

## **Appendix G**

**Verified Diesel Emission Control Strategies for Off-Road Applications  
(Last Updated October 2005)**

Table 1. Verified Diesel Emission Control Strategies for Off-road Applications

PM Level	Product Name	Technology Type	PM Reduction	NOx Reduction	Applicability
Level 1	Donaldson	DOC + crankcase filter	25%	N/A	Off-road applications: port equipment: yard tractors, large lift trucks, top picks, side picks and gantry cranes. Applicable to specified 1996-2003 MY engines. CARB or low sulfur (15 ppm) diesel. (Ref. No. RAS-03-15)
Level 1	Lubrizol ECS AZ Purifier and Purimuffler	DOC	25%	N/A	Off-road applications: port, railway yards and other intermodal/freight handling operations. Applicable to specified 1996-2002 MY engines. 15 ppm sulfur fuel. (Executive Order DE -04-003)
Level 1	Extengine	DOC + SCR	25%	80%	Off-road applications: rubber tired excavators, tuber tired loaders, rubber tired dozers, and utility tractor rigs (yard trucks). Applicable to specified 1991-1995 MY off-road Cummins 5.9L 150-200 Hp engines. CARB diesel. (Executive Order DE -05-001)
Level 2	Lubrizol ECS PuriNOx and AZ Purifier or Purimuffler	DOC + Alt Fuel (emulsified diesel)	50%	20%	Off-road applications: port, railway yards, and other intermodal/freight handling operations. Applicable to specified 1996-2002 MY engines. PuriNOx fuel. (Executive Order DE -04-007)
Level 3	Lubrizol ECS Unikat Combifilter	DPF with active regeneration	85%	N/A	Off-road applications: construction, material handling, and cargo handling. Applicable to specified 1996-2004 MY engines. CARB Diesel. (Executive Order DE -04-012)



Winston H. Hickox  
Agency Secretary

# Air Resources Board

Alan C. Lloyd, Ph.D.  
Chairman

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Gray Davis  
Governor

May 2, 2003

Mr. Steve Schmeichel, General Manager  
Exhaust – Emissions Business  
Donaldson Company, Inc.  
P.O. Box 1299  
Minneapolis, Minnesota 55440-1299

Reference No. RAS-03-15

Mr. Julian Imes, Director  
Exhaust/Emissions Technology  
Donaldson Company, Inc.  
P.O. Box 1299  
Minneapolis, Minnesota 55440-1299

Dear Mr. Steve Schmeichel and Mr. Julian Imes:

The Air Resources Board (ARB) has evaluated the Donaldson DCM diesel oxidation catalyst (DOC) mufflers with 6000 Series catalyst formulation plus closed loop crankcase with Donaldson Spiracle™ closed crankcase filtration system with California diesel or lower sulfur fuel strategy using the Verification Procedure for In-Use Strategies to Control Emissions from Diesel Engines in Appendix A of the Staff Report. Based on its evaluation of the data provided, ARB hereby verifies this system reduces emissions of diesel particulate matter (PM) by an average of at least 25%, which is consistent with a Level 1 system. This system may be used in four-stroke, turbocharged diesel engines ranging from 150 to 600 hp. A list of these engines may be found in Table 1 of Attachment A and may be placed on off-road engines used in yard tractors, large lift trucks, top picks, side picks and gantry cranes.

As specified in the Diesel Emission Control Strategy Verification Procedure, ARB assigns each Diesel Emission Control Strategy a family name and requires it to be included on a label to be affixed on both the diesel emission control system and the engine. The designated family name for this system is **CA/DON/2003/PM1/N00/OFF/SYS01**. This identification number along with other label information must be in the following format:

*The energy challenge facing California is real. Every Californian needs to take immediate action to reduce energy consumption. For a list of simple ways you can reduce demand and cut your energy costs, see our Website: <http://www.arb.ca.gov>.*

California Environmental Protection Agency

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Mr. Steve Schmeichel and Mr. Julian Imes  
May 2, 2003  
Page 2

**ARB Evaluation Label**

**Name, Address, and Phone Number of Manufacturer**

**CA/DON/2003/PM1/N00/OFF/SYS01**

**Product Serial Number**

**ZZ-ZZ (Month and Year of manufacture, e.g., 06-02)**

The ARB estimates that this system will not incur a fuel economy penalty when used in a compatible application.

Additionally, as stated in the Diesel Emission Control Strategy Verification Procedure, Donaldson Company, Inc. is responsible for honoring a warranty (Section 2707) and conducting in-use compliance testing (Section 2709).

Thank you for participating in ARB's diesel emission control strategy verification program. Should you have any questions or comments, please contact Ms. Annette Hebert, Branch Chief, Heavy-Duty Diesel In-Use Strategies Branch, at (626) 575-6973.

Sincerely,



Robert H. Cross, Chief  
Mobile Source Control Division

Attachment

The Donaldson DCM DOC mufflers with 6000 Series catalyst formulation plus closed loop crankcase with Donaldson Spiracle closed crankcase filtration system with California diesel or lower sulfur fuel may be used on these engine families.

#### CASE CORPORATION

Model Year	Engine Family	Engine Displacement (liters)
1996	TX9505R6DTRA	8.3
	TX9505R6DTRC	8.3
	TX9505R6DTRB	8.3
1997	VX9505R6DTRC	8.3
	VX9505R6DTRB	8.3
	VX9505R6DTRA	8.3
1998	WX9XL0505ACA	8.3
	WX9XL0505ABB	8.3
	WX9XL0505ABA	8.3
	WX9XL0505AAA	8.3
	WX9XL0359AAA	5.9
	WX9XL0505ABC	8.3
	WX9XL0359ABA	5.9
1999	XX9XL0505AAA	8.3
	XX9XL0359ABA	5.9
	XX9XL0505ABB	8.3
	XX9XL0505ACA	8.3
	XX9XL0505ABC	8.3
	XX9XL0505ABA	8.3
2000	YX9XL0505ABB	8.3
	YX9XL0505ABA	8.3
	YX9XL0505ACA	8.3
	YX9XL0359ABA	5.9
	YX9XL0505AAA	8.3
	YX9XL0505ABC	8.3
2001	1X9XL0540AAA	8.9
	1X9XL0505ABC	8.3
	1X9XL0505ACA	8.3
	1X9XL0359ABA	5.9
	1X9XL0505ABA	8.3
	1X9XL0505ABB	8.3
	1X9XL0505AAA	8.3
	1X9XL0359AAA	5.9
	1X9XL0505ACC	8.3

Model Year	Engine Family	Engine Displacement (liters)
2002	2X9XL0359ABA	5.9
	2X9XL0505AAA	8.3
	2X9XL0359AAA	5.9
	2X9XL0505ABA	8.3
	2X9XL0505ABB	8.3
	2X9XL0505ACA	8.3
	2X9XL0505ABD	8.3
	2X9XL0359ABB	5.9
	2X9XL0359ABB	5.9
	2X9XL0359ABE	5.9
	2X9XL0505ABC	8.3
	2X9XL0505ABC	8.3
	2X9XL0505ACC	8.3
	2X9XL0505ACC	8.3
2X9XL0540AAA	8.8	
2003	3X9XL0505ABD	8.3
	3X9XL0359AAC	5.9
	3X9XL0505ABC	8.3
	3X9XL0505ACC	8.3
	3X9XL0540AAA	8.8
	3X9XL0505AAB	8.3
3X9XL0359ABE	5.9	

The Donaldson DCM DOC mufflers with 6000 Series catalyst formulation plus closed loop crankcase with Donaldson Spiracle closed crankcase filtration system with California diesel or lower sulfur fuel may be used on these engine families.

**CATERPILLAR, INC.**

Model Year	Engine Family	Engine Displacement (liters)
1996	TCP10.RZDBRA	10.4
	TCP10.RZDBRC	10.4
	TCP10.RZDBRB	10.4
	TCP14.RZDBRC	14.6
	TCP12.RZDBRM	12
	TCP6.6RZDBRC	6.6
	TCP6.6RZDBRB	6.6
	TCP7.2RZDBRK	7.2
	TCP7.2RZDBRC	7.2
	TCP7.2RZDBRB	7.2
	TCP10.RZDBRF	10.5
	TCP10.RZDBRD	10.5
	TCP10.RZDBRG	10.5
	TCP18.RZDBRJ	18
	TCP14.RZDBRJ	14.6
	TCP18.RZDBRN	18
TCP10.RZDBRK	10.3	
1997	VCP10.RZDARA	10.4
	VCP10.RZDARC	10.4
	VCP10.RZDARF	10.5
	VCP10.RZDARG	10.5
	VCP10.RZDARK	10.3
	VCP12.RZDARM	12
	VCP14.RZDARC	14.6
	VCP14.RZDARJ	14.6
	VCP7.2RZDARK	7.2
	VCP18.RZDARJ	18
	VCP10.RZDARB	10.4
	VCP7.2RZDARB	7.2
	VCP6.6RZDARC	6.6
	VCP7.0RZDARB	7
	VCP6.6RZDARB	6.6
	VCP10.RZDARD	10.5
	VCP7.2RZDARC	7.2
VCP442DZDARK	7.1	

Model Year	Engine Family	Engine Displacement (liters)
1998	WCPXL06.6MRC	6.6
	WCPXL14.6ERK	14.6
	WCPXL10.3ERK	10.3
	WCPXL06.6MRB	6.6
	WCPXL07.2HRK	7.2
	WCPXL10.5MRD	10.5
	WCPXL07.2MRC	7.2
	WCPXL07.0MRB	7
	WCPXL27.0HRN	27
	WCPXL10.4MRC	10.4
	WCPXL15.8ERK	15.8
	WCPXL07.2MRB	7.2
	WCPXL10.4MRB	10.4
	WCPXL10.5MRG	10.5
	WCPXL14.6MRC	14.6
	WCPXL14.6MRJ	14.6
	WCPXL10.4MRA	10.4
WCPXL12.0ERM	12	
WCPXL10.5MRF	10.5	
WCPXL18.0MRJ	18	
1999	XCPXL10.4MRB	10.4
	XCPXL07.2MRC	7.2
	XCPXL07.2MRB	7.2
	XCPXL07.0MRB	7
	XCPXL10.5MRD	10.5
	XCPXL06.6MRB	6.6
	XCPXL10.4MRC	10.4
	XCPXL06.6MRC	6.6
	XCPXL10.3ERK	10.3
	XCPXL12.0ERM	12
	XCPXL10.4MRA	10.4
	XCPXL10.5MRF	10.5
	XCPXL18.0MRJ	18
XCPXL14.6MRJ	14.6	
XCPXL14.6MRC	14.6	
XCPXL10.5MRG	10.5	
XCPXL07.2HRK	7.2	

The Donaldson DCM DOC mufflers with 6000 Series catalyst formulation plus closed loop crankcase with Donaldson Spiracle closed crankcase filtration system with California diesel or lower sulfur fuel may be used on these engine families.

**CATERPILLAR, INC.**

Model Year	Engine Family	Engine Displacement (liters)
2000	YCPXL07.2HRK	7.2
	YCPXL06.6MRB	6.6
	YCPXL06.6MRC	6.6
	YCPXL07.0MRB	7
	YCPXL07.2MRB	7.2
	YCPXL07.2MRC	7.2
	YCPXL10.4MRA	10.4
	YCPXL10.4MRB	10.4
	YCPXL10.4MRC	10.4
	YCPXL10.5MRD	10.5
	YCPXL10.5MRF	10.5
	YCPXL10.5MRG	10.5
	YCPXL14.6MRC	14.6
	YCPXL14.6MRJ	14.6
	YCPXL18.0MRJ	18
	YCPXL10.3ERK	10.3
YCPXL12.0ERM	12	
2001	1CPXL06.6MRB	6.6
	1CPXL07.0MRB	7
	1CPXL06.6MRC	6.6
	1CPXL07.2MRB	7.2
	1CPXL07.2MRC	7.2
	1CPXL07.2HRK	7.2
	1CPXL10.4MRA	10.4
	1CPXL10.4MRB	10.4
	1CPXL10.4MRC	10.4
	1CPXL10.5MRD	10.5
	1CPXL10.5MRF	10.5
	1CPXL10.5MRG	10.5
	1CPXL14.6MRJ	14.6
	1CPXL06.6MRA	27
	1CPXL07.0MRA	7
	1CPXL10.3ESK	10.3
	1CPXL12.0ESK	12
	1CPXL14.6ESK	14.6
	1CPXL18.0HSK	18
	1CPXL07.2HSK	7.2

Model Year	Engine Family	Engine Displacement (liters)
2002	2CPXL08.8HSX	8.8
	2CPXL10.3ESX	10.3
	2CPXL06.6MRA	6.6
	2CPXL06.6MRB	6.6
	2CPXL06.6MRC	6.6
	2CPXL07.0MRA	7
	2CPXL07.0MRB	7
	2CPXL07.2MRB	7.2
	2CPXL07.2MRC	7.2
	2CPXL10.5MRF	10.5
	2CPXL10.5MRD	10.5
	2CPXL10.5MRG	10.5
	2CPXL18.0HSK	18
	2CPXL12.0ESK	12
	2CPXL08.8HSK	8.8
	2CPXL14.6ESK	14.6
	2CPXL10.3ESK	10.3
	2CPXL07.2HRK	7.2
2CPXL14.6MRJ	14.6	
2CPXL07.2HSX	7.2	
2CPXL07.2HSK	7.2	
2003	3CPXL07.2HSK	7.2
	3CPXL07.2HSL	7.2
	3CPXL08.8HSL	8.8
	3CPXL08.8HSK	8.8
	3CPXL12.0ESK	12
	3CPXL18.0HSK	18

The Donaldson DCM DOC mufflers with 6000 Series catalyst formulation plus closed loop crankcase with Donaldson Spiracle closed crankcase filtration system with California diesel or lower sulfur fuel may be used on these engine families.

**CUMMINS ENGINE COMPANY, INC.**

Model Year	Engine Family	Engine Displacement (liters)
1996	TCE855RGDTRA	14
	TCE855RJDTRA	14
	TCE359R6DTRA	5.9
	TCE505R6DTRA	8.3
	TCE661RGDTRA	10.8
	TCE19.RJDTRA	19
	TCE505R6DTRB	8.3
	TCE505R6DTRC	8.3
	TCE505R6DTRD	8.3
1997	VCE505R6DTRB	8.3
	VCE19.RJDTRA	19
	VCE855RGDTRA	14
	VCE661RGDTRA	10.8
	VCE505R6DTRA	8.3
	VCE505R6DTRC	8.3
	VCE505R6DTRD	8.3
	VCE855RGDTRA	14
	VCE359R6DTRB	5.9
1998	WCEXL0855AAB	14.0
	WCEXL0505AAA	8.3
	WCEXL0505ABB	8.3
	WCEXL0505ACA	8.3
	WCEXL0661AAA	10.8
	WCEXL0359AAA	5.9
	WCEXL0359ABA	5.9
	WCEXL0855AAA	14.0
	WCEXL019.AAA	19
	WCEXL0359ABB	5.9
	WCEXL0505ABA	8.3
	WCEXL0505ABC	8.3
	1999	XCEXL0505ABA
XCEXL019.AAA		19
XCEXL0855AAB		14
XCEXL0661AAB		10.8
XCEXL0505ABC		8.3
XCEXL0359ABB		5.9
XCEXL0505AAA		8.3
XCEXL0505ABB		8.3
XCEXL0505ACA		8.3
XCEXL0661AAA		10.8
XCEXL0855AAA		14
XCEXL0359ABA		5.9

Model Year	Engine Family	Engine Displacement (liters)
2000	YCEXL0359ABA	5.9
	YCEXL0661AAA	11
	YCEXL019.AAA	19
	YCEXL0855AAA	14
	YCEXL0505AAA	8.3
	YCEXL0505ABB	8.3
	YCEXL0505ABC	8.3
	YCEXL0505ACA	8.3
	YCEXL0505ABA	8.3
	YCEXL0359ABB	5.9
2001	YCEXL0661AAB	11
	YCEXL0855AAB	14
	1CEXL0540AAA	8.9
	1CEXL0661AAC	10.9
	1CEXL015.AAA	15
	1CEXL0359AAA	5.9
	1CEXL0505ABA	8.3
	1CEXL0505AAA	8.3
	1CEXL0505ABB	8.3
	1CEXL0505ABC	8.3
	1CEXL0505ACA	8.3
	1CEXL0359ABC	5.9
	1CEXL0359ABB	5.9
	1CEXL0359ABA	5.9
	1CEXL019.AAC	19
	1CEXL0661AAB	10.9
	1CEXL0661AAA	10.9
	1CEXL0505ACC	8.3
	1CEXL0359ADA	5.9
	1CEXL0505ACD	8.3
1CEXL0505ACE	8.3	
1CEXL0359ABD	5.9	
1CEXL015.AAA	15	
1CEXL0359AAA	5.9	
1CEXL0505AAA	8.3	
1CEXL0505ABB	8.3	
1CEXL0505ABC	8.3	
1CEXL0505ACB	8.3	
1CEXL0359ABB	5.9	
1CEXL0661AAA	10.8	
1CEXL0661AAB	10.8	
1CEXL0505ABA	8.3	
1CEXL0661AAD	10.9	



The Donaldson DCM DOC mufflers with 6000 Series catalyst formulation plus closed loop crankcase with Donaldson Spiracle closed crankcase filtration system with California diesel or lower sulfur fuel may be used on these engine families.

**CUMMINS ENGINE COMPANY, INC.**

Model Year	Engine Family	Engine Displacement (liters)
2002	2CEXL0661AAB	10.8
	2CEXL0661AAA	10.8
	2CEXL0359AAA	5.9
	2CEXL0359ABA	5.9
	2CEXL0359ABC	5.9
	2CEXL0359ABD	5.9
	2CEXL0359ADA	5.9
	2CEXL0505AAA	8.3
	2CEXL0505ABA	8.3
	2CEXL0505ABB	8.3
	2CEXL0505ACA	8.3
	2CEXL0505ACD	8.3
	2CEXL0505ACE	8.3
	2CEXL0661AAC	10.8
	2CEXL0661AAC	10.8
	2CEXL0505ABD	8.3
	2CEXL015.AAA	15
	2CEXL0359ABB	5.9
	2CEXL0359ABE	5.9
	2CEXL0505ABC	8.3
	2CEXL0505ACC	8.3
	2CEXL0540AAA	8.8
	2CEXL0661AAD	10.3
2CEXL0505ACB	8.3	
2003	3CEXL0359AAB	5.9
	3CEXL0359ABC	5.9
	3CEXL0505ABD	8.3
	3CEXL0505ACB	8.3
	3CEXL0661AAC	10.8
	3CEXL0540AAA	8.8
	3CEXL0359AAC	5.9
	3CEXL0359AAD	5.9
	3CEXL0505ABC	8.3
	3CEXL0505ACC	8.3
	3CEXL0661AAD	10.8
	3CEXL0661AAE	10.8
	3CEXL0359ABE	5.9
	3CEXL0409AAA	6.7

The Donaldson DCM DOC mufflers with 6000 Series catalyst formulation plus closed loop crankcase with Donaldson Spiracle closed crankcase filtration system with California diesel or lower sulfur fuel may be used on these engine families.

#### DETROIT DIESEL CORPORATION

Model Year	Engine Family	Engine Displacement (liters)
1996	TDD8.5TJDARE	8.5
	TDD5.2TG4ARE	5.2
	TDD12.TJDARE	12.7
	TDD11.TJDARE	11.1
	TDD11.TJDARE	12
1997	VDD11.TJDARE	11.1
	VDD8.5TJDARE	8.5
1998	WDDXL12.1TFM	9
	WMUXL12.0G2V	12
	VDDXL08.5TJD	8.5
	WDDXL11.1THD	11.1
	WDDXL12.7TGD	12.7
	WDDXL09.0TFE	9
1999	XDDXL09.1TFE	9
	XDDXL04.7TAE	4.7
	XDDXL12.7TGD	12.7
	XDDXL11.1THD	11.1
	XDDXL08.5TJD	8.5
	XDDXL05.2TMD	5.2
	XDDXL12.1TFM	9
	XDDXL12.1TFM	12.1
2000	YDDXL05.2TDM	5.2
	YDDXL04.7TAE	4.7
	YDDXL12.1TFM	12.1
	YDDXL09.0TFE	9
	YDDXL08.5TJD	8.5
	YDDXL11.1THD	11.1
	YDDXL12.7TGD	12.7
2001	1DDXL04.7TAE	3.1
	1DDXL05.2TDM	5.2
	1DDXL08.5TJD	8.5
	1DDXL08.5YJD	8.5
	1DDXL14.0VLD	14
2002	2DDXL04.7TAE	4.7
	2DDXL05.2TDM	5.2
	2DDXL08.5YJD	8.5
	2DDXL12.7VGD	12.7
2003	3DDXL08.5YJD	8.5
	3DDXL12.7VGD	12.7

The Donaldson DCM DOC mufflers with 6000 Series catalyst formulation plus closed loop crankcase with Donaldson Spiracle closed crankcase filtration system with California diesel or lower sulfur fuel may be used on these engine families.

**KOMATSU, LTD.**

Model Year	Engine Family	Engine Displacement (liters)
1996	TKL23.RZDARB	23.2
	TKL23.RZDARA	23.2
	TKL15.RZDARA	15.2
	TKL15.RZDARC	15.2
	TKL15.RZDARB	15.2
	TKD505R6DTRA	8.3
	TKD505R6DTRC	8.3
	TKL11.RZDARB	11
	TKL11.RZDARC	11
	TKL11.RZDARA	11
1997	VKD505R6DTRC	8.3
	VKD505R6DTRA	8.3
1998	WKDXL0505AAA	8.3
	WKDXL0505ABB	8.3
	WKDXL0359ABA	5.9
	WKDXL0359AAA	5.9
	WKLXL15.2EB1	15.2
	WKLXL11.0DC1	11
	WKLXL23.2FB1	23.2
	WKLXL7.15CC1	7.2
	WKLXL15.2ED1	15.2
	WKLXL7.15CB1	7.2
	WKLXL15.2EB1	15.2
	WKLXL11.0DB1	11
1999	XKLXL15.2ED1	15.2
	XKLXL23.2FB1	23.2
	XKLXL15.2EC1	15.2
	XKLXL15.2EB1	15.2
	XKLXL11.0DC1	11
	XKLXL11.0DB1	11
	XKLXL7.15CC1	7.2
	XKLXL7.15CB1	7.2
	XKDXL0359ABA	5.9
	XKDXL0505ACA	8.3
	XKDXL0505AAA	8.3
	XKDXL0505ABB	8.3

Model Year	Engine Family	Engine Displacement (liters)
2000	YKLXL7.15CC1	7.2
	YKLXL11.0DC1	11
	YKLXL15.2EC1	15.2
	YKLXL15.2ED1	15.2
	YKLXL23.2FB1	23.2
	YKLXL7.15CB1	5.2
	YKLXL15.2EB1	15.2
	YKLXL11.0DB1	11
	YKLXL0359ABA	5.9
	YKLXL0505ACA	8.3
	YKLXL0505AAA	8.3
YKLXL0505ABB	8.3	
2001	1KLXL15.2EC3	15.2
	1KLXL15.2ED3	15.2
	1KLXL11.0DD3	11
	1KLXL23.2FD3	23.2
	1KLXL15.2EB1	15.2
	1KLXL7.15CB1	7.2
	1KLXL7.15CC1	7.2
	1KLXL7.15CD1	7.2
	1KLXL7.15CD1	7.2
	1KLXL11.0DB1	11
	1KLXL11.0DC1	11
	1KLXL0359ABC	5.9
	1KLXL0359ABA	5.9
	1KLXL0505ABB	8.3
	1KLXL0505AAA	8.3
1KLXL0359AAA	5.9	
1KLXL0505ACA	8.3	
1KLXL11.0DD4	11	
1KLXL23.2FC3	23.2	

The Donaldson DCM DOC mufflers with 6000 Series catalyst formulation plus closed loop crankcase with Donaldson Spiracle closed crankcase filtration system with California diesel or lower sulfur fuel may be used on these engine families.

**KOMATSU, LTD.**

Model Year	Engine Family	Engine Displacement (liters)
2002	2KLXL15.2EE3	15.2
	2KLXL7.15CB1	7.2
	2KLXL7.15CC1	7.2
	2KLXL7.15CD1	7.2
	2KLXL11.0DA1	11
	2KLXL11.0DB1	11
	2KLXL11.0DC1	11
	2KLXL11.0DD3	11
	2KLXL11.0DD4	11
	2KLXL15.2EB1	15.2
	2KLXL15.2EC3	15.2
	2KLXL15.2ED3	15.2
	2KLXL23.2FC3	23.2
	2KLXL0359AAA	5.9
	2KLXL0359ABA	5.9
	2KLXL0359ABC	5.9
	2KLXL0505AAA	8.3
	2KLXL0505ABB	8.3
	2KLXL0505ACA	8.3
	2KLXL0505ABD	8.3
2KLXL11.0DC3	11	
2KLXL11.0DD5	11	
2KLXL11.0DD6	11	
2003	3KLXL0359ABC	5.9
	3KLXL0505ABD	8.3
	3KLXL11.0DD3	11
	3KLXL15.2EE3	15.2
	3KLXL15.2ED3	15.2
	3KLXL15.2EC3	15.2
	3KLXL11.0DD5	11
	3KLXL11.0DC3	11
	3KLXL23.2FC3	23.2
	3KLXL0359AAB	5.9

**State of California  
AIR RESOURCES BOARD**

**EXECUTIVE ORDER DE-04-003**

Pursuant to the authority vested in the Air Resources Board (ARB) by Health and Safety Code, Division 26, Part 5, Chapter 2; and pursuant to the authority vested in the undersigned by Health and Safety Code section 39515 and 39616 and Executive Order G-02-003;

Relating to Verification under sections 2700 through 2710 of Title 13 of the California Code of Regulations

Lubrizol Engine Control Systems  
AZ Purifier™ and AZ Purimuffler™

The ARB has reviewed Lubrizol Engine Control System's request for verification of the AZ Purifier™ and AZ Purimuffler™. Based on an evaluation of the data provided, and pursuant to the terms and conditions specified below, the Executive Officer of ARB hereby finds that the AZ Purifier™ and AZ Purimuffler™ reduce emissions of diesel particulate matter (PM) consistent with a Level 1 device (greater than or equal to 25 percent reductions) (Title 13 California Code of Regulations ("CCR") sections 2702 (f) and (g) and section 2708). Accordingly, the Executive Officer determines that the system merits verification and, subject to the terms and conditions specified below, classifies the AZ Purifier™ and AZ Purimuffler™ as a Level 1 system, for the off-road applications: port, railway yards, and other intermodal/freight handling operations.

The aforementioned verification is subject to the following terms and conditions:

- Off-road diesel engines (model year 1996 to 2002) manufactured by Cummins, Inc., Navistar (International Truck and Engine Corporation), Case Corporation, and Komatsu Ltd. listed in Attachment 1.
- The engine is a four-stroke.
- The engine can be turbocharged or naturally aspirated.
- The engine can be mechanically or electronically injected
- The engine should be well maintained and not consume lubricating oil at a rate greater than that specified by the engine manufacturer.
- Lube oil, or other oil, should not be mixed with the fuel.
- The engine must be operated on fuel that has a sulfur content of no more than 15 parts per million by weight.
- The other terms and conditions specified below.

IT IS ALSO ORDERED AND RESOLVED: That installation of the AZ Purifier™ and AZ Purimuffler™, manufactured by Lubrizol Engine Control Systems of 165 Pony Drive, Newmarket, Ontario, Canada L3Y 7V1, has been found not to reduce the effectiveness of the applicable vehicle pollution control system, and therefore, the AZ Purifier™ and AZ Purimuffler™ is exempt from the prohibitions in section 27156 of the Vehicle Code for installation on off-road engines listed in Attachment 1.

This exemption is only valid provided the engines meet the aforementioned conditions.

The AZ Purifier™ and AZ Purimuffler™ consists of a passive diesel oxidation catalyst(s). The major components of the AZ Purifier™ and AZ Purimuffler™ are identified in Attachment 2.

This Executive Order is valid provided that installation instructions for the AZ Purifier™ and AZ Purimuffler™ do not recommend tuning the off-road equipment to specifications different from those of the off-road equipment manufacturer.

Changes made to the design or operating conditions of the AZ Purifier™ and AZ Purimuffler™, as verified by ARB, which adversely affect the performance of the off-road equipment's pollution control system, shall invalidate this Executive Order.

No changes are permitted to the device. ARB must be notified in writing of any changes to any part of the AZ Purifier™ and AZ Purimuffler™. Any changes to the device must be evaluated and approved by ARB. Failure to do so shall invalidate this Executive Order.

Marketing of the AZ Purifier™ and AZ Purimuffler™ using identification other than that shown in this Executive Order or for an application other than that listed in this Executive Order shall be prohibited unless prior approval is obtained from ARB.

This Executive Order shall not apply to any AZ Purifier™ and AZ Purimuffler™ advertised, offered for sale, sold with, or installed on an off-road equipment prior to or concurrent with transfer to an ultimate purchaser.

As specified in the Diesel Emission Control Strategy Verification Procedure (Title 13 CCR section 2706 (i)), ARB assigns each Diesel Emission Control Strategy a family name. The designated family name for the verification as outlined above is: CA/LUB/2004/PM1/N00/OF/DOC01.

Additionally, as stated in the Diesel Emission Control Strategy Verification Procedure, Lubrizol Engine Control Systems is responsible for honoring their warranty (section 2707) and conducting in-use compliance testing (section 2709).

In addition to the foregoing, ARB reserves the right in the future to review this Executive Order and the exemption and verification provided herein to assure that the exempted

and verified add-on or modified part continues to meet the standards and procedures of California Code of Regulations, Title 13, section 2222, et seq and California Code of Regulations, Title 13, sections 2700 through 2710.

Off-road equipment certified under this Executive Order shall conform to all applicable California emissions regulations.

Violation of any of the above conditions shall be grounds for revocation of this Executive Order.

Executed at El Monte, California this 10 day of May 2004.

/s/

Robert H. Cross, Chief  
Mobile Source Control Division

Attachment 1: ARB Approved Engine Families for the AZ Purifier™ and AZ Purimuffler™

Attachment 2: Part Numbers and Model Numbers of the AZ Purifier™ and AZ Purimuffler™

Model Year	Engine Family	Displacement, L	Model Year	Engine Family	Displacement, L
<b>Cummins</b>					
1996	TCE359R6DTRA	5.9	2001	1CEXL0239AAA	3.9
	TCE505R6DTRA	8.3		1CEXL0239AAC	3.9
	TCE505R6DTRB	8.3		1CEXL0239ABA	3.9
	TCE505R6DTRC	8.3		1CEXL0239ACA	3.9
	TCE505R6DTRD	8.3		1CEXL0239ADA	3.9
	TCE661RGDTRA	10.8		1CEXL0239AEA	3.9
	TCE855RGDTRA	14		1CEXL0239AFA	3.9
	TCE855RJDTRA	14		1CEXL0359AAA	5.9
	TCE19.RJDTRA	19		1CEXL0359ABA	5.9
	TCE19.RJDTRB	19		1CEXL0359ABB	5.9
1997	VCE359R6DTRB	5.9	1CEXL0359ABC	5.9	
	VCE505R6DTRA	8.3	1CEXL0359ABD	5.9	
	VCE505R6DTRB	8.3	1CEXL0359ACA	5.9	
	VCE505R6DTRC	8.3	1CEXL0359ADA	5.9	
	VCE505R6DTRD	8.3	1CEXL0505AAA	8.3	
	VCE661RGDTRA	10.8	1CEXL0505ABA	8.3	
	VCE855RGDTRA	14	1CEXL0505ABB	8.3	
	VCE19.RJDTRA	19	1CEXL0505ABC	8.3	
	VCE19.RJDTRB	19	1CEXL0505ACB	8.3	
				1CEXL0505ACC	8.3
1998	WCEXL0359AAA	5.9	1CEXL0505ACD	8.3	
	WCEXL0359ABA	5.9	1CEXL0505ACE	8.3	
	WCEXL0359ABB	5.9	1CEXL0661AAA	10.8	
	WCEXL0505AAA	8.3	1CEXL0661AAB	10.8	
	WCEXL0505ABA	8.3	1CEXL0661AAC	10.8	
	WCEXL0505ABB	8.3	1CEXL0661AAD	10.8	
	WCEXL0505ABC	8.3	1CEXL015.AAA	15	
	WCEXL0505ACA	8.3	1CEXL015.ABA	15	
	WCEXL0661AAA	10.8	1CEXL019.AAB	19	
	WCEXL0855AAA	14	1CEXL019.AAC	19	
	WCEXL0855AAB	14			
	WCEXL019.AAA	19			
	WCEXL019.AAB	19			
1999	XCEXL0359ABA	5.9	2002	2CEXL0239AAA	3.9
	XCEXL0359ABB	5.9		2CEXL0239AAC	3.9
	XCEXL0505AAA	8.3		2CEXL0239AAE	3.9
	XCEXL0505ABA	8.3		2CEXL0239ABA	3.9
	XCEXL0505ABB	8.3		2CEXL0239ACA	3.9
	XCEXL0505ABC	8.3		2CEXL0239ADA	3.9
	XCEXL0505ACA	8.3		2CEXL0239AEA	3.9
	XCEXL0661AAA	10.8		2CEXL0239AFA	3.9
	XCEXL0661AAB	10.8		2CEXL0359AAA	5.9
	XCEXL0855AAA	14		2CEXL0359ABA	5.9
	XCEXL0855AAB	14		2CEXL0359ABB	5.9
	XCEXL019.AAA	19		2CEXL0359ABC	5.9
	XCEXL019.AAB	19		2CEXL0359ABD	5.9
		2CEXL0359ABE	5.9		
2000	YCEXL0359ABA	5.9	2CEXL0359ACA	5.9	
	YCEXL0359ABB	5.9	2CEXL0359ADA	5.9	
	YCEXL0505AAA	8.3	2CEXL0505AAA	8.3	
	YCEXL0505ABA	8.3	2CEXL0505ABA	8.3	
	YCEXL0505ABB	8.3	2CEXL0505ABB	8.3	



YCEXL0505ABC	8.3	2CEXL0505ABC	8.3		
YCEXL0505ACA	8.3	2CEXL0505ABD	8.3		
YCEXL0661AAA	10.8	2CEXL0505ACA	8.3		
YCEXL0661AAB	10.8	2CEXL0505ACB	8.3		
YCEXL0855AAA	14	2CEXL0505ACC	8.3		
YCEXL0855AAB	14	2CEXL0505ACD	8.3		
YCEXL015.ABA	15	2CEXL0505ACE	8.3		
YCEXL019.AAA	19	2CEXL0661AAA	10.8		
YCEXL019.AAB	19	2CEXL0661AAB	10.8		
		2CEXL0661AAC	10.8		
		2CEXL0661AAD	10.8		
		2CEXL015.AAA	15		
		2CEXL015.AAB	15		
		2CEXL015.ABA	15		
		2CEXL019.AAB	19		
		2CEXL019.AAC	19		
<b>Case</b>					
1996	TX9505R6DTRA	8.3	2001	1X9XL0239AAA	3.9
	TX9505R6DTRB	8.3		1X9XL0239AAB	3.9
	TX9505R6DTRC	8.3		1X9XL0239AAC	3.9
1997	VX9505R6DTRA	8.3		1X9XL0239ABA	3.9
	VX9505R6DTRB	8.3		1X9XL0239ACA	3.9
	VX9505R6DTRC	8.3		1X9XL0239ADA	3.9
1998	WX9XL0239ABA	3.9		1X9XL0359AAA	5.9
	WX9XL0239ACA	3.9		1X9XL0359ABA	5.9
	WX9XL0359AAA	5.9		1X9XL0505AAA	8.3
	WX9XL0359ABA	5.9		1X9XL0505ABA	8.3
	WX9XL0505AAA	8.3		1X9XL0505ABB	8.3
	WX9XL0505ABA	8.3		1X9XL0505ABC	8.3
	WX9XL0505ABB	8.3		1X9XL0505ACA	8.3
	WX9XL0505ABC	8.3		1X9XL0505ACC	8.3
	WX9XL0505ACA	8.3	2002	2X9XL0239AAA	3.9
1999	XX9XL0359ABA	5.9		2X9XL0239AAB	3.9
	XX9XL0505AAA	8.3		2X9XL0239AAC	3.9
	XX9XL0505ABA	8.3		2X9XL0239ABA	3.9
	XX9XL0505ABB	8.3		2X9XL0239ACA	3.9
	XX9XL0505ABC	8.3		2X9XL0239ADA	3.9
	XX9XL0505ACA	8.3		2X9XL0359AAA	5.9
2000	YX9XL0359ABA	5.9		2X9XL0359ABA	5.9
	YX9XL0505AAA	8.3		2X9XL0359ABB	5.9
	YX9XL0505ABA	8.3		2X9XL0359ABE	5.9
	YX9XL0505ABB	8.3		2X9XL0505AAA	8.3
	YX9XL0505ABC	8.3		2X9XL0505ABA	8.3
	YX9XL0505ACA	8.3		2X9XL0505ABB	8.3
				2X9XL0505ABC	8.3
				2X9XL0505ABD	8.3
				2X9XL0505ACA	8.3
				2X9XL0505ACC	8.3
<b>Komatsu</b>					
1996	TKD505R6DTRA	8.3	2001	1KLXL0239AAA	3.9
	TKD505R6DTRC	8.3		1KLXL0239ABA	3.9
	TKL11.RZDARA	11		1KLXL0239ACA	3.9

	TKL11.RZDARB	11		1KLXL0359AAA	5.9
	TKL11.RZDARC	11		1KLXL0359ABA	5.9
1997	VKD505R6DTRA	8.3		1KLXL0359ABC	5.9
	VKD505R6DTRC	8.3		1KLXL0359ACA	5.9
1998	WKDXL0239AAA	3.9		1KLXL0505AAA	8.3
	WKDXL0239ABA	3.9		1KLXL0505ABB	8.3
	WKDXL0239ACA	3.9		1KLXL0505ACA	8.3
	WKDXL0359AAA	5.9		1KLXL11.0DA1	11
	WKDXL0359ABA	5.9		1KLXL11.0DB1	11
	WKDXL0505AAA	8.3		1KLXL11.0DC1	11
	WKDXL0505ABB	8.3		1KLXL11.0DD3	11
	WKLXL11.0DA1	11		1KLXL11.0DD4	11
	WKLXL11.0DB1	11	2002	2KLXL0239AAA	3.9
	WKLXL11.0DC1	11		2KLXL0239ABA	3.9
1999	XKDXL0359ABA	5.9		2KLXL0239ACA	3.9
	XKDXL0505AAA	8.3		2KLXL0239ADA	3.9
	XKDXL0505ABB	8.3		2KLXL0359AAA	5.9
	XKDXL0505ACA	8.3		2KLXL0359ABA	5.9
	XKLXL11.0DA1	11		2KLXL0359ABC	5.9
	XKLXL11.0DB1	11		2KLXL0359ACA	5.9
	XKLXL11.0DC1	11		2KLXL0505AAA	8.3
2000	YKLXL0359ABA	5.9		2KLXL0505ABB	8.3
	YKLXL0505AAA	8.3		2KLXL0505ABD	8.3
	YKLXL0505ABB	8.3		2KLXL0505ACA	8.3
	YKLXL0505ACA	8.3		2KLXL11.0DA1	11
	YKLXL11.0DA1	11		2KLXL11.0DB1	11
	YKLXL11.0DB1	11		2KLXL11.0DC1	11
	YKLXL11.0DC1	11		2KLXL11.0DC3	11
				2KLXL11.0DD3	11
				2KLXL11.0DD4	11
				2KLXL11.0DD5	11
				2KLXL11.0DD6	11
<b>Navistar (International)</b>					
1996	TNV466R6DARA	7.6	1999	XNVXL0466ANA	7.6
	TNV466R6DARB	7.6		XNVXL0466BNA	7.6
	TNV466R6DASC	7.6		XNVXL0530ANA	8.7
	TNV466R6DASD	7.6		XNVXL0530ANB	8.7
	TNV530R6DARA	8.7		XNVXL0530ANC	8.7
	TNV530R6DARB	8.7		XNVXL0530AND	8.7
	TNV530R6DASD	8.7		XNVXL0530BNA	8.7
	TNV530R8DASC	8.7		XNVXL0530BNB	8.7
	TNV530R8DASE	8.7		XNVXL0530BNC	8.7
				XNVXL0530BND	8.7
1997	VNV466R6DASC	7.6	2000	YNVXL0466ANA	7.6
	VNV466R6DASD	7.6		YNVXL0530ANA	8.7
	VNV530R6DARA	8.7		YNVXL0530ANB	8.7
	VNV530R6DARB	8.7		YNVXL0530ANC	8.7
	VNV530R6DASC	8.7		YNVXL0530AND	8.7
	VNV530R6DASD	8.7			
	VNV530R8DARA	8.7	2001	1NVXL0466ANA	7.6
	VNV530R8DASC	8.7		1NVXL0530ANA	8.7
	VNV530R8DASE	8.7		1NVXL0530ANB	8.7
1998	WNVXL0466BNA	7.6		1NVXL0530ANC	8.7

WNVXL0530ANA	8.7	1NVXL0530AND	8.7
WNVXL0530ANB	8.7	1NVXL0530ANE	8.7
WNVXL0530BNA	8.7	1NVXL0530ANF	8.7
WNVXL0530BNB	8.7	2002 2NVXL0466ANA	7.6
WNVXL0530BNC	8.7	2NVXL0530ANA	8.7
WNVXL0530BND	8.7	2NVXL0530ANB	8.7
		2NVXL0530ANC	8.7
		2NVXL0530AND	8.7
		2NVXL0530ANE	8.7
		2NVXL0530ANF	8.7

**State of California  
AIR RESOURCES BOARD**

**EXECUTIVE ORDER DE-05-001**

Pursuant to the authority vested in the Air Resources Board (ARB) by Health and Safety Code, Division 26, Part 5, Chapter 2; and pursuant to the authority vested in the undersigned by Health and Safety Code Section 39515 and 39616 and Executive Order G-02-003;

Relating to Exemptions under Section 27156 of the Vehicle Code, and Verification under Sections 2700 through 2710 of Title 13 of the California Code of Regulations

Extengine Transport Systems, LLC (Extengine)  
Advanced Diesel Emission Control (ADEC) System

ARB has reviewed Extengine’s request for verification of the ADEC system. Based on an evaluation of the data provided, and pursuant to the terms and conditions specified below, the Executive Officer of ARB hereby finds that the ADEC system reduces emissions of diesel particulate matter (PM) consistent with a Level 1 device (greater than or equal to 25 percent reductions) and emissions of oxides of nitrogen (NOx) at a level of 80 percent (Title 13 California Code of Regulations (“CCR”) Sections 2702 (f) and (g) and Section 2708). Accordingly, the Executive Officer determines that the system merits verification and, subject to the terms and conditions specified below, classifies the ADEC system as a Level 1 system for the engines and applications listed in Table 1.

Table 1: Appropriate Engines and Applications for the ADEC System

Diesel Emission Control Strategy	Engines	Applications
ADEC System	1991-1995 Model Year Off-road Cummins 5.9-liter 150-200 Horsepower	Rubber Tired Excavators, Rubber Tired Loaders, Rubber Tired Dozers, and Utility Tractor Rigs (UTRs)

The aforementioned verification is subject to the following terms and conditions:

- The engines are originally manufactured by Cummins from model year 1991 through 1995, belong to the off-road 5.9-liter series, and are rated at between 150 to 200 horsepower.
- The application must have a duty cycle with an average exhaust temperature profile greater than 180 degrees Celsius for at least 55 percent of the operating cycle.
- The engine must not employ exhaust gas recirculation.
- The engine must not have a pre-existing oxidation catalyst.

- The engine must not have a pre-existing diesel particulate filter.
- The engine must be four-stroke.
- The engine must be turbocharged.
- The engine must be mechanically controlled.
- The engine should be well maintained and not consume lubricating oil at a rate greater than that specified by the engine manufacturer.
- The engines must be operated on fuel that has a sulfur content of no more than 500 parts per million by weight.
- Only Extengine may replace empty ammonia cylinders with refilled cylinders.
- The other terms and conditions specified below.

IT IS ALSO ORDERED AND RESOLVED: That installation of the ADEC system, manufactured by Extengine Transport Systems, LLC, of 1370 South Acacia Avenue, Fullerton, California 92831, has been found not to reduce the effectiveness of the applicable vehicle pollution control system.

The ADEC system consists of a diesel oxidation catalyst, a selective catalytic reduction catalyst, an ammonia slip catalyst, an anhydrous ammonia injection and storage system, an electronic control unit, and various sensors. The major components of the ADEC system are identified in Attachment 1.

The ADEC system requires the use of pressurized anhydrous ammonia. Anhydrous ammonia is a very hazardous substance. This Executive Order makes no determination concerning the safety of the ADEC system. Extengine is responsible for informing end-users of anhydrous ammonia safety procedures. Only Extengine may replace empty ammonia cylinders with refilled cylinders.

This Executive Order is valid only for the ammonia injection timing map designated by the code "ADEC ECU MAP 001."

This Executive Order is valid provided that installation instructions for the ADEC system do not recommend tuning the vehicle to specifications different from those of the vehicle manufacturer.

Changes made to the design or operating conditions of the ADEC system, as verified by ARB, which adversely affect the performance of the vehicle's pollution control system, shall invalidate this Executive Order.

No changes are permitted to the device. The ARB must be notified in writing of any changes to any part of the ADEC system. Any changes to the device must be evaluated and approved by ARB. Failure to do so shall invalidate this Executive Order.

Marketing of the ADEC system using identification other than that shown in this Executive Order or for an application other than that listed in this Executive Order shall be prohibited unless prior approval is obtained from ARB.

This Executive Order shall not apply to any ADEC system advertised, offered for sale, sold with, or installed on a motor vehicle prior to or concurrent with transfer to an ultimate purchaser.

The ARB estimates that the ADEC system might incur an average fuel economy penalty of 1.0 percent.

As specified in the Diesel Emission Control Strategy Verification Procedure (Title 13 CCR Section 2706 (g)), the ARB assigns each Diesel Emission Control Strategy a family name. The designated family name for the verification as outlined above is: CA/EXT/2005/PM1/N80/OFF/SYS01.

Additionally, as stated in the Diesel Emission Control Strategy Verification Procedure, Extengine is responsible for honoring the required warranty (Section 2707) and conducting in-use compliance testing (Section 2709).

In addition to the foregoing, ARB reserves the right in the future to review this Executive Order and the verification provided herein to assure that the verified add-on or modified part continues to meet the standards and procedures of the California Code of Regulations, Title 13, Sections 2700 through 2710.

The ADEC system utilizes selective catalytic reduction with ammonia as the reductant. This technology has the potential for generating a number of toxic compounds in the exhaust, but it is unknown at this time if these compounds are present in any significant quantity to pose a health risk. ARB will continue to study this potential concern as more information becomes available.

Systems verified under this Executive Order shall conform to all applicable California emissions regulations.

Violation of any of the above conditions shall be grounds for revocation of this Executive Order.

Executed at El Monte, California, this 20<sup>th</sup> day of January 2005.

//s//

Robert H. Cross, Chief  
Mobile Source Control Division

Attachment 1: Parts List for the Extengine ADEC System

**State of California  
AIR RESOURCES BOARD**

**EXECUTIVE ORDER DE-04-007**

Pursuant to the authority vested in the Air Resources Board (ARB) by Health and Safety Code, Division 26, Part 5, Chapter 2; and pursuant to the authority vested in the undersigned by Health and Safety Code section 39515 and 39616 and Executive Order G-02-003;

Relating to Exemptions under section 27156 of the Vehicle Code, and Verification under sections 2700 through 2710 of Title 13 of the California Code of Regulations

Lubrizol Engine Control Systems  
PuriNOx™ and AZ Purimuffler™ or AZ Purifier™ System  
(PuriNOx™ is also known as Performix™)

ARB has reviewed Lubrizol Engine Control Systems (LZ-ECS) 's request for verification of the PuriNOx™ and AZ Purimuffler™ or AZ Purifier™ system. Based on an evaluation of the data provided, and pursuant to the terms and conditions specified below, the Executive Officer of ARB hereby finds that PuriNOx™ and AZ Purimuffler™ or AZ Purifier™ System reduces emissions of diesel particulate matter (PM) consistent with a Level 2 device (greater than or equal to 50 percent reductions) and reduces oxides of nitrogen emissions by 20 percent (Title 13 California Code of Regulations ("CCR") sections 2702 (f) and (g) and section 2708). Accordingly, the Executive Officer determines that the system merits verification and, subject to the terms and conditions specified below, classifies the PuriNOx™ and AZ Purimuffler™ or AZ Purifier™ System as a Level 2 system, for the applications listed in Table 1 and engine families listed in Attachment 1.

Table 1: Appropriate Applications for the PuriNOx™ and AZ Purimuffler™ or AZ Purifier™ System

Diesel Emission Control Strategy	Application
PuriNOx™ and AZ Purimuffler™ or AZ Purifier™ System	Off-Road Port, Railway Yards, and other Intermodal/Freight Handling Operation Applications only

The aforementioned verification is subject to the following terms and conditions:

- The engines are originally manufactured from model year 1996 through 2002 having the engine family numbers listed in Attachment 1.
- The engines do not employ exhaust gas recirculation.
- The application must be able to tolerate a reduced peak engine power of 20 percent.
- The engine must not use optical or conductive fuel sensors, nor water absorbing fuel filters.
- The engine must not use the following models of the Bosch fuel pump: VP30, and VP44.
- The vendor must ensure that customers are fully aware of the attached application, storage and usage requirements.
- The customer must meet the application storage and usage requirements.
- The engine must not have a pre-existing diesel particulate filter or diesel oxidation catalyst.
- The engine must be certified in California for off-road applications.
- The engine must be certified at a PM emission level of at most 0.4 grams per brake horsepower-hour (g/bhp-hr), and greater than 0.01 g/bhp-hr.
- The engine must be four-stroke.
- The engine can be turbocharged or naturally aspirated.
- The engine can be mechanically or electronically injected.
- The engine should be well maintained and not consume lubricating oil at a rate greater than that specified by the engine manufacturer.
- Lube oil, or other oil, should not be mixed with the fuel.
- The engine must be operated on PuriNOx™ emulsified diesel fuel.
- The other terms and conditions specified below.

IT IS ALSO ORDERED AND RESOLVED: That installation of the PuriNOx™ and AZ Purimuffler™ or AZ Purifier™ System, manufactured by Lubrizol Engine Control Systems of 29400 Lakeland Blvd., Wickliffe, Ohio 44092-2298, has been found not to reduce the effectiveness of the applicable vehicle pollution control system, and therefore, the PuriNOx™ and AZ Purimuffler™ or AZ Purifier™ System is exempt from the prohibitions in Section 27156 of the Vehicle Code for installation on heavy-duty on-road vehicles listed in Attachment 1.

This exemption is only valid provided the engines meet the aforementioned conditions.

The PuriNOx™ and AZ Purimuffler™ or AZ Purifier™ System consists of an emulsified diesel fuel and a diesel oxidation catalyst. The major components of the AZ Purimuffler™ or AZ Purifier™ are identified in Attachment 2. End-users are required to follow the guidelines on operation and storage as listed in the owner's manual of PuriNOx™ fuel. In particular, there are strict requirements to ensure that PuriNOx™ does not remain static or left standing beyond a certain amount of time.



This Executive order is valid provided that installation instructions for PuriNOx™ and AZ Purimuffler™ or AZ Purifier™ System do not recommend tuning the vehicle to specifications different from those of the vehicle manufacturer.

Changes made to the design or operating conditions of the PuriNOx™ and AZ Purimuffler™ or AZ Purifier™ System, as exempted by ARB, which adversely affect the performance of the vehicle's pollution control system, shall invalidate this Executive Order.

No changes are permitted to the system. The ARB must be notified in writing of any changes to any part of the PuriNOx™ and AZ Purimuffler™ or AZ Purifier™ System. Any changes to the system must be evaluated and approved by ARB. Failure to do so shall invalidate this Executive Order.

Marketing of the PuriNOx™ and AZ Purimuffler™ or AZ Purifier™ System using identification other than that shown in this Executive Order or for an application other than that listed in this Executive Order shall be prohibited unless prior approval is obtained from ARB.

This Executive Order shall not apply to any PuriNOx™ and AZ Purimuffler™ or AZ Purifier™ System advertised, offered for sale, sold with, or installed on a motor vehicle prior to or concurrent with transfer to an ultimate purchaser.

The ARB estimates that use of the PuriNOx™ and AZ Purimuffler™ or AZ Purifier™ System might incur a fuel economy penalty between ten to fifteen percent depending on the engine and application.

As specified in the Diesel Emission Control Strategy Verification Procedure (Title 13 CCR section 2706 (g)), the ARB assigns each Diesel Emission Control Strategy a family name. The designated family name for the verification as outlined above is: CA/LUB/2004/PM2/N20/OFF/SYS01.

Additionally, as stated in the Diesel Emission Control Strategy Verification Procedure, Lubrizol Engine Control Systems is responsible for honoring their warranty (section 2707) and conducting in-use compliance testing (section 2709).

In addition to the foregoing, ARB reserves the right in the future to review this Executive Order and the exemption and verification provided herein to assure that the exempted and verified add-on or modified part continues to meet the standards and procedures of California Code of Regulations, Title 13, section 2222, et seq and California Code of Regulations, Title 13, sections 2700 through 2710.

Furthermore, Lubrizol must fulfill the conditions stated in the Resolution from the California Environmental Policy Council on April 30, 2004 (see Attachment 3). Lubrizol must provide cumulative national sales information and report to ARB on the status of the other conditions contained in the Resolution every six months.

Systems verified under this Executive Order shall conform to all applicable California emissions regulations.

Violation of any of the above conditions shall be grounds for revocation of this Executive Order.

Executed at El Monte, California, this 29<sup>th</sup> day of October 2004.

//s//

Robert H. Cross, Chief  
Mobile Source Control Division

Attachment 1: ARB Approved Model Year 1996 to 2002 Engine Families for the PuriNOx™ and AZ Purimuffler™ or AZ Purifier™ System

Attachment 2: Part Numbers and Model Numbers of the AZ Purimuffler™ or AZ Purifier™

Attachment 3: Resolution from the California Environmental Policy Council on April 30, 2004

**Engine Families Which Can Used PuriNOx and Purimuffler or Purifier System**

<b>Case Corporation</b>		
Model Year	Engine Family	Engine Displacement (liters)
1996	TX9505R6DTRA	8.3
	TX9505R6DTRC	8.3
	TX9505R6DTRB	8.3
1997	VX9505R6DTRC	8.3
	VX9505R6DTRB	8.3
	VX9505R6DTRA	8.3
1998	WX9XL0239ACA	3.9
	WX9XL0239ABA	3.9
	WX9XL0359AAA	5.9
	WX9XL0359ABA	5.9
	WX9XL0505ACA	8.3
	WX9XL0505ABB	8.3
	WX9XL0505ABA	8.3
	WX9XL0505AAA	8.3
	WX9XL0505ABC	8.3
1999	XX9XL0359ABA	5.9
	XX9XL0505AAA	8.3
	XX9XL0505ABB	8.3
	XX9XL0505ACA	8.3
	XX9XL0505ABC	8.3
	XX9XL0505ABA	8.3
2000	YX9XL0359ABA	5.9
	YX9XL0505ABB	8.3
	YX9XL0505ABA	8.3
	YX9XL0505ACA	8.3
	YX9XL0505AAA	8.3
	YX9XL0505ABC	8.3
2001	1X9XL0239AAC	3.9
	1X9XL0239AAB	3.9
	1X9XL0239AAA	3.9
	1X9XL0239ADA	3.9
	1X9XL0239ACA	3.9
	1X9XL0239ABA	3.9
	1X9XL0359ABA	5.9
	1X9XL0359AAA	5.9
	1X9XL0505ABC	8.3
	1X9XL0505ACA	8.3
	1X9XL0505ABA	8.3
	1X9XL0505ABB	8.3
	1X9XL0505AAA	8.3
1X9XL0505ACC	8.3	

<b>Case Corporation(con't)</b>		
Model Year	Engine Family	Engine Displacement (liters)
2002	2X9XL0239AAA	3.9
	2X9XL0239AAB	3.9
	2X9XL0239AAC	3.9
	2X9XL0239ACA	3.9
	2X9XL0239ABA	3.9
	2X9XL0239ADA	3.9
	2X9XL0359ABA	5.9
	2X9XL0359AAA	5.9
	2X9XL0359ABB	5.9
	2X9XL0359ABB	5.9
	2X9XL0359ABE	5.9
	2X9XL0505AAA	8.3
	2X9XL0505ABA	8.3
	2X9XL0505ABB	8.3
	2X9XL0505ACA	8.3
	2X9XL0505ABD	8.3
	2X9XL0505ABC	8.3
	2X9XL0505ACC	8.3

**Engine Families Which Can Used PuriNOx and Purimuffler or Purifier System**

<b>Cummins Engine Company Inc.</b>		
Model Year	Engine Family	Engine Displacement (liters)
1996	TCE359R6DTRA	5.9
	TCE505R6DTRA	8.3
	TCE505R6DTRB	8.3
	TCE505R6DTRC	8.3
	TCE505R6DTRD	8.3
	TCE661RGDTRA	10.8
	TCE855RGDTRA	14
	TCE855RJDTRA	14
	TCE19.RJDTRA	19
	TCE19.RJDTRB	19
1997	VCE359R6DTRB	5.9
	VCE505R6DTRB	8.3
	VCE505R6DTRA	8.3
	VCE505R6DTRC	8.3
	VCE505R6DTRD	8.3
	VCE661RGDTRA	10.8
	VCE855RGDTRA	14
	VCE855RGDTRA	14
	VCE19.RJDTRB	19
	VCE19.RJDTRA	19
1998	WCEXL0359AAA	5.9
	WCEXL0359ABA	5.9
	WCEXL0359ABB	5.9
	WCEXL0505AAA	8.3
	WCEXL0505ABB	8.3
	WCEXL0505ACA	8.3
	WCEXL0505ABA	8.3
	WCEXL0505ABC	8.3
	WCEXL0661AAA	10.8
	WCEXL0855AAB	14
	WCEXL0855AAA	14
	WCEXL019.AAB	19
	WCEXL019.AAA	19
1999	XCEXL0359ABB	5.9
	XCEXL0359ABA	5.9
	XCEXL0505ABA	8.3
	XCEXL0505ABC	8.3
	XCEXL0505AAA	8.3
	XCEXL0505ABB	8.3
	XCEXL0505ACA	8.3
	XCEXL0661AAB	10.8
	XCEXL0661AAA	10.8
	XCEXL0855AAB	14
	XCEXL0855AAA	14
	XCEXL019.AAB	19
	XCEXL019.AAA	19

<b>Cummins Engine Company Inc. (con't)</b>		
Model Year	Engine Family	Engine Displacement (liters)
2000	YCEXL0359ABA	5.9
	YCEXL0359ABB	5.9
	YCEXL0505AAA	8.3
	YCEXL0505ABB	8.3
	YCEXL0505ABC	8.3
	YCEXL0505ACA	8.3
	YCEXL0505ABA	8.3
	YCEXL0661AAA	11
	YCEXL0661AAB	11
	YCEXL0855AAB	14
	YCEXL0855AAA	14
	YCEXL015.ABA	15
	YCEXL019.AAB	19
YCEXL019.AAA	19	

**Engine Families Which Can Used PuriNOx and Purimuffler or Purifier System**

<b>Cummins Engine Company Inc. (con't)</b>		
Model Year	Engine Family	Engine Displacement (liters)
2001	1CEXL0239ADA	3.9
	1CEXL0239ABA	3.9
	1CEXL0239ACA	3.9
	1CEXL0239AAC	3.9
	1CEXL0239AAA	3.9
	1CEXL0239AEA	3.9
	1CEXL0239AFA	3.9
	1CEXL0239ACA	3.9
	1CEXL0239ABA	3.9
	1CEXL0239AAC	3.9
	1CEXL0239AAA	3.9
	1CEXL0359AAA	5.9
	1CEXL0359ACA	5.9
	1CEXL0359ABC	5.9
	1CEXL0359ABB	5.9
	1CEXL0359ABA	5.9
	1CEXL0359ADA	5.9
	1CEXL0359ABD	5.9
	1CEXL0359AAA	5.9
	1CEXL0359ABB	5.9
	1CEXL0505ABA	8.3
	1CEXL0505AAA	8.3
	1CEXL0505ABB	8.3
	1CEXL0505ABC	8.3
	1CEXL0505ACA	8.3
	1CEXL0505ACC	8.3
	1CEXL0505ACD	8.3
	1CEXL0505ACE	8.3
	1CEXL0505AAA	8.3
	1CEXL0505ABB	8.3
	1CEXL0505ABC	8.3
	1CEXL0505ACB	8.3
	1CEXL0505ABA	8.3
	1CEXL0661AAA	10.8
	1CEXL0661AAB	10.8
	1CEXL015.AAA	15
	1CEXL015.ABA	15
	1CEXL015.AAA	15
	1CEXL019.AAB	19
	1CEXL019.AAC	19

<b>Cummins Engine Company Inc. (con't)</b>		
Model Year	Engine Family	Engine Displacement (liters)
2002	2CEXL0239AAA	3.9
	2CEXL0239AAC	3.9
	2CEXL0239ABA	3.9
	2CEXL0239ACA	3.9
	2CEXL0239ADA	3.9
	2CEXL0239AEA	3.9
	2C3XL0239AFA	3.9
	2CEXL0239AAE	3.9
	2CEXL0359AAA	5.9
	2CEXL0359ABA	5.9
	2CEXL0359ABC	5.9
	2CEXL0359ABD	5.9
	2CEXL0359ACA	5.9
	2CEXL0359ADA	5.9
	2CEXL0359ABB	5.9
	2CEXL0359ABE	5.9
	2CEXL0505AAA	8.3
	2CEXL0505ABA	8.3
	2CEXL0505ABB	8.3
	2CEXL0505ACA	8.3
	2CEXL0505ACD	8.3
	2CEXL0505ACE	8.3
	2CEXL0505ABD	8.3
	2CEXL0505ABC	8.3
	2CEXL0505ACC	8.3
	2CEXL0505ACB	8.3
	2CEXL0661AAB	10.8
	2CEXL0661AAA	10.8
	2CEXL0661AAC	10.8
	2CEXL0661AAC	10.8
	2CEXL015.AAB	15
	2CEXL015.AAA	15
2CEXL015.AAA	15	
2CEXL015.ABA	15	
2CEXL019.AAB	19	
2CEXL019.AAC	19	

**Engine Families Which Can Used PuriNOx and Purimuffler or Purifier System**

**International Truck and Engine Corporation  
(Navistar)**

Model Year	Engine Family	Engine Displacement (liters)
1996	TNV466R6DARA	7.6
	TNV466R6DARB	7.6
	TNV466R6DASC	7.6
	TNV466R6DASD	7.6
	TNV530R6DARB	8.7
	TNV530R8DASC	8.7
	TNV530R6DASD	8.7
	TNV530R6DARA	8.7
	TNV530R8DASE	8.7
1997	VNV466R6DASC	7.6
	VNV466R6DASD	7.6
	VNV530R6DARA	8.7
	VNV530R8DARA	8.7
	VNV530R6DASD	8.7
	VNV530R8DASE	8.7
	VNV530R6DARB	8.7
	VNV530R6DASC	8.7
	VNV530R8DASC	8.7
1998	WNVXL0466BNA	7.6
	WNVXL0530ANB	8.7
	WNVXL0530BNA	8.7
	WNVXL0530BNB	8.7
	WNVXL0530BNC	8.7
	WNVXL0530ANA	8.7
	WNVXL0530BND	8.7
1999	XNVXL0466BNA	7.6
	XNVXL0466ANA	7.6
	XNVXL0530BNB	7.6
	XNVXL0530AND	8.7
	XNVXL0530BNC	8.7
	XNVXL0530ANA	8.7
	XNVXL0530ANB	8.7
	XNVXL0530BNA	8.7
	XNVXL0530BNB	8.7
	XNVXL0530ANC	8.7
	XNVXL0530BND	8.7
2000	YNVXL0466ANA	7.6
	YNVXL0530ANA	8.7
	YNVXL0530AND	8.7
	YNVXL0530ANB	8.7
	YNVXL0530ANC	8.7

**International Truck and Engine Corporation  
(Navistar) (con't)**

Model Year	Engine Family	Engine Displacement (liters)
2001	1NVXL0466ANA	7.6
	1NVXL0530ANA	8.7
	1NVXL0530ANB	8.7
	1NVXL0530ANC	8.7
	1NVXL0530AND	8.7
	1NVXL0530ANE	8.7
	1NVXL0530ANF	8.7
2002	2NVXL0466ANA	7.6
	2NVXL0530ANA	8.7
	2NVXL0530ANB	8.7
	2NVXL0530ANC	8.7
	2NVXL0530AND	8.7
	2NVXL0530ANE	8.7
2NVXL0530ANF	8.7	

**Engine Families Which Can Used PuriNOx and Purimuffler or Purifier System**

**Komatsu, Ltd.**

Model Year	Engine Family	Engine Displacement (liters)
1996	TKD505R6DTRA	8.3
	TKD505R6DTRC	8.3
	TKL11.RZDARB	11
	TKL11.RZDARC	11
	TKL11.RZDARA	11
1997	VKD505R6DTRC	8.3
	VKD505R6DTRA	8.3
1998	WKDXL0239AAA	3.9
	WKDXL0239ABA	3.9
	WKDXL0239ACA	3.9
	WKDXL0359ABA	5.9
	WKDXL0359AAA	5.9
	WKDXL0505AAA	8.3
	WKDXL0505ABB	8.3
	WKLXL11.0DB1	11
	WKLXL11.0DA1	11
	WKLXL11.0DC1	11
1999	XKDXL0359ABA	5.9
	XKDXL0505ACA	8.3
	XKDXL0505AAA	8.3
	XKDXL0505ABB	8.3
	XKLXL11.0DC1	11
	XKLXL11.0DB1	11
	XKLXL11.0DA1	11
2000	YKLXL0359ABA	5.9
	YKLXL0505ACA	8.3
	YKLXL0505AAA	8.3
	YKLXL0505ABB	8.3
	YKLXL11.0DA1	11
	YKLXL11.0DC1	11
	YKLXL11.0DB1	11

**Komatsu, Ltd. (con't)**

Model Year	Engine Family	Engine Displacement (liters)
2001	1KLXL0239AAA	3.9
	1KLXL0239ACA	3.9
	1KLXL0239ABA	3.9
	1KLXL0239AAA	3.9
	1KLXL0359ABC	5.9
	1KLXL0359ABA	5.9
	1KLXL0359ACA	5.9
	1KLXL0359AAA	5.9
	1KLXL0505ABB	8.3
	1KLXL0505AAA	8.3
	1KLXL0505ACA	8.3
	1KLXL11.0DD3	11
	1KLXL11.0DA1	11
	1KLXL11.0DB1	11
	1KLXL11.0DC1	11
	1KLXL11.0DD4	11
2002	2KLXL0239AAA	3.9
	2KLXL0239ABA	3.9
	2KLXL0239ACA	3.9
	2KLXL0239ADA	3.9
	2KLXL0359ACA	5.9
	2KLXL0359AAA	5.9
	2KLXL0359ABA	5.9
	2KLXL0359ABC	5.9
	2KLXL0505AAA	8.3
	2KLXL0505ABB	8.3
	2KLXL0505ACA	8.3
	2KLXL0505ABD	8.3
	2KLXL11.0DA1	11
	2KLXL11.0DB1	11
	2KLXL11.0DC1	11
	2KLXL11.0DD3	11
2KLXL11.0DD4	11	
2KLXL11.0DC3	11	
2KLXL11.0DD5	11	
2KLXL11.0DD6	11	

**State of California  
AIR RESOURCES BOARD**

**EXECUTIVE ORDER DE-04-012**

Pursuant to the authority vested in the Air Resources Board (ARB) by Health and Safety Code, Division 26, Part 5, Chapter 2; and pursuant to the authority vested in the undersigned by Health and Safety Code Section 39515 and 39616 and Executive Order G-02-003;

Relating to Exemptions under Section 27156 of the Vehicle Code, and Verification under Sections 2700 through 2710 of Title 13 of the California Code of Regulations

Lubrizol Engine Control Systems (ECS)  
Unikat Combifilter

ARB has reviewed ECS's request for verification of the Unikat Combifilter (Combifilter). Based on an evaluation of the data provided, and pursuant to the terms and conditions specified below, the Executive Officer of ARB hereby finds that the Combifilter reduces emissions of diesel particulate matter (PM) consistent with a Level 3 device (greater than or equal to 85 percent reductions) (Title 13 California Code of Regulations ("CCR") Sections 2702 (f) and (g) and Section 2708). Accordingly, the Executive Officer determines that the system merits verification and, subject to the terms and conditions specified below, classifies the Combifilter as a Level 3 system for off-road construction, material handling, and cargo handling applications and engine families listed in Attachment 1.

The aforementioned verification is subject to the following terms and conditions:

- The engines are model years 1996 through 2004 having the engine family names listed in Attachment 1.
- The engine must be in their original certified configuration.
- The engine must not have a pre-existing original equipment manufacturer oxidation catalyst.
- The engine must not have a pre-existing diesel particulate filter.
- The engine must be certified in California for off-road applications.
- The engine must be used for construction, material handling, and cargo handling purposes.
- The engine must be certified at a particulate matter emission level equal to or less than 0.43 grams per brake horsepower-hour (0.58 grams per kilowatt-hour).
- The engine must be able to return to regeneration control panel after operating for 8-10 hours.
- The engine does not employ exhaust gas recirculation.
- The engine must be four-stroke.
- The engine can be turbocharged or naturally-aspirated.
- The engine can be mechanically or electronically controlled.



- The engine should be well maintained and not consume lubricating oil at a rate greater than that specified by the engine manufacturer.
- Lube oil, or other oil, should not be mixed with the fuel.
- The engine must be operated on diesel fuel (e.g. not biodiesel blends or alternative diesel fuels) with a sulfur content of no more than 500 parts per million by weight.
- The other terms and conditions specified below.

IT IS ALSO ORDERED AND RESOLVED: That installation of the Combifilter, manufactured by Engine Control Systems, A Division of Lubrizol Canada, Ltd., 165 Pony Drive, Newmarket, Ontario, Canada L3Y 7V1, has been found not to reduce the effectiveness of the applicable vehicle pollution control system, and therefore, the Combifilter is exempt from the prohibitions in Section 27156 of the Vehicle Code for installation on heavy-duty off-road vehicles listed in Attachment 1.

This exemption is only valid provided the engines meet the aforementioned conditions.

The Combifilter is an actively regenerated non-catalyzed diesel particulate filter. The collected diesel particulate matter (PM) is stored in the filter matrix until the unit is regenerated via an electrically-heated regeneration system. The major components of the Combifilter are identified in Attachment 2.

This Executive Order is valid provided that installation instructions for the Combifilter do not recommend tuning the engine to specifications different from those of the engine manufacturer.

Changes made to the design or operating conditions of the Combifilter, as exempted by ARB, which adversely affect the performance of the vehicle's pollution control system, shall invalidate this Executive Order.

No changes are permitted to the device. The ARB must be notified in writing of any changes to any part of the Combifilter. Any changes to the device must be evaluated and approved by ARB. Failure to do so shall invalidate this Executive Order.

Marketing of the Combifilter using identification other than that shown in this Executive Order or for an application other than that listed in this Executive Order shall be prohibited unless prior approval is obtained from ARB.

This Executive Order shall not apply to any Combifilter advertised, offered for sale, sold with, or installed on a motor vehicle prior to or concurrent with transfer to an ultimate purchaser.

The ARB estimates that the Combifilter might incur an average fuel economy penalty of 4.7 percent.

As specified in the Diesel Emission Control Strategy Verification Procedure (Title 13 CCR Section 2706 (g)), the ARB assigns each Diesel Emission Control Strategy a family name. The designated family name for the verification as outlined above is: CA/LUB/2004/PM3/N00/OFF/DPF03.

Additionally, as stated in the Diesel Emission Control Strategy Verification Procedure, ECS is responsible for honoring the required warranty (Section 2707) and conducting in-use compliance testing (Section 2709).

In addition to the foregoing, ARB reserves the right in the future to review this Executive Order and the exemption and verification provided herein to assure that the exempted and verified add-on or modified part continues to meet the standards and procedures of California Code of Regulations, Title 13, Section 2222, et seq and California Code of Regulations, Title 13, Sections 2700 through 2710.

Systems verified under this Executive Order shall conform to all applicable California emissions regulations.

Violation of any of the above conditions shall be grounds for revocation of this Executive Order.

Executed at El Monte, California, this 13<sup>th</sup> day of December 2004.

//s//

Robert H. Cross, Chief  
Mobile Source Control Division

Attachment 1: Combifilter Engine Family List  
Attachment 2: Combifilter System Parts List

## Attachment 1: Combifilter Engine Family List

MY 1996

Manufacturer	Engine Family	Displace (L)
Case	TX9505R6DTRA	8.3
Case	TX9505R6DTRB	8.3
Case	TX9505R6DTRC	8.3
Caterpillar	TCP10.RZDBRF	10.5
Caterpillar	TCP10.RZDBRD	10.5
Caterpillar	TCP7.2RZDBRK	7.2
Caterpillar	TCP7.2RZDBRB	7.2
Caterpillar	TCP10.RZDBRB	10.4
Caterpillar	TCP10.RZDBRC	10.4
Caterpillar	TCP12.RZDBRM	12
Caterpillar	TCP10.RZDBRA	10.4
Caterpillar	TCP6.6RZDBRB	6.6
Caterpillar	TCP6.6RZDBRC	6.6
Caterpillar	TCP10.RZDBRG	10.5
Caterpillar	TCP7.2RZDBRC	7.2
Caterpillar	TCP10.RZDBRK	10.3
Cummins	TCE661RGDTRA	10.8
Cummins	TCE505R6DTRD	8.3
Cummins	TCE505R6DTRC	8.3
Cummins	TCE505R6DTRB	8.3
Cummins	TCE505R6DTRA	8.3
Cummins	TCE359R6DTRA	5.9
DDC	TDD8.5TJDARE	8.5
DDC	TDD11.TJDARE	12
DDC	TDD5.2TG4ARE	5.2
Deere Power	TJD7.6R6DBRA	7.6
Deere Power	TJD10.RJDBRB	10.5
Deere Power	TJD10.RJDBRA	10.5
Deere Power	TJD7.6R6DBRB	7.6
Deere Power	TJD8.1R6DBRA	8.1
Deere Power	TJD8.1R6DBRB	8.1
Deere Power	TJD8.1R6DBRC	8.1
Deere Power	TJD10.R6DBRA	10.1
Deere Power	TJD10.R6DBRB	10.1
Deere Power	TJD6.8R6DBRC	6.8
Deere Power	TJD6.8R6DBRD	6.8
Deutz Motor	TDZ7.1R6DARB	7.1
Deutz Motor	TDZ7.1R6DARA	7.1

Manufacturer	Engine Family	Displace (L)
Isuzu Motors	TSZ9.8R6DAAA	9.8
Iveco	TVE9.5R6DARA	9.5
Iveco	TVE7.7R6DARA	7.7
Iveco	TVE9.5R6DASA	9.5
Komatsu	TKD505R6DTRC	8.3
Komatsu	TKD505R6DTRA	8.3
Komatsu	TKL11.RZDARA	11
Komatsu	TKL11.RZDARB	11
Komatsu	TKL11.RZDARC	11
Liebherr Machines	TLH9.9R6DARA	9.9
Liebherr Machines	TLH9.9R6DASA	9.9
Mercedes-Benz	TMB6.0R6DARA	6
Mitsubishi Motors	TMT460D6DARA	7.5
Mitsubishi Motors	TMT729D6DARB	11.9
Mitsubishi Motors	TMT729E6DARC	11.9
Navistar International	TNV466R6DARA	7.6
Navistar International	TNV466R6DARB	7.6
Navistar International	TNV466R6DASC	7.6
Navistar International	TNV466R6DASD	7.6
Navistar International	TNV530R8DASE	8.7
Navistar International	TNV530R8DASC	8.7
Navistar International	TNV530R6DASD	8.7
Navistar International	TNV530R6DARA	8.7
Navistar International	TNV530R6DARB	8.7
New Holland	TNH7.5R6DARA	7.4
Volvo Construction	TVS12.R6DARA	12
Volvo Construction	TVS9.6R6DARA	9.6
Volvo Construction	TVS6.7R6DARA	6.7

## Attachment 1: Combifilter Engine Family List

MY 1997

Manufacturer	Engine Family	Displace. (L)
AB Volvo Penta	VVP6.7R6DASA	6.7
AB Volvo Penta	VVP6.7R6DARA	6.7
AB Volvo Penta	VVP9.6R6DASA	9.6
AB Volvo Penta	VVP12.R6DARA	12
AB Volvo Penta	VVP5.5R6DARA	5.5
Case	VX9505R6DTRA	8.3
Case	VX9505R6DTRB	8.3
Case	VX9505R6DTRC	8.3
Caterpillar	VCP6.6RZDARB	6.6
Caterpillar	VCP6.6RZDARC	6.6
Caterpillar	VCP7.0RZDARB	7
Caterpillar	VCP7.2RZDARB	7.2
Caterpillar	VCP7.2RZDARC	7.2
Caterpillar	VCP7.2RZDARK	7.2
Caterpillar	VCP10.RZDARA	10.4
Caterpillar	VCP10.RZDARB	10.4
Caterpillar	VCP10.RZDARC	10.4
Caterpillar	VCP10.RZDARD	10.5
Caterpillar	VCP10.RZDARF	10.5
Caterpillar	VCP10.RZDARG	10.5
Caterpillar	VCP10.RZDARK	10.3
Caterpillar	VCP12.RZDARM	12
Caterpillar	VCP442DZDARK	7.1
Cummins	VCE661RGDTRA	10.8
Cummins	VCE359R6DTRB	5.9
Cummins	VCE505R6DTRA	8.3
Cummins	VCE505R6DTRB	8.3
Cummins	VCE505R6DTRC	8.3
Cummins	VCE505R6DTRD	8.3
Daewoo Motor	VDW11.R6DARB	11
Daewoo Motor	VDW11.R6DARA	11
Daewoo Motor	VDW05.R6DARA	5.7
Daewoo Motor	VDW08.R6DARA	8.1
DaimlerChrysler	VMB6.0R6DARA	6
DaimlerChrysler	WMBXL6.37DIA	6.3
DDC	VDD11.TJDARE	11.1
DDC	VDD8.5TJDARE	8.5
Deere Power	VJD10.RJDBRA	10.5
Deere Power	VJD10.R6DBRA	10.1

Manufacturer	Engine Family	Displace. (L)
Deere Power	VJD10.R6DBRB	10.1
Deere Power	VJD7.6R6DBRA	7.6
Deere Power	VJD8.1R6DBRC	8.1
Deere Power	VJD6.8R6DBRC	6.8
Deere Power	VJD6.8R6DBRD	6.8
Deere Power	VJD6.8R6DBRA	6.8
Deere Power	VJD10.RJDBRB	10.5
Deere Power	VJD6.8R6DBRB	5.8
Deutz AG	VDZ6.1R6DARC	6.1
Deutz AG	VDZ7.1R6DARA	7.1
Deutz AG	VDZ7.1R6DARB	7.1
Hino Motors	VHM6.7R6DARA	6.8
Isuzu Motors	VSZ9.8R6DARA	9.8
Isuzu Motors	VSZ9.8R6DARB	9.8
Iveco	VVE7.7R6DARA	7.7
Iveco	VVE9.5R6DARA	9.5
Iveco	VVE9.5R6DASA	9.5
Komatsu	VKD505R6DTRA	8.3
Komatsu	VKD505R6DTRC	8.3
Liebherr Machines	VLH9.9R6DARA	9.9
Liebherr Machines	VLH9.9R6DARA	9.9
Mitsubishi Motors	VMT460R6DARA	7.5
Mitsubishi Motors	VMT729R6DARB	11.9
Mitsubishi Motors	VMT729R6DARC	11.9
Navistar International	VNV530R8DASE	8.7
Navistar International	VNV530R6DASC	8.7
Navistar International	VNV530R6DASD	8.7
Navistar International	VNV466R6DASC	7.6
Navistar International	VNV466R6DASD	7.6
Navistar International	VNV530R6DARA	8.7
Navistar International	VNV530R6DARB	8.7
Navistar International	VNV530R8DARA	8.7
Navistar International	VNV530R8DASC	8.7
New Holland	VNH7.5R6DARA	7.5
Power Systems	VPS442DZJARK	7.1
Volvo Construction	VVS6.7R6DARA	6.7
Volvo Construction	VVS9.6R6DARA	9.6
Volvo Construction	VVS12.R6DARA	12

## Attachment 1: Combifilter Engine Family List

MY 1998

Manufacturer	Engine Family	Displace (L)
AB Volvo Penta	WVPXL05.5ABA	5.5
AB Volvo Penta	WVPXL06.7ABA	6.7
AB Volvo Penta	WVPXL09.6ABA	9.6
AB Volvo Penta	WVPXL12.0ABA	12
AB Volvo Penta	WVPXL12.0ACB	12
AB Volvo Penta	WVPXL09.6ACB	9.6
AB Volvo Penta	WVPXL05.5AAA	5.5
AB Volvo Penta	WVPXL06.7AAA	6.7
AB Volvo Penta	WVPXL09.6AAA	9.6
Case	WX9XL0359ABA	5.9
Case	WX9XL0505AAA	8.3
Case	WX9XL0505ABA	8.3
Case	WX9XL0505ABB	8.3
Case	WX9XL0505ACA	8.3
Case	WX9XL0505ABC	8.3
Case	WX9XL0239ABA	3.9
Case	WX9XL0239ACA	3.9
Case	WX9XL0359AAA	5.9
Caterpillar	WCPXL10.3ERK	10.3
Caterpillar	WCPXL12.0ERM	12
Caterpillar	WCPXL06.6MRB	6.6
Caterpillar	WCPXL06.6MRC	6.6
Caterpillar	WCPXL10.5MRD	10.5
Caterpillar	WCPXL07.2MRC	7.2
Caterpillar	WCPXL07.0MRB	7
Caterpillar	WCPXL07.2HRK	7.2
Caterpillar	WCPXL10.5MRF	10.5
Caterpillar	WCPXL10.4MRA	10.4
Caterpillar	WCPXL10.5MRG	10.5
Caterpillar	WCPXL10.4MRB	10.4
Caterpillar	WCPXL07.2MRB	7.2
Caterpillar	WCPXL10.4MRC	10.4
Cummins	WCEXL0505AAA	8.3
Cummins	WCEXL0505ABA	8.3
Cummins	WCEXL0505ABB	8.3
Cummins	WCEXL0505ACA	8.3
Cummins	WCEXL0661AAA	10.8
Cummins	WCEXL0359AAA	5.9
Cummins	WCEXL0359ABA	5.9
Cummins	WCEXL0359ABB	5.9

Manufacturer	Engine Family	Displace (L)
Cummins	WCEXL0505ABC	8.3
Daewoo Heavy	WDWXL11.1AGN	11
Daewoo Heavy	WDWXL11.1AHT	11
Daewoo Heavy	WDWXL08.1CAN	8
Daewoo Heavy	WDWXL05.8ATT	5.7
Daewoo Heavy	WDWXL08.1APA	8.1
Daewoo Heavy	WDWXL11.1BIA	11
Daewoo Heavy	WDWXL11.1BHT	11
Daimler-Benz	WMBXL6.37DJA	6.4
DDC	WMUXL12.0G2V	12
DDC	VDDXL08.5TJD	8.5
DDC	WDDXL11.1THD	11.1
DDC	WDDXL05.2TDM	5.2
DDC	WDDXL09.0TFE	9
DDC	WDDXL12.1TFM	9
Deere Power	WJDXL06.8014	6.8
Deere Power	WJDXL06.8051	4.5
Deere Power	WJDXL06.8012	6.8
Deere Power	WJDXL10.5004	10.5
Deere Power	WJDXL07.6011	7.6
Deere Power	WJDXL07.6010	7.6
Deere Power	WJDXL06.8013	6.8
Deere Power	WJDXL10.1006	10.1
Deere Power	WJDXL10.1005	10.1
Deere Power	WJDXL08.1009	8.1
Deere Power	WJDXL08.1008	8.1
Deere Power	WJDXL08.1007	8.1
Deere Power	WJDXL10.5003	10.5
Deutz AG	WDZXL15.9002	11.9
Deutz AG	WDZXL06.1007	6.13
Deutz AG	WDZXL07.1004	7.14
Deutz AG	WDZXL07.1003	7.14
Hino Motors	WHMXL06.7HTD	6.7
New Holland	WNHXL07.5A3V	7.5
Isuzu Motors	WSZXL09.8DTB	9.8
Isuzu Motors	WSZXL09.8DTA	9.8
Iveco	WVEXL07.7DAR	7.7
Iveco	WVEXL09.5DAR	9.5
Iveco	WVEXL09.5DAS	9.5

## Attachment 1: Combifilter Engine Family List

### MY 1998 (cont.)

Manufacturer	Engine Family	Displace (L)
Komatsu	WKDXL0505AAA	8.3
Komatsu	WKDXL0505ABB	8.3
Komatsu	WKDXL0239AAA	3.9
Komatsu	WKDXL0239ABA	3.9
Komatsu	WKDXL0239ACA	3.9
Komatsu	WKDXL0359AAA	5.9
Komatsu	WKDXL0359ABA	5.9
Komatsu	WKLXL7.15CB1	7.15
Komatsu	WKLXL7.15CC1	7.15
Komatsu	WKLXL11.0DA1	11
Komatsu	WKLXL11.0DB1	11
Komatsu	WKLXL11.0DC1	11.04
Liebherr Machines	WLHAL9.96ATA	9.96
Liebherr Machines	WLHAL9.96ASA	6.6
Liebherr Machines	WLHAL9.96ARA	6.6
Mercedes-Benz	WMBXL5.96R6B	6
Mercedes-Benz	WMBXL5.96R6A	6
Mitsubishi Motors	WMTXL07.5D6A	7.5
MTU	WMUXL12.0G2V	12
Navistar International	WNVXL0466BNA	7.8
Navistar International	WNVXL0530BNA	8.8
Navistar International	WNVXL0530BNB	8.7
Navistar International	WNVXL0530BNC	8.7
Navistar International	WNVXL0530BND	8.8
Navistar International	WNVXL0530ANA	8.7
Navistar International	WNVXL0530ANB	8.7
Volvo Construction	WVSXL09.6CE1	9.6
Volvo Construction	WVSXL12.0CE1	12
Volvo Construction	WVSXL06.7CE1	6.7

### MY 1999

Manufacturer	Engine Family	Displace (L)
AB Volvo Penta	XVPXL05.5ABA	5.5
AB Volvo Penta	XVPXL06.7ABA	6.7
AB Volvo Penta	XVPXL06.7AAA	6.7
AB Volvo Penta	XVPXL09.6AAA	9.6
AB Volvo Penta	XVPXL09.6ACB	9.6
AB Volvo Penta	XVPXL12.0ABA	12
AB Volvo Penta	XVPXL09.6ABA	9.6
AB Volvo Penta	XVPXL12.0ACB	12
AB Volvo Penta	XVPXL07.3ACB	7.28
AB Volvo Penta	XVPXL07.3ABB	7.28
Case	XX9XL0359ABA	5.9
Case	XX9XL0505AAA	8.3
Case	XX9XL0505ABA	8.3
Case	XX9XL0505ABB	8.3
Case	XX9XL0505ACA	8.3
Case	XX9XL0505ABC	8.3
Caterpillar	XCPXL06.6MRB	6.6
Caterpillar	XCPXL06.6MRC	6.6
Caterpillar	XCPXL07.0MRB	7
Caterpillar	XCPXL07.2MRB	7.2
Caterpillar	XCPXL07.2MRC	7.2
Caterpillar	XCPXL10.4MRA	10.4
Caterpillar	XCPXL10.4MRB	10.4
Caterpillar	XCPXL10.4MRC	10.4
Caterpillar	XCPXL10.5MRD	10.5
Caterpillar	XCPXL10.5MRF	10.5
Caterpillar	XCPXL10.5MRG	10.5
Caterpillar	XCPXL10.3ERK	10.3
Caterpillar	XCPXL12.0ERM	12
Caterpillar	XCPXL07.2HRK	7.2
Cummins	XCEXL0359ABA	5.9
Cummins	XCEXL0505AAA	8.3
Cummins	XCEXL0505ABA	8.3
Cummins	XCEXL0505ABB	8.3
Cummins	XCEXL0505ACA	8.3
Cummins	XCEXL0661AAA	10.8
Cummins	XCEXL0359ABB	5.9
Cummins	XCEXL0505ABC	8.3
Cummins	XCEXL0661AAB	10.8
Daewoo Heavy	XDWXL08.1APA	8.1

## Attachment 1: Combifilter Engine Family List

MY 1999 (cont.)

Manufacturer	Engine Family	Displace (L)
Daewoo Heavy	XDWXL11.1BHT	11.1
Daewoo Heavy	XDWXL11.1BIA	11.1
DaimlerChrysler	XMBXL12.0RJA	11.9
DaimlerChrysler	XMBXL12.0RJA	11.9
DaimlerChrysler	XMBXL5.96R6A	6
DaimlerChrysler	XMBXL6.37RJA	6.37
DDC	XDDXL05.2TMD	5.2
DDC	XDDXL12.1TFM	9
DDC	XDDXL08.5TJD	8.5
DDC	XDDXL11.1THD	11.1
DDC	XDDXL09.1TFE	9
DDC	XDDXL04.7TAE	4.65
Deere Power	XJDXL06.8014	6.8
Deere Power	XJDXL06.8015	6.8
Deere Power	XJDXL06.8012	6.8
Deere Power	XJDXL10.5004	10.5
Deere Power	XJDXL06.8013	6.8
Deere Power	XJDXL10.1006	10.1
Deere Power	XJDXL08.1009	8.1
Deere Power	XJDXL08.1008	8.1
Deere Power	XJDXL08.1007	8.1
Deere Power	XJDXL10.5003	10.5
Deere Power	XJDXL08.1019	8.1
Deere Power	XJDXL10.5022	10.5
Deere Power	XJDXL08.1024	8.1
Deutz AG	XDZXL06.1008	6.13
Deutz AG	XDZXL07.1004	7.15
Deutz AG	XDZXL07.1005	7.15
Generac	XGNXL12.0MAA	12
Hino Motors	XHMXL06.7HTD	6.7
Hino Motors	XHMXL08.8PTD	8.8
Isuzu Motors	XSZXL09.8DTB	9.8
Isuzu Motors	XSZXL09.8DTA	9.8
Iveco	XVEXL07.7DAR	7.7
Iveco	XEVXL09.5DAR	9.5
Komatsu	XKDXL0359ABA	5.9
Komatsu	XKDXL0505AAA	8.3
Komatsu	XKDXL0505ABB	8.3
Komatsu	XKDXL0505ACA	8.3
Komatsu	XKLXL7.15CB1	7.15

Manufacturer	Engine Family	Displace (L)
Komatsu	XKLXL7.15CC1	7.15
Komatsu	XKLXL11.0DA1	11
Komatsu	XKLXL11.0DB1	11
Komatsu	XKLXL11.0DC1	11
Liebherr Machines	XLHAL9.96ARA	9.96
Liebherr Machines	XLHAL9.96ASA	9.96
Liebherr Machines	XLHAL9.96ATA	9.96
Mitsubishi Motors	XMTXL11.9D6B	11.9
Mitsubishi Motors	XMTXL11.9D6A	11.9
Mitsubishi Motors	XMTXL07.5D6A	7.5
Mitsubishi Motors	XMTXL07.5D6C	7.5
Navistar International	XNVXL0466ANA	7.6
Navistar International	XNVXL0530ANA	8.7
Navistar International	XNVXL0530ANB	8.7
Navistar International	XNVXL0530ANC	8.7
Navistar International	XNVXL0530AND	8.7
Navistar International	XNVXL0466BNA	7.6
Navistar International	XNVXL0530BNA	8.7
Navistar International	XNVXL0530BNB	7.6
Navistar International	XNVXL0530BNC	8.7
Navistar International	XNVXL0530BND	8.7
New Holland	XNHXL07.5A3V	7.5
Volvo Construction	XVSVXL06.7CE1	6.7
Volvo Construction	XVSVXL09.6CE1	9.6
Volvo Construction	XVSVXL12.0CE1	12

## Attachment 1: Combifilter Engine Family List

MY 2000

Manufacturer	Engine Family	Displace (L)
AB Volvo Penta	YVPXL06.7ABA	6.7
AB Volvo Penta	YVPXL06.7AAA	6.7
AB Volvo Penta	XVPXL09.6AAA	9.6
AB Volvo Penta	YVPXL09.6ACB	9.6
AB Volvo Penta	YVPXL05.5ABA	5.5
AB Volvo Penta	YVPXL12.0ACB	12
AB Volvo Penta	YVPXL09.6ABA	9.6
AB Volvo Penta	YVPXL12.0ABA	12
AB Volvo Penta	YVPXL07.3ACB	7.28
AB Volvo Penta	YVPXL07.3ABB	7.28
Case	YX9XL0505ABA	8.3
Case	YX9XL0505ACA	8.3
Case	YX9XL0359ABA	5.9
Case	YX9XL0505ABB	8.3
Case	YX9XL0505AAA	8.3
Case	YX9XL0505ABC	8.3
Case	YX9XL0359ABB	5.9
Caterpillar	YCPXL06.6MRB	6.6
Caterpillar	YCPXL06.6MRC	6.6
Caterpillar	YCPXL07.0MRB	7
Caterpillar	YCPXL07.2MRB	7.2
Caterpillar	YCPXL07.2MRC	7.2
Caterpillar	YCPXL10.4MRA	10.4
Caterpillar	YCPXL10.4MRB	10.4
Caterpillar	YCPXL10.4MRC	10.4
Caterpillar	YCPXL10.5MRD	10.5
Caterpillar	YCPXL10.5MRF	10.5
Caterpillar	YCPXL10.5MRG	10.5
Caterpillar	YCPXL07.2HRK	7.2
Caterpillar	YCPXL10.3ERK	10.3
Caterpillar	YCPXL12.0ERM	12
Cummins	YCEXL0359ABA	5.9
Cummins	YCEXL0661AAA	11
Cummins	YCEXL0505AAA	8.3
Cummins	YCEXL0505ABB	8.3
Cummins	YCEXL0505ABC	8.3
Cummins	YCEXL0505ACA	8.3
Cummins	YCEXL0505ABA	8.3
Cummins	YCEXL0359ABB	5.9
Cummins	YCEXL0661AAB	11

Manufacturer	Engine Family	Displace (L)
Daewoo Heavy	YDWXL08.1APA	8.1
Daewoo Heavy	YDWXL08.1APA	8.1
DaimlerChrysler	YMBXL5.96R6A	6
DaimlerChrysler	YMBXL12.9R6A	10
DaimlerChrysler	YMBXL6.37RJA	6.37
DaimlerChrysler	YMBXL12.0RJA	12.0
DDC	YDDXL05.2TDM	5.2
DDC	YDDXL04.7TAE	4.65
DDC	YDDXL09.0TFE	9
DDC	YDDXL08.5TJD	8.5
DDC	YDDXL11.1THD	11.1
Deere Power	YJDXL10.5004	10.5
Deere Power	YJDXL08.1007	8.1
Deere Power	YJDXL08.1008	8.1
Deere Power	YJDXL08.1019	8.1
Deere Power	YJDXL10.1006	10.1
Deere Power	YJDXL10.5022	10.5
Deere Power	YJDXL08.1024	8.1
Deere Power	YJDXL08.1009	8.1
Deere Power	YJDXL06.8012	6.8
Deere Power	YJDXL06.8013	6.8
Deere Power	YJDXL06.8014	6.8
Deere Power	YJDXL06.8015	6.8
Deutz AG	YDZXL15.9003	11.9
Deutz AG	YDZXL07.1004	7.15
Deutz AG	YDZXL07.1005	7.15
Deutz AG	YDZXL06.1008	6.13
Generac	YGNXL12.0MAA	12
Hino Motors	YHMXL08.8PTD	8.821
Hino Motors	YHMXL06.7HTD	6.72
Ishikawajima	YH3XM.451M10	0.451
Ishikawajima	YH3XM.676M20	0.676
Isuzu Motors	YSZXL09.8ATA	9.8
Isuzu Motors	YSZXL09.8ATB	9.8
Isuzu Motors	YSZXL06.5EXA	6.5
Isuzu Motors	YSZXL07.8EXA	7.8
Iveco	YVEXL07.7DAR	7.7
Iveco	YVEXL09.5DAR	9.5
Komatsu	YKLXL7.15CB1	5.15
Komatsu	YKLXL7.15CC1	7.15



## Attachment 1: Combifilter Engine Family List

### MY 2000 (cont.)

Manufacturer	Engine Family	Displace (L)
Komatsu	YKLXL11.0DA1	11
Komatsu	YKLXL11.0DC1	11
Komatsu	YKLXL11.0DB1	11
Komatsu	YKLXL11.0DD1	11
Komatsu	YKLXL0359ABA	5.9
Komatsu	YKLXL0505ACA	8.3
Komatsu	YKLXL0505AAA	8.3
Komatsu	YKLXL0505ABB	8.3
Kubota	YKBXL.400KCB	0.4
Kubota	YKBXL.400KCC	0.4
Liebherr Machines	YLHAL9.96ARA	9.96
Liebherr Machines	YLHAL9.96ASA	9.96
Liebherr Machines	YLHAL9.96ATA	9.96
Lister-Petter	YL5XL1.86FWS	1.86
Lombardini	YLBLD.916F69	0.916
Mercedes Benz	YMBXL12.0RJB	12
Mitsubishi Motors	YMTXL07.5D6C	7.5
Mitsubishi Motors	YMTXL11.9D6A	11.9
Mitsubishi Motors	YMTXL11.9D6B	11.9
Mitsubishi Motors	YMTXL07.5D6A	7.5
Mitsubishi Motors	YMTXL05.8D3A	5.8
Mitsubishi Motors	YMTXL11.9D2A	11.9
Navistar International	YNVXL0466ANA	7.6
Navistar International	YNVXL0530ANA	8.7
Navistar International	YNVXL0530ANB	8.7
Navistar International	YNVXL0530ANC	8.7
Navistar International	YNVXL0530AND	8.7
New Holland	YNHXL07.5A3V	7.5
Perkins	YPKXL05.9YJ1	5.9
Volvo Construction	YVSLX06.7CE1	6.7
Volvo Construction	YVSLX09.6CE1	9.6
Volvo Construction	YVSLX12.0CE1	12
Volvo Construction	YVSLX06.7CE1	6.7
Volvo Construction	YVSLX09.6CE1	9.6

### MY 2001

Manufacturer	Engine Family	Displace (L)
AB Volvo Penta	1VPXL07.3ABB	7.28
AB Volvo Penta	1VPXL09.6ABA	9.6
AB Volvo Penta	1VPXL06.7ABA	6.7
AB Volvo Penta	1VPXL07.3ACB	7.28
AB Volvo Penta	1VPXL05.5ABA	5.5
AB Volvo Penta	1VPXL06.7AAA	6.7
AB Volvo Penta	1VPXL09.6AAA	9.6
AB Volvo Penta	1VPXL09.6ACB	9.6
Case	1X9XL0540AAA	8.88
Case	1X9XL0505ABC	8.3
Case	1X9XL0505ACA	8.3
Case	1X9XL0359ABA	5.9
Case	1X9XL0505ABA	8.3
Case	1X9XL0505ABB	8.3
Case	1X9XL0505AAA	8.3
Case	1X9XL0505ACC	8.3
Caterpillar	1CPXL06.6MRB	6.6
Caterpillar	1CPXL07.0MRB	7
Caterpillar	1CPXL06.6MRC	6.6
Caterpillar	1CPXL07.2MRB	7.2
Caterpillar	1CPXL07.2MRC	7.2
Caterpillar	1CPXL07.2HRK	7.2
Caterpillar	1CPXL10.4MRA	10.4
Caterpillar	1CPXL10.4MRB	10.4
Caterpillar	1CPXL10.4MRC	10.4
Caterpillar	1CPXL10.5MRD	10.5
Caterpillar	1CPXL10.5MRF	10.5
Caterpillar	1CPXL10.5MRG	10.5
Caterpillar	1CPXL10.3ESK	10.3
Caterpillar	1CPXL12.0ESK	12
Caterpillar	1CPXL07.2HSK	7.2
Caterpillar	1CPXL08.8HSK	8.8
Cummins	1CEXL0540AAA	8.88
Cummins	1CEXL0661AAC	11
Cummins	1CEXL0359ACA	5.9
Cummins	1CEXL0505ABA	8.3
Cummins	1CEXL0505ABA	8.3
Cummins	1CEXL0505AAA	8.3
Cummins	1CEXL0505AAA	8.3
Cummins	1CEXL0505ABB	8.3

## Attachment 1: Combifilter Engine Family List

MY 2001 (cont.)

Manufacturer	Engine Family	Displace (L)
Cummins	1CEXL0505ABB	8.3
Cummins	1CEXL0505ABC	8.3
Cummins	1CEXL0505ABC	8.3
Cummins	1CEXL0505ACB	8.3
Cummins	1CEXL0505ACB	8.3
Cummins	1CEXL0359ABC	5.9
Cummins	1CEXL0359ABB	5.9
Cummins	1CEXL0359ABB	5.9
Cummins	1CEXL0359ABA	5.9
Cummins	1CEXL0239ACA	3.9
Cummins	1CEXL0239ACA	3.9
Cummins	1CEXL0661AAB	10.8
Cummins	1CEXL0661AAB	10.8
Cummins	1CEXL0661AAA	10.8
Cummins	1CEXL0661AAA	10.8
Cummins	1CEXL0505ACC	8.3
Cummins	1CEXL0359ABD	5.9
Cummins	1CEXL0505ACD	8.3
Cummins	1CEXL0505ACE	8.3
Cummins	1CEXL0661AAD	10.9
Daewoo Heavy	1DWXL08.1APA	8.1
Daewoo Heavy	1DWXL11.1BIA	11.1
Daewoo Heavy	1DWXL08.1BPA	8.1
Daihatsu Motor	1DHXL.9532DT	0.953
Daihatsu Motor	1DHXL.9532D1	0.953
DaimlerChrysler	1MBXL7.20RJA	7.2
DaimlerChrysler	1MBXL12.0RJB	12
DaimlerChrysler	1MBXL5.96R6A	6
DaimlerChrysler	1MBXL12.9R6A	10
DaimlerChrysler	1MBXL6.37RJA	6.37
DaimlerChrysler	1MBXL14.6R6A	11
DaimlerChrysler	1MBXL6.37RJB	6.37
DaimlerChrysler	1MBXL12.0RJC	12
DDC	1DDXL04.7TAE	4.7
DDC	1DDXL05.2TDM	5.2
DDC	1DDXL08.5TJD	8.5
DDC	1DDXL08.5YJD	8.5
Deere Power	1JDXL08.1024	8.1
Deere Power	1JDXL06.8012	6.8
Deere Power	1JDXL06.8013	6.8

Manufacturer	Engine Family	Displace (L)
Deere Power	1JDXL06.8014	6.8
Deere Power	1JDXL06.8015	6.8
Deere Power	1JDXL08.1007	8.1
Deere Power	1JDXL08.1008	8.1
Deere Power	1JDXL08.1009	8.1
Deere Power	1JDXL08.1019	8.1
Deere Power	1JDXL10.1006	10.1
Deere Power	1JDXL08.1037	8.1
Deere Power	1JDXL08.1036	8.1
Deere Power	1JDXL06.8039	6.8
Deere Power	1JDXL06.8038	6.8
Deutz AG	1DZXL07.1004	7.15
Deutz AG	1DZXL07.1005	7.15
Deutz AG	1DZXL06.1008	6.13
Deutz AG	1DZXL00.9024	0.92
Deutz AG	1DZXL02.7018	2.73
Deutz AG	1DZXL02.9017	2.91
Deutz AG	1DZXL03.8016	3.77
Generac	1GNXL03.0KNA	3
Generac	1GNXL03.0KTA	3
Hino Motors	1HMXL08.8PTD	8.8
Hino Motors	1HMXL06.7HTD	6.7
International Truck	1NVXL0466ANA	7.66
International Truck	1NVXL0530ANA	8.7
International Truck	1NVXL0530ANB	8.7
International Truck	1NVXL0530ANC	8.7
International Truck	1NVXL0530AND	8.7
International Truck	1NVXL0530ANE	8.7
International Truck	1NVXL0530ANF	8.7
Ishikawajima	1H3XL.761LCS	0.761
Ishikawajima	1H3XL.451E2V	0.451
Ishikawajima	1H3XM.451M10	0.451
Ishikawajima	1H3XL.761ELV	0.761
Ishikawajima	1H3XL1.13SLV	1.131
Ishikawajima	1H3XL1.49N3C	1.496
Ishikawajima	1H3XM.676M20	0.676
Ishikawajima	1H3XL1.13MSL	1.131
Ishikawajima	1H3XL1.33J84	1.33
Ishikawajima	1H3XL2.00N84	1.995
Ishikawajima	1H3XL2.22L84	2.216

## Attachment 1: Combifilter Engine Family List

MY 2001 (cont.)

Manufacturer	Engine Family	Displace (L)
Ishikawajima	1H3XL2.22NLC	2.216
Ishikawajima	1H3XM.954M30	0.954
Ishikawajima	1H3XM1.49M40	1.496
Ishikawajima	1H3XL2.00NCS	1.995
Ishikawajima	1H3XL1.13LCS	1.131
Isuzu Motors	1SZXL06.5EXA	6.5
Isuzu Motors	1SZXL07.8EXA	7.8
Isuzu Motors	1SZXL09.8ATA	9.8
Isuzu Motors	1SZXL09.8ATB	9.8
Isuzu Motors	1SZXL02.2YNB	2.2
Isuzu Motors	1SZXL01.1YNA	1.1
Isuzu Motors	1SZXL01.5YNB	1.5
Isuzu Motors	1SZXL01.5YNC	1.5
Isuzu Motors	1SZXL01.7YNA	1.7
Isuzu Motors	1SZXL02.2YNA	2.2
Isuzu Motors	1SZXL02.2YNB	2.2
Isuzu Motors	1SZXL02.2YNC	2.2
Isuzu Motors	1SZXL02.4YNA	2.4
Isuzu Motors	1SZXL02.4YNC	2.4
Isuzu Motors	1SZXL03.1YNB	3.1
Isuzu Motors	1SZXL03.1YNC	3.1
Isuzu Motors	1SZXL09.8EXA	9.8
Isuzu Motors	1SZXL01.1WNA	1.1
Isuzu Motors	1SZXL01.5WNA	1.5
Isuzu Motors	1SZXL07.8ATA	7.8
Isuzu Motors	1SZXL01.5DNA	1.5
Isuzu Motors	1SZXL01.5DNA	1.5
Isuzu Motors	1SZXL01.7DNA	1.7
Isuzu Motors	1SZXL02.2DNA	2.2
Iveco	1VEXL07.7DAR	7.7
Iveco	1VEXL09.5DAR	9.5
Iveco	1VEXL07.8CRS	7.8
Iveco	1VEXL10.3CRS	10.3
Komatsu	1KLXL11.0DD3	11
Komatsu	1KLXL11.0DA1	11
Komatsu	1KLXL7.15CB1	7.15
Komatsu	1KLXL7.15CC1	7.15
Komatsu	1KLXL7.15CD1	7.15
Komatsu	1KLXL7.15CD1	7.15
Komatsu	1KLXL11.0DB1	11

Manufacturer	Engine Family	Displace (L)
Komatsu	1KLXL11.0DC1	11
Komatsu	1KLXL0359ABC	5.9
Komatsu	1KLXL0359ABA	5.9
Komatsu	1KLXL0505ABB	8.3
Komatsu	1KLXL0505AAA	8.3
Komatsu	1KLXL0505ACA	8.3
Komatsu	1KLXL11.0DD4	11
Kubota	1KBXL01.3BCC	1.1335
Kubota	1KBXL01.4FCC	1.393
Kubota	1KBXL.400KCC	0.4
Kubota	1KBXL.400KCB	0.4
Kubota	1KBXL.416KCB	0.416
Kubota	1KBXL.276KCB	0.276
Kubota	1KBXL01.0BCB	1.001
Kubota	1KBXL01.1BCB	1.123
Kubota	1KBXL.719KCB	0.656
Kubota	1KBXL.719KCC	0.719
Kubota	1KBXL.778KCB	0.778
Kubota	1KBXL01.5BCC	1.498
Kubota	1KBXL.309KCB	0.309
Kubota	1KBXL02.8BCC	2.746
Kubota	1KBXL02.4ECD	2.434
Kubota	1KBXL02.2ECC	2.197
Kubota	1KBXL02.2ECD	2.197
Kubota	1KBXL02.0FAC	1.999
Kubota	1KBXL01.5BAD	1.498
Kubota	1KBXL02.2FCC	2.197
Kubota	1KBXL01.9FCC	1.857
Kubota	1KBXL01.5FAD	1.499
Kubota	1KBXL01.2BCD	1.198
Kubota	1KBXL01.3BCD	1.335
Kubota	1KBXL01.5BCD	1.498
Kubota	1KBXL02.4FCD	2.434
Kubota	1KBXL02.2FCD	2.197
Kubota	1KBXL01.9FCD	1.857
Kubota	1KBXL01.5FCD	1.499
Liebherr Machines	1LHAL9.96ASA	10
Liebherr Machines	1LHAL9.96ARA	10
Liebherr Machines	1LHAL9.96ATA	9.96
Liebherr Machines	1LHAL9.96AUA	10

## Attachment 1: Combifilter Engine Family List

MY 2001 (cont.)

Manufacturer	Engine Family	Displace (L)
Lister-Petter	1L5XL1.86FWS	1.86
Lister-Petter	1L5XL1.86LWS	1.86
Lombardini	1LBDL.916F69	0.916
Lombardini	1LBDL.686SF2	0.686
Lombardini	1LBDL1.22FO4	1.221
Lombardini	1LBDL1.37SFO	1.37
Lombardini	1LBDL1.22FOT	1.22
Mitsubishi Heavy	1MVXL01.8AAA	1.8
Mitsubishi Heavy	1MVXL01.0BBB	1
Mitsubishi Heavy	1MVXL01.0AAA	1
Mitsubishi Heavy	1MVXL01.3AAA	1.5
Mitsubishi Heavy	1MVXL02.5AAA	2.5
Mitsubishi Heavy	1MVXL01.5BBB	1.5
Mitsubishi Heavy	1MVXL02.3AAA	2.3
Mitsubishi Heavy	1MVXL02.3BBB	2.3
Mitsubishi Motors	1MTXL07.5D6A	7.545
Mitsubishi Motors	1MTXL07.5D6C	7.545
Mitsubishi Motors	1MTXL11.9D6A	11.945
Mitsubishi Motors	1MTXL11.9D6B	11.945
Mitsubishi Motors	1MTXL05.8D3A	5.861
Motorenfabrik	1HZXL.667C81	0.667
Motorenfabrik	1HZXL.997V40	0.997
New Holland	1NHXL07.5A3V	7.5
Perkins	1PKXL05.9YJ1	6
Perkins	1PKXL05.9YK1	6
Perkins	1PKXL05.9YJ1	6
Volvo Construction	1VSXL09.6CE1	9.6
Volvo Construction	1VSXL06.7CE1	6.7
Volvo Construction	1VSXL12.0CE1	12
Volvo Construction	1VSXL09.6CE2	9.6
Yanmar	1YDXM0.32P1N	0.318
Yanmar	1YDXL0.52R2N	0.523
Yanmar	1YDXL0.74P3N	0.739
Yanmar	1YDXL0.78R3N	0.784
Yanmar	1YDXL0.78P3N	0.784
Yanmar	1YDXL0.88P3N	0.879
Yanmar	1YDXL1.01R3N	1.006
Yanmar	1YDXL1.01P3N	1.006
Yanmar	1YDXL1.20F3N	1.204
Yanmar	1YDXL1.33F3N	1.331

Manufacturer	Engine Family	Displace (L)
Yanmar	1YDXL1.50H3N	1.496
Yanmar	1YDXL1.64F3N	1.642
Yanmar	1YDXL0.75P2N	0.749
Yanmar	1YDXM0.64P2N	0.636
Yanmar	1YDXL1.01T3N	1.006
Yanmar	1YDXL1.33D3N	1.331
Yanmar	1YDXL1.50D3N	1.496
Yanmar	1YDXL1.50F3T	1.496
Yanmar	1YDXL1.64D3N	1.642
Yanmar	1YDXL1.90D4N	1.901
Yanmar	1YDXL2.00F4N	1.995
Yanmar	1YDXL2.09D4N	2.091
Yanmar	1YDXL2.00F4T	1.995
Yanmar	1YDXL2.19E4N	2.19
Yanmar	1YDXL2.19H4N	2.19
Yanmar	1YDXL2.78F4N	2.776
Yanmar	1YDXM1.50D3N	1.496

## Attachment 1: Combifilter Engine Family List

MY 2002

Manufacturer	Engine Family	Displace (L)
AB Volvo Penta	2VPXL09.6ACB	9.6
AB Volvo Penta	2VPXL07.3ABB	7.3
AB Volvo Penta	2VPXL07.3ACB	7.3
AB Volvo Penta	2VPXL05.5ABA	5.5
AB Volvo Penta	2VPXL06.7AAA	6.7
AB Volvo Penta	2VPXL06.7ABA	6.7
AB Volvo Penta	2VPXL09.6AAA	9.6
AB Volvo Penta	2VPXL09.6ABA	9.6
Alaska Diesel	2ADEL2.491DZ	2.486
Case	2CPXL08.8HSX	8.8
Case	2CPXL10.3ESX	10.3
Case	2CPXL06.6MRB	6.6
Case	2CPXL06.6MRC	6.6
Case	2CPXL07.0MRB	7
Case	2CPXL07.2MRB	7.2
Case	2CPXL07.2MRC	7.2
Case	2CPXL10.5MRF	10.5
Case	2CPXL10.5MRD	10.5
Case	2CPXL10.5MRG	10.5
Case	2CPXL12.0ESK	12
Case	2CPXL08.8HSK	8.8
Case	2CPXL10.3ESK	10.3
Case	2CPXL07.2HRK	7.2
Case	2CPXL07.2HSX	7.2
Case	2X9XL0359ABA	5.9
Case	2X9XL0505AAA	8.3
Case	2X9XL0505ABA	8.3
Case	2X9XL0505ABB	8.3
Case	2X9XL0505ACA	8.3
Case	2X9XL0505ABD	8.3
Case	2X9XL0359ABB	5.9
Case	2X9XL0359ABB	5.9
Case	2X9XL0359ABE	5.9
Case	2X9XL0505ABC	8.3
Case	2X9XL0505ABC	8.3
Case	2X9XL0505ACC	8.3
Case	2X9XL0505ACC	8.3
Case	2X9XL0540AAA	8.8
Cummins	2CEXL0661AAB	10.8
Cummins	2CEXL0661AAA	10.8

Manufacturer	Engine Family	Displace (L)
Cummins	2CEXL0239ACA	3.9
Cummins	2CEXL0359ABA	5.9
Cummins	2CEXL0359ABC	5.9
Cummins	2CEXL0359ABD	5.9
Cummins	2CEXL0505AAA	8.3
Cummins	2CEXL0505ABA	8.3
Cummins	2CEXL0505ABB	8.3
Cummins	2CEXL0505ACA	8.3
Cummins	2CEXL0505ACD	8.3
Cummins	2CEXL0505ACE	8.3
Cummins	2CEXL0661AAC	10.8
Cummins	2CEXL0661AAC	10.8
Cummins	2CEXL0505ABD	8.3
Cummins	2CEXL0359ABB	5.9
Cummins	2CEXL0359ABE	5.9
Cummins	2CEXL0505ABC	8.3
Cummins	2CEXL0505ACC	8.3
Cummins	2CEXL0540AAA	8.8
Cummins	2CEXL0661AAD	10.3
Cummins	2CEXL0505ACB	8.3
Daewoo Heavy	2DWXL08.1APA	8.1
Daewoo Heavy	2DWXL11.1BIA	11.1
Daewoo Heavy	2DWXL08.1BPA	8.1
Daihatsu Motor	2DHXL.9532DT	0.935
Daihatsu Motor	2DHXL.6972D1	0.697
Daihatsu Motor	2DHXL.9532D1	0.953
DaimlerChrysler	2MBXL12.0RJC	11.95
DaimlerChrysler	2MBXL12.0RJB	12
DDC	2DDXL04.7TAE	4.7
DDC	2DDXL05.2TDM	5.2
DDC	2DDXL08.5YJD	8.5
Deere Power	2JDXL04.5040	4.5
Deere Power	2JDXL04.5042	4.5
Deere Power	2JDXL04.5042	4.5
Deere Power	2JDXL10.1006	10.1
Deere Power	2JDXL08.1007	8.1
Deere Power	2JDXL08.1019	8.1
Deere Power	2JDXL08.1024	8.1
Deere Power	2JDXL08.1036	8.1
Deere Power	2JDXL08.1037	8.1

## Attachment 1: Combifilter Engine Family List

MY 2002 (cont.)

Manufacturer	Engine Family	Displace (L)
Deere Power	2JDXL08.1008	8.1
Deere Power	2JDXL08.1009	8.1
Deere Power	2JDXL06.8012	6.8
Deere Power	2JDXL06.8013	6.8
Deere Power	2JDXL06.8038	6.8
Deere Power	2JDXL06.8039	6.8
Deere Power	2JDXL06.8014	6.8
Deere Power	2JDXL06.8015	6.8
Deere Power	2JDXL08.1045	8.1
Deere Power	2JDXL08.1045	8.1
Deere Power	2JDXL06.8046	6.8
Deere Power	2JDXL06.8046	6.8
Deere Power	2JDXL06.8047	6.8
Deere Power	2JDXL06.8047	6.8
Deere Power	2JDXL06.8049	6.8
Deutz AG	2DZXL07.1032	7.1
Deutz AG	2DZXL07.1004	7.1
Deutz AG	2DZXL07.1005	7.1
Deutz AG	2DZXL06.1028	6.1
Deutz AG	2DZXL06.1008	6.1
Deutz AG	2DZXL03.8016	3.8
Deutz AG	2DZXL02.9017	2.9
Deutz AG	2DZXL02.7018	2.7
Deutz AG	2DZXL03.1031	3.1
Deutz AG	2DZXL01.2022	1.2
Deutz AG	2DZXL01.2023	1.2
Deutz AG	2DZXL00.9024	0.9
Deutz AG	2DZXL01.4029	1.4
Deutz AG	2DZXL00.7030	0.7
Generac	2GNXL03.0KNA	3
Generac	2GNXL03.0KTA	3
Generac	2GNXL03.0KTA	3
Hino Motors	2HMXL08.8PTD	8.8
Hino Motors	2HMXL06.7HTD	6.7
Hino Motors	2HMXL06.7HTD	6.7
International Truck	2NVXL0466ANA	7.6
International Truck	2NVXL0530ANA	8.7
International Truck	2NVXL0530ANB	8.7
International Truck	2NVXL0530ANC	8.7
International Truck	2NVXL0530AND	8.7

Manufacturer	Engine Family	Displace (L)
International Truck	2NVXL0530ANE	8.7
International Truck	2NVXL0530ANF	8.7
International Truck	2NVXL0444ANA	7.3
Iseki Matsuyama	2ICLL0.93B3C	0.929
Iseki Matsuyama	2ICLL1.01B3F	1.006
Iseki Matsuyama	2ICLL1.12B3G	1.124
Iseki Matsuyama	2ICLL1.43C3B	1.43
Iseki Matsuyama	2ICLL1.50C3D	1.498
Iseki Matsuyama	2ICLL1.50C3T	1.498
Iseki Matsuyama	2ICLL2.20C4E	2.197
Iseki Matsuyama	2ICLL1.46C3C	1.464
Ishikawajima	2H3XL.761LCS	0.761
Ishikawajima	2H3XM.451M10	0.451
Ishikawajima	2H3XL1.49N3C	1.496
Ishikawajima	2H3XL1.13SLV	1.131
Ishikawajima	2H3XM.676M20	0.676
Ishikawajima	2H3XL.761ELV	0.761
Ishikawajima	2H3XL1.13LCS	1.131
Ishikawajima	2H3XM.954M30	0.954
Ishikawajima	2H3XL1.33J84	1.33
Ishikawajima	2H3XL2.00N84	1.995
Ishikawajima	2H3XL2.22L84	2.216
Ishikawajima	2H3XM1.49M40	1.496
Ishikawajima	2H3XL2.00NCS	1.995
Ishikawajima	2H3XL2.22NLC	2.216
Ishikawajima	2H3XL1.13MSL	1.131
Ishikawajima	2H3XL1.49N3V	1.496
Isuzu Motors	2SZXL01.1WNA	1.1
Isuzu Motors	2SZXL01.5WNA	1.5
Isuzu Motors	2SZXL01.1YNA	1.1
Isuzu Motors	2SZXL01.5DNA	1.5
Isuzu Motors	2SZXL01.5DTA	1.5
Isuzu Motors	2SZXL01.5YNB	1.5
Isuzu Motors	2SZXL01.5YNC	1.5
Isuzu Motors	2SZXL01.7DNA	1.7
Isuzu Motors	2SZXL01.7YNA	1.7
Isuzu Motors	2SZXL02.2DNA	2.2
Isuzu Motors	2SZXL02.2YNA	2.2
Isuzu Motors	2SZXL02.2YNB	2.2
Isuzu Motors	2SZXL02.2YNC	2.2

## Attachment 1: Combifilter Engine Family List

MY 2002 (cont.)

Manufacturer	Engine Family	Displace (L)
Isuzu Motors	2SZXL02.4YNA	2.4
Isuzu Motors	2SZXL02.4YNC	2.4
Isuzu Motors	2SZXL03.1YNB	3.1
Isuzu Motors	2SZXL03.1YNC	3.1
Isuzu Motors	2SZXL06.5EXA	6.5
Isuzu Motors	2SZXL07.8ATA	7.8
Isuzu Motors	2SZXL07.8EXA	7.8
Isuzu Motors	2SZXL09.8ATA	9.8
Isuzu Motors	2SZXL09.8ATB	9.8
Isuzu Motors	2SZXL09.8EXA	9.8
Isuzu Motors	2SZXL03.1YND	3.1
Iveco	2VEXL05.9DCR	5.9
Iveco	2VEXL07.7DAR	7.7
Iveco	2VEXL10.3CRS	10.3
Iveco	2VEXL07.8CRS	7.8
Komatsu	2KLXL7.15CB1	7.2
Komatsu	2KLXL7.15CC1	7.2
Komatsu	2KLXL7.15CD1	7.2
Komatsu	2KLXL11.0DA1	11
Komatsu	2KLXL11.0DB1	11
Komatsu	2KLXL11.0DC1	11
Komatsu	2KLXL11.0DD3	11
Komatsu	2KLXL11.0DD4	11
Komatsu	2KLXL0359ABA	5.9
Komatsu	2KLXL0359ABC	5.9
Komatsu	2KLXL0505AAA	8.3
Komatsu	2KLXL0505ABB	8.3
Komatsu	2KLXL0505ACA	8.3
Komatsu	2KLXL0505ABD	8.3
Komatsu	2KLXL11.0DC3	11
Komatsu	2KLXL11.0DD5	11
Komatsu	2KLXL11.0DD6	11
Kubota	2KBXL.276KCB	0.276
Kubota	2KBXL.309KCB	0.309
Kubota	2KBXL.400KCB	0.4
Kubota	2KBXL.400KCC	0.4
Kubota	2KBXL.416KCB	0.416
Kubota	2KBXL.719KCB	0.719
Kubota	2KBXL.719KCC	0.719
Kubota	2KBXL.778KCB	0.778

Manufacturer	Engine Family	Displace (L)
Kubota	2KBXL01.0BCB	1.001
Kubota	2KBXL01.1BCB	1.123
Kubota	2KBXL01.3BCC	1.335
Kubota	2KBXL01.4FCC	1.393
Kubota	2KBXL01.5BCC	1.498
Kubota	2KBXL01.2BCD	1.198
Kubota	2KBXL01.3BCD	1.335
Kubota	2KBXL01.5BAD	1.498
Kubota	2KBXL01.5BCD	1.498
Kubota	2KBXL01.5EAD	1.499
Kubota	2KBXL01.5ECD	1.499
Kubota	2KBXL01.5FAD	1.499
Kubota	2KBXL01.5FCD	1.499
Kubota	2KBXL01.9FCC	1.857
Kubota	2KBXL01.9FCD	1.857
Kubota	2KBXL02.0FAC	1.999
Kubota	2KBXL02.2ECC	2.197
Kubota	2KBXL02.2ECD	2.197
Kubota	2KBXL02.2FCC	2.197
Kubota	2KBXL02.2FCD	2.197
Kubota	2KBXL02.4ECD	2.434
Kubota	2KBXL02.4FCD	2.434
Kubota	2KBXL02.8BCC	2.746
Kubota	2KBXL.898KCB	0.898
Liebherr Machines	2LHAL9.96AUA	10
Liebherr Machines	2LHAL9.96ARA	10
Liebherr Machines	2LHAL9.96ASA	10
Liebherr Machines	2LHAL9.96ATA	10
Lister-Petter	2L5XL1.86LWS	1.9
Lister-Petter	2L5XL1.86FWS	1.9
Lister-Petter	2L5XL2.29FX9	2.3
Lombardini	2LBDL1.22FOT	1.221
Lombardini	2LBDL.686SF2	0.686
Lombardini	2LBDL1.37SFO	1.37
Lombardini	2LBDL.916F69	0.916
Lombardini	2LBDL1.22F04	1.221
Mitsubishi Fuso	2MFTL05.8D3B	5.861
Mitsubishi Heavy	2MVXL00.6BBB	0.6
Mitsubishi Heavy	2MVXL01.0AAA	1
Mitsubishi Heavy	2MVXL01.0BBB	1

## Attachment 1: Combifilter Engine Family List

MY 2002 (cont.)

Manufacturer	Engine Family	Displace (L)
Mitsubishi Heavy	2MVXL01.3AAA	1.5
Mitsubishi Heavy	2MVXL01.5AAA	1.5
Mitsubishi Heavy	2MVXL01.5BBB	1.8
Mitsubishi Heavy	2MVXL01.8AAA	1.8
Mitsubishi Heavy	2MVXL02.3AAA	2.3
Mitsubishi Heavy	2MVXL02.3BBB	2.3
Mitsubishi Heavy	2MVXL02.5AAA	2.5
Mitsubishi Heavy	2MVXL02.3CCC	2.3
Mitsubishi Motor	2MTXL11.9D2A	11.9
Mitsubishi Motor	2MTXL07.5D6A	7.5
Mitsubishi Motor	2MTXL07.5D6C	7.5
Mitsubishi Motor	2MTXL11.9D6A	11.9
Mitsubishi Motor	2MTXL11.9D6B	11.9
Mitsubishi Motor	2MTXL11.9D2C	11.9
Mitsubishi Motor	2MTXL05.8D3A	5.8
Mitsubishi Motor	2MTXL07.5D6D	7.5
Motorenfabrik	2HZXL.997C40	1
Motorenfabrik	2HZXL.667C81	0.7
New Holland	2NHXL07.5A3V	7.5
New Holland	2NHXL07.5A3A	7.5
New Holland	2NHXL07.5A3F	7.5
Perkins	2PKXL05.9YJ1	5.9
Perkins	2PKXL05.9YK1	5.985
Scania	2Y9XL09.0AAC	9
Volvo Construction	2VSXL06.7CE1	6.7
Volvo Construction	2VSXL09.6CE2	9.6
Yanmar	2YDXL1.01T3N	1.006
Yanmar	2YDXL1.33D3N	1.331
Yanmar	2YDXL1.50D3N	1.496
Yanmar	2YDXL1.50F3T	1.496
Yanmar	2YDXL1.64D3N	1.642
Yanmar	2YDXL1.90D4N	1.901
Yanmar	2YDXL2.00F4N	1.995
Yanmar	2YDXL2.00F4T	1.995
Yanmar	2YDXL2.09D4N	2.091
Yanmar	2YDXL2.19E4N	2.19
Yanmar	2YDXL2.19H4N	2.19
Yanmar	2YDXL2.78F4N	2.776
Yanmar	2YDXM1.50D3N	1.496
Yanmar	2YDXL0.52R2N	0.523

Manufacturer	Engine Family	Displace (L)
Yanmar	2YDXM0.64P2N	0.636
Yanmar	2YDXL0.74P3N	0.739
Yanmar	2YDXL0.75P2N	0.749
Yanmar	2YDXL0.78P3N	0.784
Yanmar	2YDXL0.78R3N	0.784
Yanmar	2YDXL0.88P3N	0.879
Yanmar	2YDXL1.01P3N	1.006
Yanmar	2YDXL1.01R3N	1.006
Yanmar	2YDXL1.20F3N	1.204
Yanmar	2YDXL1.33F3N	1.331
Yanmar	2YDXL1.50H3N	1.496
Yanmar	2YDXL1.64F3N	1.642
Yanmar	2YDXM0.32P1N	0.318



## Attachment 1: Combifilter Engine Family List

MY 2003

Manufacturer	Engine Family	Displace (L)
AB Volvo Penta	3VPXL07.3ACB	7.3
AB Volvo Penta	3VPXL09.6ACB	9.6
Caterpillar	3CPXL07.2HSK	7.2
Caterpillar	3CPXL07.2HSL	7.2
Caterpillar	3CPXL08.8HSL	8.8
Caterpillar	3CPXL08.8HSK	8.8
Caterpillar	3CPXL10.3ESK	10.3
Caterpillar	3CPXL12.0ESK	12
Caterpillar	3CPXL14.6MRW	5
Caterpillar	3CPXL10.5MRW	10.5
Caterpillar	3CPXL07.2MRW	7.2
Caterpillar	3CPXL06.6MTW	6.6
Caterpillar	3CPXL06.6MRW	6.6
Caterpillar	3CPXL04.4MRW	4.4
CNH Engine	3X9XL0239ABA	3.9
CNH Engine	3X9XL0505ABD	8.3
CNH Engine	3X9XL0359AAC	5.9
CNH Engine	3X9XL0505ABC	8.3
CNH Engine	3X9XL0505ABC	8.3
CNH Engine	3X9XL0505ABC	8.3
CNH Engine	3X9XL0505ACC	8.3
CNH Engine	3X9XL0505ACC	8.3
CNH Engine	3X9XL0505ACC	8.3
CNH Engine	3X9XL0540AAA	8.8
CNH Engine	3X9XL0540AAA	8.8
CNH Engine	3X9XL0505AAB	8.3
CNH Engine	3X9XL0359ABE	5.9
CNH UK Limited	3NHXL07.5B3A	7.5
CNH UK Limited	3NHXL07.5B3C	7.5
CNH UK Limited	3NHXL07.5B2K	7.5
CNH UK Limited	3NHXL05.9DTA	5.9
CNH UK Limited	3NHXL07.5B3F	7.5
CNH UK Limited	3NHXL07.5B2H	7.5
CNH UK Limited	3NHXL06.7DTA	6.7
CNH UK Limited	3NHXL06.7DCR	6.7
Cummins	3CEXL0275AAA	4.5
Cummins	3CEXL0359AAB	5.9
Cummins	3CEXL0359AAB	5.9
Cummins	3CEXL0239AAD	3.9
Cummins	3CEXL0239AAD	3.9

Manufacturer	Engine Family	Displace (L)
Cummins	3CEXL0239AAD	3.9
Cummins	3CEXL0359ABC	5.9
Cummins	3CEXL0505ABD	8.3
Cummins	3CEXL0505ACB	8.3
Cummins	3CEXL0661AAC	10.8
Cummins	3CEXL0540AAA	8.8
Cummins	3CEXL0359AAC	5.9
Cummins	3CEXL0359AAC	5.9
Cummins	3CEXL0359AAC	5.9
Cummins	3CEXL0359AAD	5.9
Cummins	3CEXL0359AAD	5.9
Cummins	3CEXL0359AAD	5.9
Cummins	3CEXL0359AAD	5.9
Cummins	3CEXL0505ABC	8.3
Cummins	3CEXL0505ACC	8.3
Cummins	3CEXL0505ACC	8.3
Cummins	3CEXL0239AAF	3.9
Cummins	3CEXL0239AAF	3.9
Cummins	3CEXL0661AAD	10.8
Cummins	3CEXL0661AAE	10.8
Cummins	3CEXL0359ABE	5.9
Cummins	3CEXL0359ABE	5.9
Cummins	3CEXL0409AAA	6.7
Cummins	3CEXL0275AAB	4.5
Cummins	3CEXL0505AAD	8.3
Daedong	3DCLL02.2D87	2.197
Daedong	3DCLL02.0D83	2
Daedong	3DCLL01.4D80	1.4
Daedong	3DCLL.927D5G	0.927
Daedong	3DCLL02.0D5T	2
Daewoo Heavy	3DWXL2.37ANT	2.37
Daewoo Heavy	3DWXL08.1CPA	8.1
Daewoo Motor	3DWXL05.8COA	5.8
Daewoo Motor	3DWXL11.1DJA	11.1
Daihatsu Motor	3DHXL.9532DT	0.953
Daihatsu Motor	3DHXL.9532DT	0.953
Daimlerchrysler	3MBXL4.25RJB	4.25
Daimlerchrysler	3MBXL6.37RJB	6.37
Daimlerchrysler	3MBXL7.20RJA	7.2
Daimlerchrysler	3MBXL12.0RJB	12

## Attachment 1: Combifilter Engine Family List

MY 2003 (cont.)

Manufacturer	Engine Family	Displace (L)
Daimlerchrysler	3MBXL12.0RJJC	12
DDC	3DDXL08.5YJD	8.5
Deere Power	3JDXL06.8038	6.8
Deere Power	3JDXL06.8039	6.8
Deere Power	3JDXL04.5040	4.5
Deere Power	3JDXL06.8044	6.8
Deere Power	3JDXL06.8048	6.8
Deere Power	3JDXL06.8049	6.8
Deere Power	3JDXL06.8052	6.8
Deere Power	3JDXL06.8053	6.8
Deere Power	3JDXL06.8046	6.8
Deere Power	3JDXL06.8041	6.8
Deere Power	3JDXL06.8054	6.8
Deere Power	3JDXL06.8055	6.8
Deere Power	3JDXL06.8056	6.8
Deere Power	3JDXL08.1058	8.1
Deere Power	3JDXL08.1037	8.1
Deere Power	3JDXL08.1045	8.1
Deere Power	3JDXL08.1059	8.1
Deere Power	3JDXL04.5062	4.5
Deutz AG	3DZXL07.1034	7.2
Deutz AG	3DZXL07.1032	7.15
Deutz AG	3DZXL05.7019	5.7
Deutz AG	3DZXL06.1028	6.1
Deutz AG	3DZXL05.7033	5.7
Deutz AG	3DZXL03.8016	3.8
Deutz AG	3DZXL02.9017	2.9
Deutz AG	3DZXL02.7018	2.7
Deutz AG	3DZXL03.1031	3.1
Deutz AG	3DZXL01.2022	1.2
Deutz AG	3DZXL01.2023	1.2
Deutz AG	3DZXL00.9024	0.9
Deutz AG	3DZXL01.4029	1.4
Deutz AG	3DZXL00.7030	0.686
Generac	3GNXL03.0KNA	3
Generac	3GNXL03.0KTA	3
International Truck	3NVXL0530ANE	8.7
International Truck	3NVXL0530ANF	8.7
International Truck	3NVXL0365AFA	5.98

Manufacturer	Engine Family	Displace (L)
Iseki Matsuyama	3ICLL0.93B3C	0.929
Iseki Matsuyama	3ICLL1.12B3G	1.124
Iseki Matsuyama	3ICLL1.01B3F	1.006
Iseki Matsuyama	3ICLL1.43C3B	1.43
Iseki Matsuyama	3ICLL1.46C3C	1.464
Iseki Matsuyama	3ICLL1.50C3D	1.498
Iseki Matsuyama	3ICLL2.20C4E	2.197
Iseki Matsuyama	3ICLL1.50C3T	1.498
Ishikawajima	3H3XM.451M10	0.451
Ishikawajima	3H3XL.761LCS	0.761
Ishikawajima	3H3XL1.49N3C	1.496
Ishikawajima	3H3XL1.13SLV	1.131
Ishikawajima	3H3XL1.13LCS	1.131
Ishikawajima	3H3XL1.49N3V	1.496
Ishikawajima	3H3XL.761ELV	0.761
Ishikawajima	3H3XL1.33J84	1.33
Ishikawajima	3H3XL.676M20	0.676
Ishikawajima	3H3XL2.00N84	1.995
Ishikawajima	3H3XL2.22L84	2.216
Ishikawajima	3H3XL2.00NCS	1.995
Ishikawajima	3H3XL2.22NLC	2.216
Ishikawajima	3H3XL1.13MSL	1.13
Ishikawajima	3H3XM.954M30	0.954
Ishikawajima	3H3XM1.49M40	1.496
Isuzu Motors	3SZXL01.1WNA	1.1
Isuzu Motors	3SZXL01.5WNA	1.5
Isuzu Motors	3SZXL01.1YNA	1.1
Isuzu Motors	3SZXL01.5DNA	1.5
Isuzu Motors	3SZXL01.5YNB	1.5
Isuzu Motors	3SZXL01.5YNC	1.5
Isuzu Motors	3SZXL01.5DTA	1.5
Isuzu Motors	3SZXL01.7DNA	1.7
Isuzu Motors	3SZXL01.7YNA	1.7
Isuzu Motors	3SZXL02.2DNA	2.2
Isuzu Motors	3SZXL02.2YNA	2.2
Isuzu Motors	3SZXL02.2YNB	2.2
Isuzu Motors	3SZXL02.2YNC	2.2
Isuzu Motors	3SZXL02.4YNA	2.4
Isuzu Motors	3SZXL02.4YNC	2.4
Isuzu Motors	3SZXL03.1YNB	3.1

## Attachment 1: Combifilter Engine Family List

MY 2003 (cont.)

Manufacturer	Engine Family	Displace (L)
Isuzu Motors	3SZXL03.1YNC	3.1
Isuzu Motors	3SZXL07.8EXA	7.8
Isuzu Motors	3SZXL07.8ETA	7.8
Isuzu Motors	3SZXL09.8EXA	9.8
Isuzu Motors	3SZXL02.2DNB	2.2
Isuzu Motors	3SZXL04.3FTA	4.3
Isuzu Motors	3SZXL04.3FXA	4.3
Isuzu Motors	3SZXL06.5FTA	4.3
Isuzu Motors	3SZXL06.5FTA	6.5
Isuzu Motors	3SZXL06.5FXA	6.5
Isuzu Motors	3SZXL06.5EXA	6.5
Iveco	3EXL03.9DTA	3.9
Iveco	3VEXL03.9DTA	3.9
Iveco	3VEXL05.9DTA	5.9
Iveco	3VEXL06.7DCR	6.7
Iveco	3VEXL07.8CRS	7.8
Komatsu	3KLXL0239AAD	3.9
Komatsu	3KLXL0359ABC	5.9
Komatsu	3KLXL0505ABD	8.3
Komatsu	3KLXL11.0DD3	11
Komatsu	3KLXL0239AAF	3.9
Komatsu	3KLXL11.0DD5	11
Komatsu	3KLXL11.0DC3	11
Komatsu	3KLXL0359AAB	5.9
Kubota	3KBXL.276KCB	0.276
Kubota	3KBXL.309KCB	0.309
Kubota	3KBXL.400KCB	0.4
Kubota	3KBXL.416KCB	0.416
Kubota	3KBXL.719KCB	0.719
Kubota	3KBXL.719KCC	0.719
Kubota	3KBXL.778KCB	0.778
Kubota	3KBXL.898KCB	0.898
Kubota	3KBXL01.0BCB	1.001
Kubota	3KBXL01.1BCB	1.123
Kubota	3KBXL01.2BCD	1.198
Kubota	3KBXL01.3BCC	1.335
Kubota	3KBXL01.3BCD	1.335
Kubota	3KBXL01.4FCC	1.393
Kubota	3KBXL01.5BAD	1.498
Kubota	3KBXL01.5BCC	1.498

Manufacturer	Engine Family	Displace (L)
Kubota	3KBXL01.5BCD	1.498
Kubota	3KBXL01.5EAD	1.499
Kubota	3KBXL01.5ECD	1.499
Kubota	3KBXL01.5FAD	1.499
Kubota	3KBXL01.5FCD	1.499
Kubota	3KBXL01.9FCC	1.857
Kubota	3KBXL01.9FCD	1.857
Kubota	3KBXL02.0FAC	1.999
Kubota	3KBXL02.2ECC	2.197
Kubota	3KBXL02.2ECD	2.197
Kubota	3KBXL02.2FCC	2.197
Kubota	3KBXL02.2FCD	2.197
Kubota	3KBXL02.4ECD	2.434
Kubota	3KBXL02.4FCD	2.434
Kubota	3KBXL02.8BCC	2.746
Liebherr Machines	3LHAL9.96AUA	10
Liebherr Machines	3LHAL9.96ATA	10
Liebherr Machines	3LHAL9.96ARA	10
Liebherr Machines	3LHAL9.96ASA	9.96
Lister-Petter	3L5XL1.17FX8	1.17
Lister-Petter	3L5XL1.17VX8	1.17
Lister-Petter	3L5XL1.72FX9	1.72
Lister-Petter	3L5XL1.86FWS	1.86
Lister-Petter	3L5XL1.86LWS	1.86
Lister-Petter	3L5XL2.29FX9	2.3
Lombardini	3LBDL.401154	0.401
Lombardini	3LBDL.916F69	0.916
Lombardini	3LBDL1.22FO4	1.221
Lombardini	3LBDL1.22FOT	1.221
Lombardini	3LBDL.686SF2	0.686
Lombardini	3LBDL1.37SFO	1.028
Lombardini	3LBDL2.07CHD	2.08
Lombardini	3LBDL2.07CHT	2.068
Lombardini	3LBDL2.19CHP	2.2
Lombardini	3LBDL.954127	0.954
Lombardini	3LBDL1.87911	1.872
Mack Trucks	3MKXL11.9P69	11.9
Mahindra & Mahindra	3MMLL01.8475	1.892
Mahindra & Mahindra	3MMLL02.4NEF	2.394
Mahindra & Mahindra	3MMLL01.8C27	1.892

## Attachment 1: Combifilter Engine Family List

MY 2003 (cont.)

Manufacturer	Engine Family	Displace (L)
Mitsubishi Fuso	3MFTL07.5D6A	7.545
Mitsubishi Fuso	3MFTL07.5D6D	7.545
Mitsubishi Fuso	3MFTL07.5D6D	7.545
Mitsubishi Fuso	3MFTL07.5D6D	7.545
Mitsubishi Fuso	3MFTL07.5D6E	7.545
Mitsubishi Fuso	3MFTL05.8D3B	5.861
Mitsubishi Fuso	3MFTL05.8D3A	5.861
Mitsubishi Fuso	3MFTL03.9D3A	3.907
Mitsubishi Heavy	3MVXL01.0AAA	1
Mitsubishi Heavy	3MVXL01.0BBB	1
Mitsubishi Heavy	3MVXL01.3AAA	1.5
Mitsubishi Heavy	3MVXL01.5BBB	1.5
Mitsubishi Heavy	3MVXL01.8AAA	1.8
Mitsubishi Heavy	3MVXL02.3AAA	2.3
Mitsubishi Heavy	3MVXL02.3BBB	2.3
Mitsubishi Heavy	3MVXL02.3CCC	2.3
Mitsubishi Heavy	3MVXL02.5AAA	2.5
Mitsubishi Heavy	3MVXL05.0DDD	5
Mitsubishi Heavy	3MVXL06.4AAB	6.4
Mitsubishi Heavy	3MVXL06.4DDD	6.4
Mitsubishi Heavy	3MVXL01.5CCC	1.5
Mitsubishi Motors	3MTXL11.9D2A	11.945
Motorenfabrik	3HZXL.997C40	1
Motorenfabrik	3HZXL.667C81	0.7
Motorenfabrik	3HZXL.667C83	0.667
Motorenfabrik	3HZXL.722C91	0.722
Perkins	3PKXL04.4RK1	4.4
Perkins	3PKXL04.4RJ1	4.4
Perkins	3PKXL06.0VK1	5.985
Perkins	3PKXL04.4RH2	4.4
Volvo Construction	3VSXL09.6CE2	9.6
Yanmar	3YDXL1.11W3N	1.115
Yanmar	3YDXL1.50M3N	1.496
Yanmar	3YDXL1.64M3N	1.642
Yanmar	3YDXL1.33M3N	1.331
Yanmar	3YDXL1.11V3N	1.116
Yanmar	3YDXL2.09K4N	2.091
Yanmar	3YDXL1.33K3N	1.331
Yanmar	3YDXL2.00K4N	1.995
Yanmar	3YDXL2.19K4N	2.19

Manufacturer	Engine Family	Displace (L)
Yanmar	3YDXL1.01T3N	1.006
Yanmar	3YDXL1.33D3N	1.331
Yanmar	3YDXL1.50D3N	1.496
Yanmar	3YDXL1.50F3T	1.496
Yanmar	3YDXL1.50K3T	1.496
Yanmar	3YDXL1.64D3N	1.642
Yanmar	3YDXL1.90D4N	1.901
Yanmar	3YDXL2.00F4N	1.995
Yanmar	3YDXL2.00F4T	1.995
Yanmar	3YDXL2.09D4N	2.091
Yanmar	3YDXL2.19E4N	2.19
Yanmar	3YDXL2.19H4N	2.19
Yanmar	3YDXL2.78F4N	2.776
Yanmar	3YDXM1.50D3N	1.496
Yanmar	3YDXL0.75P2N	0.749
Yanmar	3YDXL0.52R2N	0.523
Yanmar	3YDXL0.74P3N	0.739
Yanmar	3YDXL0.78R3N	0.784
Yanmar	3YDXL0.78P3N	0.784
Yanmar	3YDXL0.88P3N	0.879
Yanmar	3YDXL0.88R3N	0.879
Yanmar	3YDXL1.01R3N	1.006
Yanmar	3YDXL1.01P3N	1.006
Yanmar	3YDXL1.20F3N	1.204
Yanmar	3YDXL1.33F3N	1.331
Yanmar	3YDXL1.50H3N	1.496
Yanmar	3YDXL1.64F3N	1.642
Yanmar	3YDXM0.64P2N	0.636
Yanmar	3YDXM0.32P1N	0.318
Yanmar	3YDXL1.50J3T	1.496
Yanmar	3YDXL2.00J4N	1.995
Yanmar	3YDXL2.19J4N	2.19
Yanmar	3YDXL1.50J3N	1.496
Yanmar	3YDXL1.64J3N	1.642
Yanmar	3YDXL0.85W3N	0.854
Yanmar	3YDXL3.05J4N	3.054

## Attachment 1: Combifilter Engine Family List

MY 2004

Manufacturer	Engine Family	Displace (L)
AB Volvo Penta	4VPXL07.3ACB	7.3
AB Volvo Penta	4VPXL09.6ACB	9.6
AB Volvo Penta	4VPXL09.4ACA	9.4
AB Volvo Penta	4VPXL09.6ACC	9.4
AB Volvo Penta	4VPXL09.4ACC	9.4
Caterpillar	4CPXL07.2MRW	7.2
Caterpillar	4CPXL10.5MRW	10.5
Caterpillar	4CPXL10.3ESK	10.3
Caterpillar	4CPXL07.2HSK	7.2
Caterpillar	4CPXL07.2HSL	7.2
Caterpillar	4CPXL08.8HSK	8.8
Caterpillar	4CPXL08.8HSL	8.8
Caterpillar	4CPXL12.0ESK	12
Caterpillar	4CPXL08.8ESK	8.8
Caterpillar	4CPXL11.1ESK	11.1
Caterpillar	4CPXL12.5ESK	11.1
CNH Engine	4X9XL0505AAB	8.3
CNH Engine	4X9XL0505ABD	8.3
CNH Engine	4X9XL0359ABE	5.9
CNH Engine	4X9XL0505ABC	8.3
CNH Engine	4X9XL0505ABC	8.3
CNH Engine	4X9XL0505ACC	8.3
CNH Engine	4X9XL0505ACC	8.3
CNH Engine	4X9XL0540AAA	8.8
CNH Engine	4X9XL0239AAB	3.9
CNH Engine	4X9XL0239AAC	3.9
CNH Engine	4X9XL0359AAJ	5.9
CNH Engine	4X9XL0359AAK	5.9
CNH UK Limited	4NHXL07.5B3F	7.5
CNH UK Limited	4NHXL05.9DTA	5.9
CNH UK Limited	4NHXL06.7DCR	6.7
CNH UK Limited	4NHXL06.7DTA	6.7
CNH UK Limited	4NHXL07.5B2H	7.5
CNH UK Limited	4NHXL07.5B2K	7.5
CNH UK Limited	4NHXL07.5B3A	7.5
CNH UK Limited	4NHXL07.5B3C	7.5
CNH UK Limited	4NHXL04.5DNA	4.5
CNH UK Limited	4NHXL04.5DTC	4.5
Cummins	4CEXL0359AAE	5.9
Cummins	4CEXL0661AAC	10.8

Manufacturer	Engine Family	Displace (L)
Cummins	4CEXL0661AAD	10.8
Cummins	4CEXL0661AAD	10.8
Cummins	4CEXL0661AAD	10.8
Cummins	4CEXL0661AAE	10.8
Cummins	4CEXL0661AAE	10.8
Cummins	4CEXL0359AAF	5.9
Cummins	4CEXL1.46A32	1.461
Cummins	4CEXL1.71A31	1.714
Cummins	4CEXL2.08A43	2.082
Cummins	4CEXL2.28A42	2.286
Cummins	4CEXL2.28A41	2.286
Cummins	4CEXL0239AAD	3.9
Cummins	4CEXL0239AAD	3.9
Cummins	4CEXL0239AAF	3.9
Cummins	4CEXL0239AAF	3.9
Cummins	4CEXL0275AAB	4.5
Cummins	4CEXL0275AAB	4.5
Cummins	4CEXL0275AAC	4.5
Cummins	4CEXL0275AAC	4.5
Cummins	4CEXL0275AAC	4.5
Cummins	4CEXL0275AAD	4.5
Cummins	4CEXL0275AAD	4.5
Cummins	4CEXL0359AAB	5.9
Cummins	4CEXL0359AAB	5.9
Cummins	4CEXL0359AAC	5.9
Cummins	4CEXL0359AAC	5.9
Cummins	4CEXL0359AAD	5.9
Cummins	4CEXL0359AAD	5.9
Cummins	4CEXL0359AAD	5.9
Cummins	4CEXL0359AAD	5.9
Cummins	4CEXL0359ABC	5.9
Cummins	4CEXL0409AAA	6.7
Cummins	4CEXL0505ABD	8.3
Cummins	4CEXL0505ACB	8.3
Cummins	4CEXL03.3ABA	3.3
Cummins	4CEXL03.3ABB	3.3
Cummins	4CEXL0359ABE	5.9
Cummins	4CEXL0359ABE	5.9
Cummins	4CEXL0359ABE	5.9
Cummins	4CEXL0505ABC	8.3
Cummins	4CEXL0505ACC	8.3

## Attachment 1: Combifilter Engine Family List

MY 2004 (cont.)

Manufacturer	Engine Family	Displace (L)
Cummins	4CEXL0540AAA	8.8
Cummins	4CEXL0505AAD	8.3
Cummins	4CEXL0359AAH	5.9
Cummins	4CEXL0275AAE	4.5
Cummins	4CEXL0239AAG	3.9
Daedong	4DCLL01.4D80	1.4
Daedong	4DCLL02.0D83	2
Daedong	4DCLL02.2D87	2.197
Daedong	4DCLL02.0D5T	2
Daedong	4DCLL02.2D7T	2.2
Daedong	4DCLL01.3D13	1.299
Daedong	4DCLL01.4D14	1.395
Daewoo Heavy	4DWXL05.8C5A	5.8
Daewoo Heavy	4DWXL2.37ANT	2.37
Daewoo Heavy	4DWXL08.1CPA	8.1
Daewoo Heavy	4DWXL11.1BIA	11.1
Daewoo Heavy	4DWXL05.8COA	5.8
Daewoo Heavy	4DWXL11.1DJA	11.1
Daewoo Heavy	4DWXL05.8CRN	5.8
Daihatsu Motors	4DJXL.9532D1	0.953
Daimlerchrysler	4MBXL12.0RJB	12
Daimlerchrysler	4MBXL12.0RJC	12
Daimlerchrysler	4MBXL7.20RJA	7.2
Daimlerchrysler	4MBXL6.3RJB	6.37
Daimlerchrysler	4MBXL4.25RJB	4.25
DDC	4DDXL08.5YJD	8.5
Deere Power	4JDXL03.0064	3
Deere Power	4JDXL03.0063	3
Deere Power	4JDXL02.9017	2.9
Deere Power	4JDXL02.9018	2.9
Deere Power	4JDXL02.9050	2.9
Deere Power	4JDXL02.9050	2.9
Deere Power	4JDXL04.5025	4.5
Deere Power	4JDXL04.5043	4.5
Deere Power	4JDXL04.5051	6.8
Deere Power	4JDXL06.8038	6.8
Deere Power	4JDXL06.8039	6.8
Deere Power	4JDXL04.5040	4.5
Deere Power	4JDXL06.8044	6.8

Manufacturer	Engine Family	Displace (L)
Deere Power	4JDXL06.8048	6.8
Deere Power	4JDXL06.8049	6.8
Deere Power	4JDXL06.8052	6.8
Deere Power	4JDXL06.8053	6.8
Deere Power	4JDXL06.8072	6.8
Deere Power	4JDXL06.8014	6.8
Deere Power	4JDXL06.8041	6.8
Deere Power	4JDXL04.5042	4.5
Deere Power	4JDXL06.8054	6.8
Deere Power	4JDXL06.8055	6.8
Deere Power	4JDXL04.5057	4.5
Deere Power	4JDXL04.5062	4.5
Deere Power	4JDXL08.1058	8.1
Deere Power	4JDXL08.1037	8.1
Deere Power	4JDXL08.1045	8.1
Deere Power	4JDXL08.1059	8.1
Deere Power	4JDXL02.4074	2.4
Deere Power	4JDXL02.4074	2.4
Deere Power	4JDXL04.5075	4.5
Deutz AG	4DZXL06.5035	6.472
Deutz AG	4DZXL06.5036	6.472
Deutz AG	4DZXL06.5037	6.472
Deutz AG	4DZXL06.5042	6.472
Deutz AG	4DZXL06.1038	6.057
Deutz AG	4DZXL07.1005	4.76
Deutz AG	4DZXL03.1039	3.109
Deutz AG	4DZXL03.1040	3.108
Deutz AG	4DZXL03.1041	3.109
Deutz AG	4DZXL07.1034	7.2
Deutz AG	4DZXL07.1032	7.2
Deutz AG	4DZXL05.7019	5.7
Deutz AG	4DZXL06.1028	6
Deutz AG	4DZXL05.7033	5.7
Deutz AG	4DZXL06.5043	6.5
Deutz AG	4DZXL01.4029	0.3428
Deutz AG	4DZXL01.4029	1.37
Deutz AG	4DZXL01.2023	1.221
Deutz AG	4DZXL01.2022	1.221
Deutz AG	4DZXL00.9024	0.3054
Deutz AG	4DZXL00.9024	0.916

## Attachment 1: Combifilter Engine Family List

MY 2004 (cont.)

Manufacturer	Engine Family	Displace (L)
Deutz AG	4DZXL00.7030	0.686
Deutz AG	4DZXL01.4018	1.37
Hino Motors	4HMXL04.0WDH	4
International Truck	4NVXL0530ANE	8.7
International Truck	4NVXL0530ANF	8.7
International Truck	4NVXL0365AFA	5.98
Iseki Matsuyama	4ICLL0.93B3C	0.929
Iseki Matsuyama	4ICLL1.01B3F	1.006
Iseki Matsuyama	4ICLL1.12B3G	1.124
Iseki Matsuyama	4ICLL1.43C3B	1.43
Iseki Matsuyama	4ICLL1.46C3C	1.464
Iseki Matsuyama	4ICLL1.50C3D	1.498
Iseki Matsuyama	4ICLL1.50C3T	1.498
Iseki Matsuyama	4ICLL2.20C4E	2.197
Iseki Matsuyama	4ICLL2.84D4D	2.835
Ishikawajima	4H3XM.451M10	0.451
Ishikawajima	4H3XL.761LCS	0.761
Ishikawajima	4H3XL1.00S7V	1.005
Ishikawajima	4H3XL1.49N3C	1.496
Ishikawajima	4H3XM.676M20	0.676
Ishikawajima	4H3XL1.13SLV	1.131
Ishikawajima	4H3XL.761ELV	0.761
Ishikawajima	4H3XL1.13CS	1.131
Ishikawajima	4H3XL1.49N3V	1.496
Ishikawajima	4H3XL2.224LC	2.216
Ishikawajima	4H3XM.954M30	0.954
Ishikawajima	4H3XL1.33J84	1.33
Ishikawajima	4H3XL2.00N84	1.995
Ishikawajima	4H3XL2.22L84	2.216
Ishikawajima	4H3XM1.49M40	1.496
Ishikawajima	4H3XL2.00NCS	1.995
Ishikawajima	4H3XL2.22NLC	2.216
Ishikawajima	4H3XL1.13MSL	1.131
Ishikawajima	4H3XL1.13LC	1.131
Ishikawajima	4H3XL2.2NLT	2.216
Ishikawajima	4H3XL2.00N4T	1.995
Ishikawajima	4H3XL2.22N4L	2.216
Ishikawajima	4H3XL2.22N4T	2.216
Ishikawajima	4H3XL.507E2V	0.507
Ishikawajima	4H3XL.507E2C	0.507
Ishikawajima	4H3XL.761E3V	0.761
Isuzu Motors	4SZXL01.1WNA	1.1

Manufacturer	Engine Family	Displace (L)
Isuzu Motors	4SZXL01.5WNA	1.5
Isuzu Motors	4SZXL01.1DNA	1.1
Isuzu Motors	4SZXL01.5DNA	1.5
Isuzu Motors	4SZXL02.2DNA	2.2
Isuzu Motors	4SZXL02.2DNB	2.2
Isuzu Motors	4SZXL02.2DNC	2.2
Isuzu Motors	4SZXL02.4DNA	2.4
Isuzu Motors	4SZXL02.2GNA	2.2
Isuzu Motors	4SZXL03.1GNA	3.1
Isuzu Motors	4SZXL03.1GNB	3.1
Isuzu Motors	4SZXL03.1GNC	3.1
Isuzu Motors	4SZXL03.1GTA	3.1
Isuzu Motors	4SZXL03.1GTB	3.1
Isuzu Motors	4SZXL04.3GTA	4.3
Isuzu Motors	4SZXL04.3GTG	4.3
Isuzu Motors	4SZXL04.3GTG	4.3
Isuzu Motors	4SZXL04.3FTA	4.3
Isuzu Motors	4SZXL04.3FXA	4.3
Isuzu Motors	4SZXL06.5FTA	6.5
Isuzu Motors	4SZXL06.5FXA	6.5
Isuzu Motors	4SZXL06.5FXG	6.5
Isuzu Motors	4SZXL06.5EXA	6.5
Isuzu Motors	4SZXL06.8ETA	7.8
Isuzu Motors	4SZXL07.8EXA	7.8
Isuzu Motors	4SZXL09.8EXA	9.8
Isuzu Motors	4SZXL01.5DNB	1.5
Isuzu Motors	4SZXL04.3GXA	4.3
Iveco	4VEXL05.9DGS	5.9
Iveco	4VEXL03.9B1Z	3.9
Iveco	4VEXL03.9B1X	3.9
Iveco	4VEXL04.5DNA	4.5
Iveco	4VEXL04.5DTC	4.5
Iveco	4VEXL05.9DTA	5.9
Iveco	4VEXL06.7DTA	6.7
Iveco	4VEXL06.7DCR	6.7
Iveco	4VEXL07.8CRS	7.8
Iveco	4VEXL10.3CRS	10.3
Komatsu	4KLXL0359AAE	5.9
Komatsu	4KLXL0239AAD	3.9
Komatsu	4KLXL0239ADA	3.9
Komatsu	4KLXL0275AAC	4.5
Komatsu	4KLXL0275AAD	4.5

## Attachment 1: Combifilter Engine Family List

MY 2004 (cont.)

Manufacturer	Engine Family	Displace (L)
Komatsu	4KLXL0359ABC	5.9
Komatsu	4KLXL0359AAB	5.9
Komatsu	4KLXL0505ABD	8.3
Komatsu	4KLXL0239AAF	3.9
Komatsu	4KLXL03.3JA3	3.3
Komatsu	4KLXL03.3JB3	3.3
Komatsu	4KLXL11.0DC3	11
Komatsu	4KLXL11.0DD3	11
Komatsu	4KLXL11.0DD5	11
Komatsu	4KLXL03.3JD3	3.3
Komatsu	4KLXL0505ABC	8.3
Kubota	4KBXL03.8AAD	3.769
Kubota	4BKXL03.8AAD	3.769
Kubota	4KBXL03.8AAD	3.769
Kubota	4KBXL03.3AAD	3.318
Kubota	4KBXL03.3AAD	3.318
Kubota	4KBXL02.0FCD	1.999
Kubota	4KBXL02.2GCD	2.197
Kubota	4KBXL02.2FCD	2.197
Kubota	4KBXL02.2FCD	2.197
Kubota	4KBXL02.4FCD	2.434
Kubota	4KBXL01.3BCD	1.335
Kubota	4KBXL01.5BCD	1.498
Kubota	4KBXL03.3BCD	3.318
Kubota	4KBXL02.4HCD	2.434
Kubota	4KBXL03.3BAD	3.318
Kubota	4KBXL03.3BAD	3.318
Kubota	4KBXL01.5BAD	1.498
Kubota	4KBXL03.3BCC	3.318
Kubota	4KBXL02.0FAD	1.999
Kubota	4KBXL03.3BAC	3.318
Kubota	4KBXL02.0EAD	1.999
Kubota	4KBXL01.5FAD	1.499
Kubota	4KBXL01.5EAD	1.499
Kubota	4KBXL02.4EAD	2.434
Kubota	4KBXL02.4GCD	2.434
Kubota	4KBXL03.3ACD	3.318
Kubota	4KBXL03.8ACD	3.769
Kubota	4KBXL02.2ECC	2.197
Kubota	4KBXL02.2ECD	2.197
Kubota	4KBXL02.0FCC	1.999

Manufacturer	Engine Family	Displace (L)
Kubota	4KBXL02.4FCC	2.434
Kubota	4KBXL02.2FCC	2.197
Kubota	4KBXL02.4ECD	2.434
Kubota	4KBXL02.0FAC	1.999
Kubota	4KBXL01.5ECD	1.499
Kubota	4KBXL02.8BCC	2.746
Kubota	4KBXL.276KCB	0.276
Kubota	4KBXL.309KCB	0.309
Kubota	4KBXL.400KCB	0.4
Kubota	4KBXL.400KCB	0.4
Kubota	4KBXL.416KCB	0.416
Kubota	4KBXL.719KCB	0.719
Kubota	4KBXL.719KCC	0.719
Kubota	4KBXL.778KCB	0.778
Kubota	4KBXL.898KCB	0.898
Kubota	4KBXL.898KCB	0.898
Kubota	4KBXL01.0BCB	1.001
Kubota	4KBXL01.1BCB	1.123
Kubota	4KBXL01.3BCC	1.335
Kubota	4KBXL01.4FCC	1.393
Kubota	4KBXL01.5BCC	1.498
Kukje	4KMCL1.46A32	1.461
Kukje	4KMCL1.71A31	1.714
Kukje	4KMCL2.08A43	2.082
Kukje	4KMCL2.28A42	2.286
Kukje	4KMCL2.28A41	2.286
Liebherr Machines	4LHAL9.96ARA	9.96
Liebherr Machines	4LHAL9.96ATA	9.96
Liebherr Machines	4LHAL9.96AUA	9.96
Liebherr Machines	4LHAL9.96ASA	9.96
Lister-Petter	4L5XL1.72FX9	1.72
Lister-Petter	4L5XL1.72VX9	1.72
Lister-Petter	4L5XL2.29VX9	2.29
Lister-Petter	4L5XL1.17FX8	1.17
Lister-Petter	4L5XL1.17VX8	1.17
Lister-Petter	4L5XL1.56FX8	1.56
Lister-Petter	4L5XL1.56VX8	1.56
Lister-Petter	4L5XL1.86FWS	1.86
Lombardini	4LBDL.401154	0.401
Lombardini	4LBDL.686SF2	0.686



## Attachment 1: Combifilter Engine Family List

MY 2004 (cont.)

Manufacturer	Engine Family	Displace (L)
Lombardini	4LBDL.954127	0.954
Lombardini	4LBDL2.07CHD	2.08
Lombardini	4LBDL1.37SFO	1.371
Lombardini	4LBDL2.19CHP	2.2
Lombardini	4LBDL.851R19	0.851
Lombardini	4LBDL1.259LD	1.248
Lombardini	4LBDL.916F69	0.916
Mack Trucks	4MKXL11.9P69	11.9
Mack Trucks	4MKXL11.9P72	11.9
Mazda Motor	4TKXL02.5DAA	2.5
Mazda Motor	4TKXL03.0DAA	3
Mitsubishi Fuso	4MFTL03.9D3A	3.907
Mitsubishi Fuso	4MFTL05.8D3A	5.861
Mitsubishi Fuso	4MFTL05.8D3B	5.861
Mitsubishi Fuso	4MFTL07.5D6A	7.545
Mitsubishi Fuso	4MFTL07.5D6D	7.545
Mitsubishi Fuso	4MFTL07.5D6E	7.545
Mitsubishi Fuso	4MFTL02.8M4A	2.835
Mitsubishi Fuso	4MFTL11.9D2A	11.945
Mitsubishi Heavy	4MVXL01.8AAA	1.8
Mitsubishi Heavy	4MVXL01.8BBB	1.8
Mitsubishi Heavy	4MVXL02.3CCC	2.3
Mitsubishi Heavy	4MVXL02.5AAA	2.5
Mitsubishi Heavy	4MVXL05.0AAD	5
Mitsubishi Heavy	4MVXL05.0AAE	5
Mitsubishi Heavy	4MVXL01.5CCC	1.5
Mitsubishi Heavy	4MVXL05.0AAA	5
Mitsubishi Heavy	4MVXL02.5BBB	2.5
Mitsubishi Heavy	4MVXL02.5CCC	2.5
Mitsubishi Heavy	4MVXL03.3AAF	3.3
Mitsubishi Heavy	4MVXL04.2AAA	4.2
Mitsubishi Heavy	4MVXL01.0AAA	1
Mitsubishi Heavy	4MVXL01.0BBB	1
Mitsubishi Heavy	4MVXL01.3AAA	1.5
Mitsubishi Heavy	4MVXL05.0DDD	5
Mitsubishi Heavy	4MVXL06.4AAB	6.4
Mitsubishi Heavy	4MVXL06.4DDD	6.4
Motorenfabrik	4HZXL.722C91	0.722
Motorenfabrik	4HZXL.667C83	0.667
Motorenfabrik	4HZXL.667C81	0.667

Manufacturer	Engine Family	Displace (L)
Motorenfabrik	4HZXL.997C40	0.997
Motorenfabrik	4HZXL3.43V41	2.57
Motorenfabrik	4HZXL3.43C41	2.57
Motorenfabrik	4HZXL3.43V42	3.43
Motorenfabrik	4HZXL3.43C42	3.43
Nissan	4NDXL02.7TNA	2.663
Nissan	4NDXL03.0FTA	2.953
Perkins	4PKXL04.4RF1	4.4
Perkins	4PKXL04.4RG1	4.4
Perkins	4PKXL04.4RH1	4.4
Perkins	4PKXL04.4RH2	4.4
Perkins	4PKXL04.4RJ1	4.4
Perkins	4PKXL04.4RK1	4.4
Perkins	4PKXL06.0VK1	5.985
Perkins	4PKXL02.6UB1	2.6
Perkins	4PKXL04.4RE1	4.4
Perkins	4PKXL03.3DC1	3.3
VM Motori	4V5XL02.1R7R	2.1
VM Motori	4V5XL02.1P7J	2.1
VM Motori	4V5XL04.2S5V	4.2
VM Motori	4V5XL03.0R6W	3
VM Motori	4V5XL02.8R6V	2.8
Volvo Construction	4VSXL09.6CE2	9.6
Volvo Construction	4VSXL09.4CE2	9.4
Volvo Construction	4VSXL09.4CE2	9.4
Yanmar	4YDXM1.64D3N	1.642
Yanmar	4YDXM1.11P3N	1.116
Yanmar	4YDXL1.33J3N	1.33
Yanmar	4YDXL1.11X3N	1.12
Yanmar	4YDXL1.11X3N	1.12
Yanmar	4YDXL2.00J4T	2
Yanmar	4YDXM0.32P1N	0.318
Yanmar	4YDXL0.75P2N	0.749
Yanmar	4YDXL0.52R2N	0.523
Yanmar	4YDXL0.74P3N	0.739
Yanmar	4YDXL0.74P3N	0.739
Yanmar	4YDXL0.78R3N	0.784
Yanmar	4YDXL0.78P3N	0.784
Yanmar	4YDXL0.78P3N	0.784
Yanmar	4YDXL0.88P3N	0.879

## Attachment 1: Combifilter Engine Family List

MY 2004 (cont.)

Manufacturer	Engine Family	Displace (L)
Yanmar	4YDXL0.88R3N	0.879
Yanmar	4YDXL1.01R3N	1.006
Yanmar	4YDXL1.01P3N	1.006
Yanmar	4YDXL1.20F3N	1.204
Yanmar	4YDXL1.33F3N	1.331
Yanmar	4YDXL1.50H3N	1.496
Yanmar	4YDXL1.64F3N	1.642
Yanmar	4YDXM0.64P2N	0.636
Yanmar	4YDXL0.85W3N	0.854
Yanmar	4YDXL1.11V3N	1.116
Yanmar	4YDXL1.11W3N	1.116
Yanmar	4YDXL1.33K3N	1.331
Yanmar	4YDXL1.33K3N	1.331
Yanmar	4YDXL1.50J3N	1.496
Yanmar	4YDXL1.64J3N	1.642
Yanmar	4YDXL1.33M3N	1.331
Yanmar	4YDXL1.50J3T	1.496
Yanmar	4YDXL1.50K3T	1.496
Yanmar	4YDXL1.50M3N	1.496
Yanmar	4YDXL1.64M3N	1.642
Yanmar	4YDXL2.00J4N	1.995
Yanmar	4YDXL2.00K4N	1.995
Yanmar	4YDXL2.09K4N	2.091
Yanmar	4YDXL2.19J4N	2.19
Yanmar	4YDXL2.19K4N	2.19
Yanmar	4YDXL3.05J4N	3.054
Yanmar	4YDXL2.00M4T	1.995
Yanmar	4YDXL3.05M4N	3.054
Yanmar	4YDXL3.32J4N	3.319
Yanmar	4YDXL3.32J4T	3.319
Yanmar	4YDXL3.32K4N	3.319
Yanmar	4YDXL3.32K4T	3.319
Yanmar	4YDXL4.41K4N	4.412
Yanmar	4YDXL4.41K4T	4.412
Yanmar	4YDXL0.57U2N	0.57
Yanmar	4YDXL0.85U3N	0.854
Yanmar	4YDXL1.11U3N	1.116
Yanmar	4YDXL0.57V2N	0.57
Yanmar	4YDXL0.85V3N	0.854
Yanmar	4YDXL0.78U3N	0.784
Yanmar	4YDXL1.11Y3N	1.116