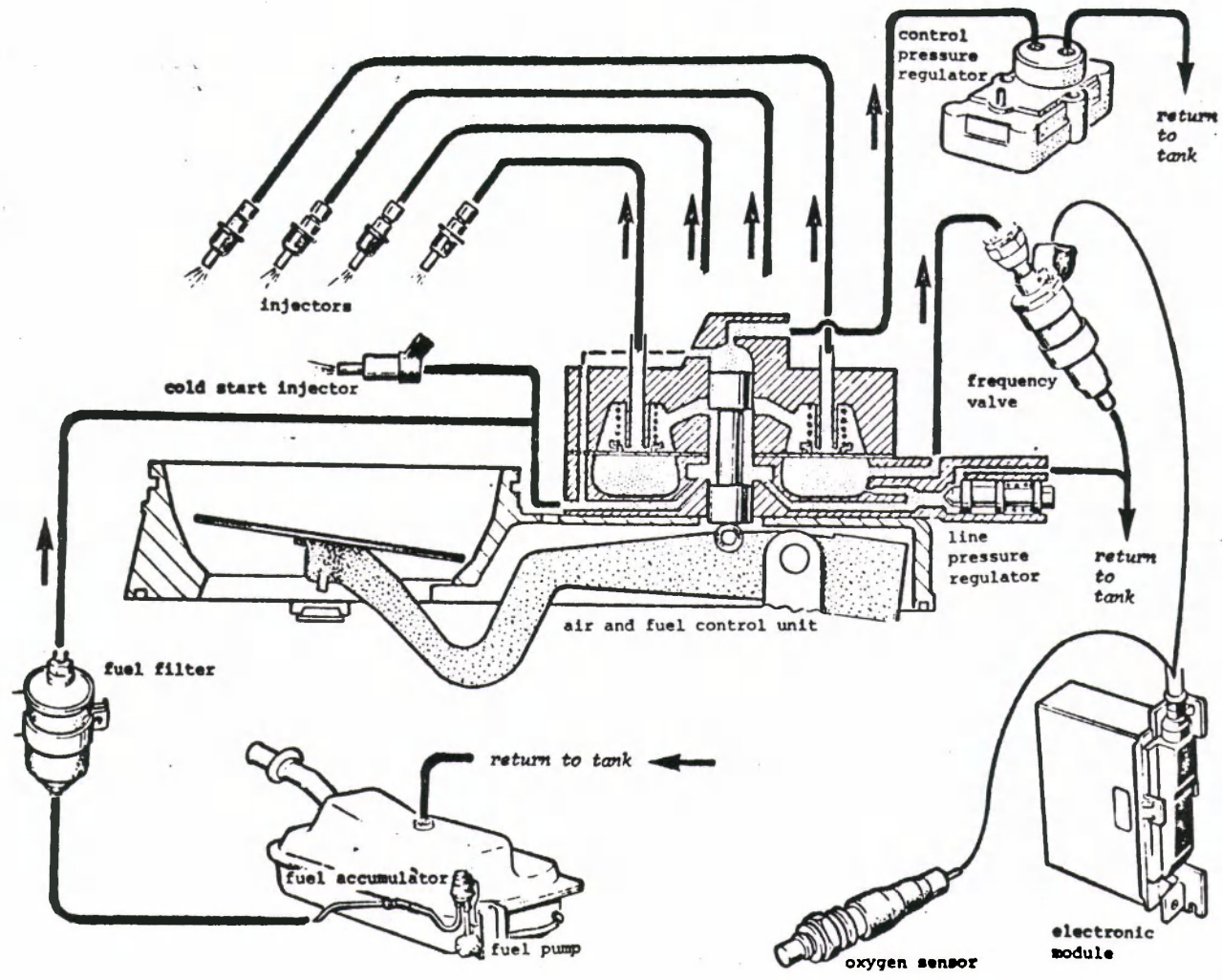


VOLVO'S PRESENTATION

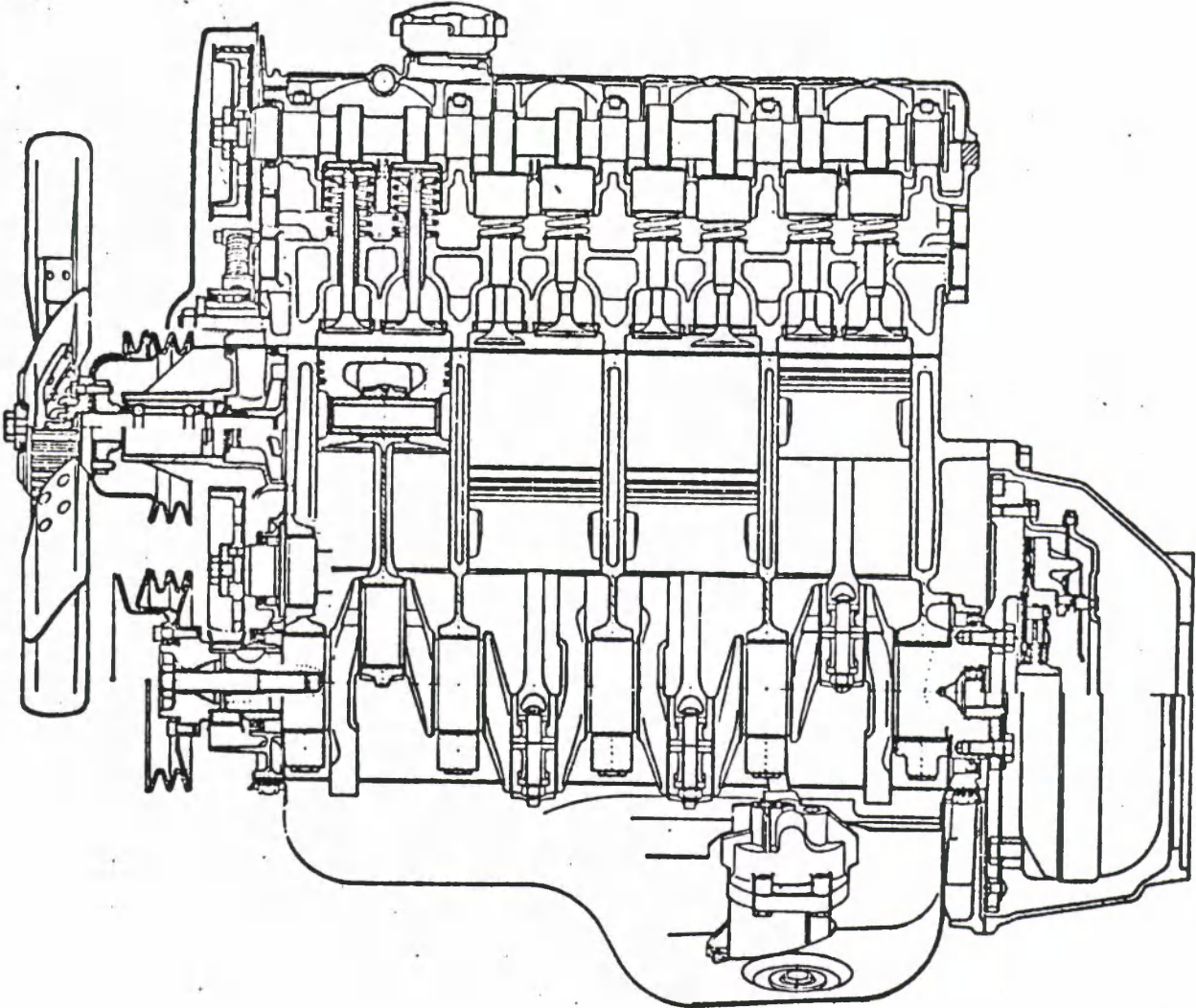
RSV PHASE III ENGINE

Volvo of America Corporation
Donald W. Taylor
William Shapiro
August 9, 1977

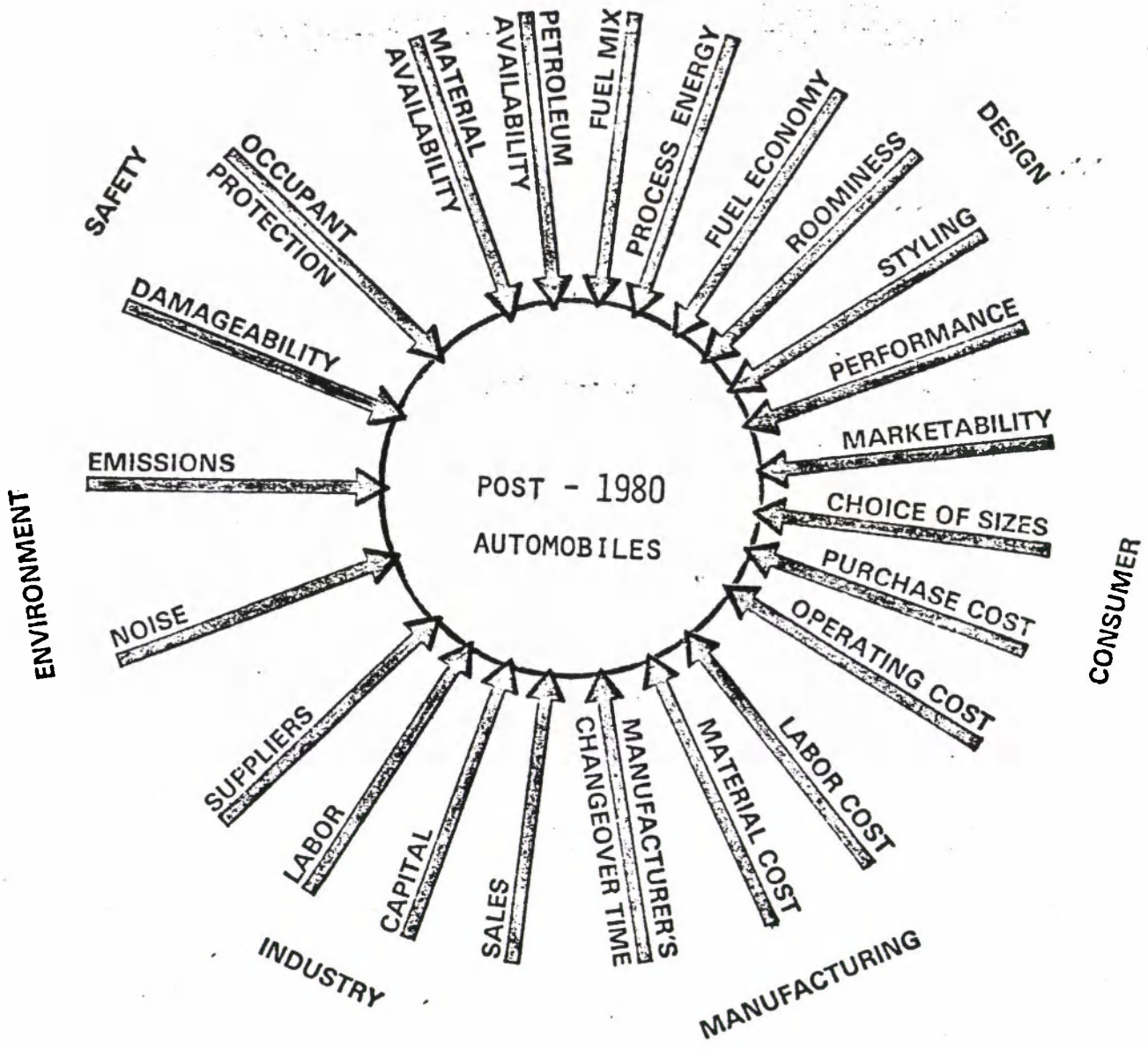
VOLVO LAMBDA-SOND(R) SYSTEM



VOLVO B21F 4-CYLINDER ENGINE



PETROLEUM AND OTHER
RESOURCES



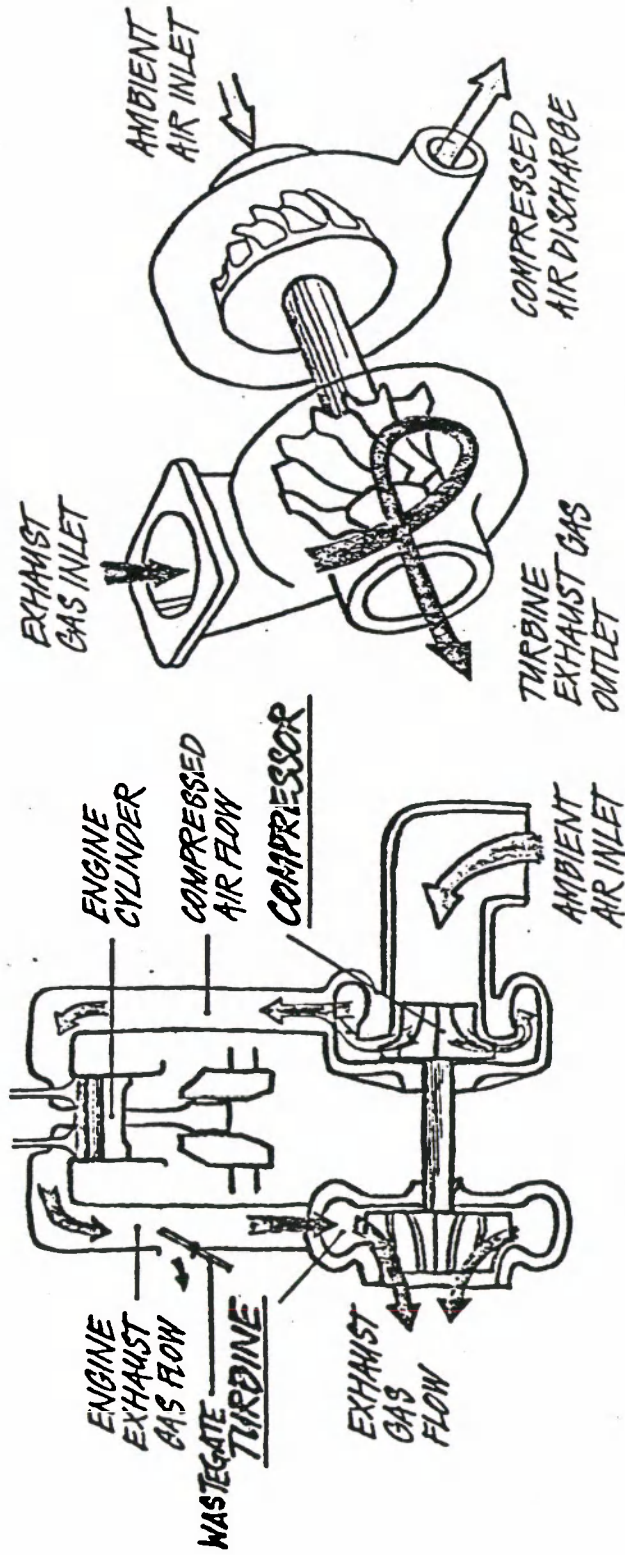
PARAMETERS OF 1977 VOLVO 242 LAMBDA-SOND(R)

	HC	CO	NOx
EXHAUST EMISSIONS	.20	2.7	.21 @ 4000 MI.
FUEL ECONOMY	18.1 CITY	31.4 HIGHWAY	22.4 COMBINED
PERFORMANCE	13.6 SEC.	0-60 MPH	

VOLVO OF AMERICA CORPORATION

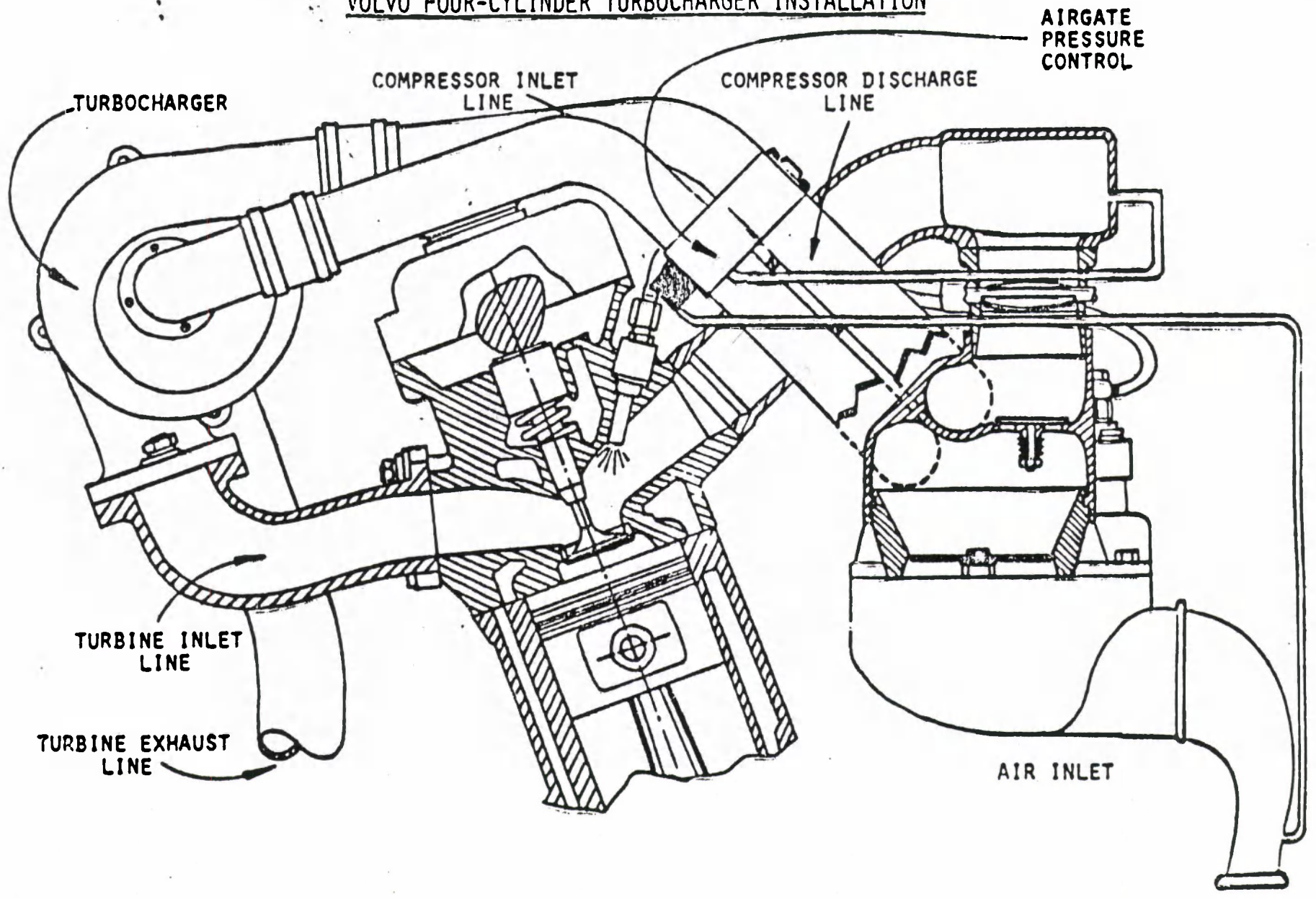
PRODUCT ENGINEERING AND DEVELOPMENT
PRODUCT PLANNING ROLE

SCHEMATIC FLOW TURBOCHARGER



WHAT IS A TURBOCHARGER

VOLVO FOUR-CYLINDER TURBOCHARGER INSTALLATION



TURBOCHARGER

COMPRESSOR INLET LINE

COMPRESSOR DISCHARGE LINE

AIRGATE PRESSURE CONTROL

TURBINE INLET LINE

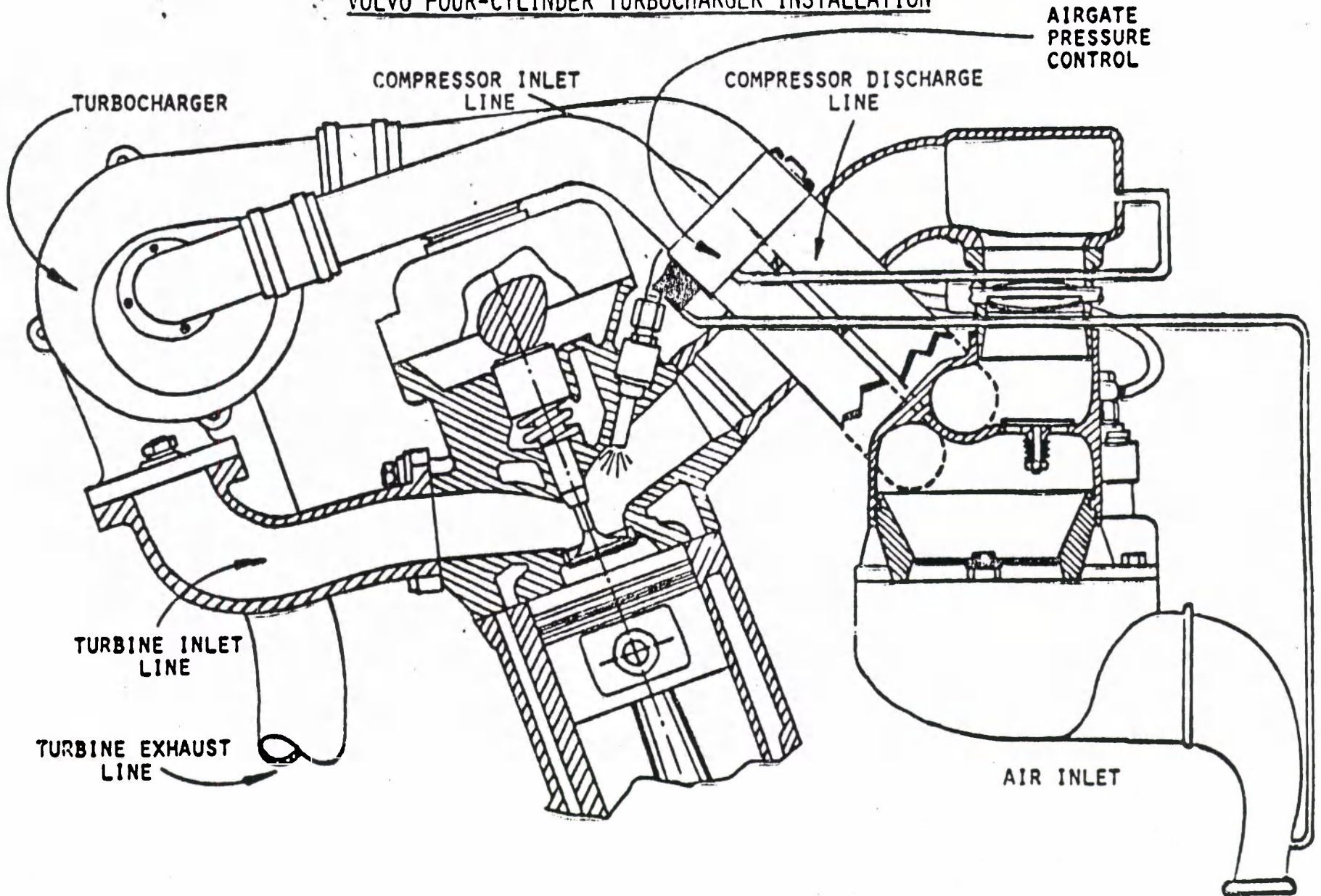
TURBINE EXHAUST LINE

AIR INLET

TEST RESULTS OF 1977 VOLVO TURBOCHARGED 242 LAMBDA-SOND (R)

	<u>HC</u>	<u>CO</u>	<u>NOx</u>
EXHAUST EMISSIONS	.14	2.6	.13 @0 MI.
FUEL ECONOMY	17.1 CITY		
PERFORMANCE	10.8 SEC.	0-60 MPH	

VOLVO FOUR-CYLINDER TURBOCHARGER INSTALLATION



- SAFETY
- CLEANLINESS
- FUEL EFFICIENCY
- CUSTOMER ACCEPTABILITY

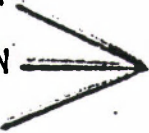
CHARACTERISTICS OF ENGINE WE WILL PROVIDE

EMISSIONS
FUEL ECONOMY



"STATUTORY"

DRIVEABILITY
ACCELERATION
PERFORMANCE

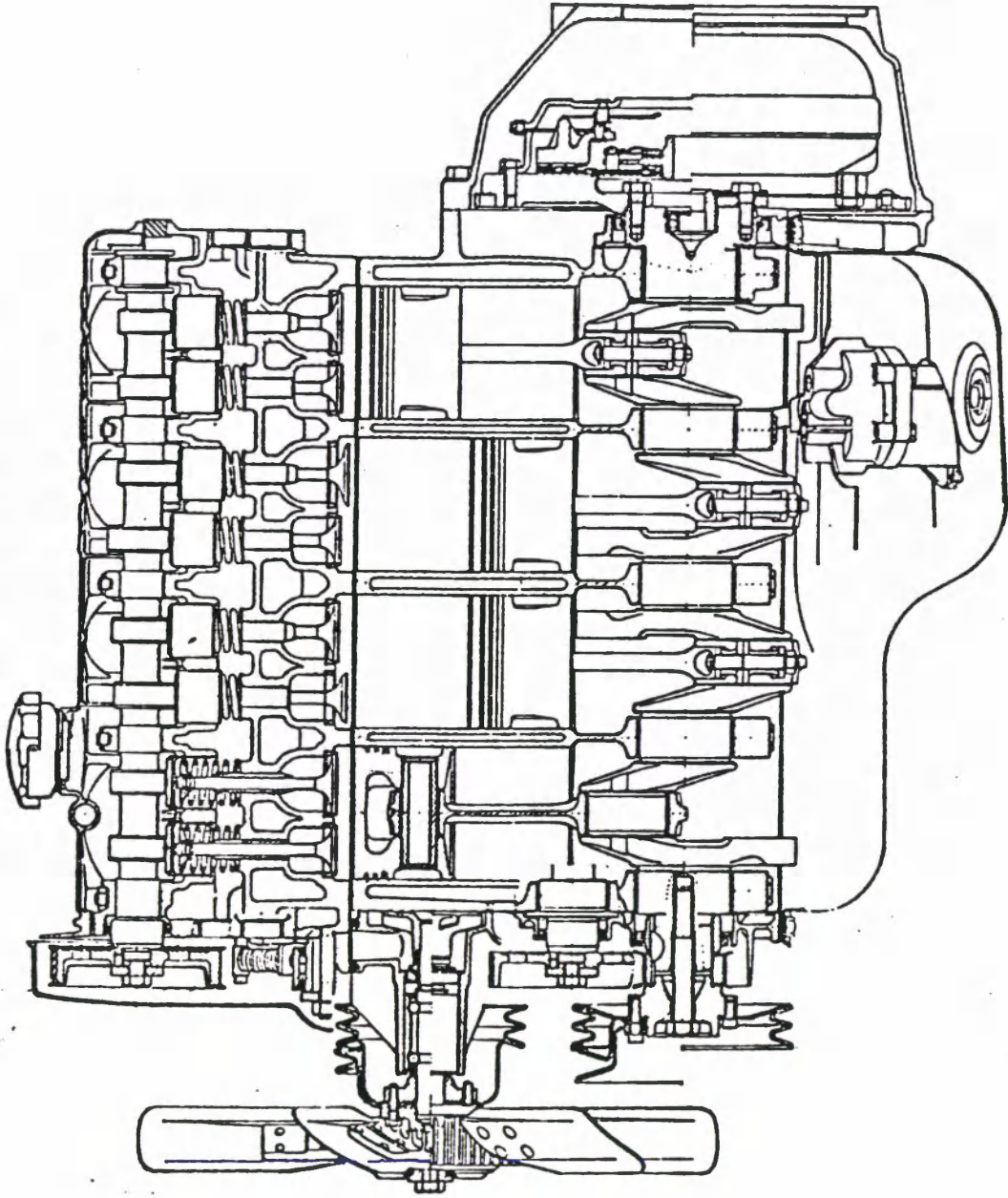


"CONSUMER ACCEPTABILITY"

VOLVO PROPOSAL FOR THE RSV VEHICLE

	HC	CO	NOx
EXHAUST EMISSIONS	.41	3.4	0.4
FUEL ECONOMY		27.5 MPG	
PERFORMANCE	12.0-13.5 SEC.	0-60 MPH	

VOLVO B21F 4-CYLINDER ENGINE



MEANS TO INFLUENCE FUEL ECONOMY AND PERFORMANCE

	FUEL ECONOMY (MPG)	PERFORMANCE (0-60 MPH TIME)
BASE 1977 VOLVO 242 LAMBDA-SOND ^(R) M-5	22.3	13.6
TURBOCHARGING		-2.8
DISPLACEMENT REDUCTION (2.1 L TO 1.9 L)	+1.5	+1.0
FINAL DRIVE RATIO CHANGE (3.91 TO 3.54)	+1.5	+1.0
OPTIMUM GEARING	+1.0	-
REDUCTION IN FRICTIONAL AND ROTATIONAL LOSSES	+1.0-2.0	-
	<hr/> 27.3 - 28.3	<hr/> 12.8 SEC.

WORKING ARRANGEMENTS

- A) MONTHLY REPORTS
- B) TECHNICAL LIAISON
- C) ENGINE/VEHICLE INTERFACE
- D) SUBCONTRACTING OF CONSTRUCTION
OF TURBOCHARGER, EMISSIONS AND
FUEL ECONOMY TESTING

SCHEDULE OF EVENTS

AUGUST 1 - SEPTEMBER 30, 1977

FINALIZE PRELIMINARY ENGINE AND COMPONENT DESIGN, DEFINE PACKAGING CONCESSIONS.

OCTOBER 1 - NOVEMBER 30, 1977

FABRICATE SPECIAL COMPONENTS. ASSEMBLE FIRST TEST ENGINE. CARRY OUT ENGINE DYNAMOMETER TESTS.

DECEMBER 1 - DECEMBER 31, 1977

REVISE ENGINE SPECIFICATION AND COMPONENT DESIGN BASED ON DYNAMOMETER TEST RESULTS. PREPARE A SECOND-GENERATION TEST ENGINE AND INSTALL IN VOLVO 242 IN PREPARATION FOR FULL-SCALE EVALUATION AND TESTING.

JANUARY 1 - JANUARY 31, 1978

INITIAL EMISSIONS, FUEL ECONOMY, AND ACCELERATION TESTS WITH ENGINE INSTALLED IN VOLVO 242. COMPONENT REVISIONS AND RECALIBRATION AS NECESSARY.

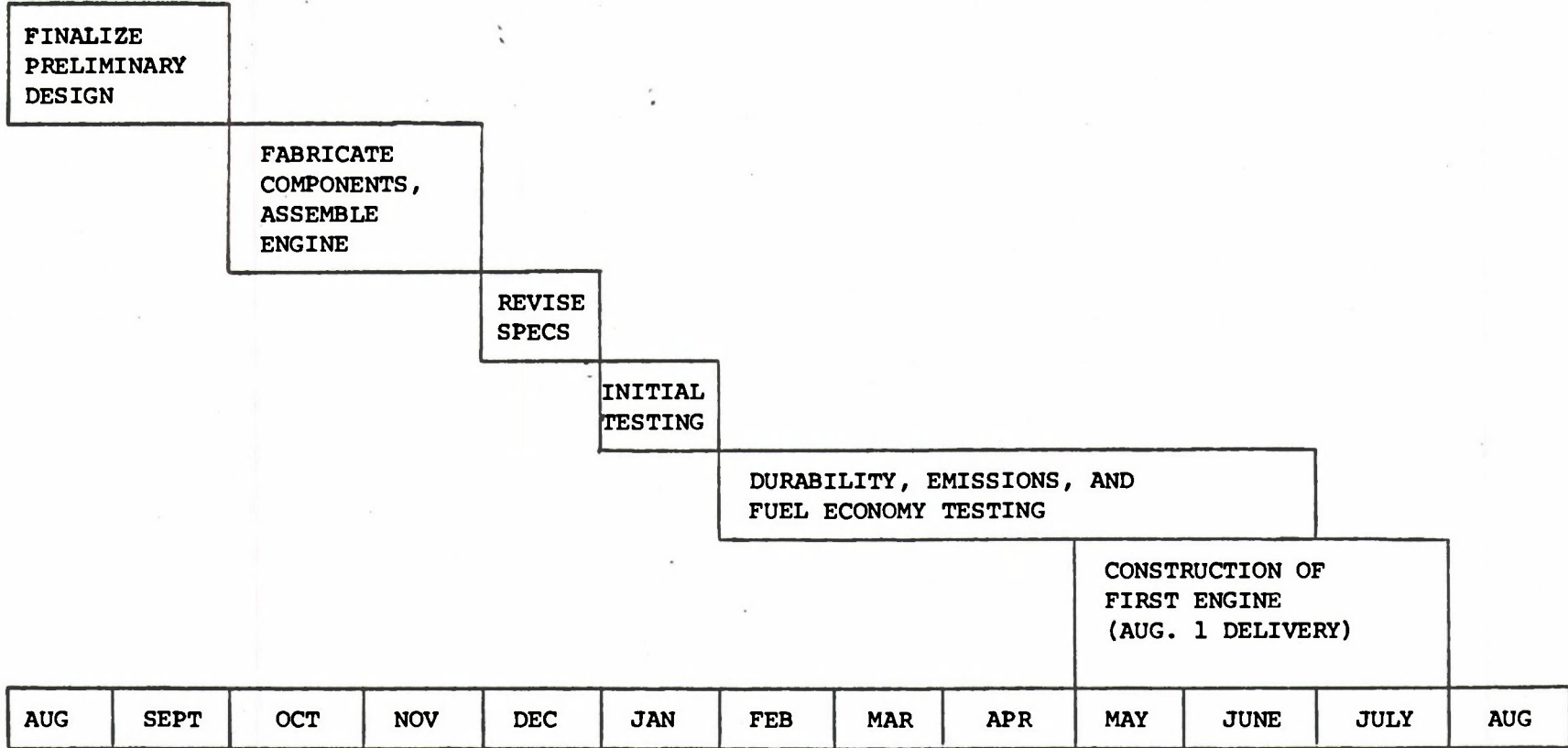
FEBRUARY 1 - JUNE 30, 1978

DURABILITY TESTING OF ENGINE INSTALLED IN VOLVO EXHAUST EMISSIONS AND FUEL ECONOMY TESTED AT 0, 5000, 10,000 AND 20,000 MILE POINTS.

MAY 1 - JULY 31, 1978

CONSTRUCTION OF FIRST ENGINE FOR DELIVERY TO MINICARS, INC., ON OR ABOUT AUGUST 1, 1978.

PROJECT SCHEDULE OF EVENTS

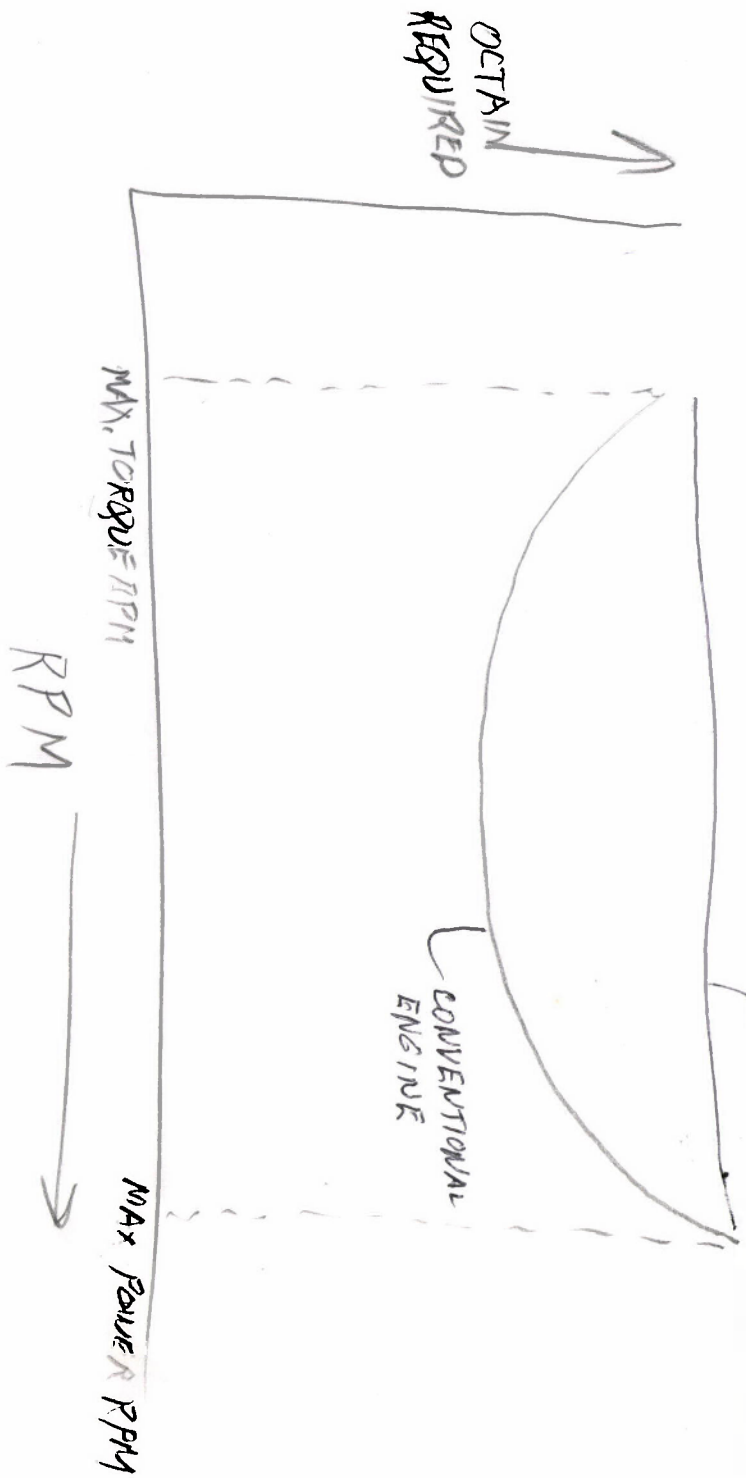


1977

1978

COSTS OF PROGRAM

	Cost
a. Base Volvo engine and components	\$ 5,000.00
b. Design, modification and construction of engine and turbocharger	\$10,000.00
c. VAC personnel technical, engineering, managerial and administration fringes at 20%	\$20,000.00 4,000.00
d. Travel and transportation	\$ 2,500.00
e. Depreciation and operation of test car	\$ 3,500.00
f. Testing emissions and fuel economy	\$ 5,000.00
	<hr/> \$50,000.00



Proposed for Turbocharged B21
By refined design of air valve