NO_X emissions. TRT's initial analysis applied three percent increase to the new engine certification levels for HC + NO_X emissions for 1982 and later model year engines for which such data is available. This predicts that only one engine (a 325 horsepower version of 1982 model year 6V92TA engine family CGM0552FWG5) would exceed its NO_X standard. Further analysis for this engine, applying three percent increase in its NO_X emission level added to 50 percent decrease in its reported HC certification level, indicates that the combined federal emission standard would not be exceeded for this engine if equipped with the candidate equipment. Based on this analysis and TRT's emission test data indicating significant reductions in HC emissions (at least 50 percent), the Agency believes that for any applicable pre-1985 engine equipped with MUI, an increase in NO_X emissions of the percentage measured on the 1977 6V71N MUI test engine will be more than offset by a decrease in HC emissions, such that the HC + NO_X standard will not be exceeded.

Another part of TRT's analysis pertains to engines equipped with MUI and certified using the ''transient'' test procedure (that is, the engines of model year 1985 and later). TRT's analysis, applying three percent increase to NO_X levels developed during new engine certification testing, indicates that no 1985 or later engine equipped with MUI would exceed the applicable federal standard if equipped with the candidate equipment. TRT also analyzed the impact of six percent increase in NO_X emissions on electronically-controlled engines, because their data show that NO_X emissions for the 1988 model year 6V92TA DDEC II test engine increase roughly six percent when equipped with the B20-catalyst configuration without injection retard. This increase in NO_X emissions is important, especially because federal standards for NO_X were lowered to 6.0 g/bhp-hr for the 1990 model year and 5.0 g/bhp-hr for the 1991 model year. Therefore, TRT analyzed the impact of six percent increase in NO_X emission levels developed during new-engine certification testing on Detroit Diesel Corporation's DDEC engines. (Under the new engine certification program, all DDEC engines have been tested using the ''transient'' procedure.) The results indicate that NO_X levels for the engine families in Table 5 would exceed the appropriate federal emission standard. Therefore, the Agency proposes that use of the candidate equipment without fuel injection retard on any urban bus engines of the engine families listed in Table 5 not be covered by certification under the urban bus program.

TABLE 5.—ENGINE FAMILIES NOT COVERED BY CERTIFICATION

Configuration: B20 and Catalyst (without injection retard)

Model year	Model	Engine family
1990	6V92TA DDEC II	LDD0552FZG6
	6V92TA DDEC II Coach	LDD0552FZL2
1991	6L71TA DDEC ALCC	MDD0426FZFX
	6V92TA DDEC II	MDD0552FZG5
	6V92TA DDEC II	MDD0552FZL1
1992	6V92TA DDEC II	NDD0552FZG4
	6V92TA DDEC II Coach	NDD0552FZL0
1993	6V92TA DDEC II	PDD0552FZG2
	6V92TA DDEC II Coach	PDD0552FZL9

The Agency requests comment, additional analysis, or additional emission test data or for engine families to which the equipment is intended to apply, to determine whether regulatory requirements are met with urban bus engines using the candidate equipment.

While absolute smoke opacity levels during testing of the 1977 6V71N MUI test engine were well below relevant standards, increases were measured between the baseline test and testing using B20, catalyst and retarded timing. This is not of significant concern because the Agency believes the absolute level of increase is more relevant than the percentage increase. Further, the absolute level of increase in opacity is believed not significant in the context of the current smoke test and opacity standards (in other words, there is probably no real increase in smoke opacity, given the nature of the smoke test and level of the standards). Finally, smoke emissions from heavy duty diesel engines, in general, have declined over the years as engines are designed to comply with declining federal PM emissions standards. The Agency believes that even if this test data accurately predicts an increase in smoke emission opacity with other engines for which the equipment is intended to apply, it is not a significant increase. The Agency requests comment regarding the applicability of that data to other engines having MUI for which the equipment is intended to apply.

Smoke emission measurements for the 1988 engine indicate compliance with applicable standards.

As indicated in the notification, the 6V71N test engine qualities as a ''worst case'' for all two-stroke/cycle engines with exception of the 1990 DDC