rebuilding or replacing the applicable engines. If certified, the candidate kit would meet, and exceed, this requirement. The candidate kit could also be used in full compliance if the program requirement to use equipment certified to the 0.10 g/bhp-hr standard is triggered.

If the Agency certifies the candidate equipment, then operators who choose to comply with Program 2 and install this equipment, would use the 0.10 g/bhp-hr certification level in their calculations for fleet level attained (FLA) as specified in the program regulations.

The date of this notice initiates a 45-day period during which EPA will accept written comments relevant to whether the equipment described in the JM notification of intent to certify should be certified pursuant to the urban bus retrofit/rebuild regulations. Interested parties are encouraged to review this notification, and provide written comments during the 45-day review period. Separate comments should be provided in writing to each of the addresses listed under the Addresses section of this notice.

At a minimum, EPA expects to evaluate this notification of intent to certify, and other materials submitted as applicable, to determine whether there is adequate demonstration of compliance with: (1) the certification requirements of § 85.1406, including whether the testing accurately substantiates the claimed emission reduction or emission levels; and, (2) the requirements of § 85.1407 for a notification of intent to certify.

EPA requests that those commenting also consider these regulatory requirements, plus provide comments on any experience or knowledge concerning: (a) problems with installing, maintaining, and/or using the equipment on applicable engines; and, (b) whether the equipment is compatible with affected vehicles.

EPA will review this notification of intent to certify, along with comments received from the interested parties, and attempt to resolve or clarify issues as necessary. During the review process, EPA may add additional documents to the docket as a result of the review process. These documents will also be available for public review and comment.

Dated: May 5, 1998.

Richard D. Wilson,

Acting Assistant Administrator for Air and Radiation.

[FR Doc. 98–12849 Filed 5–13–98; 8:45 am]

BILLING CODE 6560–50–P

ENVIRONMENTAL PROTECTION AGENCY

[FRL–6013–8]

Retrofit/Rebuild Requirements for 1993 and Earlier Model Year Urban Buses; Certification of Equipment

AGENCY: Environmental Protection Agency (EPA).

ACTION: Notice of EPA certification of equipment provided by Detroit Diesel Corporation.

SUMMARY: Today's **Federal Register** notice announces EPA's decision to certify equipment to the 0.10 g/bhp-hr standard for the Urban Bus Retrofit/Rebuild Program. The equipment is provided by the Detroit Diesel Corporation (DDC).

DDC submitted to EPA a notification of intent to certify equipment, in materials signed July 16, 1997, pursuant to the program regulations at 40 CFR Part 85, Subpart O. On November 6, 1997, EPA published a notice in the **Federal Register** that the DDC notification had been received and made the notification available for public review and comment for a period of 45 days (62 FR 60077). EPA has completed its review and the Director of the Engine Programs and Compliance Division has determined that it meets all requirements for certification. Therefore, EPA certified this equipment in a letter to DDC dated April 6, 1998.

The equipment consists of the base engine components used on the 25% reduction retrofit/rebuild kit certified by DDC, components from the 25% retrofit catalyst kit certified by Engine Control Systems, Ltd. (ECS) and a TurboPac supercharger system supplied by Turbodyne Systems, Inc. that supplies additional air for combustion during engine acceleration.

The kit is applicable to 6V92TA urban bus engine models made by Detroit Diesel Corporation (DDC) from model years 1979 to 1989 and equipped with mechanical unit injectors (MUI), and may be used immediately by transit operators in compliance with program requirements. The kit would be available in three horsepower levels (253, 277, and 294).

EPA has determined that this DDC kit complies with the 0.10 gram per brake horsepower-hour (g/bhp-hr) particulate matter (PM) standard for the applicable engines. EPA has not determined that DDC's notification complies with the life cycle cost requirements of the program regulations because no life cycle costs were supplied with the application.

Today's **Federal Register** notice does not trigger any additional program requirements for transit operators. The 0.10 g/bhp-hr PM level has already been triggered for all engines covered by this notification.

The notification of intent to certify, as well as other materials specifically relevant to it, are contained in Category XX–A of Public Docket A–93–42, entitled ''Certification of Urban Bus Retrofit/Rebuild Equipment.'' This docket is located at the address listed below.

Additional details concerning this certification, the DDC's kit, and responsibilities of transit operators, are provided below.

DATES: EPA certified this equipment in a letter to DDC dated April 6, 1998. Today's **Federal Register** notice announces this certification. The 0.10 g/bhp-hr standard was triggered on March 14, 1997 (62 FR 12166) for all engines covered by this certification.

ADDRESSES: The DDC notification, as well as other material specifically relevant to it, are contained at the U.S. Environmental Protection Agency's Public Air Docket A–93–42 (Category XX–A), Room M–1500, 401 ''M'' Street SW, Washington, DC 20460.

The DDC notification of intent to certify, as well as other materials specifically relevant to it, are contained in the public docket indicated above. Docket items may be inspected from 8:00 a.m. until 5:30 p.m., Monday through Friday. As provided in 40 CFR Part 2, a reasonable fee may be charged by EPA for copying docket materials.

FOR FURTHER INFORMATION CONTACT: Anthony Erb, Engine Programs and Compliance Division (6403J), U.S. Environmental Protection Agency, 401 ''M'' St. SW, Washington, D.C. 20460. Telephone: (202) 564–9259.

SUPPLEMENTARY INFORMATION:

I. Description of the Certified Kit

The certified kit described in today's **Federal Register** notice is provided by DDC. It is certified to the 0.10 g/bhp-hr standard but does not comply with the applicable life cycle cost requirements of the program. No cost data was provided in the notification.

The certification described in today's notice applies to 1979 through 1989 model year DDC 6V92TA engines that are equipped with mechanical unit injectors (MUI) and certified to federal emissions standards. It does not apply to engines certified to California emissions standards. The impact of this decision on transit operators is discussed in more detail in the ''Transit Operator Requirements'' section below.

The kit, described further below, consists of base engine components used on the 25% reduction kit certified by DDC earlier, a catalytic exhaust muffler supplied by Engine Control Systems, Ltd. (ECS), and a TurboPac supercharger system supplied by Turbodyne Systems, Inc. that supplies additional combustion air during acceleration. The kit is available in three horsepower (hp) ratings (253, 277, and 294 hp).

For retrofit with the DDC kit, an engine is rebuilt in accordance with standard DDC rebuild procedures, using specified engine components. This component set essentially includes the equipment certified by EPA to provide a 25% particulate reduction on October 2, 1995, at 60 FR 51472. These components are provided in two separate sets of parts. The first set of components is comprised of newly manufactured parts, including a gasket kit, air inlet hose, cylinder kits (piston assemblies and cylinder liners) a by-pass valve and a truck type throttle delay. The second set of components includes Reliabilt™ remanufactured parts, including the fuel injectors, camshafts, blower assembly, turbocharger, and head assemblies. Kit usage is based on engine rotation (righthand (RH) or lefthand (LH)), engine orientation, right bank cam gear mounting (bolt or nut), and engine power output based on injector size. The only difference from the previously certified equipment according to DDC is the inclusion of a truck-style throttle delay, adjustment of the throttle delay and injector timing settings to improve driveability. Additionally, the cylinder kit components have been modified to improve durability.

The converter is the same size and shape as the catalytic converter muffler certified by ECS for the Urban Bus Program as described in the **Federal Register** on January 6, 1997 (61 FR 746), is a direct replacement for the original equipment muffler, and is designed to fit the specific bus/engine combination. The use of diesel fuel that has been mixed with crankcase oil is prohibited by DDC.

The third constituent of the kit consists of an electrically powered supercharger system which is supplied by Turbodyne Systems, Inc. This component set, referred to as the TurboPac™ supplies additional intake air during engine acceleration from low engine speeds. DDC states that in addition to decreasing PM emissions and visible smoke during engine acceleration, the supercharger also improves engine response and vehicle driveability by reducing the fuel modulation during acceleration. The basic system consists of a supercharger blower, a diverter valve, a boost pressure sensor, an electrical control box and power cables, and a throttle switch for detecting the start of the engine acceleration mode, and will be supplied in two kits. One includes those components common to all installations and a second kit to accommodate the installation requirements of the various engine and vehicle configurations.

To complete an engine rebuild two (2) base engine component kits, one (1) converter muffler kit, and two (2) supercharger kits are required. The specific kits used will depend on the engine/vehicle combination.

DDC states there are no differences in the service intervals or maintenance practices for the base engine associated with the installation of the upgrade kit. The converter/muffler requires no regularly scheduled maintenance, only an occasional cleaning if the maximum back pressure of the exhaust system is exceeded. The supercharger does not require scheduled maintenance; however, a visual inspection for air leaks is recommended whenever the engine is serviced.

Standard procedures as described in the service manual for 92 Series engines are to be used when rebuilding the base engines using the candidate equipment. No unique rebuild procedures are required.

Use of the candidate kit is restricted to 6V92TA Detroit Diesel Corporation engines manufactured from January 1979 through December 1989, equipped with mechanical unit fuel injectors (MUI), and originally certified to meet Federal emission standards. The required fuel is low sulphur (0.05% max by weight) diesel fuel, either number 1 or number 2. Complete rebuild kits will be sold by DDC through normal distribution channels.

All of the testing presented by DDC for this certification was conducted using original equipment (OE) parts, except for the converter muffler and the TurboPac components. EPA has no assurance that engines rebuilt using parts that are not (OE) would comply with the 0.10 g/bhp-hr standard. Therefore, use of engine parts that are not the specified OE parts are not covered by the certification described in today's **Federal Register** notice.

Pursuant to 40 CFR 85.1409, DDC will provide a 100,000-mile defect warranty and a 150,000-mile emissions performance warranty for the kit, and all of its components.

EPA's certification of the Engelhard Corporation's ETX™ kit (62 FR 12166; March 14, 1997) triggered the 0.10 g/bhp-hr standard for 1979–1989 6V92TA MUI engines. That kit provided the three power ratings: 253, 277, and 294 hp that are included in this certification. Consequently, the certification of the DDC kit described in today's **Federal Register** notice, does not trigger the 0.10 g/bhp-hr standard for engines included in the certification.

II. Background and Basis for Certification

In a notification of intent to certify equipment, composed of an initial document signed July 16, 1997 and subsequent documents, DDC applied for certification of the kit under the Environmental Protection Agency's (EPA) Urban Bus Retrofit/Rebuild Program. Engines applicable to the certified kit are 6V92TA urban bus engine models made by Detroit Diesel Corporation (DDC) from model years 1979 to 1989 that are equipped with mechanical unit injectors (MUI) and certified to, or rebuilt to, comply with federal emissions standards. The certifier's principal place of business is: Detroit Diesel Corporation, 13400 Outer Drive, West, Detroit, Michigan 48329–4001.

Using engine dynamometer (transient) testing in accordance with the Federal Test Procedure for heavy-duty diesel engines, DDC demonstrated compliance with the 0.10 g/bhp-hr particulate matter (PM) emissions standard. Engine dynamometer data, shown below in Table A, is the basis for the certification approval of the kit when used on applicable engines. The emissions test data is part of DDC's notification of intent to certify, which is available in the public docket located at the above-mentioned address. All testing was conducted using #2 low-sulfur diesel fuel.

TABLE A.—EXHAUST EMISSIONS SUMMARY

Gaseous and particulate test	g/bhp-hr	
	1989 HDDE standards	6V92TA MUI with DDC kit
HC	1.3	0.1
CO	15.5	0.4
NO_X	10.7	9.8
PM	0.60	0.091
BSFC [1]		0.464
Smoke Test:	Standards	
ACCEL	20%	3.3%
LUG	15%	2.5%
PEAK	50%	4.2%

[1] Brake Specific Fuel Consumption (BSFC) is measured in units of lb/bhp-hr.

The exhaust emissions data presented by DDC is from testing a Detroit Diesel Corporation (DDC) engine model 6V92TA, in accordance with procedures set forth at 40 CFR Part 86, Subparts N and I. The engine model was tested after being equipped with the DDC kit. The 6V92 engine was tested in one horsepower (hp) rating: 277hp.

The data of Table A demonstrates that the test engine, when rebuilt with the DDC kit, PM emissions are less than 0.10 g/bhp-hr and, emissions of hydrocarbon (HC), carbon monoxide (CO), NO_X and smoke opacity are within applicable federal standards.

This action applies a PM emissions level of 0.10 g/bhp-hr to all 1979 through 1989 DDC 6V92TA MUI urban bus engines, when properly equipped with the DDC kit and when using either diesel fuel #1 or #2. Table B lists the applicable engine models and certification levels associated with the certification announced in today's **Federal Register.**

TABLE B.—CERTIFICATION LEVEL OF DDC KIT

Engine models	Engine codes	Certification PM level
1979–1989 DDC 6V92TA MUI.	All certified to meet federal emissions standards.	0.10 g/bhp-hr.

All engines for which the DDC kit is intended to apply are expected to meet the 0.10 g/bhp-hr PM standard because the kit instructs the rebuilder to replace all emissions-related parts during the rebuild with DDC specified parts included in the kit, install the converter muffler and install the TurboPac system. The engine-out emissions level (upstream of the catalyst) is expected to be predictable because all emission-related parts are replaced using the DDC specified emissions-related parts and settings of the kit. As demonstrated by the test engine, the combination of the specified parts, the specified settings of the kit, the converter muffler and the TurboPac system, result in a PM level less than 0.10 g/bhp-hr.

A life cycle cost analysis is necessary only for certification of equipment that is meant to trigger a program emissions standard. Certification of Engelhard Corporation's ETX™ kit triggered the 0.10 g/bhp-hr standard for 6V92TA MUI engines, and made available kits rated at 253, 277, and 294 hp. The DDC certification does not include a cost analysis and one is not necessary for this certification. DDC states that engines equipped with the kit will have no additional maintenance or service requirements.

III. Summary and Analysis of Comments and Concerns

Comments were received from five parties in response to the **Federal Register** notice of November 6, 1997 (62 FR 60077). The commenters are Johnson Matthey Incorporated (JMI), Engelhard Corporation (Engelhard), the Washington Metropolitan Area Transit Authority (WMATA), the Maryland Department of Transportation Mass Transit Administration (MTA), and the Milwaukee County Transit System (MCTS). JMI and Engelhard provided extensive comment. JMI is a manufacturer of equipment certified to meet the 0.10 g/bhp-hr standard for the 1979–1989 6V92TA MUI engines (see 62 FR 60079; November 6, 1997). Engelhard is the manufacturer of equipment certified under the urban bus program that triggered the 0.10 g/bhp-hr standard for the 1979–1989 6V92TA MUI engines (see 62 FR 12166; March 14, 1997). WMATA, the MTA, and the MCTS are large transit bus operators in major metropolitan areas, which are subject to requirements of the urban bus program. The transits provided generally favorable comments on their experience with the equipment.

Comments or issues fell into the following general categories: (A) applicability of the kit; (B) description of the kit; (C) testing demonstration and documentation; (D) life cycle cost analysis; (E) warranty; (F) durability, and (G) in-use experience. All correspondence, comments, and other documentation are located in the public docket at the address above.

(A) Applicability

In the November 6, 1997, **Federal Register** notice, EPA stated that the information provided in DDC's notification applied to 6V92TA DDC engines manufactured from January 1979 to December 1989 equipped with mechanical unit injectors (MUI) and originally certified to meet Federal emission standards.

In comments dated December 19, 1997, Engelhard stated that DDC has failed to provide information demonstrating that this retrofit system can be applied safely to all vehicles. Engelhard commented that the electrical charging systems of urban buses can vary by make and design and asked how can we be sure that this system can be installed in all urban buses without an assessment of the charging system and information on the stress that the system that the DDC system will place on the charging system. Additionally, Engelhard commented that the Turbodyne system uses a high speed motor that draws over 300 amps for 8 seconds while the bus is accelerating. This will dramatically increase the load on the bus' electrical system and will cause premature wear of the alternator, battery and electrical systems according to Engelhard. The motor that Turbodyne uses to drive the compressor can also fail. Engelhard asked if there are any durability data or effective life data for this motor, and noted that because urban buses stop and start continuously the Turbodyne system will be operating during a large portion of the bus operating time.

According to Engelhard this system is not designed to operate continuously and the urban bus application will require it to operate much more frequently than it is designed to operate. DDC needs to provide information, demonstrating that it is reasonable to expect the Turbodyne system will remain operational for 150,000 miles. Engelhard commented that it had thoroughly tested the Turbodyne system and found air leaks and malfunctioning of the controller system occurred frequently. In its comments of December 19, 1997 JMI states that the Turbodyne system appears to have two states: on and off. Considering the performance cycle of a typical urban bus, this system would be turned on every time a bus would pull away from the curb. Since the system has a high amperage draw on the bus' electrical system long term use could prematurely wear out the battery or starter solemoid. What are the long term impacts on the life to the electrical system? Was a standard bus battery/starter system used in the test cell? How high is the amperage and could this require modifications to the bus' electrical system? Could rewiring be required and are there concerns of shorts, or fire hazards?

In response to these comments, DDC states that The TurboPac unit is intended to compensate for the inherent lag in the engine turbocharger during rapid accelerations from low speed/light load conditions. During these periods the TurboPac operates at high speed with a current draw of approximately 300 amps. At all other times when the engine is operational, the TurboPac runs at low speed in the ''standby'' condition with a current draw of about 10 amps. Accelerations sufficient to trigger high speed TurboPac operation are expected to occur quite frequently in urban bus applications. However, the duration of the high speed TurboPac operation is very short. The system limits high speed operation to a maximum of eight seconds. In most cases the system returns to standby operation in a shorter period of time after a preset air box pressure has been achieved. DDC logged data on a pilot bus installation at MATS in Milwaukee to determine the real-world duty cycle and current draw of the TurboPac 2500. The bus was run on a city route through downtown Milwaukee in November 1997. The data logger recorded data for approximately eight hours in one second intervals. The data analyzed encompass a 3 hour time period from just before noon to approximately 3:00 p.m. This portion was chosen due to the relatively low idle time in this sample and the inability of the software to accommodate additional data. In the evaluation, when off it was assumed to draw 10 amps and when it was on it was assumed to draw 300 amps. The data based on this evaluation indicates that the TurboPac will be active in the high speed mode approximately 10% of the time. The time average draw is about 35 amps.

DDC states that in order to operate on a dedicated electrical circuit, unit power is taken directly from the battery, so there are no modification necessary to the bus electrical system. A 500 amp fuse is installed on the circuit to the controller to protect the system in case of a short. DDC began field trials of the retrofit system in July 1997. To date, eight complete retrofit units have been installed in buses and are in regular revenue operation at four major U.S. transit services. DDC stated that there have been no problems with the electrical systems or batteries on these buses. These units have almost 40,000 miles of customer service with the high mileage unit having accrued over 13,000 miles. In addition, TurboPac systems were installed on two buses operating in transit service. One of these units experienced an early failure of a hand assembled prototype controller. The other bus has operated over 18,000 miles with no failures to the TurboPac system.

DDC states that the in-use evaluation program has not revealed any problems with leaks. Consequently, no improvements have been found necessary to reduce leaks. Since leaks have not been a problem, DDC has not quantified the size of leak that would be sufficient to impair performance. With regard to the Engelhard comment concerning system leaks, DDC commented that the TurboPac system which Engelhard evaluated in early 1996 was a prototype design. In this design, the TurboPac and the engine turbocharger compressor were configured in parallel and a diverter valve was placed downstream where the two flow paths merged. During TurboPac operation, the valve was positioned to permit flow from the TurboPac to enter the engine and to block off flow from the turbocharger. When the TurboPac was not operational, the valve assumed the opposite position. In some early units, the diverter valve did not seal adequately and there was backflow through the turbocharger during TurboPac operation which resulted in reduced system performance. The current system has been completely redesigned to alleviate this problem. The TurboPac and engine turbocharger are now in a series arrangement. A check valve is placed downstream of the TurboPac and allows the engine to draw its intake air either from the TurboPac or directly from the engine air cleaner. The check valve has been shown to seal adequately and prevent backflow during TurboPac operation. DDC noted that the check valve operates in a relatively low pressure zone compared to the earlier diverter valve which was exposed to the full pressure supplied by the turbocharger.

Additional batteries or larger capacity alternators have not been installed in any of the pilot units and there have been no problems with the electrical system. DDC states that because the electrical connections for the TurboPac system are independent of the bus electrical system, it is not necessary to rewire electrical systems on buses. No fires or electrical shorts are expected and none have been reported during the pilot installations. DDC does not expect any negative impacts on the long term viability and integrity of bus electrical systems. During emission testing electrical power for the TurboPac was batter supplied.

DDC has stated that the Delco-Remy 50dn alternator rated at 270 or 300 amps is the standard in the transit industry and is the only alternator that DDC offered with the 6V–92 transit engines. DDC cannot state that no other alternator is or could be used on affected transit buses, but does state that the use of another type alternator would be extremely rare. Delco-Remy provided a statement that the 50dn alternator is an approved candidate for use with the DDC kit. It further states that the 50dn charging system is designed to operate at full capacity and that electrical demand beyond the alternators capacity will not adversely affect the alternators performance, reliability or durability.

Based on the above discussion and the responses provided by DDC concerning the comments, EPA finds no clear evidence that the DDC system is inadequately designed to operate on the urban bus engines to which it applies. Further, the in use evaluation program has demonstrated the ability to operate without adversely effecting the bus electrical systems. Therefore, EPA can find no reason based on the above comments not to grant certification of this kit. EPA further notes that DDC is required to provide a 100,000 mile defect warranty and 150,000 mile emissions performance warranty for the DDC kit and all of its components.

JMI commented that a Turbodyne representative stated publicly at APTA's Urban Bus Retrofit/Rebuild Program Panel session in Nashville, TN in August 1997, that Transit buses with routes that would require the TurboPac to operate more than 30% of the time would not be good candidates for using this system to reduce PM levels below 0.1 g/bhp-hr. JMI noted that this was not referenced in the notice of intent to certify and asked if this statement is still accurate? What data is available to substantiate DDC/Turbodyne's claim and is industry be informed of this comment? In response, Turbodyne provided information in letters dated February 23 and February 27, 1998 that during the August 1997 APTA Bus Maintenance Workshop in Nashville, a transit operator commented that the TurboPac on his routes ''would be on all the time.'' The Turbodyne representative replied that he would not recommend the TurboPac for applications that exceeded 30% high-speed duty cycle. The ceiling of a 30% duty cycle was based on the assumption that the bus alternator would not have sufficient excess capacity for this type of duty cycle. Excess alternator capacity is a direct function of the accessory load and alternator rating. In citing an example, a 270-amp system with a total electrical load including the accessories of lighting and air conditioning would be 160 amps. The excess alternator capacity in this situation would be 110 amps. Assuming a 10% duty cycle, this system would have more than sufficient excess alternator capacity to meet the average current draw from the TurboPac of 35 amps.

However, if a hypothetical duty cycle of 40% were to exist, the TurboPac would require a time-average draw of 140 amps and in this scenario the alternator would need to be upgraded before the TurboPac would be appropriate. Turbodyne stated, however, that duty cycles that exceed 30% are not expected. In practice, Turbodyne stated it would be very hard to envision a scenario that would demand 30% high speed operation for more than a few minutes. However, DDC/Turbodyne will analyze and make recommendations for any situation in which the operator believes the vehicle electrical system capacity may be in question.

(B) Description of the DDC Kit

In its comments Engelhard asked how DDC will ensure that future rebuilds using this kit will use a new catalyst and not an existing catalyst. Will all parts be purchased from DDC? What is the price? Will the catalyst be different from the standard ECS 25% catalyst? Will the catalyst be labeled as part of the DDC kit? Can DDC ensure catalysts are not swapped between buses? In response, DDC states that a converter muffler will be part of each rebuild kit. Complete kits will be sold by DDC through normal distribution channels. It will not be possible to purchase a complete rebuild kit without a converter/muffler assembly included. Swapping of catalysts between buses should not be an issue since a new catalyst is provided with each kit. The converter muffler which will be included in the DDC rebuild kits are supplied by Engine Control Systems, LTD (ECS) and are identical to the ECS converter/mufflers certified to provide a 25% reduction in PM emissions on DDC engines on January 6, 1997 as referenced earlier. The catalyst will be labeled with an ECS serial and model number. Pricing information on the catalyst was not provided as this kit is not being certified within the cost ceiling requirements.

In its comments, JMI asked how many superchargers are actually installed on the engine? What are the physical space requirements for the supercharger(s)? Will there be adequate space for the supercharger(s) on all engines and why are two base engine component kits required?

DDC indicates that one TurboPac Supercharger unit is required for each installation. However, the equipment will be supplied in two kits, one containing components required for all installations and a second which includes those components needed to accommodate the installation requirements of the various engine and vehicle configurations. With regard to the space issue, DDC indicates that it has performed pilot installations on eight different buses which represent five different configurations and all have had adequate space to install all kit components. According to DDC, these configurations represent over 60% of the MUI buses in operation. The remaining designs have been reviewed by DDC and found to be similar.

JMI and Engelhard commented that the DDC instructions for installation tell the installer to, ''provide support to the TurboPac as required.'' JMI asked what support is required and if the TurboPac is not supported as required does this negate the warranty? Engelhard asked if this means that additional support of the unit is necessary to prevent damage to it or to keep it from contacting other engine components. Engelhard also expressed the concern that the directions for installation of the Turbodyne TurboPac are insufficient to ensure proper installation and operation of the system. Engelhard further noted that the instructions require the assembler to ''mount the controller in the engine compartment. The location of the controller must be in a position which will allow connection of the motor leads directly to the TurboPac. The location should provide easy connection to the engines starter and in a location which will receive adequate air circulation.'' Engelhard asked what is adequate air circulation? Engelhard asked if heat would damage the controller and whether the unit needs to be shielded?

In regard to the support concerns, DDC states that the motor and compressor weigh 16.5 pounds and will need to be properly supported. There are mounting holes on the unit to which the bracket can be attached. In the pilot installations, either the transit property or the DDC distributor has fabricated a simple bracket to support the unit. DDC will provide installation instructions in the assembly and installation manual provided with each kit to assist maintenance personnel in selecting appropriate support. DDC states that if the equipment is not properly installed, damage to the TurboPac due to faulty support is not warrantable. DDC states that support failure will not damage the engine because the location of the motor and compressor is sufficiently away from the engine and does not require contact of any kind with the engine components. DDC states that extreme heat would damage the controller. Therefore, the controller will be located away from exhaust system components, preferably in a area where air can circulate around it. It is not recommended that the electronic controller be shielded. DDC will provide guidance on locating the controller in the installation instructions that are provided with each kit. EPA finds that based on the pilot installation experience cited by DDC and its review of remaining designs, the guidance provided by DDC in its installation instructions should be adequate to properly support and locate the kit components. EPA further notes that failure of kit components which are installed according to DDC instructions will be covered under the warranty provisions.

Engelhard commented that DDC did not provide a component list for the retrofit engine and stated that the list is necessary for comparison of the parts used in a standard rebuild to the DDC retrofit kit. Engelhard asked if the truck check valve was installed on the test engine and whether it will be included in the DDC retrofit kit? In response DDC provided information that the build list for the test engine corresponds to ''new part kit'' number 23522349 and ''reliabilt kit'' number R3518035 included in Parts List Number 3 of the notification; TurboPac kits as defined in Parts List Number 5 and converter muffler part number 6000–005D as shown in Parts List Number 6 also in the notification. The check valve is integral to the throttle delay assembly and was included in the ''new part kit'' on the test engine.

JMI commented that the DDC application states that ''the throttle delay was set for optimum vehicle driveability.'' JMI questioned how you adjust for optimum vehicle driveability in the engine test cell? Was the throttle delay changed to account for the faster response of the engine with the TurboPac? If not, what is the rationale behind this decision? In response, DDC stated that the throttle delay is a dashpot device which delays the movement of the injector rack to the full fuel position. The setting dimension controls the rack position at which delays are incurred. A higher numerical setting dimension results in the rack being further from the full fuel position and results in more delay and poorer driveability. The minimum numeric setting dimension positions the rack closest to the full fuel position before any delay is incurred. This results in the minimum delay and the best driveability. During development testing for the retrofit system, DDC determined that the 0.10g/bhp-hr PM level and acceptable engine smoke opacity could be achieved with the minimum throttle delay setting of 0.490 inches. The orifice through which the oil is purged during engine acceleration is the same for both truck and bus throttle delays. The truck throttle delay has a smaller fill hole which slows the fill rate of the oil in the throttle delay body. Bus throttle delays have a larger fill hole to provide a more rapid fill. The use of the retrofit system has shown that the more rapid fill of the bus throttle delay is no longer required to achieve 0.10 g/bhp-hr PM and acceptable smoke control. Therefore, a truck type throttle delay was specified in order to provide improved driveability.

JMI commented that in the notification DDC states that; ''Pursuant to 40 CFR Section 85.1406(e), * * * does not alter or render inoperative any feature of the on-board diagnostic system incorporated by the engine manufacturer.'' JMI asked what type of diagnostic systems are incorporated on MUI engines? In response, DDC states that MUI engines are not equipped with a computer which can store problem codes that can be used later by a service technician to diagnose an engine problem. The reference statement was provided by DDC as part of the standard format for notifications of intent to certify under the urban bus retrofit/rebuild program.

(c) Testing

JMI commented that the notification started that the rebuilt engine for the test program was originally a 1984 engine but it doesn't state that the engine was rebuilt to a 1984 configuration prior to testing. What was the configuration of the baseline engine and is it consistent with the claims made by DDC? Engelhard commented that DDC has not included a baseline test for comparison with the proposed retrofit kit and that this data is necessary to verify that the equipment being installed on the engine does not affect engine performance or fuel economy.

EPA notes that DDC did not perform baseline testing for this notification. Under the urban bus retrofit/rebuild program baseline testing is required when certification is requested within specified life cycle cost limitations. In such cases, baseline testing is needed to demonstrate equipment impact on fuel economy and associated life cycle costs. EPA does not require baseline testing when demonstrating compliance with the 0.10 g/bhp-hr PM standard when certification with life cycle cost requirements is not requested and if all applicable engines are to be converted to the test engine configuration during retrofit/rebuild. In view of the fact that this certification is not being made within life cycle cost limits, and all converted engines will be retrofit to the test engine configuration, baseline testing is not required for this certification.

Prior to performance of the emissions test, the test engine was rebuilt using the DDC kit. DDC stated that the test engine was in a post-rebuild configuration which is not related to a particular model year. However, DDC noted that the test engine was mechanically similar to a 1989 configuration.

JMI commented that DDC stated in the notification that the 277 hp rating was chosen because, ''it represents the engine injector combination on which the candidate equipment will be used.'' JMI commented that this statement is understandable if DDC is certifying only 277 hp engine kits. However, the DDC application also claims 0.10 g/bhp-hr PM levels for 253 hp and 294 hp engine kits. JMI asked what FTP test date is available to demonstrate that this technology is effective on 253 hp and 294 hp engine. JMI stated that the EPA should require DDC to demonstrate that they can attain 0.10 g/bhp-hr level for these two horsepower ratings before including them in DDC's application.

Additionally, Engelhard commented that DDC has not tested the worst case engine for its system. The Turbodyne system is designed to force additional air into the intake before the standard turbocharger can spool up. According to Engelhard, it is the amount of air supplied during aceleration that allows better combustion which reduces the particulate emissions during acceleration. The amount of air supplied is critical for obtaining PM reduction. The emissions data supplied by DDC is for a 277 hp engine. Engelhard states that to meet the 0.10 g/bhp-hr level, the Turbodyne system will have to supply more air for a 294 hp engine. However, DDC has provided no justification or data demonstrating that the device is large enough to accommodate the air flow requirements of the 294 hp engine. This requirement is supported by the fact that DDC uses a different turbo with a higher A/R ratio for the 294 hp engine than the 277 hp engine.

DDC stated that it selected the 277 hp engine rating for certification testing because this is the rating most commonly used in transit bus operations. DDC agrees that the 294 hp engine will require more airflow than an engine rated at 277 hp when both engines are operating at their respective full rated power. DDC also points out that the TurboPac is not intended to deliver the full airflow requirements of the engine. The purpose of the TurboPac is to provide additional air during engine accelerations to compensate for the lag of the engine turbocharger, and its air supply performance is the same for all engines regardless of power rating. DDC states that an engine at the 294 hp rating is capable of injecting more fuel than an engine at the 277 hp rating, but the difference in fueling is small. The 294 hp rating has a peak torque of 875 lb-ft at 1200 rpm while the 277 hp rating has a peak torque of 880lb-ft at 1000 rpm. At 1200 rpm, full load, under steady state conditions, the 294 hp rating delivers 71.0 lb/hr of fuel vs. 68.5 lb/hr for the 277 hp engine. DDC notes that this is only a 3.6% difference. DDC has not measured fueling differences for the two ratings during rapid accelerations, but because the throttle delay limits fueling to some fraction of the full rack fueling, the fueling difference during acceleration would be somewhat less than the steady state difference. Since the fueling difference is small, DDC believes the TurboPac will provide sufficient supplementary air to provide adequate particulate control with the 294 hp engine.

EPA's urban bus certification requirements for heavy-duty urban bus diesel engines, 40 CFR 85.1406 (a)(2)(i) states ''The test engine used must represent the 'worst case' with respect to particulate emissions of all those engine configurations for which the retrofit/rebuild equipment is being certified. The worst case engine configuration shall be the engine configuration having the highest engine-out particulate matter emission levels, when properly maintained and used, prior to installation of the retrofit/rebuild equipment.'' Based on available information, it is not clear whether an engine rated at 253 hp, 277 hp, or 294 hp would have significantly different exhaust emissions or, which would represent the worst case for this certification decision.

EPA believes that a comparison with the criteria for selecting test engines under EPA's new engine certification program is relevant. EPA's new engine certification requirements for heavy-duty diesel engines, 40 CFR § 86.090–24 (b)(3)(ii) for test engine selection state ''* * * Within each combination, the engine that features the highest fuel feed per stroke, primarily at the speed of maximum rated torque and secondarily at rated speed, will usually be selected'' for a test engine. In a facsimile dated March 7, 1998, DDC provided information on the fuel feed rate for each hp at maximum rated torque. That information shows that the fuel feed per stroke for the 277 hp engine clearly exceeds the 253 hp at maximum rated torque (88.8 mm/stroke vs. 77.4 mm/stroke). With regard to the 294 hp engine, DDC has provided information that the fuel feed per stroke for the 277 hp engine is virtually identical to the fuel feed per stroke of the 294 hp engine at maximum rated torque (88.8 vs. 88.9 mm/stroke). While a strict comparison of this data indicates that the 277 hp engine does not meet the ''highest fuel feed per stroke'' criteria as stated, it is within one-tenth of one percent of the 294 hp rating with regard to this measurement. DDC's March 27, 1998 submission has been placed in the docket at the above address.

In conjunction with the discussion above and the following reasons, EPA believes that the 6V92TA engine equipped with the DDC kit rated at 277hp, is acceptable for compliance at the 253, 277 and 294 hp ratings. First, the 6V92TA MUI test engine is clearly the engine model for which DDC is claiming applicability of the DDC kit. Further, the hp rating of the certification is the most popular power rating. It is therefore the most representative power rating. Second, it is consistent with the use of a 277hp test engine by JMI for certification applicable to various hp ratings applicable to 6V92TA model engines (see 62 FR 60079; November 6, 1997). In EPA's approval of this JMI certification kit, EPA allowed the certification test engine at the 277 hp rating to represent additional hp ratings which were certified. No additional information was presented by JMI or Engelhard in their respective comments relative to different emission levels from the various ratings. Lacking such information EPA can find no reason to change from the decision made in the JMI certification to allow the 277 hp test engine to represent the additional ratings. Additionally, it is not clear that an engine of the DDC rated 253 hp or 294 hp would have significantly different exhaust emissions from the certified test engine. Because of the above noted reasons, and consistent with EPA's decision in that JMI certification, EPA finds that the 277 hp rating is acceptable to represent the 253 hp and the 294 hp ratings in this certification. EPA retains the authority to conduct in-use testing of any certified equipment for compliance with the 150,000 mile performance warranty on all certified equipment.

JMI commented that the test data states that the muffler was installed 6 feet from the turbocharger exit. JMI asked if this is the way it will be installed in the buses. JMI noted that the converter muffler is a direct bolt on replacement for the original muffler. With the extreme variation in diameter from muffler to muffler, how many different size catalyst elements are used? If more than one, which one was used during the FTP test? If only one, the EPA should require DDC to provide assurances that the catalyst was sized to achieve 0.1 g/bhp-hr PM for the complete range of 6V92TA MUI engines form 1979 to 1989.

DDC stated that the converter muffler was tested at a location of six feet from the turbocharger outlet. The installation on a particular urban bus will vary based on the original muffler location. DDC tested at this distance as most urban bus mufflers are installed within this distance from the turbocharger and chose this location to represent a worst case in terms of exhaust temperature. EPA accepts the placement of the converter at six feet from the turbocharger in this instance and notes that EPA has accepted this distance in previous certification approvals.

DDC stated that parts list number six in the notification provides a listing of the different converter/muffler configurations that will be used. The particular converter/muffler configuration used to generate the emission test results in the notification was a 12 inch by 23 inch oval cross section design, 22 inches in length. This unit has the minimum catalyst volume of the different converter/muffler configurations that will be used according to DDC and corresponds to part number 6000–005D of that list.

Engelhard asked how the backpressure was set for emissions testing. DDC testing was performed at Southwest Research Institute in San Antonio, Texas. With a standard muffler installed in the test cell exhaust system, the damper was closed (with the test engine at rated speed) to adjust the backpressure to 80% of the specified maximum, or 2 inches of mercury. The standard muffler was then removed, and the catalyst was installed in its place. Certification testing was conducted without changing the position of the throttling valve. The resulting backpressure was 2.7 inches of mercury with the catalyst installed. Engelhard asked where did the original muffler come from and is it a bus muffler? The muffler was provided by the testing facility and was selected to represent an urban bus muffler.

(D) Life Cycle Cost Analysis

Engelhard commented that DDC has not provided a life cycle cost calculation for this retrofit equipment. Engelhard noted that this is extremely important due to the complexity of the installation required for the Turbodyne system, the potentially expensive maintenance of the system, the detrimental effect of the huge electrical demand of the Turbodyne system on the buses charging system, and the increased fuel consumption of the Turbodyne system. Engelhard commented that this information is needed so bus companies can make a valid assessment of this technology's cost effectiveness. DDC's application also did not include prices or installation costs for any of the retrofit kits. JMI also commented on the cost of the DDC/Turbodyne kit. It asked about the labor costs to install the DDC/Turbodyne system because the addition of a supercharger is over and above what is done during a standard rebuild. Are there any periodic maintenance requirements that would increase the cost of the system? What is the impact of the DDC/Turbodyne technology on fuel consumption? Should a fuel penalty be assessed?

As stated earlier, DDC has not provided life cycle cost information in conjunction with this notification. Such a cost analysis is necessary for certification of equipment that is meant to trigger a program emissions standard. Certification of Engelhard Corporation's ETX™ kit triggered the 0.10 g/bhp-hr standard for 6V92TA MUI engines, and made available kits rated at 253, 277, and 294 hp. The DDC certification does not include a cost analysis, and one is not necessary for this certification. DDC states that engines equipped with the kit will have no additional maintenance or service requirements and the system will not have a detrimental impact on the electrical system as discussed earlier. Based on the field installations to date, DDC estimates that the installation of the TurboPac unit will average an additional eight hours of labor beyond the labor associated with a standard rebuild. However, this figure could vary depending on the specific installation requirements. No claims have been made by DDC with regard to the impact of this system on fuel economy and the impact of this system on fuel economy is undetermined. No specific information on fuel economy impact was provided in the comments. EPA notes that it is not appropriate to assess a fuel economy penalty in a certification that does not contain life cycle cost information. With regard to fuel consumption, the brake specific fuel consumption (BSFC) measured during emission testing of the DDC kit was 0.464 lb/bhp-hr. In testing conducted for the three notifications for 0.1 g/bhp-hr PM certification for 6V92TA MUI engine models that EPA has received to date, the BSFC measured during emission testing after the installation of the retrofit/rebuild kits has been between 0.438 and 0.471 lb/bhp-hr.

JMI asked if there are any components or ancillary parts that are required in order to install the DDC/Turbodyne system that are not included on any of the parts lists included with DDC's application? If so, what are the additional costs associated with these parts? In response, DDC states that the parts list in the application does not include the electrical wire (16 AWG and 00 cable), and some nuts and bolts. DDC states that it believes these are standard items commonly available in bus repair facilities. Total cost for all of these parts is estimated by DDC to be between $20 and $40, depending on the length of the 00 cable. No additional batteries or other changes are required to the battery charging system. No rewiring of the bus electrical system is needed according to DDC.

(E) Warranty

Engelhard commented that DDC does not provide any coverage for damage resulting to other engine components, such as the charging system, due to the installation of its retrofit kit. In response, DDC notes that field evaluations have not resulted in any failures to bus charging or electrical systems. Neither DDC nor Delco-Remy anticipate that use of the TurboPac system will increase failure rates of the vehicle charging and electrical systems. Standard warranty coverages, if not expired, will remain in effect for any failures which may occur in these systems. DDC will not provide additional warranty coverage for these systems. Based on the review of comments and the in-use pilots, EPA is not award of any damage to other components as a result of the installation of this equipment and does not see reason not to approve this certification. If significant in-use problems were to develop, EPA can take action and, ultimately, has authority to decertify equipment.

(F) Durability

JMI commented that DDC stated in its notification; ''The cylinder kit components were modified to improve durability.'' JMI expressed concerns that changes to any parts of the cylinder kits could result in increased soot formation in the oil or increased oil consumption. JMI further questioned what the modifications were, how will they be made, who will make them, how DDC will control uniformity and quality, whether the change was made for all 92 series engines or just the engines with the kit and whether the parts will be made available on a nationwide basis. Engelhard commented that though durability data is not a requirement of the Urban Bus regulation, the EPA has required verification of durability and data supporting the claim that the system will last 150,000 miles.

In response DDC stated that the primary change in the cylinder kit is the elimination of a ''J-relief'' groove. The J-relief was a machining process to the lower side of the bottom compression ring groove which was designed to relieve any pressure build-up between the upper and lower compression rights. The change to the piston eliminates the machining operation. DDC states that this change has no affect on the combustion process, and will have no affect on generation of soot during the combustion process. According to DDC the change was made strictly to improve the durability of the lower compression ring. The changes have been incorporated in the cylinder kits used to service all DDC series 92 engines, whether used to service truck, bus, or nonroad engines. The new piston domes are also used on production engines. Therefore, the parts are subject to the same quality control as any other DDC production or service part. The new kits are available worldwide through DDC's distributor network.

EPA is concerned, in general, with equipment durability, and believes that certifiers will want to evaluate the durability of their equipment in order to minimize their liability resulting from the emissions defect and performance warranties. However, program regulations do not require a durability demonstration. EPA believes that DDC's explanation does not indicate a durability concern with the equipment certified in today's notice, and therefore, does not provide sufficient basis to deny certification on these grounds. EPA has the authority to conduct in-use testing of certified equipment to determine compliance with the requirements of the program. In addition, equipment certifiers must provide a 100,000 mile defect warranty and a 150,000 miles emissions performance warranty on all certified equipment

(G) In-Use Experience

The Washington Metropolitan Area Transit Authority (WMATA), the Maryland Department of Transportation Mass Transit Administration (MTA), and the Milwaukee County Transit System (MCTS) provided favorable comments on the DDC system. WMATA noted that one DDC kit was installed on September 17, 1997 and that WMATA has not encountered any installation or servicing problems with the engine and there have been no failures. The MTA commented that it has installed the DDC kit and it has performed ''flawlessly.'' The MCTS commented that it has installed five DDC kits. The first kit was installed in September 1997. To date, MCTS has not experienced ''any'' electrical component problems on the buses. By electrical problems, MCTS stated it meant any alternator, regulator, battery, or wiring problems. MCTS commented that it experienced ''one'' TurboPac electrical turbo motor failure early in the test process. MCTS commented that the DDC kit is reliable but that it was too early in the process to determine if there are any fuel or power increases.

IV. Certification

The Agency has reviewed the notification of intent to certify and other information provided by DDC, along with comments received from interested parties, and finds that the DDC kit described above:

(1) Complies with the particulate matter exhaust emissions standard of 0.10 g/bhp-hr, without causing the applicable engine families to exceed other exhaust emissions standards;

(2) Will not cause an unreasonable risk to the public health, welfare, or safety;

(3) Will not result in any additional range of parameter adjustability; and,

(4) Meets other requirements necessary for certification under the Retrofit/Rebuild Requirements for 1993 and Earlier Model Year Urban Buses (40 CFR Sections 85.1401 through 85.1415).

Therefore, today's **Federal Register** notice announces certification of the above-described DDC kit for use in the urban bus retrofit/rebuild program as discussed below in section V.

V. Transit Operator Responsibilities

Today's **Federal Register** notice announces certification of the above-described DDC kit, when properly applied, as meeting the 0.10 g/bhp-hr particulate matter standard of the Urban Bus Retrofit/Rebuild Program.

In a **Federal Register** notice dated March 14, 1997 (62 FR 12166), EPA announced certification of a retrofit/rebuild kit produced by the Engelhard Corporation (the ETX™ kit). That certification means that urban bus operators using compliance program 1 must use equipment certified to the 0.10 g/bhp-hr standard when rebuilding or replacing applicable 1979 through 1989 model year DDC 6V92TA MUI model engines after September 14, 1997. The certified DDC equipment described in today's notice may be used by operators in compliance with the 0.10 g/bhp-hr standard. Operators using compliance program 2 having applicable engines may use the certified DDC kit and claim the certification PM level from Table B above, when calculating their Fleet Level Attained (FLA). Under program 2, an operator must use sufficient certified equipment so that its actual fleet emission level complies with the target level for its fleet.

As mentioned above, certification of the Engelhard ETX™ kit triggered the 0.10 g/bhp-hr standard for applicable 1979–1989 6V92TA MUI engines. That kit provides three power ratings: 253, 277, and 294 horsepower. DDC will offer the DDC kit in these three power ratings as well: 253, 277, and 294hp.

Engines of urban buses certified to meet California emissions standards are not applicable to the DDC kit discussed in today's **Federal Register** notice. Additionally, the 0.10 g/bhp-hr PM standard is not triggered for engines certified to meet California emission standards. Operators of such urban buses, who choose to comply with program 1, are not required to use equipment certified to the 0.10 g/bhp-hr PM standard until the standard has been triggered for such engines. Operators of urban buses having engines certified to meet California emission standards, and who choose to comply with program 2, may not use the DDC kit described in today's notice to meet program requirements.

As stated in the program regulations (40 CFR 85.1401 through 85.1415), operators must, beginning January 1, 1995, maintain records for each engine in their fleet to demonstrate that they are in compliance with the requirements of the Urban Bus Retrofit/Rebuild Program. These records include purchase records, receipts, and part numbers for the parts and components used in the rebuilding or urban bus engines.

Dated: May 5, 1998.

Richard D. Wilson,

Acting Assistant Administrator for Air and Radiation.

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ENVIRONMENTAL PROTECTION AGENCY

[FRL–6013–6]

Acid Rain Provisions

AGENCY: Environmental Protection Agency.

ACTION: Notice.

SUMMARY: EPA today announces the allocation of allowances to small diesel refineries for desulfurization of fuel during 1997. The eligibility for and calculation of allowances to small diesel refineries is in accordance with Section 410(h) of the Clean Air Act, implemented at 40 CFR part 73, subpart G.

FOR FURTHER INFORMATION CONTACT: Kathy Barylski, EPA Acid Rain Division (6204J), 401 M St., SW, Washington DC; telephone (202) 564–9074; or the Acid Rain Hotline at (202) 564–9620. Electronic copies of this rulemaking and technical support documents can be accessed through the Acid Rain Division website at www.epa.gov/acidrain.

SUPPLEMENTARY INFORMATION: EPA's Acid Rain Program was established by Title IV of the Clean Air Act Amendments of 1990 (CAAA) to reduce acid rain in the continental United States. The Acid Rain Program will achieve a 50 percent reduction in sulfur dioxide (SO_2) emissions from utility units. The SO_2 reduction program is a flexible market-based approach to environmental management. As part of this approach, EPA allocates ''allowances'' to affected utility units. Each allowance is a limited authorization to emit up to one ton of SO_2. At the end of each calendar year, each unit must hold allowances in an amount equal to or greater than its SO_2 emissions for the year. Allowances may be bought, sold, or transferred between utilities and other interested parties. Those utility units whose annual emissions are likely to exceed their allocations may install control technologies or switch to cleaner fuels to reduce SO_2 emissions or buy additional allowances.

Section 410(h) of the Clean Air Act provides allowances for small diesel refineries that desulfurize diesel fuel from October 1, 1993 through December 31, 1999. Small refineries are not otherwise affected by the Acid Rain Program and do not need the allowances to comply with any provision of the Clean Air Act. Thus, the allowances serve as a financial benefit to small diesel refineries desulfurizing diesel fuel.

The following table lists allowances to be allocated to eligible refineries for desulfurization of diesel fuel during calendar year 1997.

Refiner	Refinery/location	Allocation
Big West Oil	Flying J	1304
Cenex	Laurel, Montana	1500
Frontier	Cheyenne, Wyoming	1500
Giant	Ciniza	1500
	Giant	1151
Holly	Lea	1469
	Navajo	1420
	Montana	329
Hunt	Tuscaloosa, Alabama	1402
Inland Refining	Woods Cross, Utah	757
Kern	Bakersfield, California	1500
La Gloria	Crown Refinery, Tyler, Texas	1500
Lion	El Dorato	1500
Paramount	Paramount, California	1282
Pennzoil	Atlas	1500
	Rasville	487
Pride	Abilene, Texas	1226
Sinclair	Little America	1500
	Sinclair, Wyoming	1500
	Tulsa, Oklahoma	1500
U.S. Oil & Refining	Tacoma, Washington	1072
Witco	Golden Bear	66
Wyoming Refining	Denver, Colorado	691

A total of 27,656 allowances are allocated to 17 refiners, which produced 55,111 thousand barrels of desulfurized diesel fuel. These allowances have a compliance year of 1998.