

APPENDIX A: Board Resolution 01-31

State of California
AIR RESOURCES BOARD

Resolution 01-31

September 20, 2001

Agenda Item No.: 01-7-2

WHEREAS, sections 39600 and 39601 of the Health and Safety Code authorize the Air Resources Board (the "Board") to adopt standards, rules and regulations and to do such acts as may be necessary for the proper execution of the powers and duties granted to and imposed upon the Board by law;

WHEREAS, in section 43000 of the Health and Safety Code, the Legislature has declared that the emission of air pollutants from motor vehicles is the primary cause of air pollution in many parts of the state and, in sections 39002 and 39003 of the Health and Safety Code, has charged the Board with the responsibility of systematically addressing the serious air pollution problem caused by motor vehicles;

WHEREAS, sections 43013, 43101, and 43104 of the Health and Safety Code direct the Board to endeavor to achieve the maximum degree of emission reduction possible from motor vehicle sources to accomplish the attainment of state ambient air quality standards by the earliest practicable date;

WHEREAS, sections 43013, 43101, and 43104 of the Health and Safety Code authorize the Board to adopt motor vehicle emission standards, in-use performance standards, and test procedures, which it finds to be necessary, cost-effective, and technologically feasible;

WHEREAS, section 43806 of the Health and Safety Code directs the Board to adopt emission standards and procedures applicable to new engines used in publicly owned and privately owned public transit buses;

WHEREAS, the United States Environmental Protection Agency has promulgated emission standards and programs to reduce emissions from urban transit buses, and those standards and programs can be found in Title 40 of the Code of Federal Regulations, Part 86;

WHEREAS, section 43701(b) of the Health and Safety Code requires the Board to adopt regulations that require heavy-duty diesel vehicles to utilize emission control equipment and alternative fuels to reduce emissions to the greatest extent feasible;

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WHEREAS, on August 27, 1998, following extensive scientific review and public hearings, and consistent with the conclusions of the Scientific Review Panel and the Office of Environmental Health Hazard Assessment, the Board formally identified particulate emissions from diesel-fueled engines as a toxic air contaminant and on September 28, 2000, approved a plan to reduce risk from diesel particulate pollution by reducing harmful particulate matter emissions from diesel engines;

WHEREAS, the Board, through the adoption of Resolution 98-49 on September 24, 1998, called on state, local, and federal agencies to join together to “clean the fleet,” supported immediate and continuing efforts to replace diesel-fueled school and public urban transit buses with low-emission alternative-fuel buses, including the provision of necessary infrastructure and technical training, and directed the staff to distribute this resolution to multiple affected parties;

WHEREAS, section 39667 of the Health and Safety Code directs the Board to achieve the maximum possible reduction in public exposure to toxic air contaminants by establishing emission standards for vehicular sources, including new and in-use motor vehicles and fuels;

WHEREAS, on February 24, 2000, the Board adopted Resolution 00-2 to achieve near-term and long-term emission reductions from urban transit buses through a fleet rule designed to reduce emissions of oxides of nitrogen (NO_x) and diesel particulate matter (PM) by mandating a lower fleet average of NO_x emissions; by requiring engines be retrofitted with devices to reduce diesel PM emissions by at least 85 percent; by requiring engine manufacturers to significantly reduce the allowable emissions from certified bus engines; by requiring that transit agencies switch to a specified percentage of low sulfur (less than 15 parts per million) diesel fuel; and by requiring transit agencies to purchase specified percentages of zero emission buses when adding to their fleets;

WHEREAS, the Board, through Resolution 00-2, directed the Executive Officer to work with transit agencies during implementation of the regulations, including provisions of the fleet rule, and to report to the Board regularly on transit agencies’ progress in implementing the regulations;

WHEREAS, the regulations allow both diesel and alternative fuel fleet operators to apply for an exemption from the Model Year 2004-2006 NO_x standards if specified criteria are met;

WHEREAS, the Board, through discussion at the February 24, 2000, public hearing and Resolution 00-2, directed the Executive Officer to report to the Board on implementation of emission reduction strategies as an alternative to compliance with the 2004 standards, including presenting recommendations based on its analysis of the first exemption application received, and on the status of demonstrations of advanced aftertreatment systems;

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WHEREAS, the Board, through Resolution 00-2, directed the Executive Officer report to the Board on the development a test procedure for the evaluation of hybrid electric bus emissions;

WHEREAS, based on the information in the public record, the Board finds that:

1. Seventy transit agencies operating 6,698 diesel buses and 1,864 alternative-fuel buses are subject to the regulation, of which 43, or 61 percent, chose the diesel path and 27, or 39 percent, chose the alternative-fuel path.
2. As of August 1, 2001, 68 of the 70 transit agencies had submitted their fleet averages of NOx as of January 1, 2001, and projected fleet averages as of October 1, 2002, as required by the regulation. Of these 68 transit agencies, approximately 80 percent either comply with the required NOx fleet average of 4.8 grams per brake horsepower-hour (g/bhp-hr) as of January 1, 2001, or report that they will as of October 1, 2002.
3. Fifteen transit agencies have applied as required by June 30, 2001, for an exemption from the requirement that model years 2004 through 2006 transit bus engines as purchased be certified to emit no more than 0.5 g/bhp-hr NOx, but of those 15 only one transit agency, Santa Clara Valley Transportation Authority, submitted complete plans detailing how it would achieve greater NOx emission benefits through 2015, and no transit agency has submitted a declaration that it is demonstrating or contracted to demonstrate advanced NOx aftertreatment technology.
4. Fourteen transit agencies that submitted applications for exemption have requested additional time and assistance from the Executive Officer to develop plans showing how each would achieve greater NOx emission benefits through 2015, as required in the regulation, and all 15 transit agencies have requested additional time to demonstrate advanced NOx aftertreatment technology.
5. The plan submitted by Santa Clara Valley Transportation Authority to achieve greater NOx emission benefits through 2015 provides a good framework that can be followed by other transit agencies.
6. As of August 2, 2001, the Executive Officer has verified that two devices manufactured by Engelhard Corporation and Johnson Matthey, respectively, reduce diesel particulate matter emissions by 85 percent or more and meet the additional requirements for verification, including durability and warranty, and that these devices may be installed and operated on certain Cummins and Detroit Diesel Corporation bus engines to meet the requirement of this regulation, but that thus far no retrofit devices have been certified for any bus engines older than model year 1995.

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7. Advanced NOx aftertreatment systems that achieve significant reductions in NOx emissions require additional research and development, and that while the June 30, 2001, deadline for transit agencies to be demonstrating, or contracted to demonstrate, advanced NOx aftertreatment systems is a premature deadline that should be extended, the demonstration requirement should be retained because demonstration of the technology in transit buses will assist California in meeting its NOx emission reduction goals;
8. The Executive Officer is making progress in developing a test procedure for the evaluation of hybrid electric bus emissions; and
9. The Public Transit Bus Fleet Rule Status Report included as Attachment A to this resolution and incorporated by references herein adequately sets forth the status of implementation of the Public Transit Bus Fleet Rule, as required in Resolution 00-2.

NOW, THEREFORE, BE IT RESOLVED, that the Board hereby approves the Public Transit Bus Fleet Rule Status Report.

BE IT FURTHER RESOLVED, that the Board expresses extreme disappointment at the lack of progress by engine manufacturers and diesel-path transit agencies towards achieving advanced diesel bus engine technology and reiterates its resolve to implement and enforce the requirements of the urban transit bus regulations adopted by the Board February 24, 2000.

BE IT FURTHER RESOLVED, that the Board directs the Executive Officer to work with transit agencies that have reported that they will not meet the required NOx fleet average of 4.8 g/bhp-hr by October 1, 2002, to assist them in achieving compliance, and to proceed with enforcement actions against those transit agencies that do not comply by October 1, 2002.

BE IT FURTHER RESOLVED, that the Board directs the Executive Officer to assist rural and smaller transit agencies in identifying, assessing, and implementing economies of scale and other strategies in infrastructure development to support alternative-fuel bus fleets.

BE IT FURTHER RESOLVED, that the Board directs the Executive Officer to make the necessary regulatory changes to allow transit agencies that applied for an exemption by June 30, 2001, additional time to demonstrate advanced NOx aftertreatment technology; to require transit agencies to commit resources to a demonstration project as of December 31, 2001; and to require those transit agencies to have initiated advanced NOx aftertreatment demonstrations by December 31, 2002; or the Executive Officer shall rescind any conditional approvals granted previously.

BE IT FURTHER RESOLVED, that the Board directs the Executive Officer to allow each transit agency that applied for an exemption the option of performing a joint demonstration of advanced NOx aftertreatment as follows: a joint project may involve all or several transit agencies that applied for an exemption, include at least three buses

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operating in fare service, and demonstrate NOx aftertreatment technology that will offer commercial potential (i.e., reduce NOx emissions by 70 percent or more). Any transit agency that elects not to participate in a joint project shall demonstrate advanced NOx aftertreatment technology that offers commercial potential in at least one bus operating in fare service.

BE IT FURTHER RESOLVED, that the Board directs the Executive Officer to convene a delegation to meet with representatives of the Engine Manufacturers Association to assess and encourage efforts to advance the status of NOx emission control technology and to report back to the Board by March, 2002, the results of these efforts.

BE IT FURTHER RESOLVED, that the Board directs the Executive Officer to continue development of a test procedure for the evaluation of hybrid electric bus emissions and to report back to the Board by late-2002 on progress in this effort.

BE IT FURTHER RESOLVED, that the Board directs the Executive Officer to be prepared to introduce a proposal to eliminate the diesel path option in the urban transit bus fleet rule if efforts towards clean diesel technology and compliance with low NOx emission standards do not improve considerably in the next six months.

I hereby certify that the above is a true and correct copy of Resolution 01-31, as adopted by the Air Resources Board.

Marie Kavan, Clerk of the Board

APPENDIX B: Fuel Path Selection and Bus Fleet Total (2001)

Air Basin	Total Agencies	Diesel Path	Number of Buses	Alternative Fuel Path	Number of Buses
Bay Area AQMD	15	13	2684	2	61
Sacramento Metro AQMD	2	1	13	1	214
San Diego County APCD	6	1	12	5	635
San Joaquin Valley APCD	8	4	151	4	204
South Coast AQMD	16	7	467	9	3798
All Others	24	18	327	6	200
Total	71	44	3654	27	5112

APPENDIX C: Transit Agencies by Fuel Path and Fleet Size

*(D): Diesel, (A): Alternative Fuel; AQMD: Air Quality Management District; APCD: Air Pollution Control District

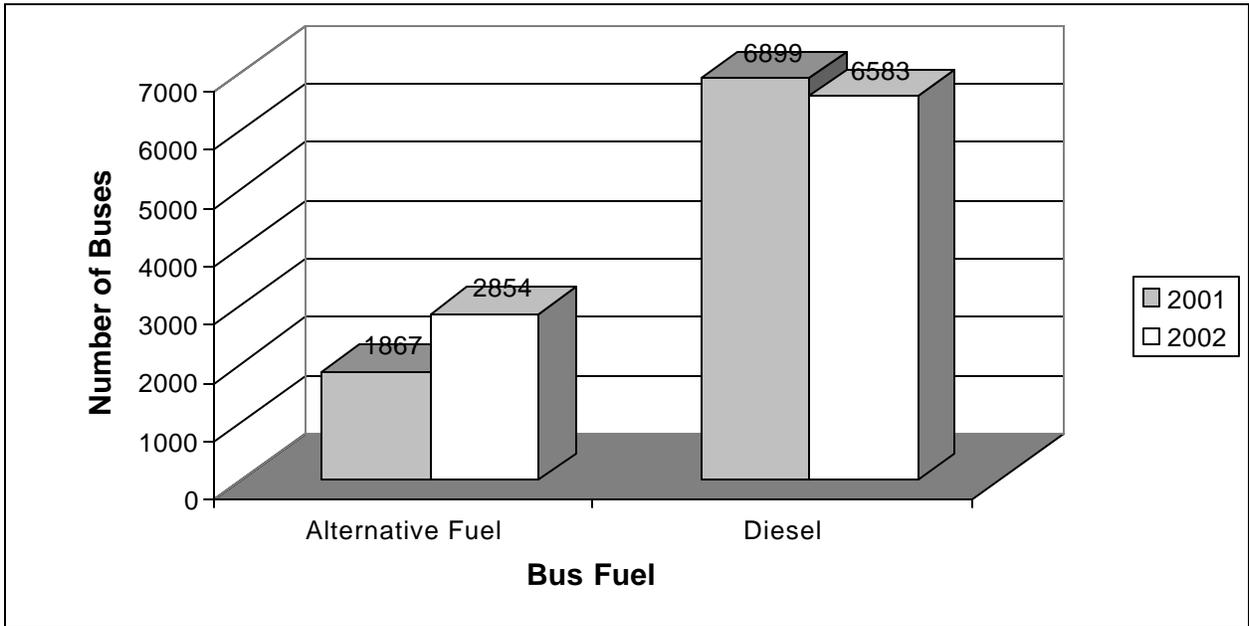
	Transit Agency	Fuel Path	Air District	Fleet Total (2001)	Fleet Total (2002)
1	Alameda/Contra Costa Transit District	D	Bay Area AQMD	741	751
2	Antelope Valley Transit Authority	D	Antelope Valley APCD	41	30
3	Arcata & Mad River Transit System	D	North Coast Unified AQMD	4	4
4	Central Contra Costa Transit Authority	D	Bay Area AQMD	132	128
5	Chico Area Transit System	D	Butte County AQMD	10	13
6	Chula Vista Transit	A	San Diego County APCD	25	35
7	Commerce Municipal Bus Lines	D	South Coast AQMD	13	13
8	Culver City, City of	A	South Coast AQMD	43	45
9	Eastern Contra Costa Transit Authority	D	Bay Area AQMD	45	52
10	El Dorado County Transit Authority	D	El Dorado County	4	8
11	Eureka Transit Service	D	North Coast Unified AQMD	8	9
12	Fairfield/Suisun Transit	D	Bay Area AQMD	26	40
13	Folsom Stage Lines	D	Sacramento Metro AQMD	13	15
14	Foothill Transit	A	South Coast AQMD	203	203
15	Fresno Area Express	A	San Joaquin Valley APCD	117	117
16	Gardena Municipal Bus Lines	D	South Coast AQMD	50	51
17	Golden Empire Transit District	A	San Joaquin Valley APCD	78	78
18	Golden Gate Bridge Highway and Transportation District	D	Bay Area AQMD	273	277
19	Humboldt Transit Authority	D	North Coast Unified AQMD	10	11
20	Livermore/Amador Valley Transit Authority	D	Bay Area AQMD	67	71
21	Lodi	A	San Joaquin Valley APCD	5	6
22	Lompoc	D	Santa Barbara County APCD	2	2
23	Long Beach Transit	D	South Coast AQMD	192	192
24	Los Angeles County Metropolitan Transportation Authority	A	South Coast AQMD	2448	2411
25	Los Angeles Department of Transportation	A	South Coast AQMD	109	109
26	Mendocino Transit Authority	D	Mendocino County AQMD	9	9
27	Merced County Transit	D	San Joaquin Valley APCD	19	21
28	Metropolitan Transit Development Board	A	San Diego County APCD	92	106
29	Modesto, City of	D	San Joaquin Valley APCD	40	52
30	Montebello Bus Lines	D	South Coast AQMD	78	78
31	Monterey-Salinas Transit	D	Monterey Bay Unified APCD	70	76
32	Napa VINE Transit Service	D	Bay Area AQMD	23	23
33	National City Transit	D	San Diego County APCD	12	16
34	North San Diego County Transit District	A	San Diego County APCD	149	149
35	Norwalk, City of	D	South Coast AQMD	24	28
36	Omnitrans	A	South Coast AQMD	189	209
37	Orange County Transportation Authority	A	South Coast AQMD	506	543
38	Redding Area Bus Authority	D	Shasta County AQMD	18	18

	Transit Agency	Fuel Path	Air District	Fleet Total (2001)	Fleet Total (2002)
39	Riverside Transit Agency	A	South Coast AQMD	83	94
40	Roseville, City of	D	Placer County APCD	7	19
41	Sacramento Regional Transit District	A	Sacramento Metro AQMD	214	214
42	San Diego County Transit System	A	San Diego County APCD	51	44
43	San Diego Transit	A	San Diego County APCD	318	321
44	San Francisco Municipal Railway	D	Bay Area AQMD	445	546
45	San Joaquin Regional Transit District	D	San Joaquin Valley APCD	71	83
46	San Luis Obispo Transit	D	San Luis Obispo County APCD	15	12
47	San Luis Obispo Regional Transit Authority	D	San Luis Obispo County APCD	18	18
48	San Mateo County Transit District	D	Bay Area AQMD	306	353
49	Santa Barbara Metropolitan Transit District	D	Santa Barbara County APCD	53	53
50	Santa Clara Valley Transportation Authority	D	Bay Area AQMD	528	574
51	Santa Clarita Transit	D	South Coast AQMD	60	60
52	Santa Cruz Metropolitan Transit District	A	Monterey Bay Unified APCD	99	110
53	Santa Maria Area Transit	D	Santa Barbara County APCD	8	8
54	Santa Monica's Big Blue Bus	A	South Coast AQMD	179	199
55	Santa Rosa CityBus	D	Bay Area AQMD	25	25
56	Simi Valley Transit	A	Ventura County APCD	9	11
57	Siskiyou County STAGE	D	Siskiyou County APCD	3	3
58	Sonoma County Transit	A	Bay Area AQMD	49	60
59	South Coast Area Transit	D	Ventura County APCD	43	43
60	South County Area Transit	D	San Luis Obispo County APCD	4	4
61	Stanislaus Regional Transit	A	San Joaquin Valley APCD	4	6
62	SunLine Transit Agency	A	South Coast AQMD	38	38
63	Thousand Oaks	A	Ventura County APCD	5	7
64	Torrance Transit System	D	South Coast AQMD	50	50
65	Union City Transit	A	Bay Area AQMD	12	14
66	Unitrans	A	Yolo-Solano AQMD	34	34
67	Vallejo Transit	D	Bay Area AQMD	54	27
68	Victor Valley Transit Authority	A	Mohave Desert AQMD	21	19
69	Visalia City Coach	D	San Joaquin Valley APCD	21	24
70	Western Contra Costa Transit Authority	D	Bay Area AQMD	19	19
71	Yolobus	A	Yolo-Solano AQMD	32	47
TOTAL				8766	9137

APPENDIX D: Number of Diesel and Alternative Fuel Buses by Air District (2001)

Air District	Number of Diesel Buses	Percentage	Number of Alternative Fuel Buses	Percentage
Bay Area AQMD	2718	39%	27	1%
Sacramento Metro AQMD	79	1%	148	8%
San Diego County APCD	458	7%	189	10%
San Joaquin Valley APCD	309	4%	46	3%
South Coast AQMD	2935	43%	1265	68%
All Others	400	6%	192	10%
Total	6899	100%	1867	100%

APPENDIX E: Fleet Composition by Fuel Type (2001-2002)



APPENDIX F: Letter from Transit Agencies

ADMINISTRATIVE OFFICES
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The County Connection

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January 22, 2002

Nancy Steele
Manager, Retrofit Implementation
California Air Resources Board
9480 Telstar Avenue, Suite 4
El Monte, CA 91731

Dear Ms. Steele:

I am sending this letter on behalf of the transit agencies in the state of California to try to clarify issues with statements made by the CARB Executive Committee that the Bay Area and transit agencies in general are not in compliance with or are in some way attempting to circumvent the Urban Bus Transit Regulations. Transit agencies are not only in full compliance with the regulation, but are in many cases exceeding the requirements.

VTA, SamTrans, Golden Gate Transit, Fresno Montebello Bus Line, and others have been aggressively repowering existing buses in their fleets with new certified 4-cycle engines. While some of these repowers are being done to meet the 4.8 gram NOx fleet average, the majority are being done to get the older 2-cycle engines out of their fleets and making the repowered buses able to use the particulate filters that are called for in the particulate matter (PM) retrofit section of the rule, thereby reducing NOx and PM emissions in their fleet. As an example, SamTrans was required to complete twenty (20) repowers to meet the 4.8 gram average, but has committed funds to complete 137 buses. Each bus repower results in a reduction in NOx of 25%, in PM of 50%.

The Bay Area went out to bid as a region for ultra low sulfur diesel. Because of the volume of fuel being bought through this multi-year contract, ultra low sulfur diesel is now being produced in the Bay Area, resulting in a price premium of less than .5 cents per gallon. This also helps make the fuel available to the private fleets at a cost competitive price.

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Most Bay Area properties made the transition to ultra low sulfur diesel on or before January 1, 2002, a full six months before the regulation calls for (and VTA/one Bay Area Transit Property transitioned to ultra low sulfur diesel fuel back in April 2001). Testing conducted by New York City Transit (NYCT) has demonstrated 23% reduction in PM just from the use of ultra low sulfur diesel. This assures that Bay Area properties are prepared to participate in NOx and PM reduction programs.

Eastern Contra Costa County has been running a test on Purinox fuel. They have seen a NOx reduction average of 19.45%.

Long Beach Transit has a contract in place to install particulate filters on 166 of its buses. Long Beach has been running its fleet on ultra low sulfur diesel since October 1, 2001.

The San Francisco Muni is looking to install particulate filters on 375 buses over the next two years.

Central Contra Costa Transit Authority (CCCTA) is waiting for approval from the Air Resources Board so that it can have the OEM install particulate filters on its new buses scheduled for delivery in 2002. SamTrans is also interested in receiving buses built in 2002 and 2003 with PM filters meeting the 0.01 gm/bhr standard.

AC Transit, VTA, San Francisco and Fresno are in the process of testing the Swedish Turbo Technology (STT) on its buses. This technology has demonstrated the ability to reduce NOx emissions on 4 gram engines up to 50%.

CCCTA is preparing to test a lean NOx catalyst technology that will reduce NOx by up to 40% and PM emissions by 85%. Even though these technologies fall short of the ARB goal of 70% NOx reduction, this equipment may provide a cost-effective (bolt of technology) to greatly reduce NOx and PM emission on heavy-duty vehicles in California.

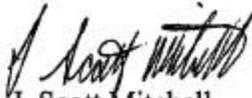
Fresno, Orange County, Torrance Transit, and the San Francisco Muni are currently testing electric hybrid buses in revenue service and San Joaquin Transit has funding in place to purchase and test this technology.

Transit agencies are preparing for a joint program for an advanced NOx reduction demonstration in accordance with the regulations. These agencies include AC Transit, Golden Gate, Merced, El Dorado, Eastern Contra Costa County, Visalia, Tri-Delta, and VTA. SamTrans as well as CCCTA, although not required to do so, are committed to this program as well. Additionally, Torrance is pursuing a separate NOx reduction demonstration program with a potential 70% NOx reduction.

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Nancy, the transit agencies in California are proactively pursuing projects, equipment, and fuels beyond the scope of the CARB regulations. Our commitment to follow the regulation did not stop at mere compliance. The transit agencies are committed to working with the ARB staff for the duration of this regulation. Please make this information available to the Executive Committee. We look forward to a continued partnership between the ARB and the California public transit agencies.

Sincerely,



J. Scott Mitchell
Director of Maintenance CCCTA
Chairman CTA Maintenance Committee

JSM/tr

C: Rick Ramacier, CCCTA
Durand Rawl, Omni Trans
Josh Shaw, CTA

APPENDIX G: California Transit Association Presentation

APPENDIX H: Estimated Timeframes for Diesel Emission Control Strategies Verification

Year	Engines	Model Year	MECA Probability	Verified
2001	Cummins L-10	>1994	9	x
2001	Cummins M-11	>1994	8-10	x
2001	DDC Series 50	>1994	10	x
2002	Cummins L-10	1991-1993	9	
2002	Cummins M-11	1991-1993	8-10	
2002	DDC Series 40	1991-1993	10	
2002	DDC Series 50	1991-1993	10	
2003	Cummins M-11	1988 - 1990	Not available	
2003	Cummins M-11	<1988	Not available	
2003	DDC 6V-92	>1991	5-7	
2003	DDC 6V-92	1988 - 1990	5-7	
2003	DDC Series 50	1988 - 1990	Not available	
2003	DDC Series 50	<1988	Not available	
2003	DDC 6L-71	>1991	2-3	
2003	DDC 6L-71	1988 - 1990	2-3	
2003	DDC 6L-71	<1988	2-3	
2003	DDC 6V-71	>1991	2-3	
2003	DDC 6V-71	1988 - 1990	2-3	
2003	DDC 6V-71	<1988	2-3	
2003	DDC 6V-92	<1988	Not available	