ATTACHMENT 1

Certification Summary Sheet: (2 pages)

- -- Blank Form in Word 97 format
- -- Sample as printed (and can be used in lieu of the Word 97 form) from entries that were entered for the Access 97 Certification Database Form (see Attachment 2).

Supplemental Information Formats (8 pages)

AIF	AIR RESOURCES BOARD CERTIFICATION SUMMARY OFF-ROAD LSI ENGINES MODEL-YEAR EXECUTIVE ORDER: U-L- Emission-Compliant Engines: fill in 1-11 Emission Non-Compliant Engines: fill in 1-8								
	Emissi	on-Compli	ant Engines	: fill in 1-11		Emission I	Non-Compl	iant Engines	s: fill in 1-8
b.	EF Name	on Engine La	abel:		c. T	rade Name (e.	.g., Vortec):		
2.	Equipn	nent Appli	cations: (list a	all applicable)	-0.1 O T		A = Fork Lift	B = Turf Care C P = Pre- te 49-State	= Generator
3	ΔII Fno	eper E = Con iino Salos (npressor F=R	n FF :/check a	ounp G = Irad	ctor U = Otne	r v 50_Stat	P = Pre-	Emptea Eqmt
4.	Produc	tion Engin	e Assembly	(as leaving the	e Certifving Ma	nufacturer's fa	ctorv): (list all a	applicable)	. Omy
•	A = comp	olete engine w	ithout equipmer	nt B = comple	ete engine integ	grated with equ	uipment C = in	complete engin	e (i.e.,
	catalytic of The Certi	converter and fying Manufac	/ or exhaust systurer is still held	stem to be insta I liable if these	lled by OEM pe engines are no	er Certifying Ma t completed as	anufacturer's s described in it	pecifications and s application for	d agreement. certification.)
5.	All Eng	ine Displa	cement in E	F : (in liters, L)	1)	2)	3)	4)	
6.	Rated F	Power with	in Engine F	amily: (in HF): Highest Mo	odel:	Lowe	est Model:	
1.	Engine	Design: a.	Combustion C	ycle: (check on	e) 4-stroke	2-stroke	@ Oil/Fuel	Ratio	
b.	Engine T	ype: (check or	ne) Reciprocati	ng Rotar	y Other(e.g., turbine, e	tc.) (specify)	r (specify)r	·
d.	Total Nur	mber of Intake	and Exhaust V	side alves (Ports) pe	er Cvlinder: 2	PISION POIL	.eu Othe 5 Othe	r (specify)	·
e.	Type of E	Engine Cooling	g: (check one)	Air Wat	erOil	Other (s	pecify)	16 Other	
f.	Number	of Cylinders: (check one) 1	23	4 5	68	10 12	16 Other	(specify)
g. h.	Operating	Arrangement: a Fuel: (An EF	(cneck one) ir mav have engi	ine vee_ ine models that	Horr.Oppo	ised (Flat) ferent fuels. Ex	Other (specif 2 ample 1: EF	y) 23 has Models /	ABC and
	DEF that	are dedicated	gasoline engin	es. For EF 123	3, the "1" check	box in (i) and '	"Dedicated" ch	eck box in (ii) ar	e checked
								ngine and Mode	
								checked and "0 3 4_	
	(ii) Fuel S	System Types:	: (check all appl	icable) Dedica	ated F	lexible Fuel	Dual F	uel Bi l	Fuel .
_	(iii) Fuel:	(specify Gaso	oline, Liquefied I	Petroleum Gas	(LPG, Propane	e), Natural Gas	s (CNG, LNG))		. -
8.	Intake,	Fuel and E	Emission Co	ontrol Syste	ms':				
9.	Deterior Durability	ration Fact	ors (DFS): a	New Durability . ا	/Testing: Yes_	No	_ Carryover fr	om EF:	·
C.	DITABILITY DF Type:	(check one)	ı Multiplicative (n	ı o less than 1.0	00: no units)	Addit	ive (no less tha	ulation Hours: _ in 0.000; in g/bh	p-hr) .
A	DE Value	o. ⊔C.	NOv.	ш	C±NIOv· (antior	aal) (for additiv	o DE only)	\sim	
10.	Certific	ation Test	Engine Info	rmation: N	lew Test	Carryover fro	om Engine Fam	ily	
a.	Rreak-in/S	ne: Model Stabilization H	ours.	ID: Test Date	g-	Rated Pov	wer, HP:	@ ecs	<u>rpm</u> .
b.	Test Fuel	: (i) Gasoline:	Indolene Clea	rest bate r Calif. I	o Ph2 Oth	ner (specify)			
C.	Test Proc	edure (TP): (i) Sampling Met	hod: Raw Gas "G-1"·	Method (RGM)) Co ied "C":	onstant Volume Modified "D"·	Sampling (CVS Modified	6) "G-1"
	Approved	Alternative or	Special Cycle:	(specify)	Approved Modif		(iii) Special	Test Equipment	(e.g., cooling
			etc.): No Y	es/Describe:		<u> </u>		Test Equipment	
11.	Certific	ation Emis	ssion Levels	(in g/bhp-hr):	HC+NOx		C(O st value from all	 :
	in compli	ance with Em i	Enter) ission Standard	· level from con ds of: (in a/bbb	firmatory test, r -hr\ HC+NOv	f any. If none, e	enter the highe	st value from all າ	tests below.)
	for a Dur	ability Period	of: (check one	1000 Hours	3500 Ho	urs 500	0 Hours	Other / Specify	·
		-				·			
Tes	st No.	Of	ficial Test Re	esults, g/bhp	-hr	Deteriorate		ion Emission	s, g/bhp-hr
An							(i.e., with [OFs applied)	
Тур	oe ²	HC	NOx	HC+NOx	CO	HC	NOx	HC+NOx	CO
1									
2									
3									
4									
	duction	ı l ine Test	ing: CumSu	m 1%	leeu	e Date:	Por	│ vision Date:	
	marks:	. Eine 1691	y. oumou	111 1 /0	issu	C Date	ive	vision Date.	·
									<u> </u>
FOF	R ARB US	E ONLY. Pro	cessed by:		Date:	Reviewed	by:	Date):

1 Use SAE J1930 abbreviations. Examples: NA for natural aspiration; TC turbocharging; SC supercharging; CAC charge air cooling; CARB carburetion; TBI throttle body fuel injection; MPI multiport fuel injection; SMPI sequential MPI; DGI direct gasoline injection; AIR secondary air injection; PAIR pulsed AIR; EGR exhaust gas recirculation; O2S oxygen sensor; HO2S heated O2S; OC for oxidation catalyst; TWC three-way catalyst; OC+TWC for OC plus TWC in one container; EM for Engine Modification (use if only NA and/or CARB are the only other selections in the field).

Use **prefix** "2" or "3" etc. in front of O2S, TWC, etc. to designate **parallel** arrangement, e.g., 2TWC for two TWC in parallel. Use **suffix** "2" or "3" etc. to designate **series** arrangement, e.g., TWC-3 for three TWC in three separate containers, one after the other.

AIR RESOURCES BOARD CERTIFICATION SUMMARY OFF-ROAD LSI ENGINES MODEL-YEAR EXECUTIVE ORDER: U-L- Emission-Compliant Engines: fill in 1-11 Emission Non-Compliant Engines: fill in 1-8

N N E	lodel Year: lanufacturer Nam ingine Family:	ne:		Page: Issued: Revised:					
C	FF-ROAD LSI EN	IGINE SUPPLEMENTAL IN	FORMATION	E.O.#:					
S0°	a. Number of Cb. Number of Bc. Feedback Co	OR: Yes No arburetors: arrels per Carburetor: ontrol: Yes No Yes No	e. Fast Idle Circuit: Yes _ f. Other Subsystems (spe g. Used in previous/other If yes, last model year	ecify): engine model: No Yes					
S0:	a. Type (e.g., TBI, DGI, MPI, SMPI): b. Feedback Control: Yes No c. Point of Injection (e.g., manifold, cylinder, pre-chamber, throttle body): d. Used in previous/other engine models: No Yes If yes, last year used:								
SO:	a. Type (e.g., PC b. Routing: Air	V valve, uncontrolled flow, crank	ccase scavenging for 2-stroke engines) fold Inlet Ports (2-Stroke Eng	: gines) Other (specify)					
S04	a. Type: Heated b. Location: Pol	rt Exhaust Manifold	ther (specify) Other (specify) : No Yes If yes, last ye						
S0:	S05. SECONDARY AIR INJECTION: Yes No a. Type: Pump (AIR) Pulsed (PAIR) b. Point of Injection: Port Exhaust Manifold Other (specify) c. Method of Modulation: Vacuum Solenoid d. Sensed Parameters (check all applicable): Coolant Temp Engine RPM MAP Throttle Position Other (specify) e. Used in previous/other engine models: No Yes If yes, last year used:								
S00	Throttle Pos	ition Other (specify)	GR): Yes No : Coolant Temp Engine F Solenoid s: No Yes If yes, last y						
S0	7. ADJUSTABLI	E PARAMETERS AND A	NTI-TAMPERING MEASURES	}					
	Parameter	Adjustable Range (or N/A)	Tamper Resistance Method (or N/A)	Approval Reference					

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OFF-ROAD LSI ENGINE SUPPLEMENTAL INFORMATION	E.O.#:

S08. AUXILIARY EMISSION CONTROL DEVICES (AECD)³ AND DEFEAT DEVICES⁴

TABLE A: Sensed Parameters⁵ versus Controlled Parameters⁶

Sensed Parameter	Sensor	Control Parameters			

TABLE B: Justifications for AECDs

Parar	meters	Device	Justifications / Notes
Controlled	Sensed		

³ **AECD**: any element of design which senses temperature, vehicle speed, engine RPM, transmission gear, manifold vacuum, or any other parameter for the purpose of activating, modulating, delaying, or deactivating the operation of any of the emission control system.

⁴ **Defeat Device**: An AECD that reduces the effectiveness of the emission control system under conditions that may reasonably be expected to be encountered in normal operation and use, unless (1) such conditions are substantially included in the emission test procedure, (2) the need for the AECD is justified in terms of protecting the engine against damage or accident, or (3) the AECD does not go beyond the requirements of engine starting. A pending engine family that is shown to contain a defeat device will not be certified. A certified engine family that is found to contain a defeat device will subject the manufacturer to enforcement actions.

⁵ Examples of Sensed Parameters: atmospheric pressure, crankshaft position, engine RPM, cylinder position, coolant temperature, intake air temperature, intake manifold pressure, throttle position, oxygen concentration in exhaust gas, vehicle speed, knocking, EGR valve position, shift position of transmission, etc.

⁶ Examples of Controlled Parameters: fuel metering, ignition timing, idle speed, EGR valve, secondary air injection pump or valve, etc.

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OFF-ROAD LSI ENGINE SUPPLEMENTAL INF	ORMATION	E.O.#:	
S09. CATALYTIC CONVERTER: Yes N a. Type/Number/Arrangement (e.g., TWC, C) b. Location (e.g., close coupled, exhaust manifold c. Catalyst Manufacturer.: d. Substrate: (i) Volume: cc (ii) (Number of cells: (per cm²) (iii) Composition: Ceramic Metallic e. Active Material:	oc, 2TWC for 2 para d, muffler): Construction: Pe		
Composition (Pt, Pd, Rh):	Ratio:	Loading (g/L)	
CONFIDENTIAL			
 S10. PROJECTED SALES AND PRODUCTION a. Projected California Annual Sales (unit b. Estimated Production Period: Start Date: Estimated Introduction into Commerce S11. MANUFACTURER'S AUTHORIZED CO 	its): ite: e Date:	CONFIDENTIAL Projected 50 State Sales (units): End Date:	
Certification Contact			
Name: Title: Address: Telephone Number: Fax Number: E-Mail Address:			
Recipient of Executive Order			
Name: Title: Address: Telephone Number: Fax Number: E-Mail Address:			
Plant Contact			
Name: Title: Address: Telephone Number: Fax Number E-Mail Address:			
Plant Contact			
Name: Title: Address: Telephone Number: Fax Number E-Mail Address:			

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S12. MODEL SUMMARY (Use an asterisk (*) to identify worst-case engine model used for certification testing.)

S13. Engine Model	S14. Engine Code	Sales Codes gine (Check ALL		Sales Codes (Check ALL		S17. Rated Power	S18. Rated Speed	S19. Peak Torque	S20. Peak Torque
		Calif. Only	49- State	50- State	(Liters)	(HP)	(RPM)	(FT-LB)	Torque Speed (RPM)

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OFF-ROAD LSI ENGINE SUPPLEMENTAL INFORMATION	E.O.#:
S21. EMISSION-RELATED PART NUMBERS	

(Part numbers as stamp	ed on the component, not the stock or inv	ventory numbers, snould	d be listed here.)	
		S11. Engine Mod	del	
Fuel System:				
Carb/Mixer Assy.				
Fuel Injector				
Fuel Pump				
ECM				
Pressure Regulator				
Oxygen Sensor				
Other (specify)				
Intake System:				
Air Cleaner Element				
Intake Manifold				
Turbocharger				
Supercharger				
Charge Air Cooler				
Other (specify)				
Ignition System:				
Spark Plug				
Ignition Coil				
Ignition Control Valve Module				
Distributor				
Other (specify)				
EGR:				
EGR Valve Assembly				
Vacuum Control Valve				
Air Injection				
Control Valve				
Check Valve				
Solenoid Valve				
Aftertreatment System:				
Catalyst				
Exhaust Manifold				
Crankcase System:				
DCV/ Volvo				

Model Year: Manufacturer Name: Engine Family: OFF-ROAD LSI ENGINE SUPPLEMENTAL INFORMATION	Page: Issued: Revised: E.O.#:
OFF-ROAD ESI ENGINE SUFFLEMENTAL INFORMATION	E.O.#.
S22. LABELING:	
 a. Emission label format approved? No Yes If yes, ref Sample label attached? No Yes (put label in #S24) 	
S23. WARRANTY: Emission warranty approved? No (Provide	full warranty statement in #S24)
	nce approval:)
Have any changes been made since the last approval?	/
No Yes If yes, provide an explanation of the change	s:

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Engine Family:OFF-ROAD LSI ENGINE SUPPLEMENTAL INFORMATION	Revised: E.O.#:	
	L.O.m.	
S24. ADDITIONAL INFORMATION AND COMMENTS		

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ATTACHMENT 2

CERTIFICATION DATABASE FORM

The certification database form closely follows the Certification Summary described in Attachment 1. The database form is an **Access 97** file; the **electronic version** of this form can be **obtained by contacting your assigned ARB Certification Section staff person**. An imprint of this database form is enclosed for information purposes (only for hard copy mailings of this guidance). In the Access 97 file, the light blue fields indicate fill-in boxes, dark blue fields indicate pull-down menus and red fields indicate they are "reserved for ARB use only. The optimal screen viewing setting for your computer display is 600 x 800 pixels on 256-colors or better.

After **completing** and **verifying** this database form for each engine family, the manufacturer should (1) print a **hard copy** and submit it in lieu of the Certification Summary form described in Attachment 1 (which is a Word 97 document) as part of the engine family's certification application package, and (2) **electronically send** the certification database information to its assigned Certification staff person.

Below is a list of the information fields that manufacturers must provide in order to complete an application for certification. **Incorrect or missing information will render the application incomplete and result in a certification delay**. The fields below are numbered in the order encountered when one fills in the Certification Database Form.

	Field	Reserved for ARB Use Only	Pull- Down Menu	Fill-In/Describe
1.	Model Year		\boxtimes	
2.	Application Type		\boxtimes	
3.	Manufacturer		\boxtimes	
4.	EO No.	\boxtimes		
5.	Emission Compliant EF?			
6.	Engine Family Name			12 alphanumeric characters
7.	EF Name on Engine Label			12 alphanumeric characters
8.	Trade Name			Up to 32 alphanumeric characters
9.	Equipment Applications (six pulldown fields)			
10.	Sales_Code		\boxtimes	
11.	EF CA Projected Sales			Up to 10 digits
12.	EF US Projected Sales			Up to 10 digits
13.	Production Engine Assembly			
14.	Engine_Displace_x (five fill-in fields)			xxxx.xxx (in cc)
15.	Highest Power (in hp)			xxx.xxx (in hp)
16.	Lowest Power (in hp)			xxx.xxx (in hp)
17.	Engine Models			Up to 200 alphanumeric characters
18.	Combustion Cycle			

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	Field	Reserved for ARB Use Only	Pull- Down Menu	Fill-In/Describe
19.	Oil/Fuel Ratio			Up to 10 alphanumeric characters (e.g., 40:1, 50:1); enter "N/A" for 4-strokes
20.	Engine Type		\boxtimes	
21.	Valvetrain			
22.	Valve (Ports)/Cylinder			
23.	Cooling Medium			
24.	# of Cylinders			
25.	Cylinder Arrangement			
26.	Fuel System Configuration			
27.	# of Fuel System		\boxtimes	
28.	Operating Fuel			
29.	ECS_Cat		\boxtimes	
30.	ECS_O ₂ S		\boxtimes	
31.	ECS_fuelsys1		\boxtimes	
32.	ECS_fuelsys2		\boxtimes	
33.	ECS_fuelsys3		\boxtimes	
34.	ECS_egr		\boxtimes	
35.	ECS_asp		\boxtimes	
36.	ECS_air		\boxtimes	
37.	ECS_em:			Use "EM" only when CARB (carburetor) fuel system and NA (natural aspiration) are the only other information. Use "*" otherwise.
38.	New Durability Testing?			
39.	Durability Carryover EF Name			12 alphanumeric characters; enter "N/A" if #38 is "Yes"
40.	Durability Engine Model			Up to 32 characters
41.	Durability Engine ID Number			Up to 32 characters
42.	Service Accumulation Hours			xxx.xxx (in hours)
43.	DF_Type		\boxtimes	
44.	xxHC_DF			XX.XXX
45.	NOx_DF			XX.XXX
46.	xxHC+NOx_DF			xx.xxx (This is optional and for additive DF type only.)
47.	CO_DF			XX.XXX
48.	CERT_EDE_type			
49.	Emission Carryover Engine Family Name			12 alphanumeric characters; enter "N/A" if #48 is "NEW"

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50.	Cert_engine model			Up to 32 characters
	Field	Reserved for ARB Use Only	Pull- Down Menu	Fill-In/Describe
51.	Cert_engine_id			Up to 32 characters
52.	Rated Power (hp)			xxx.xxx (in hp)
53.	@ Rated_rpm			Up to 5 digits; no decimals
54.	Cert_engine_stabilizati on_ hours (for certification emission test)			Up to 3 digits
55.	cert_test_date			month/date/year (e.g., 06/19/00 for June 19, 2000)
56.	Certification Test Fuel		\boxtimes	
57.	Certification Test Procedure		\boxtimes	
58.	Certification Test Cycle		\boxtimes	
59.	Cert_TP: List all special test equipment			Up to 200 alphanumeric characters
60.	HC+Nox_Hi (Certification Level)			xxx.xxx (in g/bhp-hr); (Enter level from confirmatory test, if any. If none, enter highest value from all certification tests for this EF.)
61.	CO_Hi (Certification Level)			xxx.xxx (in g/bhp-hr), (Enter level from confirmatory test, if any. If none, enter highest value from all certification tests for this EF.)
62.	HC+Nox_standard			xxx.x (in g/bhp-hr)
63.	CO_standard			xxx.x (in g/bhp-hr)
64.	Emission Standard Durability Period			xxxx.x (in hours); enter "0" for emission compliance phase-in and non-compliant EFs.
65.	TEST_SET_x; (_x- denotes upto 4 sets of data, if applicable)			
66.	HC_x; (_x-denotes upto 4 sets of data, if applicable)			xxx.xxx (in g/bhp-hr)
67.	Nox_x; (_x-denotes upto 4 sets of data, if applicable)			xxx.xxx (in g/bhp -hr)
68.	HC+Nox_x; (_x- denotes upto 4 sets of data, if applicable)			xxx.xxx (This is optional and for additive DF only.)

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69.	CO_x; (_x-denotes upto 4 sets of data, if applicable)			xxx.xxx (in g/bhp-hr)
	Field	Reserved for ARB Use Only	Pull- Down Menu	Fill-In/Describe
70.	HC_x (Deteriorated); (_x-denotes upto 4 sets of data, if applicable)			xxx.xxx (in g/bhp-hr)
71.	Nox_x (Deteriorated); (_x-denotes upto 4 sets of data, if applicable)			xxx.xxx (in g/bhp-hr)
72.	HC+Nox_x (Deteriorated); (_x- denotes upto 4 sets of data, if applicable)			xxx.xxx (in g/bhp-hr)
73.	CO_x (Deteriorated); (_x-denotes upto 4 sets of data, if applicable)			xxx.xxx (in g/bhp-hr)
74.	QA_Procedure		\boxtimes	
75.	Date_issued			month/date/year (e.g., 06/19/00 for June 19, 2000)
76.	Date_revision			month/date/year (e.g., 06/19/00 for June 19, 2000)
77.	Remarks			Up to 200 alphanumeric characters
78.	Processed By:	$oxed{\square}$		
79.	Process_Date			
80.	Review By:			
81.	Review_date			