

**A16. Report Forms  
Sequence VIII Engine Evaluation of Engine Oils**

**Form 1**

VERSION VIII VERSION 2000128 BETA

CONDUCTED FOR

CC  
CC

<i>C</i>	V = VALID
	I = INVALID

<i>CC</i>	NR = Non-reference Oil Test
	RO = Reference Oil Test

Test Number			
Test Stand	Power Section	# of Runs on Power Section Since Calibration Test	Total Runs on Power Section
<i>CCCCC</i>	<i>CCCCCC</i>	<i>CCC</i>	<i>CCCCC</i>
Date Completed: <i>YYYYMMDD</i>		Completion Time: <i>HH:MM</i>	
Oil Code: <i>CC</i>			
Formulation/Stand Code: <i>CC-CCCCCCCCC-C-C-CCCCC-CC-CC-CCCC</i>			
Alternate Codes:	<i>CCCCCCCCC</i>	<i>CCCCCCCCC</i>	<i>CCCCCCCCC</i>

In my opinion this test *CCCCCCC* been conducted in a valid manner in accordance with the Sequence VIII Test Method D6709 and the appropriate amendments through the information letter system. The remarks included in this report describe the anomalies associated with this test.

SUBMITTED BY: \_\_\_\_\_  
Testing Laboratory  
Signature Image  
 \_\_\_\_\_  
Signature  
 \_\_\_\_\_  
Typed Name  
 \_\_\_\_\_  
Title

FIG. A16.1 Operational Validity Statement

**Sequence VIII Engine Evaluation of Engine Oils  
Form 4  
Test Results**

Laboratory	CC	Oilcode	CC
Date Completed	YYYYMMDD	Time Completed	HH:MM
Test Number	CCCCC / CCCCC / CCC / CCCCC		
Formulation/Stand	CC-CCCCCCCCC-C-C-CCCCC-CC-CC-CCCC		

SAE Viscosity	CCCCCC	Test Oil Temperature (135.0° or 143.5°C)	S12345.1
Laboratory Oil Code	CCCCCCCCCCCC	Date Started	YYYYMMDD
Test Fuel Type	CCCCCCCCCCCC	Time Started	HH:MM
Test Fuel Lot	CCCCCC	Bearing Batch No.	CCCCC
Bearing Storage Oil Lead, ppm <sup>A</sup>	S12	Bearing Lot	CC
Test Length	S12	Industry Reference Oil Code <sup>A</sup>	CCCCCC

Bearing Weight Loss Summary	
Test Length @ Measurement, hours	CCC
Top Bearing Half, mg	S123.1
Bottom Bearing Half, mg	S123.1
Total, mg	S123.1
Industry Correction Factor	S123.1
Severity Adjustment (non-reference tests only)	S123.1
Final Bearing Weight Loss, mg	S123.1

Hours	Viscosity cSt @ 40°C	Viscosity cSt @ 100°C	Stripped Viscosity @ 100°C
New Oil	S123.12	S123.12	
10	S123.12	S123.12	S12.12

Test Stand/Power Section Reference History					
Stand No.	CCCCC	Power Section No.	CCCCC	Runs on Power Section	CCCCC
Bearing Batch No.		CCCCC	Bearing Lot No.		CC
Industry Reference Oil Code		CCCCC	Stripped Viscosity, cSt		S12.12
Completion Date		YYYYMMDD	Completion Time		HH:MM
Total Bearing Weight Loss, mg		S123.1	Final Bearing Weight Loss, mg		S123.1
Oil Code		CC			

<sup>A</sup> Reference Oil Tests Only

FIG. A16.4 Test Results

**Sequence VIII Engine Evaluation of Engine Oils  
Form 5  
Operational Summary**

Laboratory	CC	Oil Code	CC
Date Completed	YYYYMMDD		
Test No.	CCCCC / CCCCC / CCC / CCCCC		
Formulation/Stand	CC-CCCCCCCCC-C-C-CCCCC-CC-CC-CCCC		

Test Parameter	Specification	Minimum	Maximum	Average
Speed, r/min	3150 ± 25	S1234.1	S1234.1	S1234.1
Air/Fuel Ratio	13.43 ± 0.5:1	S123.1	S123.1	S123.1
Fuel Flow, kg/h	2.25 ± 0.11	S1.12	S1.12	S1.12
Output, W	Record	S1234.1	S1234.1	S1234.1
Oil Heater Input, W (optional)	Record	S1234.1	S1234.1	S1234.1
Crankcase Off-Gas, L/h	850 ± 28	S1234	S1234	S1234
Temperatures	Specification	Minimum	Maximum	Average
Gallery Oil <sup>A</sup> , °C	143.5 or 135.0 ± 1	S123.1	S123.1	S123.1
Coolant-In, °C	Record	S123.1	S123.1	S123.1
Coolant-Out, °C	93.5 ± 1	S123.1	S123.1	S123.1
Delta T Coolant, °C	5.6 ± 1	S12.1	S12.1	S12.1
Intake Air, °C	Record	S123.1	S123.1	S123.1
Pressures	Specification	Minimum	Maximum	Average
Oil, kPa	276 ± 14	S12345	S12345	S12345
Intake Man. Vac., kPa	Record	S1.1	S1.1	S1.1
Exhaust, in. kPa	0 to 3.4	S1.1	S1.1	S1.1
Crankcase Vac., kPa	0.50 ± 0.12	S12.12	S12.12	S12.12
Spark Advance, °BTDC	35 ± 1	S12	S12	S12
Blowby, L/h	Record	S123.1	S123.1	S123.1

Oil Consumption <sup>B</sup>	Initial Oil Charge (ml)	New Oil Added (ml)	Oil Samples (ml)	Final Oil Drain (ml)
	S12345	S12345	S12345	S12345
Total Oil Consumption				S12345

<sup>A</sup> (See Table 1 for Viscosity-Related Temperature.)

<sup>B</sup> Total Oil Consumption = (Initial Oil Charge + New Oil Added) - (Oil Samples + Final Oil Drain)

FIG. A16.5 Operational Summary

**Sequence VIII Engine Evaluation of Engine Oils  
Form 6  
Parts Measurement and Critical Parts Listing**

Laboratory	CC	Oil Code	CC
Date Completed	YYYYMMDD		
Test Number	CCCCC / CCCCCC / CCC / CCCCC		
Formulation/Stand	CC-CCCCCCCCC-C-C-CCCCC-CC-CC-CCCC		

<b>Power Section Measurements, mm</b>				
<b>Measurement</b>	<b>Specification</b>	<b>Minimum</b>	<b>Maximum</b>	<b>Average</b>
Valve Stem Clearance in Guide, Inlet	0.0508 - 0.1016	<i>SI.1234</i>	<i>SI.1234</i>	<i>SI.1234</i>
Valve Stem Clearance in Guide, Exhaust	0.0762 - 0.1270	<i>SI.1234</i>	<i>SI.1234</i>	<i>SI.1234</i>
Connecting Rod Bearing Clearance	0.0610 - 0.0762	<i>SI.1234</i>	<i>SI.1234</i>	<i>SI.1234</i>
Main Bearing Clearance, Front	0.0508 - 0.0762	<i>SI.1234</i>	<i>SI.1234</i>	<i>SI.1234</i>
Main Bearing Clearance, Rear	0.0508 - 0.0762	<i>SI.1234</i>	<i>SI.1234</i>	<i>SI.1234</i>
Connecting Rod Journal Out-of-Round	0.0254 Maximum		<i>SI.1234</i>	

Runs on Liner	<i>SI2</i>	Liner may be used as long as the piston to liner clearance is in the specified range.
Piston to Liner Clearance	<i>SI.1234</i>	0.0305 to 0.0635 mm

<b>Critical Parts Listing</b>	
<b>Parts</b>	<b>I.D. Code</b>
Crankshaft	CCCCCCCCCC
Camshaft	CCCCCCCCCC
Main Bearings	CCCCCCCCCC
Camshaft Bearings	CCCCCCCCCC
Connecting Rod	CCCCCCCCCC
Piston	CCCCCCCCCC
Cylinder Liner	CCCCCCCCCC

FIG. A16.6 Parts Measurement, Oil Analysis, and Critical Parts Listing

**Sequence VIII Engine Evaluation of Engine Oils  
Form 7  
Downtime Occurrences and Other Comments**

Laboratory	CC	Oil Code	CC
Date Completed	YYYYMMDD		
Test Number	CCCCC	/ CCCCC	/ CCC / CCCCC
Formulation/Stand	CC-CCCCCCCCC-C-C-CCCCC-CC-CC-CCCC		

Number of Downtime Occurrences			SI
Test Hours	Date	Downtime	Reasons
HHH:MM	YYYYMMDD	HHH:MM	CC
		HHH:MM	Total Downtime

Other Comments	
Number of Comment Lines	SI
CC	

FIG. A16.7 Downtime Occurrences and Other Comments

**Sequence VIII Engine Evaluation of Engine Oils  
Form 8  
Operational Outliers Occurrences**

Laboratory	<i>CC</i>	Oil Code	<i>CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC</i>
Date Completed	<i>YYYYMMDD</i>		
Test Number	<i>CCCCC / CCCCC / CCC / CCCCC</i>		
Formulation/Stand	<i>CC-CCCCCCCCC-C-C-CCCCCC-CC-CC-CCCC</i>		

Number of Operational Outliers Occurrences <i>S12</i>					
Test Hours	Parameter	Parameter Range	Reading	Time Out	Deviation Percentage
<i>HH:MM</i>	<i>CCCCCCCCCCCCCCCC</i>	<i>CCCCCCCCCCCCCCCC</i>	<i>CCCCCCCC</i>	<i>HH:MM</i>	<i>S123.1</i>

FIG. A16.8 Operational Outliers Occurrences

**Sequence VIII Engine Evaluation of Engine Oils  
Form 9  
Deviations of Operational Parameters**

Laboratory	<i>cc</i>	Oil Code	<i>cc</i>
Date Completed	<i>YYYYMMDD</i>		
Test Number	<i>cccc / ccccc / ccc / ccccc</i>		
Formulation/Stand	<i>cc-cccccccc-c-c-cccc-cc-cc-cccc</i>		

<b>Primary Parameter</b>	Maximum Permitted Deviation Percentage	Calculated Total Deviation Percentage
Engine Oil Gallery Temperature	2.5%	<i>S123.1</i>
Engine Coolant Outlet Temperature	2.5%	<i>S123.1</i>
Engine Coolant Delta Temperature	2.5%	<i>S123.1</i>
Fuel Flow	2.5%	<i>S123.1</i>
Crankcase Off Gas	2.5%	<i>S123.1</i>
Oil Pressure	2.5%	<i>S123.1</i>
<b>Secondary Parameters</b>		
Engine Speed	5%	<i>S123.1</i>
AFR	5%	<i>S123.1</i>
Spark Advance	5%	<i>S123.1</i>
Exhaust	5%	<i>S123.1</i>
Crankcase Vacuum	5%	<i>S123.1</i>

FIG. A16.9 Deviations of Operational Parameters

**Sequence VIII Engine Evaluation of Engine Oils  
Form 10  
Data Acquisition System Details**

Laboratory	CC	Oil Code	CC
Date Completed	YYYYMMDD		
Test Number	CCCCC / CCCCCC / CCC / CCCCC		
Formulation/Stand	CC-CCCCCCCCC-C-C-CCCCC-CC-CC-CCCC		

PARAMETER (1)	SENSING DEVICE (2)	CALIBRATION FREQUENCY (3)	RECORD DEVICE (4)	OBSERVATION FREQUENCY (5)	RECORD FREQUENCY (6)	LOG FREQUENCY (7)	SYSTEM RESPONSE (8)
<b>TEMPERATURES</b>							
OIL IN	CCCCCCCCCCCC	CCCCCCCCCCCC	CCC	CCCCCCCCCCCC	CCCCCCCCCCCC	CCCCCCCCCCCC	CCCCCCCC
COOLANT OUT	CCCCCCCCCCCC	CCCCCCCCCCCC	CCC	CCCCCCCCCCCC	CCCCCCCCCCCC	CCCCCCCCCCCC	CCCCCCCC
COOLANT DELTA	CCCCCCCCCCCC	CCCCCCCCCCCC	CCC	CCCCCCCCCCCC	CCCCCCCCCCCC	CCCCCCCCCCCC	CCCCCCCC
<b>OTHER</b>							
FUEL FLOW	CCCCCCCCCCCC	CCCCCCCCCCCC	CCC	CCCCCCCCCCCC	CCCCCCCCCCCC	CCCCCCCCCCCC	CCCCCCCC
ENGINE SPEED	CCCCCCCCCCCC	CCCCCCCCCCCC	CCC	CCCCCCCCCCCC	CCCCCCCCCCCC	CCCCCCCCCCCC	CCCCCCCC
AFR	CCCCCCCCCCCC	CCCCCCCCCCCC	CCC	CCCCCCCCCCCC	CCCCCCCCCCCC	CCCCCCCCCCCC	CCCCCCCC
EXHAUST PRESSURE	CCCCCCCCCCCC	CCCCCCCCCCCC	CCC	CCCCCCCCCCCC	CCCCCCCCCCCC	CCCCCCCCCCCC	CCCCCCCC
CRANKCASE OFF GAS	CCCCCCCCCCCC	CCCCCCCCCCCC	CCC	CCCCCCCCCCCC	CCCCCCCCCCCC	CCCCCCCCCCCC	CCCCCCCC
OIL	CCCCCCCCCCCC	CCCCCCCCCCCC	CCC	CCCCCCCCCCCC	CCCCCCCCCCCC	CCCCCCCCCCCC	CCCCCCCC
CRANKCASE VAC.	CCCCCCCCCCCC	CCCCCCCCCCCC	CCC	CCCCCCCCCCCC	CCCCCCCCCCCC	CCCCCCCCCCCC	CCCCCCCC

**LEGEND:**

- (1) OPERATING PARAMETER
- (2) THE TYPE OF DEVICE USED TO MEASURE TEMPERATURE, PRESSURE OR FLOW
- (3) FREQUENCY AT WHICH THE MEASUREMENT SYSTEM IS CALIBRATED
- (4) THE TYPE OF DEVICE WHERE DATA IS RECORDED  
 LG - HANDLOG SHEET  
 DL - AUTOMATIC DATA LOGGER  
 SC - STRIP CHART RECORDER  
 C/M - COMPUTER, USING MANUAL DATA ENTRY  
 C/D - COMPUTER, USING DIRECT I/O ENTRY
- (5) DATA ARE OBSERVED BUT ONLY RECORDED IF OFF SPEC
- (6) DATA ARE RECORDED BUT ARE NOT RETAINED AT EOT
- (7) DATA ARE LOGGED AS PERMANENT RECORD, NOTE SPECIFY IF:  
 SS - SNAPSHOT TAKEN AT SPECIFIED FREQUENCY  
 AG/X AVERAGE OF X DATA POINTS AT SPECIFIED FREQUENCY
- (8) TIME FOR THE OUTPUT TO REACH 63.2% OF FINAL VALUE FOR STEP CHANGE AT INPUT
- (9) SEE ANNEX A11 FOR PROCEDURE TO DETERMINE SYSTEM RESPONSE OF THE CHARACTERISTICS OF THE ACQUISITION SYSTEM.

FIG. A16.10 Data Acquisition System Details