Report Forms

SEQUENCE VIB

VERSION: ***VIB VERSION 20010716***

CONDUCTED FOR:

CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC

CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC

C	V = VALID
	I = INVALID
	N = RESULTS CANNOT BE INTERPRETED (REFER TO COMMENT SECTION)

CC	NR = Non-reference Oil Test
	RO = Reference Oil Test

Lab: *CC*	Date Completed: *YYYYMMDD*	Time Completed: *HH:MM*	
Test Number			
Test Stand: *CCCCC*	Runs On The Stand: *CCCC*	Engine No.: *CCCCCCCCCCCCCC*	Runs on Engine: *CCCC*
Oil Code: *CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC*			
Formulation/Stand Code: *CC-CCCCCCCCCC-C-C-CCCCCC-CC-CC-CCCCC*			
Alternate Codes	*CCCCCCCCCC*	*CCCCCCCCCC*	*CCCCCCCCCC*

In my opinion this test *CCCCCCCC* been conducted in a valid manner in accordance with the VIB Test Procedure (RR:) and the appropriate amendments through the Information Letter System. The remarks included in the report describe the anomalies associated with this test.

SUBMITTED BY: *CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC*

Testing Laboratory

Signature Image

Signature

CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC

Typed Name

CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC

Title

Fig. A7.1 Test Report Cover

SEQUENCE VIB
FORM 4
TEST RESULT SUMMARY
NON-REFERENCE & REFERENCE OIL TESTS

Lab: *CC*	Date Completed: *YYYYMMDD*	Time Completed: *HH:MM*
Test Number		
Test Stand: *CCCCC*	Runs On The Stand: *CCCC*	Engine No.: *CCCCCCCCCCCCCC* Runs on Engine: *CCCC*
Oil Code: *CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC*		Engine Serial Number: *CCCCCCCCCCC*
Formulation/Stand Code: *CC-CCCCCCCCCC-C-C-CCCCCC-CC-CC-CCCCC*		

TEST DOCUMENTATION			
	BC Before	Test Oil	BC After
Start Date	*YYYYMMDD*	*YYYYMMDD*	*YYYYMMDD*
Start Time	*HH:MM*	*HH:MM*	*HH:MM*
End Date	*YYYYMMDD*	*YYYYMMDD*	*YYYYMMDD*
End Time	*HH:MM*	*HH:MM*	*HH:MM*
Oil Test Length, hhh:mm	*HHH:MM*	*HHH:MM*	*HHH:MM*
Calibration Oil Batch	*CCCCCCCCCC*		
Flush Oil Batch	*CCCCCCCCCC*		
Laboratory Oil Code		*CCCCCCCCCCC*	
SAE Viscosity Grade		*CCCCCCC*	
TMC Oil Code (Reference Oil Tests Only)		*CCCCCC*	
New Oil Viscosity @ 40 ˚C, cSt		*S1234.12*	
New Oil Viscosity @ 100˚C, cSt		*S1234.12*	
Aged (80 h) Oil Viscosity @ 40 ˚C, cSt		*S1234.12*	
Aged (80 h) Oil Viscosity @ 100˚C, cSt		*S1234.12*	
Total Test Length, hhh:mm	*CCCCCC*		
Total Engine Hours @ EOT	*CCCCC*		
Most Recent Fuel Batch	*CCCCCCCCCC*		

OVERALL RESULTS				
	BC Oil		Test Oil	
	Before	After	Phase I	Phase II
Fuel Consumed, kg	*S1.123456*	*S1.123456*	*S1.123456*	*S1.123456*
Shift Delta, %	*S1.12*			
Fuel Economy Improvement, %			*S12.12*	*S12.12*
FEI Industry Correction Factor, %			*S12.12*	*S12.12*
FEI Severity Adjustment, % (non-reference tests only)			*S12.12*	*S12.12*
FEI Final Result, %			*S12.12*	*S12.12*
Total Oil Consumption, mL			*S12345*	

Last Reference Oil Test on Stand/Engine History (Non-Reference Tests Only)			
Date Completed	*YYYYMMDD*	Fuel Batch	*CCCCCCCCCC*
TMC Oil Code	*CCCCCC*	SAE Viscosity Grade	*CCCCCCC*
Oilcode	*CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC*	Calibration Oil Batch	*CCCCCCCCCC*
Runs on Stand	*CCCC*	Runs on Engine	*CCCC*
		Phase I	Phase II
Final FEI Results		*S12.12*	*S12.12*

Fig. A7.4 Test Result Summary - Non-reference and Reference Oil Tests

SEQUENCE VIB
FORM 5
OPERATIONAL DATA ANALYSIS

Lab: *CC*	Date Completed: *YYYYMMDD*	Time Completed: *HH:MM*	
Test Number			
Test Stand: *CCCCC*	Runs On The Stand: *CCCC*	Engine No.: *CCCCCCCCCCCCCC*	Runs on Engine: *CCCC*
Oil Code: *CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC*			
Formulation/Stand Code: *CC-CCCCCCCCCC-C-C-CCCCCC-CC-CC-CCCCC*			

Computed Averages						
Oil	Stage	BSFC kg/kW-h	BSFC C.V.%	Nominal Power kW	Weight Factor	Weighted Fuel Consumed kg
BC Before Test Oil	**1**	*S1.12345*	*S1.12*	15.39	0.0802	*S1.123456*
	2	*S1.12345*	*S1.12*	2.18	0.0787	*S1.123456*
	3	*S1.12345*	*S1.12*	2.18	0.0848	*S1.123456*
	4	*S1.12345*	*S1.12*	15.39	0.0864	*S1.123456*
	5	*S1.12345*	*S1.12*	15.39	0.0699	*S1.123456*
Total Fuel Consumed						*S1.123456*

Computed Averages						
Oil	Stage	BSFC kg/kW-h	BSFC C.V.%	Nominal Power kW	Weight Factor	Weighted Fuel Consumed kg
Test Oil Phase I	**1**	*S1.12345*	*S1.12*	15.39	0.0802	*S1.123456*
	2	*S1.12345*	*S1.12*	2.18	0.0787	*S1.123456*
	3	*S1.12345*	*S1.12*	2.18	0.0848	*S1.123456*
	4	*S1.12345*	*S1.12*	15.39	0.0864	*S1.123456*
	5	*S1.12345*	*S1.12*	15.39	0.0699	*S1.123456*
Total Fuel Consumed						*S1.123456*

Fig. A7.5 Operational Data Analysis

SEQUENCE VIB
FORM 6
OPERATIONAL DATA ANALYSIS

Lab: *CC*	Date Completed: *YYYYMMDD*	Time Completed: *HH:MM*	
Test Number			
Test Stand: *CCCCC*	Runs On The Stand: *CCCC*	Engine No.: *CCCCCCCCCCCCCC*	Runs on Engine: *CCCC*
Oil Code: *CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC*			
Formulation/Stand Code: *CC-CCCCCCCCCC-C-C-CCCCCC-CC-CC-CCCCC*			

Computed Averages						
Oil	Stage	BSFC kg/kW-h	BSFC C.V.%	Nominal Power kW	Weight Factor	Weighted Fuel Consumed kg
Test Oil Phase II	**1**	*S1.12345*	*S1.12*	15.39	0.0802	*S1.123456*
	2	*S1.12345*	*S1.12*	2.18	0.0787	*S1.123456*
	3	*S1.12345*	*S1.12*	2.18	0.0848	*S1.123456*
	4	*S1.12345*	*S1.12*	15.39	0.0864	*S1.123456*
	5	*S1.12345*	*S1.12*	15.39	0.0699	*S1.123456*
Total Fuel Consumed						*S1.123456*

Computed Averages						
Oil	Stage	BSFC kg/kW-h	BSFC C.V.%	Nominal Power kW	Weight Factor	Weighted Fuel Consumed kg
BC After Test Oil	**1**	*S1.12345*	*S1.12*	15.39	0.0802	*S1.123456*
	2	*S1.12345*	*S1.12*	2.18	0.0787	*S1.123456*
	3	*S1.12345*	*S1.12*	2.18	0.0848	*S1.123456*
	4	*S1.12345*	*S1.12*	15.39	0.0864	*S1.123456*
	5	*S1.12345*	*S1.12*	15.39	0.0699	*S1.123456*
Total Fuel Consumed						*S1.123456*

Fig. A7.6 Operational Data Analysis

SEQUENCE VIB
FORM 7

GENERAL PARAMETER LISTING

Lab: *CC*	Date Completed: *YYYYMMDD*	Time Completed: *HH:MM*	
Test Number			
Test Stand: *CCCCC*	Runs On The Stand: *CCCC*	Engine No.: *CCCCCCCCCCCCCC*	Runs on Engine: *CCCC*
Oil Code: *CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC*			
Formulation/Stand Code: *CC-CCCCCCCCCC-C-C-CCCCCC-CC-CC-CCCCC*			

16 Hour Aging

	SPEC	AVERAGE [A]	MAX [A]	MIN [A]
1. Speed, r/min	1500 ± 5	*S1234.1*	*S1234.1*	*S1234.1*
2. Torque, N-m	98 ± 0.10	*S12.12*	*S12.12*	*S12.12*
3. Oil Gallery Temperature, ˚C	125 ± 2	*S123.1*	*S123.1*	*S123.1*
4. Coolant Inlet Temperature, ˚C	105 ± 2	*S123.1*	*S123.1*	*S123.1*
5. Oil Circulation Temperature, ˚C	Record	*S123.1*	*S123.1*	*S123.1*
6. Coolant Out Temperature, ˚C	Record	*S123.1*	*S123.1*	*S123.1*
7. Intake Air Temperature, ˚C	27 ± 2	*S123.1*	*S123.1*	*S123.1*
8. Fuel to Flowmeter Temperature, ˚C	20 - 32	*S123.1*	*S123.1*	*S123.1*
9. Fuel to Fuel Rail Temperature, ˚C	20 ± 2	*S123.1*	*S123.1*	*S123.1*
10. Load Cell Temperature, ˚C	Record	*S123.1*	*S123.1*	*S123.1*
11. Oil Heater Temperature, ˚C	205 max	*S123.1*	*S123.1*	*S123.1*
12. Intake Air Pressure, kPa	0.05 ± 0.02	*S1.12*	*S1.12*	*S1.12*
13. Fuel to Flowmeter Pressure, kPa	100 min	*S123.1*	*S123.1*	*S123.1*
14. Fuel to Fuel Rail Pressure, kPa	205 - 310	*S123.1*	*S123.1*	*S123.1*
15. Intake Manifold Pressure, kPa abs.	Record	*S12.1*	*S12.1*	*S12.1*
16. Exhaust Back Pressure, kPa abs.	104 ± 0.20	*S123.12*	*S123.12*	*S123.12*
17. Engine Oil Pressure, kPa	Record	*S123.1*	*S123.1*	*S123.1*
18. Coolant Flow, L/min	130 ± 4	*S123.1*	*S123.1*	*S123.1*
19. Fuel Flow, kg/h	Record	*S12.123*	*S12.123*	*S12.123*
20. Intake Air Humidity, grains/kg	11.4 ± 0.8	*S12.1*	*S12.1*	*S12.1*
21. Air/Fuel Ratio	Record	*S12.12*	*S12.12*	*S12.12*
22. Crankcase Pressure, kPa	0.00 ± 0.25	*S12.12*	*S12.12*	*S12.12*

[A] *Based on a minimum of one determination per hour*

Fig. A7.7 General Parameter Listing

SEQUENCE VIB
FORM 8
GENERAL PARAMETER LISTING

Lab: *CC*	Date Completed: *YYYYMMDD*	Time Completed: *HH:MM*	
Test Number			
Test Stand: *CCCCC*	Runs On The Stand: *CCCC*	Engine No.: *CCCCCCCCCCCCCC*	Runs on Engine: *CCCC*
Oil Code: *CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC*			
Formulation/Stand Code: *CC-CCCCCCCCCC-C-C-CCCCCC-CC-CC-CCCCC*			

80 Hour Aging

	SPEC	AVERAGE [A]	MAX [A]	MIN [A]
1. Speed, r/min	2250 ± 5	*S1234.1*	*S1234.1*	*S1234.1*
2. Torque, N-m	98 ± 0.10	*S12.12*	*S12.12*	*S12.12*
3. Oil Gallery Temperature, ˚C	135 ± 2	*S123.1*	*S123.1*	*S123.1*
4. Coolant Inlet Temperature, ˚C	105 ± 2	*S123.1*	*S123.1*	*S123.1*
5. Oil Circulation Temperature, ˚C	Record	*S123.1*	*S123.1*	*S123.1*
6. Coolant Out Temperature, ˚C	Record	*S123.1*	*S123.1*	*S123.1*
7. Intake Air Temperature, ˚C	27 ± 2	*S123.1*	*S123.1*	*S123.1*
8. Fuel to Flowmeter Temperature, ˚C	20 - 32	*S123.1*	*S123.1*	*S123.1*
9. Fuel to Fuel Rail Temperature, ˚C	20 ± 2	*S123.1*	*S123.1*	*S123.1*
10. Load Cell Temperature, ˚C	Record	*S123.1*	*S123.1*	*S123.1*
11. Oil Heater Temperature, ˚C	205 max	*S123.1*	*S123.1*	*S123.1*
12. Intake Air Pressure, kPa	0.05 ± 0.02	*S1.12*	*S1.12*	*S1.12*
13. Fuel to Flowmeter Pressure, kPa	100 min	*S123.1*	*S123.1*	*S123.1*
14. Fuel to Fuel Rail Pressure, kPa	205 - 310	*S123.1*	*S123.1*	*S123.1*
15. Intake Manifold Pressure, kPa abs.	Record	*S12.1*	*S12.1*	*S12.1*
16. Exhaust Back Pressure, kPa abs.	104 ± 0.20	*S123.12*	*S123.12*	*S123.12*
17. Engine Oil Pressure, kPa	Record	*S123.1*	*S123.1*	*S123.1*
18. Coolant Flow, L/min	130 ± 4	*S123.1*	*S123.1*	*S123.1*
19. Fuel Flow, kg/h	Record	*S12.123*	*S12.123*	*S12.123*
20. Intake Air Humidity, grains/kg	11.4 ± 0.8	*S12.1*	*S12.1*	*S12.1*
21. Air/Fuel Ratio	Record	*S12.12*	*S12.12*	*S12.12*
22. Crankcase Pressure, kPa	0.00 ± 0.25	*S12.12*	*S12.12*	*S12.12*

[A] *Based on a minimum of one determination per hour*

Fig. A7.8 General Parameter Listing

SEQUENCE VIB
FORM 9
GENERAL PARAMETER SUMMARY

Lab: *CC*	Date Completed: *YYYYMMDD*	Time Completed: *HH:MM*	
Test Number			
Test Stand: *CCCCC*	Runs On The Stand: *CCCC*	Engine No.: *CCCCCCCCCCCCCC*	Runs on Engine: *CCCC*
Oil Code: *CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC*			
Formulation/Stand Code: *CC-CCCCCCCCCC-C-C-CCCCCC-CC-CC-CCCCC*			

BC Before Test Oil

General Parameters

		Stage				
	Spec	**1**	**2**	**3**	**4**	**5**
1. Oil Circulation Temperature, ˚C	Record	*S123.1*	*S123.1*	*S123.1*	*S123.1*	*S123.1*
2. Coolant Out Temperature, ˚C	Record	*S123.1*	*S123.1*	*S123.1*	*S123.1*	*S123.1*
3. Fuel to Flowmeter Temperature, ˚C	20-32	*S12.1*	*S12.1*	*S12.1*	*S12.1*	*S12.1*
4. Delta Fuel to Flowmeter Temp., ˚C [A]	≤ 4	*S12.1*	*S12.1*	*S12.1*	*S12.1*	*S12.1*
5. Test Cell Temperature, ˚C	Record	*S12.1*	*S12.1*	*S12.1*	*S12.1*	*S12.1*
6. Load Cell Temperature, ˚C	Record	*S12.1*	*S12.1*	*S12.1*	*S12.1*	*S12.1*
7. Delta Load Cell Temperature, ˚C [A]	≤ 12	*S12.1*	*S12.1*	*S12.1*	*S12.1*	*S12.1*
8. Oil Heater Temperature, ˚C	205 max	*S123.1*	*S123.1*	*S123.1*	*S123.1*	*S123.1*
9. Intake Air Pressure, kPa	0.05 ± .02	*S1.12*	*S1.12*	*S1.12*	*S1.12*	*S1.12*
10. Fuel to Flowmeter Pressure, kPa	100 min	*S123.1*	*S123.1*	*S123.1*	*S123.1*	*S123.1*
11. Fuel to Fuel Rail Pressure, kPa	205 - 310	*S123.1*	*S123.1*	*S123.1*	*S123.1*	*S123.1*
12. Intake Manifold Pressure, kPa abs.	Record	*S12.1*	*S12.1*	*S12.1*	*S12.1*	*S12.1*
13. Engine Oil Pressure, kPa	Record	*S123.1*	*S123.1*	*S123.1*	*S123.1*	*S123.1*
14. Coolant Flow, L/min	130 ± 4	*S123.1*	*S123.1*	*S123.1*	*S123.1*	*S123.1*
15. Intake Air Humidity, grains/kg	11.4 ± 0.8	*S12.1*	*S12.1*	*S12.1*	*S12.1*	*S12.1*
16. Crankcase Pressure, kPa	0.00 ± 0.25	*S12.12*	*S12.12*	*S12.12*	*S12.12*	*S12.12*
17. Blowby, L/min [B]	Record	*S12.12*				
18. Barometric Pressure, kPa	Record	*S123.12*	*S123.12*	*S123.12*	*S123.12*	*S123.12*

[A] Difference between the maximum stage average reading of the entire test and the individual stage average readings

[B] Not required by test procedure

Fig. A7.9 General Parameter Summary

SEQUENCE VIB
FORM 10
GENERAL PARAMETER SUMMARY

Lab: *CC*	Date Completed: *YYYYMMDD*	Time Completed: *HH:MM*	
Test Number			
Test Stand: *CCCCC*	Runs On The Stand: *CCCC*	Engine No.: *CCCCCCCCCCCCCC*	Runs on Engine: *CCCC*
Oil Code: *CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC*			
Formulation/Stand Code: *CC-CCCCCCCCCC-C-C-CCCCCC-CC-CC-CCCCC*			

Test Oil Phase I

General Parameters

		Stage				
	Spec	**1**	**2**	**3**	**4**	**5**
1. Oil Circulation Temperature, ˚C	Record	*S123.1*	*S123.1*	*S123.1*	*S123.1*	*S123.1*
2. Coolant Out Temperature, ˚C	Record	*S123.1*	*S123.1*	*S123.1*	*S123.1*	*S123.1*
3. Fuel to Flowmeter Temperature, ˚C	20-32	*S12.1*	*S12.1*	*S12.1*	*S12.1*	*S12.1*
4. Delta Fuel to Flowmeter Temp., ˚C [A]	≤ 4	*S12.1*	*S12.1*	*S12.1*	*S12.1*	*S12.1*
5. Test Cell Temperature, ˚C	Record	*S12.1*	*S12.1*	*S12.1*	*S12.1*	*S12.1*
6. Load Cell Temperature, ˚C	Record	*S12.1*	*S12.1*	*S12.1*	*S12.1*	*S12.1*
7. Delta Load Cell Temperature, ˚C [A]	≤ 12	*S12.1*	*S12.1*	*S12.1*	*S12.1*	*S12.1*
8. Oil Heater Temperature, ˚C	205 max	*S123.1*	*S123.1*	*S123.1*	*S123.1*	*S123.1*
9. Intake Air Pressure, kPa	0.05 ± .02	*S1.12*	*S1.12*	*S1.12*	*S1.12*	*S1.12*
10. Fuel to Flowmeter Pressure, kPa	100 min	*S123.1*	*S123.1*	*S123.1*	*S123.1*	*S123.1*
11. Fuel to Fuel Rail Pressure, kPa	205 - 310	*S123.1*	*S123.1*	*S123.1*	*S123.1*	*S123.1*
12. Intake Manifold Pressure, kPa abs.	Record	*S12.1*	*S12.1*	*S12.1*	*S12.1*	*S12.1*
13. Engine Oil Pressure, kPa	Record	*S123.1*	*S123.1*	*S123.1*	*S123.1*	*S123.1*
14. Coolant Flow, L/min	130 ± 4	*S123.1*	*S123.1*	*S123.1*	*S123.1*	*S123.1*
15. Intake Air Humidity, grains/kg	11.4 ± 0.8	*S12.1*	*S12.1*	*S12.1*	*S12.1*	*S12.1*
16. Crankcase Pressure, kPa	0.00 ± 0.25	*S12.12*	*S12.12*	*S12.12*	*S12.12*	*S12.12*
17. Barometric Pressure, kPa	Record	*S123.12*	*S123.12*	*S123.12*	*S123.12*	*S123.12*

[A] Difference between the maximum stage average reading of the entire test and the individual stage average readings

Fig. A7.10 General Parameter Summary

SEQUENCE VIB
FORM 11
GENERAL PARAMETER SUMMARY

Lab: *CC*	Date Completed: *YYYYMMDD*	Time Completed: *HH:MM*	
Test Number			
Test Stand: *CCCCC*	Runs on Test Stand: *CCCC*	Engine No.: *CCCCCCCCCCCCCC*	Runs on Engine: *CCCC*
Oil Code: *CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC*			
Formulation/Stand Code: *CC-CCCCCCCCCC-C-C-CCCCCC-CC-CC-CCCCC*			

Test Oil Phase II

General Parameters

		Stage				
	Spec	**1**	**2**	**3**	**4**	**5**
1. Oil Circulation Temperature, ˚C	Record	*S123.1*	*S123.1*	*S123.1*	*S123.1*	*S123.1*
2. Coolant Out Temperature, ˚C	Record	*S123.1*	*S123.1*	*S123.1*	*S123.1*	*S123.1*
3. Fuel to Flowmeter Temperature, ˚C	20-32	*S12.1*	*S12.1*	*S12.1*	*S12.1*	*S12.1*
4. Delta Fuel to Flowmeter Temp., ˚C [A]	≤ 4	*S12.1*	*S12.1*	*S12.1*	*S12.1*	*S12.1*
5. Test Cell Temperature, ˚C	Record	*S12.1*	*S12.1*	*S12.1*	*S12.1*	*S12.1*
6. Load Cell Temperature, ˚C	Record	*S12.1*	*S12.1*	*S12.1*	*S12.1*	*S12.1*
7. Delta Load Cell Temperature, ˚C [A]	≤ 12	*S12.1*	*S12.1*	*S12.1*	*S12.1*	*S12.1*
8. Oil Heater Temperature, ˚C	205 max	*S123.1*	*S123.1*	*S123.1*	*S123.1*	*S123.1*
9. Intake Air Pressure, kPa	0.05 ± .02	*S1.12*	*S1.12*	*S1.12*	*S1.12*	*S1.12*
10. Fuel to Flowmeter Pressure, kPa	100 min	*S123.1*	*S123.1*	*S123.1*	*S123.1*	*S123.1*
11. Fuel to Fuel Rail Pressure, kPa	205 - 310	*S123.1*	*S123.1*	*S123.1*	*S123.1*	*S123.1*
12. Intake Manifold Pressure, kPa abs.	Record	*S12.1*	*S12.1*	*S12.1*	*S12.1*	*S12.1*
13. Engine Oil Pressure, kPa	Record	*S123.1*	*S123.1*	*S123.1*	*S123.1*	*S123.1*
14. Coolant Flow, L/min	130 ± 4	*S123.1*	*S123.1*	*S123.1*	*S123.1*	*S123.1*
15. Intake Air Humidity, grains/kg	11.4 ± 0.8	*S12.1*	*S12.1*	*S12.1*	*S12.1*	*S12.1*
16. Crankcase Pressure, kPa	0.00 ± 0.25	*S12.12*	*S12.12*	*S12.12*	*S12.12*	*S12.12*
17. Barometric Pressure, kPa	Record	*S123.12*	*S123.12*	*S123.12*	*S123.12*	*S123.12*

[A] Difference between the maximum stage average reading of the entire test and the individual stage average readings

Fig. A7.11 General Parameter Summary

SEQUENCE VIB
FORM 12
GENERAL PARAMETER SUMMARY

Lab: *CC*	Date Completed: *YYYYMMDD*	Time Completed: *HH:MM*	
Test Number			
Test Stand: *CCCCC*	Runs On The Stand: *CCCC*	Engine No.: *CCCCCCCCCCCCCC*	Runs on Engine: *CCCC*
Oil Code: *CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC*			
Formulation/Stand Code: *CC-CCCCCCCCCC-C-C-CCCCCC-CC-CC-CCCCC*			

BC After Test Oil

General Parameters

		Stage				
	Spec	**1**	**2**	**3**	**4**	**5**
1. Oil Circulation Temperature, ˚C	Record	*S123.1*	*S123.1*	*S123.1*	*S123.1*	*S123.1*
2. Coolant Out Temperature, ˚C	Record	*S123.1*	*S123.1*	*S123.1*	*S123.1*	*S123.1*
3. Fuel to Flowmeter Temperature, ˚C	20-32	*S12.1*	*S12.1*	*S12.1*	*S12.1*	*S12.1*
4. Delta Fuel to Flowmeter Temp.,˚C [A]	≤ 4	*S12.1*	*S12.1*	*S12.1*	*S12.1*	*S12.1*
5. Test Cell Temperature, ˚C	Record	*S12.1*	*S12.1*	*S12.1*	*S12.1*	*S12.1*
6. Load Cell Temperature, ˚C	Record	*S12.1*	*S12.1*	*S12.1*	*S12.1*	*S12.1*
7. Delta Load Cell Temperature, ˚C [A]	≤ 12	*S12.1*	*S12.1*	*S12.1*	*S12.1*	*S12.1*
8. Oil Heater Temperature, ˚C	205 max	*S123.1*	*S123.1*	*S123.1*	*S123.1*	*S123.1*
9. Intake Air Pressure, kPa	0.05 ± .02	*S1.12*	*S1.12*	*S1.12*	*S1.12*	*S1.12*
10. Fuel to Flowmeter Pressure, kPa	100 min	*S123.1*	*S123.1*	*S123.1*	*S123.1*	*S123.1*
11. Fuel to Fuel Rail Pressure, kPa	205 - 310	*S123.1*	*S123.1*	*S123.1*	*S123.1*	*S123.1*
12. Intake Manifold Pressure, kPa abs.	Record	*S12.1*	*S12.1*	*S12.1*	*S12.1*	*S12.1*
13. Engine Oil Pressure, kPa	Record	*S123.1*	*S123.1*	*S123.1*	*S123.1*	*S123.1*
14. Coolant Flow, L/min	130 ± 4	*S123.1*	*S123.1*	*S123.1*	*S123.1*	*S123.1*
15. Intake Air Humidity, grains/kg	11.4 ± 0.8	*S12.1*	*S12.1*	*S12.1*	*S12.1*	*S12.1*
16. Crankcase Pressure, kPa	0.00 ± 0.25	*S12.12*	*S12.12*	*S12.12*	*S12.12*	*S12.12*
17. Barometric Pressure, kPa	Record	*S123.12*	*S123.12*	*S123.12*	*S123.12*	*S123.12*

[A] Difference between the maximum stage average reading of the entire test and the individual stage average readings

Fig. A7.12 General Parameter Summary

SEQUENCE VIB
FORM 13
CRITICAL PARAMETER SUMMARY- STAGE 1

Lab: *CC*	Date Completed: *YYYYMMDD*	Time Completed: *HH:MM*	
Test Number			
Test Stand: *CCCCC*	Runs On The Stand: *CCCC*	Engine No.: *CCCCCCCCCCCCCC*	Runs on Engine: *CCCC*
Oil Code: *CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC*			
Formulation/Stand Code: *CC-CCCCCCCCCC-C-C-CCCCCC-CC-CC-CCCCC*			

BC Before Test Oil

Step SPEC	BSFC kg/kW-h	Speed r/min 1500 ± 2	Torque N-m 98 ± .07	Oil Gallery Temp. °C 125 ± 1	Coolant In Temp, °C 105 ± 1	Intake Air Temp, °C 27 ± 2	Fuel Rail Temp, °C 20 ± 2	EBP kPa 104 ± .17	Fuel Flow kg/h Record	AFR 14.25-15.25	Delta AFR ≤ .50 [A]
1	*S1.1234*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	
2	*S1.1234*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	
3	*S1.1234*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	
4	*S1.1234*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	
5	*S1.1234*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	
6	*S1.1234*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	
AVG.	*S1.12345*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	*S12.12*
SD	*S1.1234*										
C.V.	*S1.12*										

Test Oil Phase I

Step SPEC	BSFC kg/kW-h	Speed r/min 1500 ± 2	Torque N-m 98 ± .07	Oil Gallery Temp. °C 125 ± 1	Coolant In Temp, °C 105 ± 1	Intake Air Temp, °C 27 ± 2	Fuel Rail Temp, °C 20 ± 2	EBP kPa 104 ± .17	Fuel Flow kg/h Record	AFR 14.25-15.25	Delta AFR ≤ .50 [A]
1	*S1.1234*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	
2	*S1.1234*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	
3	*S1.1234*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	
4	*S1.1234*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	
5	*S1.1234*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	
6	*S1.1234*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	
AVG.	*S1.12345*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	*S12.12*
SD	*S1.1234*										
C.V.	*S1.12*										

[A] Difference between the maximum stage average reading of the entire test and the individual stage average readings.

Fig. A7.13 Critical Parameter Summary - Stage 1

SEQUENCE VIB
FORM 13A
CRITICAL PARAMETER SUMMARY- STAGE 1

Lab: *CC*	Date Completed: *YYYYMMDD*	Time Completed: *HH:MM*	
Test Number			
Test Stand: *CCCCC*	Runs On The Stand: *CCCC*	Engine No.: *CCCCCCCCCCCCCC*	Runs on Engine: *CCCC*
Oil Code: *CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC*			
Formulation/Stand Code: *CC-CCCCCCCCCC-C-C-CCCCCC-CC-CC-CCCCC*			

Test Oil Phase II

Step SPEC	BSFC kg/kW-h	Speed r/min 1500 ± 2	Torque N-m 98 ± .07	Oil Gallery Temp. °C 125 ± 1	Coolant In Temp, °C 105 ± 1	Intake Air Temp, °C 27 ± 2	Fuel Rail Temp, °C 20 ± 2	EBP kPa 104 ± .17	Fuel Flow kg/h Record	AFR 14.25-15.25	Delta[A] AFR < .50
1	*S1.1234*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	
2	*S1.1234*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	
3	*S1.1234*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	
4	*S1.1234*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	
5	*S1.1234*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	
6	*S1.1234*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	
AVG.	*S1.12345*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	*S12.12*
SD	*S1.1234*										
C.V.	*S1.12*										

BC After Test Oil

Step SPEC	BSFC kg/kW-h	Speed r/min 1500 ± 2	Torque N-m 98 ± .07	Oil Gallery Temp. °C 125 ± 1	Coolant In Temp, °C 105 ± 1	Intake Air Temp, °C 27 ± 2	Fuel Rail Temp, °C 20 ± 2	EBP kPa 104 ± .17	Fuel Flow kg/h Record	AFR 14.25-15.25	Delta[A] AFR ≤ .50
1	*S1.1234*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	
2	*S1.1234*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	
3	*S1.1234*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	
4	*S1.1234*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	
5	*S1.1234*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	
6	*S1.1234*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	
AVG.	*S1.12345*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	*S12.12*
SD	*S1.1234*										
C.V.	*S1.12*										

[A] Difference between the maximum stage average reading of the entire test and the individual stage average readings.

Fig. A7.13A Critical Parameter Summary - Stage 1

SEQUENCE VIB
FORM 14
CRITICAL PARAMETER SUMMARY- STAGE 2

Lab: *CC*	Date Completed: *YYYYMMDD*	Time Completed: *HH:MM*	
Test Number			
Test Stand: *CCCCC*	Runs On The Stand: *CCCC*	Engine No.: *CCCCCCCCCCCCCC*	Runs on Engine: *CCCC*
Oil Code: *CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC*			
Formulation/Stand Code: *CC-CCCCCCCCCC-C-C-CCCCCC-CC-CC-CCCCC*			

BC Before Test Oil

Step SPEC	BSFC kg/kW-h	Speed r/min 800 ± 2	Torque N-m 26 ± .07	Oil Gallery Temp. °C 105 ± 1	Coolant In Temp, °C 95 ± 1	Intake Air Temp, °C 27 ± 2	Fuel Rail Temp, °C 20 ± 2	EBP kPa 104 ± .17	Fuel Flow kg/h Record	AFR 14.25-15.25	Delta AFR ≤ .50 [A]
1	*S1.1234*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	
2	*S1.1234*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	
3	*S1.1234*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	
4	*S1.1234*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	
5	*S1.1234*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	
6	*S1.1234*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	
AVG.	*S1.12345*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	*S12.12*
SD	*S1.1234*										
C.V.	*S1.12*										

Test Oil Phase I

Step SPEC	BSFC kg/kW-h	Speed r/min 800 ± 2	Torque N-m 26 ± .07	Oil Gallery Temp. °C 105 ± 1	Coolant In Temp, °C 95 ± 1	Intake Air Temp, °C 27 ± 2	Fuel Rail Temp, °C 20 ± 2	EBP kPa 104 ± .17	Fuel Flow kg/h Record	AFR 14.25-15.25	Delta AFR ≤ .50 [A]
1	*S1.1234*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	
2	*S1.1234*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	
3	*S1.1234*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	
4	*S1.1234*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	
5	*S1.1234*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	
6	*S1.1234*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	
AVG.	*S1.12345*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	*S12.12*
SD	*S1.1234*										
C.V.	*S1.12*										

[A] Difference between the maximum stage average reading of the entire test and the individual stage average readings

Fig. A7.14 Critical Parameter Summary - Stage 2

SEQUENCE VIB
FORM 14A
CRITICAL PARAMETER SUMMARY- STAGE 2

Lab: *CC*	Date Completed: *YYYYMMDD*	Time Completed: *HH:MM*	
Test Number			
Test Stand: *CCCCC*	Runs On The Stand: *CCCC*	Engine No.: *CCCCCCCCCCCCCC*	Runs on Engine: *CCCC*
Oil Code: *CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC*			
Formulation/Stand Code: *CC-CCCCCCCCCC-C-C-CCCCCC-CC-CC-CCCCC*			

Test Oil Phase II

Step SPEC	BSFC kg/kW-h	Speed r/min 800 ± 2	Torque N-m 26 ± .07	Oil Gallery Temp. °C 105 ± 1	Coolant In Temp, °C 95 ± 1	Intake Air Temp, °C 27 ± 2	Fuel Rail Temp, °C 20 ± 2	EBP kPa 104 ± .17	Fuel Flow kg/h Record	AFR 14.25-15.25	Delta AFR ≤ .50 [A]
1	*S1.1234*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	
2	*S1.1234*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	
3	*S1.1234*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	
4	*S1.1234*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	
5	*S1.1234*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	
6	*S1.1234*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	
AVG.	*S1.12345*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	*S12.12*
SD	*S1.1234*										
C.V.	*S1.12*										

BC After Test Oil

Step SPEC	BSFC kg/kW-h	Speed r/min 800 ± 2	Torque N-m 26 ± .07	Oil Gallery Temp. °C 105 ± 1	Coolant In Temp, °C 95 ± 1	Intake Air Temp, °C 27 ± 2	Fuel Rail Temp, °C 20 ± 2	EBP kPa 104 ± .17	Fuel Flow kg/h Record	AFR 14.25-15.25	Delta AFR ≤ .50 [A]
1	*S1.1234*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	
2	*S1.1234*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	
3	*S1.1234*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	
4	*S1.1234*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	
5	*S1.1234*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	
6	*S1.1234*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	
AVG.	*S1.12345*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	*S12.12*
SD	*S1.1234*										
C.V.	*S1.12*										

[A] Difference between the maximum stage average reading of the entire test and the individual stage average readings

Fig. A7.14A Critical Parameter Summary - Stage 2

SEQUENCE VIB
FORM 15
CRITICAL PARAMETER SUMMARY- STAGE 3

Lab: *CC*	Date Completed: *YYYYMMDD*	Time Completed: *HH:MM*	
Test Number			
Test Stand: *CCCCC*	Runs On The Stand: *CCCC*	Engine No.: *CCCCCCCCCCCCCC*	Runs on Engine: *CCCC*
Oil Code: *CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC*			
Formulation/Stand Code: *CC-CCCCCCCCCC-C-C-CCCCCC-CC-CC-CCCCC*			

BC Before Test Oil

Step SPEC	BSFC kg/kW-h	Speed r/min 800 ± 2	Torque N-m 26 ± .07	Oil Gallery Temp. °C 70 ± 1	Coolant In Temp, °C 60 ± 1	Intake Air Temp, °C 27 ± 2	Fuel Rail Temp, °C 20 ± 2	EBP kPa 104 ± .17	Fuel Flow kg/h Record	AFR 14.25-15.25	Delta AFR ≤ .50 [A]
1	*S1.1234*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	
2	*S1.1234*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	
3	*S1.1234*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	
4	*S1.1234*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	
5	*S1.1234*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	
6	*S1.1234*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	
AVG.	*S1.12345*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	*S12.12*
SD	*S1.1234*										
C.V.	*S1.12*										

Test Oil Phase I

Step SPEC	BSFC kg/kW-h	Speed r/min 800 ± 2	Torque N-m 26 ± .07	Oil Gallery Temp. °C 70 ± 1	Coolant In Temp, °C 60 ± 1	Intake Air Temp, °C 27 ± 2	Fuel Rail Temp, °C 20 ± 2	EBP kPa 104 ± .17	Fuel Flow kg/h Record	AFR 14.25-15.25	Delta AFR ≤ .50 [A]
1	*S1.1234*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	
2	*S1.1234*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	
3	*S1.1234*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	
4	*S1.1234*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	
5	*S1.1234*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	
6	*S1.1234*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	
AVG.	*S1.12345*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	*S12.12*
SD	*S1.1234*										
C.V.	*S1.12*										

[A] Difference between the maximum stage average reading of the entire test and the individual stage average readings

Fig. A7.15 Critical Parameter Summary - Stage 3

SEQUENCE VIB
FORM 15A
CRITICAL PARAMETER SUMMARY- STAGE 3

Lab: *CC*	Date Completed: *YYYYMMDD*	Time Completed: *HH:MM*	
Test Number			
Test Stand: *CCCCC*	Runs On The Stand: *CCCC*	Engine No.: *CCCCCCCCCCCCCC*	Runs on Engine: *CCCC*
Oil Code: *CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC*			
Formulation/Stand Code: *CC-CCCCCCCCCC-C-C-CCCCCC-CC-CC-CCCCC*			

Test Oil Phase II

Step SPEC	BSFC kg/kW-h	Speed r/min 800 ± 2	Torque N-m 26 ± .07	Oil Gallery Temp. °C 70 ± 1	Coolant In Temp, °C 60 ± 1	Intake Air Temp, °C 27 ± 2	Fuel Rail Temp, °C 20 ± 2	EBP kPa 104 ± .17	Fuel Flow kg/h Record	AFR 14.25-15.25	Delta AFR ≤ .50 [A]
1	*S1.1234*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	
2	*S1.1234*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	
3	*S1.1234*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	
4	*S1.1234*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	
5	*S1.1234*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	
6	*S1.1234*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	
AVG.	*S1.12345*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	*S12.12*
SD	*S1.1234*										
C.V.	*S1.12*										

BC After Test Oil

Step SPEC	BSFC kg/kW-h	Speed r/min 800 ± 2	Torque N-m 26 ± .07	Oil Gallery Temp. °C 70 ± 1	Coolant In Temp, °C 60 ± 1	Intake Air Temp, °C 27 ± 2	Fuel Rail Temp, °C 20 ± 2	EBP kPa 104 ± .17	Fuel Flow kg/h Record	AFR 14.25-15.25	Delta AFR ≤ .50 [A]
1	*S1.1234*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	
2	*S1.1234*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	
3	*S1.1234*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	
4	*S1.1234*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	
5	*S1.1234*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	
6	*S1.1234*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	
AVG.	*S1.12345*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	*S12.12*
SD	*S1.1234*										
C.V.	*S1.12*										

[A] Difference between the maximum stage average reading of the entire test and the individual stage average readings

Fig. A7.15A Critical Parameter Summary - Stage 3

SEQUENCE VIB
FORM 16
CRITICAL PARAMETER SUMMARY- STAGE 4

Lab: *CC*	Date Completed: *YYYYMMDD*	Time Completed: *HH:MM*	
Test Number			
Test Stand: *CCCCC*	Runs On The Stand: *CCCC*	Engine No.: *CCCCCCCCCCCCCC*	Runs on Engine: *CCCC*
Oil Code: *CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC*			
Formulation/Stand Code: *CC-CCCCCCCCCC-C-C-CCCCCC-CC-CC-CCCCC*			

BC Before Test Oil

Step SPEC	BSFC kg/kW-h	Speed r/min 1500 ± 2	Torque N-m 98 ± .07	Oil Gallery Temp. °C 70 ± 1	Coolant In Temp, °C 60 ± 1	Intake Air Temp, °C 27 ± 2	Fuel Rail Temp, °C 20 ± 2	EBP kPa 104 ± .17	Fuel Flow kg/h Record	AFR 14.25-15.25	Delta AFR ≤ .50 [A]
1	*S1.1234*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	
2	*S1.1234*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	
3	*S1.1234*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	
4	*S1.1234*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	
5	*S1.1234*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	
6	*S1.1234*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	
AVG.	*S1.12345*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	*S12.12*
SD	*S1.1234*										
C.V.	*S1.12*										

Test Oil Phase I

Step SPEC	BSFC kg/kW-h	Speed r/min 1500 ± 2	Torque N-m 98 ± .07	Oil Gallery Temp. °C 70 ± 1	Coolant In Temp, °C 60 ± 1	Intake Air Temp, °C 27 ± 2	Fuel Rail Temp, °C 20 ± 2	EBP kPa 104 ± .17	Fuel Flow kg/h Record	AFR 14.25-15.25	Delta AFR ≤ .50 [A]
1	*S1.1234*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	
2	*S1.1234*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	
3	*S1.1234*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	
4	*S1.1234*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	
5	*S1.1234*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	
6	*S1.1234*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	
AVG.	*S1.12345*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	*S12.12*
SD	*S1.1234*										
C.V.	*S1.12*										

[A] Difference between the maximum stage average reading of the entire test and the individual stage average readings

Fig. A7.16 Critical Parameter Summary - Stage 4

SEQUENCE VIB
FORM 16A
CRITICAL PARAMETER SUMMARY- STAGE 4

Lab: *CC*	Date Completed: *YYYYMMDD*	Time Completed: *HH:MM*	
Test Number			
Test Stand: *CCCCC*	Runs On The Stand: *CCCC*	Engine No.: *CCCCCCCCCCCCCC*	Runs on Engine: *CCCC*
Oil Code: *CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC*			
Formulation/Stand Code: *CC-CCCCCCCCCC-C-C-CCCCCC-CC-CC-CCCCC*			

Test Oil Phase II

Step SPEC	BSFC kg/kW-h	Speed r/min 1500 ± 2	Torque N-m 98 ± .07	Oil Gallery Temp. °C 70 ± 1	Coolant In Temp, °C 60 ± 1	Intake Air Temp, °C 27 ± 2	Fuel Rail Temp, °C 20 ± 2	EBP kPa 104 ± .17	Fuel Flow kg/h Record	AFR 14.25-15.25	Delta[A] AFR ≤ .50
1	*S1.1234*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	
2	*S1.1234*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	
3	*S1.1234*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	
4	*S1.1234*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	
5	*S1.1234*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	
6	*S1.1234*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	
AVG.	*S1.12345*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	*S12.12*
SD	*S1.1234*										
C.V.	*S1.12*										

BC After Test Oil

Step SPEC	BSFC kg/kW-h	Speed r/min 1500 ± 2	Torque N-m 98 ± .07	Oil Gallery Temp. °C 70 ± 1	Coolant In Temp, °C 60 ± 1	Intake Air Temp, °C 27 ± 2	Fuel Rail Temp, °C 20 ± 2	EBP kPa 104 ± .17	Fuel Flow kg/h Record	AFR 14.25-15.25	Delta[A] AFR ≤ .50
1	*S1.1234*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	
2	*S1.1234*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	
3	*S1.1234*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	
4	*S1.1234*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	
5	*S1.1234*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	
6	*S1.1234*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	
AVG.	*S1.12345*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	*S12.12*
SD	*S1.1234*										
C.V.	*S1.12*										

[A] Difference between the maximum stage average reading of the entire test and the individual stage average readings

Fig. A7.16A Critical Parameter Summary - Stage 4

SEQUENCE VIB
FORM 17
CRITICAL PARAMETER SUMMARY- STAGE 5

Lab: *CC*	Date Completed: *YYYYMMDD*	Time Completed: *HH:MM*	
Test Number			
Test Stand: *CCCCC*	Runs On The Stand: *CCCC*	Engine No.: *CCCCCCCCCCCCCC*	Runs on Engine: *CCCC*
Oil Code: *CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC*			
Formulation/Stand Code: *CC-CCCCCCCCCC-C-C-CCCCCC-CC-CC-CCCCC*			

BC Before Test Oil

Step SPEC	BSFC kg/kW-h	Speed r/min 1500 ± 2	Torque N-m 98 ± .07	Oil Gallery Temp. °C 45 ± 1	Coolant In Temp, °C 45 ± 1	Intake Air Temp, °C 27 ± 2	Fuel Rail Temp, °C 20 ± 2	EBP kPa 104 ± .17	Fuel Flow kg/h Record	AFR 14.25-15.25	Delta AFR ≤ .50 [A]
1	*S1.1234*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	
2	*S1.1234*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	
3	*S1.1234*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	
4	*S1.1234*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	
5	*S1.1234*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	
6	*S1.1234*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	
AVG.	*S1.12345*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	*S12.12*
SD	*S1.1234*										
C.V.	*S1.12*										

Test Oil Phase I

Step SPEC	BSFC kg/kW-h	Speed r/min 1500 ± 2	Torque N-m 98 ± .07	Oil Gallery Temp. °C 45 ± 1	Coolant In Temp, °C 45 ± 1	Intake Air Temp, °C 27 ± 2	Fuel Rail Temp, °C 20 ± 2	EBP kPa 104 ± .17	Fuel Flow kg/h Record	AFR 14.25-15.25	Delta AFR ≤ .50 [A]
1	*S1.1234*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	
2	*S1.1234*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	
3	*S1.1234*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	
4	*S1.1234*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	
5	*S1.1234*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	
6	*S1.1234*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	
AVG.	*S1.12345*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	*S12.12*
SD	*S1.1234*										
C.V.	*S1.12*										

[A] Difference between the maximum stage average reading of the entire test and the individual stage average readings

Fig. A7.17 Critical Parameter Summary - Stage 5

SEQUENCE VIB
FORM 17A
CRITICAL PARAMETER SUMMARY- STAGE 5

Lab: *CC*	Date Completed: *YYYYMMDD*	Time Completed: *HH:MM*	
Test Number			
Test Stand: *CCCCC*	Runs On The Stand: *CCCC*	Engine No.: *CCCCCCCCCCCCCC*	Runs on Engine: *CCCC*
Oil Code: *CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC*			
Formulation/Stand Code: *CC-CCCCCCCCCC-C-C-CCCCCC-CC-CC-CCCCC*			

Test Oil Phase II

Step SPEC	BSFC kg/kW-h	Speed r/min 1500 ± 2	Torque N-m 98 ± .07	Oil Gallery Temp. °C 45 ± 1	Coolant In Temp, °C 45 ± 1	Intake Air Temp, °C 27 ± 2	Fuel Rail Temp, °C 20 ± 2	EBP kPa 104 ± .17	Fuel Flow kg/h Record	AFR 14.25-15.25	Delta[A] AFR ≤ .50
1	*S1.1234*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	
2	*S1.1234*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	
3	*S1.1234*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	
4	*S1.1234*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	
5	*S1.1234*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	
6	*S1.1234*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	
AVG.	*S1.12345*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	*S12.12*
SD	*S1.1234*										
C.V.	*S1.12*										

BC After Test Oil

Step SPEC	BSFC kg/kW-h	Speed r/min 1500 ± 2	Torue N-m 98 ± .07	Oil Gallery Temp. °C 45 ± 1	Coolant In Temp, °C 45 ± 1	Intake Air Temp, °C 27 ± 2	Fuel Rail Temp, °C 20 ± 2	EBP kPa 104 ± .17	Fuel Flow kg/h Record	AFR 14.25-15.25	Delta[A] AFR ≤ .50
1	*S1.1234*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	
2	*S1.1234*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	
3	*S1.1234*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	
4	*S1.1234*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	
5	*S1.1234*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	
6	*S1.1234*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	
AVG.	*S1.12345*	*S1234.1*	*S12.12*	*S123.1*	*S123.1*	*S12.1*	*S12.1*	*S123.12*	*S1.123*	*S12.12*	*S12.12*
SD	*S1.1234*										
C.V.	*S1.12*										

[A] Difference between the maximum stage average reading of the entire test and the individual stage average readings

Fig. A7.17A Critical Parameter Summary - Stage 5

SEQUENCE VIB
FORM 18
DOWNTIME AND OTHER COMMENTS

Lab: *CC*	Date Completed: *YYYYMMDD*	Time Completed: *HH:MM*
Test Number		
Test Stand: *CCCCC*	Runs On The Stand: *CCCC*	Engine No.: *CCCCCCCCCCCCCC*	Runs on Engine: *CCCC*
Oil Code: *CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC*		
Formulation/Stand Code: *CC-CCCCCCCCCC-C-C-CCCCCC-CC-CC-CCCCC*		

Downtime Occurrences	*S12*	
Test Hours	**Date**	**Downtime**	**Reasons**
HHH:MM	*YYYYMMDD*	*HH:MM*	*CCCCCCCCCCCCCCCCCCCC

SEQUENCE VIB
FORM 19
Used Oil Analysis

Lab: *CC*	Date Completed: *YYYYMMDD*	Time Completed: *HH:MM*	
Test Number			
Test Stand: *CCCCC*	Runs On The Stand: *CCCC*	Engine No.: *CCCCCCCCCCCCCC*	Runs on Engine: *CCCC*
Oil Code: *CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC*			
Formulation/Stand Code: *CC-CCCCCCCCCC-C-C-CCCCCC-CC-CC-CCCCC*			

USED OIL ANALYSIS	
High Temperature High Shear @ 100˚C, cP	*S1234.1*
Cold Crank Simulator Viscosity, cP/˚C	*CCCCCCCC*
Friction Coefficient by HFRR @ 105˚C, mm	*S123.12*
Fuel Dilution, %	*S123.1*
Infrared for Oxidation, Abs./.01 mm	*S12.123*
Infrared for Nitration, Abs./.01 mm	*S12.123*

Fig. A7.19 Used Oil Analysis