Roller Follower Wear Test

Report Packet Version No.

Conducted For

	V = Valid
	I = Invalid

Test Number			
Test Stand:	**Stand Run Number:**	**Engine Number:**	**Engine Run Number:**
Date Completed:		**Time Completed:**	
Oil Code [A]:			
Formulation/Stand Code:			
Alternate Codes:			

[A] CMIR or Non-Reference Oil Code

Submitted By:

_____
Testing Laboratory

_____
Signature

_____
Typed Name

_____
Title

FIG. A5.1 Final Report Cover Sheet

Roller Follower Wear Test

Reference Oil Test					Non-Reference Oil Test				
Lab	**Stand**	**Stand Run No.**	**Engine**	**Engine Run No.**	**Lab**	**Stand**	**Stand Run No.**	**Engine**	**Engine Run No.**
Start Date	**Date Completed**	**End of Test Time**	**Test Length**		**Start Date**	**Date Completed**	**End of Test Time**	**Test Length**	
CMIR	**TMC Oil Code**	**Viscosity Grade**			**Oil Code**			**Viscosity Grade**	
Laboratory Oil Code					**Laboratory Oil Code**				
Engine Displacement					**Formulation Stand Code**				
Average Wear (mils)					**Average Wear (mils)**	**Severity Adjustment**	**Adjusted Average Wear**		

FIG. A5.2 Test Lab Affidavit

Roller Follower Wear Test

Laboratory:	
Test Number:	
Oil Code:	
Formulation/Stand Code:	

Lifter Part Number:

Profilometer Wear Measurements in Mils

Lifter Number	Wear (Mils)	Lifter Number	Wear (Mils)
1L		1R	
2L		2R	
3L		3R	
4L		4R	
5L		5R	
6L		6R	
7L		7R	
8L		8R	
Wear Statistics			
Minimum	**Maximum**	**Average**	**Std. Deviation**

Wear is measured at location shown by arrow

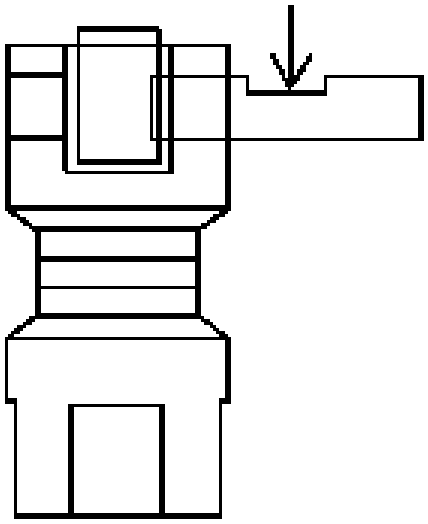


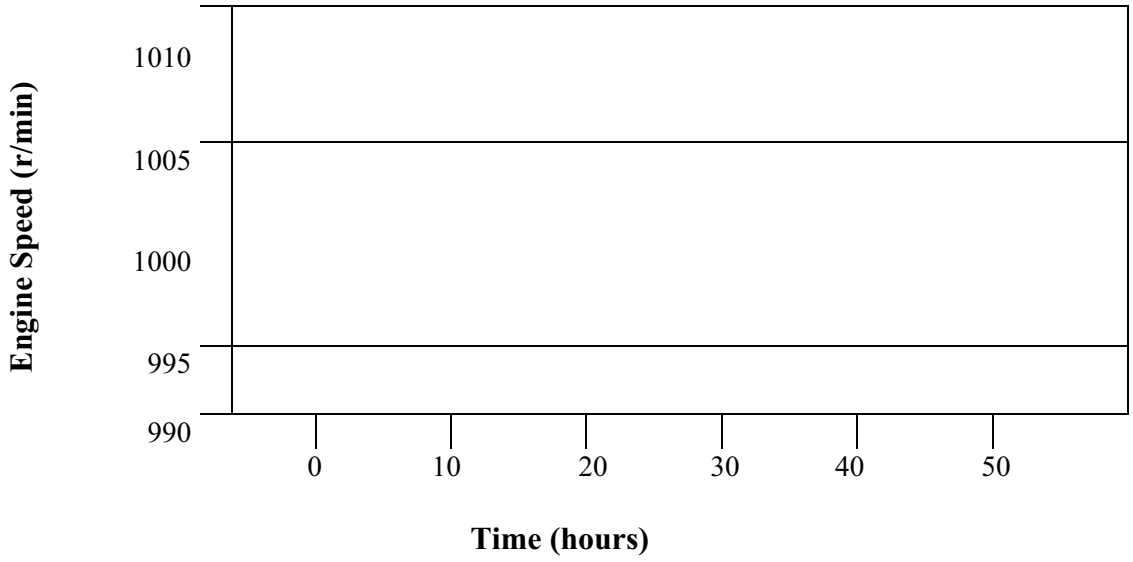
FIG. A5.3 Summary of Roller Follower Wear

Roller Follower Wear Test

Laboratory:	
Test Number:	
Oil Code:	
Formulation/Stand Code:	

Engine Speed (r/min)

Process Mean
Xav =



Process Variability (s)
Sav =

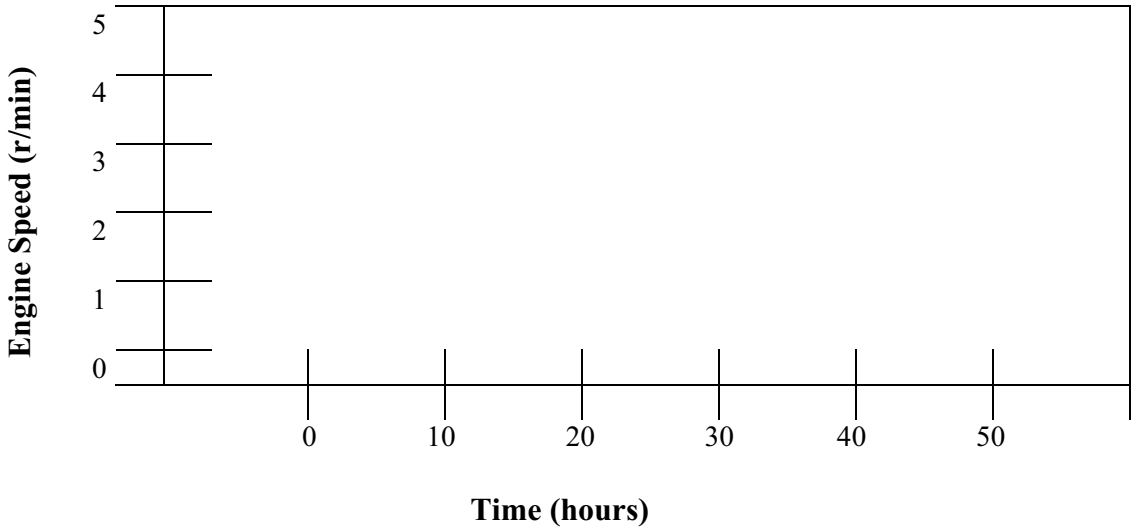


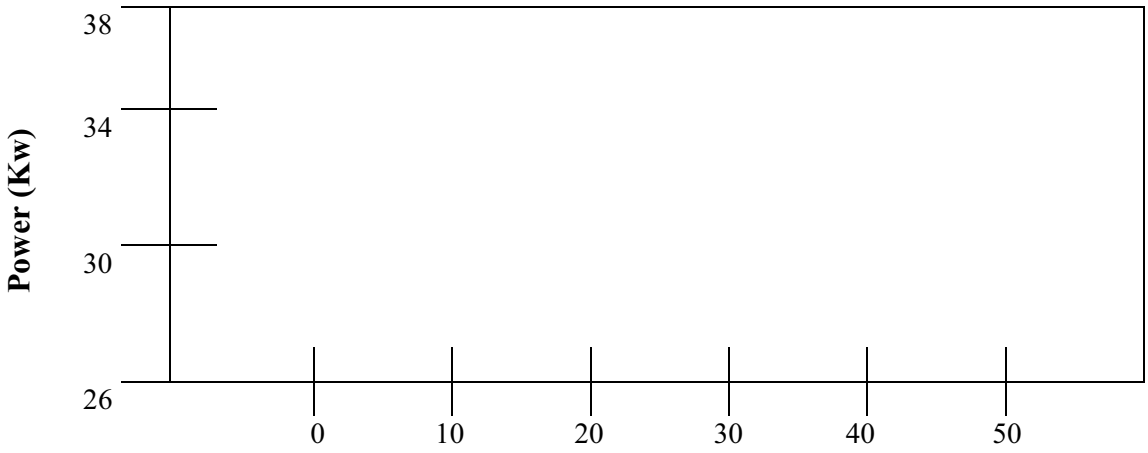
FIG. A5.4 Operational Data Summary - Engine Speed

Roller Follower Wear Test

Laboratory:	
Test Number:	
Oil Code:	
Formulation/Stand Code:	

Power (kW)

Process Mean
Xav =



Process Variability (s)
Sav =

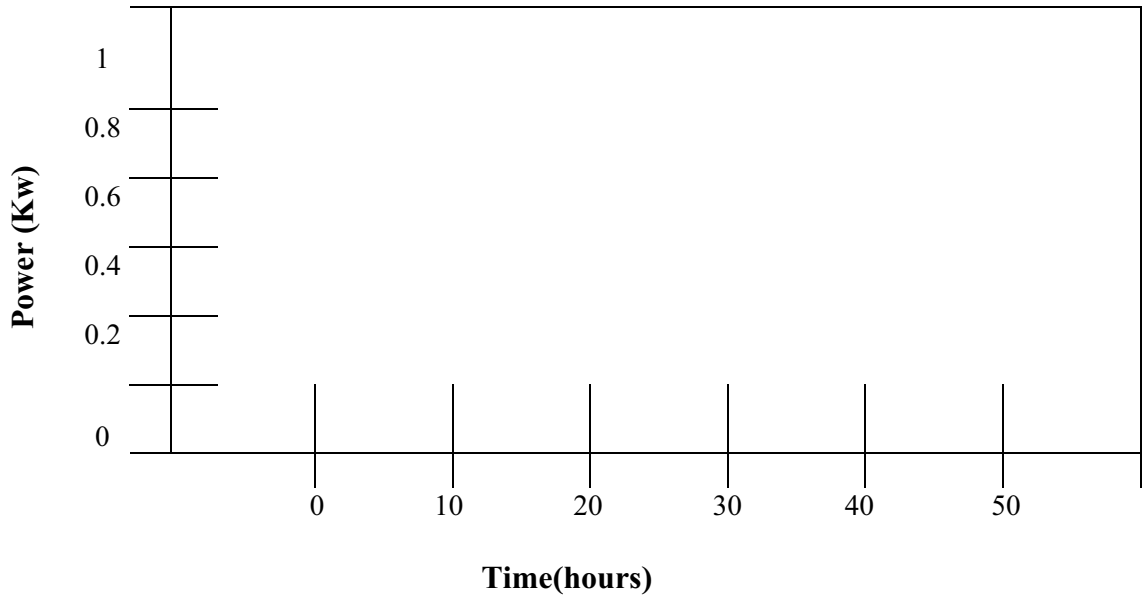


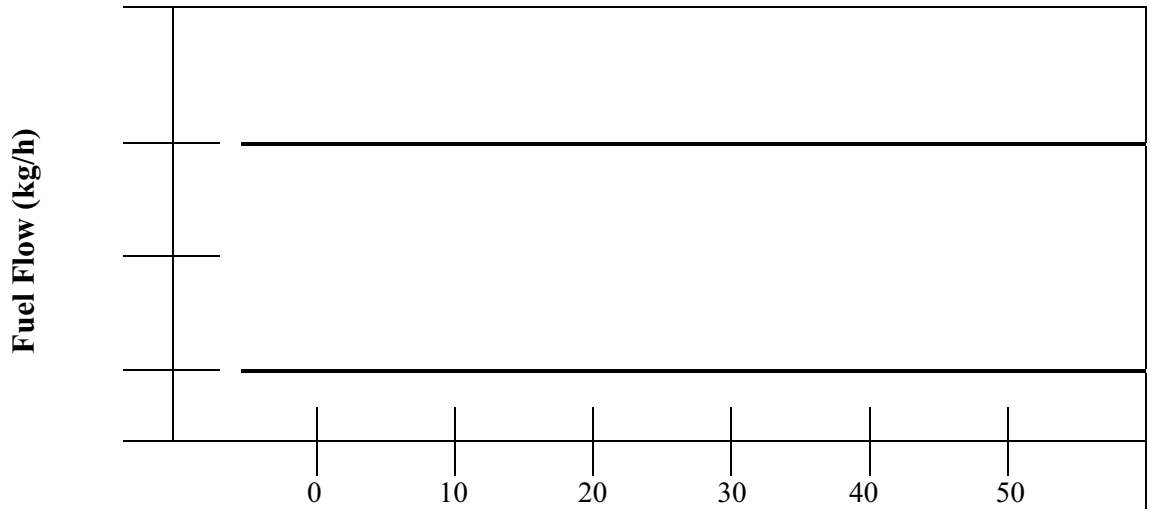
FIG. A5.5 Operational Data Summary – Power

Roller Follower Wear Test

Laboratory:	
Test Number:	
Oil Code:	
Formulation/Stand Code:	

Fuel Flow (kg/h)

Process Mean
Xav =



Process Variability (s)
Sav =

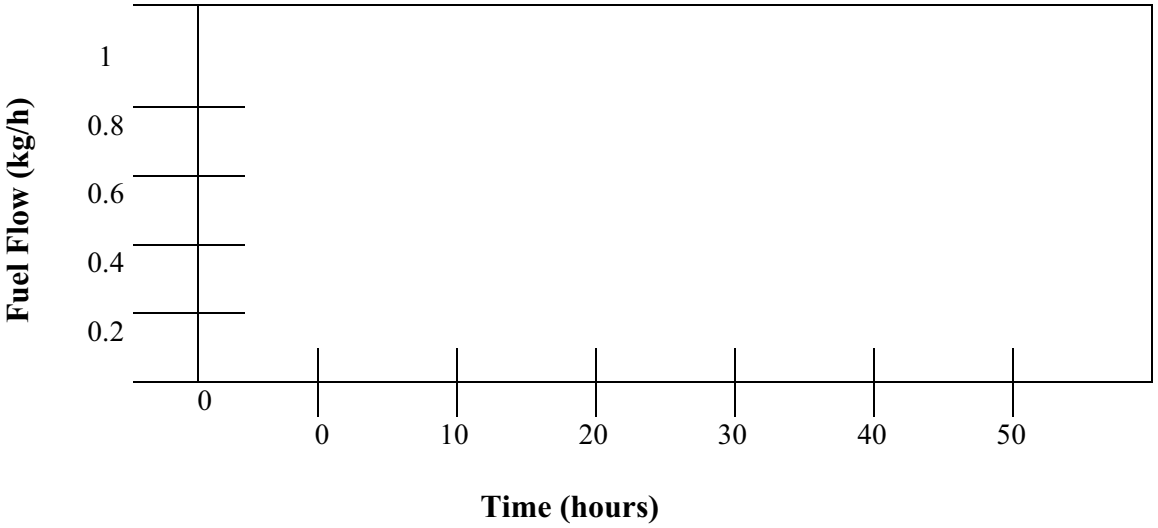


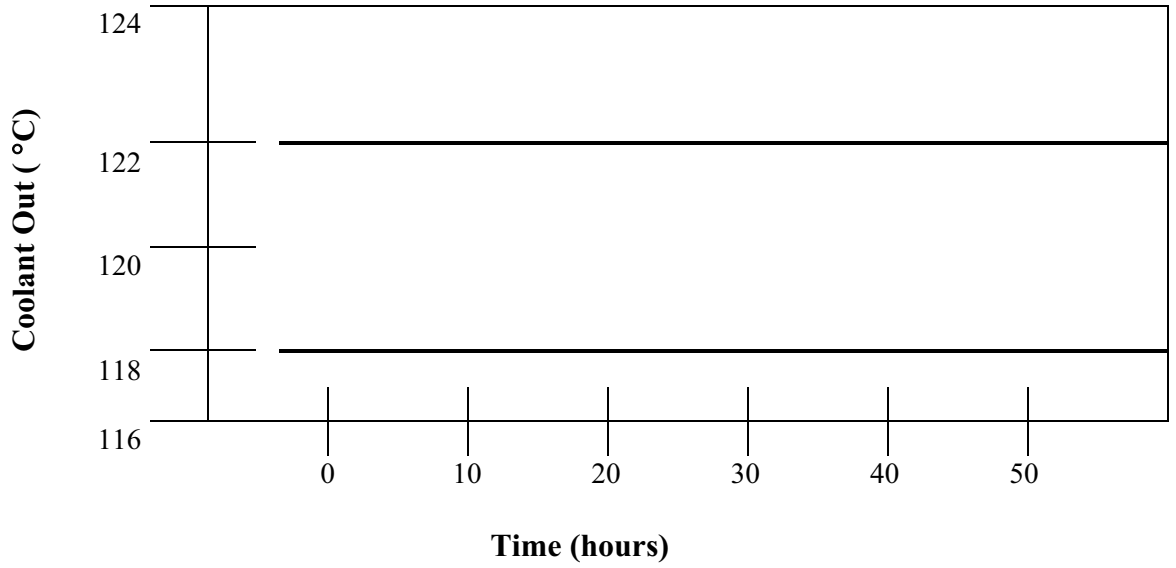
FIG. A5.6 Operational Data Summary – Fuel Flow

Roller Follower Wear Test

Laboratory:	
Test Number:	
Oil Code:	
Formulation/Stand Code:	

Coolant Out Temperature

Process Mean
Xav =



Process Variability (s)
Sav =

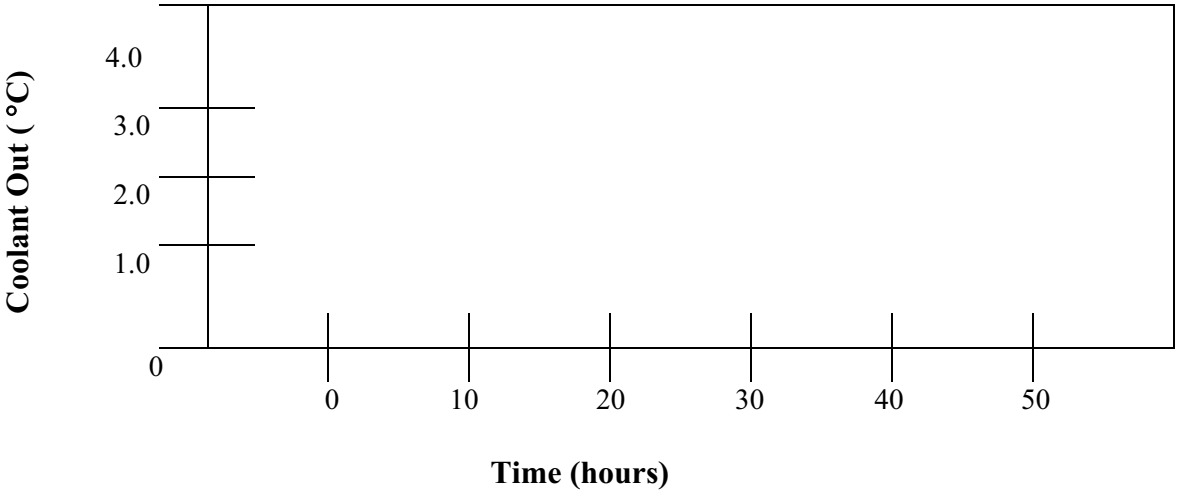


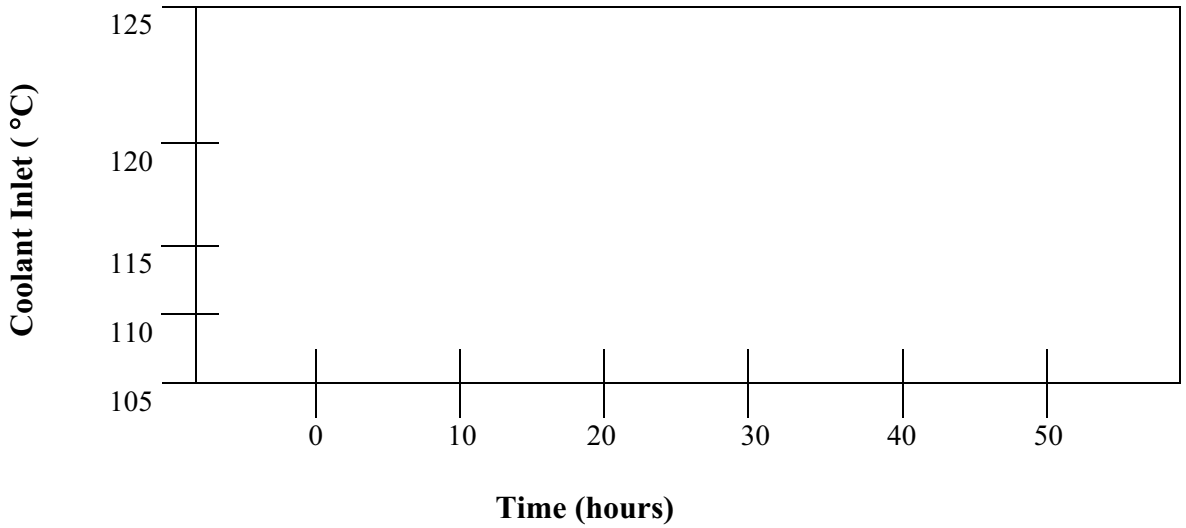
FIG. A5.7 Operational Data Summary – Coolant Output Temperature

Roller Follower Wear Test

Laboratory:	
Test Number:	
Oil Code:	
Formulation/Stand Code:	

Coolant Inlet Temperature

Process Mean
Xav =



Process Variability (s)
Sav =

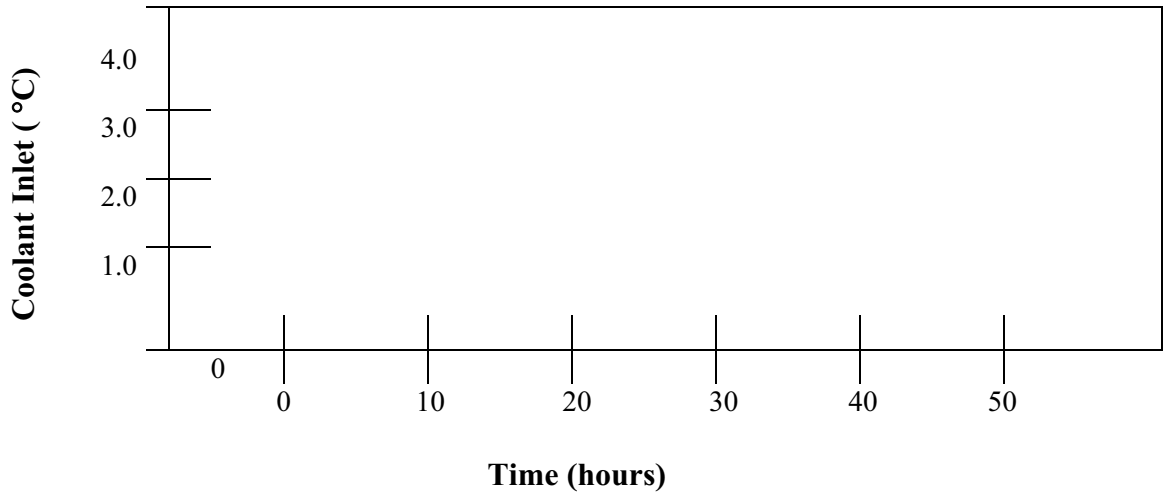


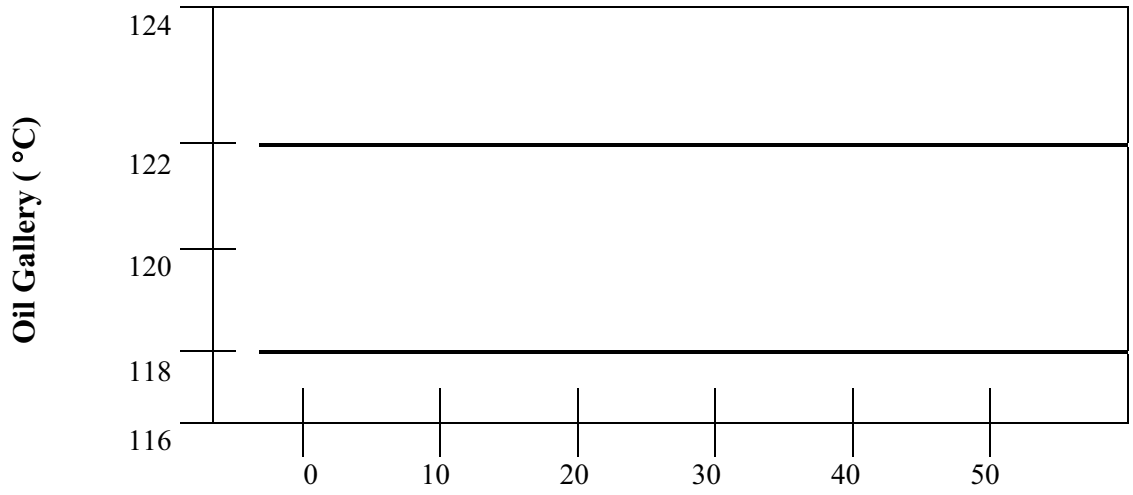
FIG. A5.8 Operational Data Summary – Coolant Inlet Temperature

Roller Follower Wear Test

Laboratory:	
Test Number:	
Oil Code:	
Formulation/Stand Code:	

Oil Gallery Temperature

Process Mean
Xav =



Process Variability (s)
Sav =

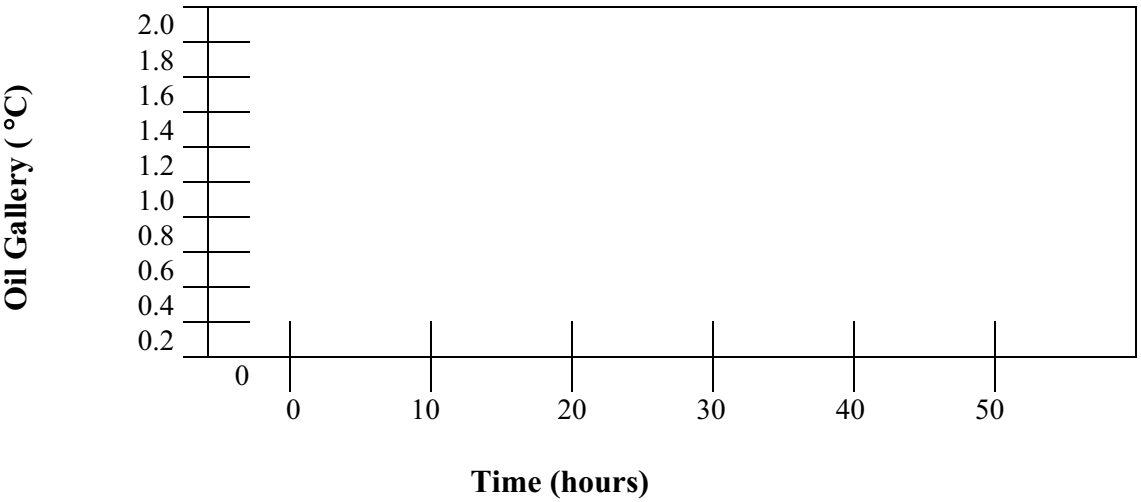


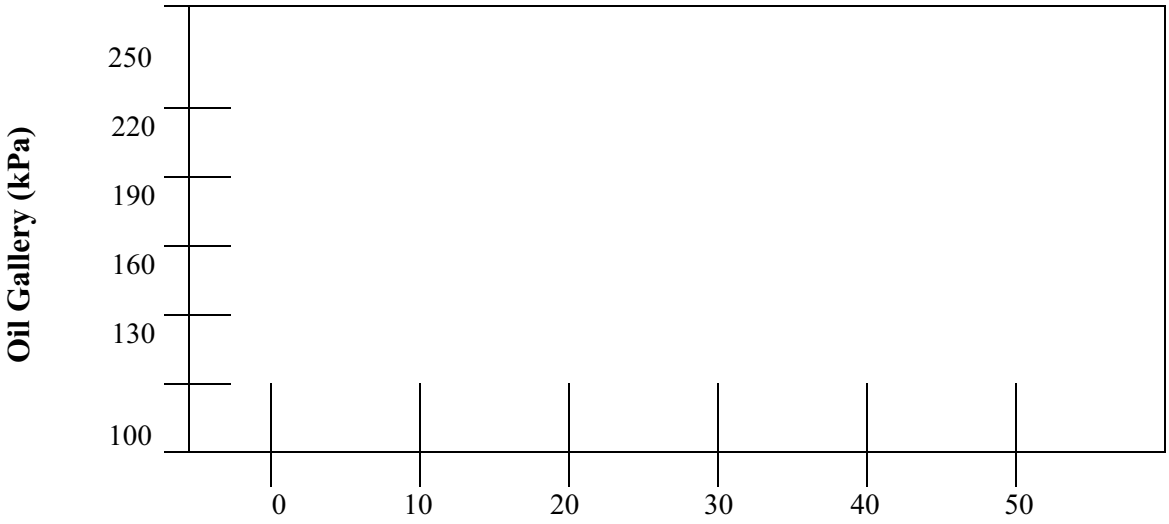
FIG. A5.9 Operational Data Summary – Oil Gallery Temperature

Roller Follower Wear Test

Laboratory:	
Test Number:	
Oil Code:	
Formulation/Stand Code:	

Oil Gallery Pressure

Process Mean
Xav =



Process Variability (s)
Sav =

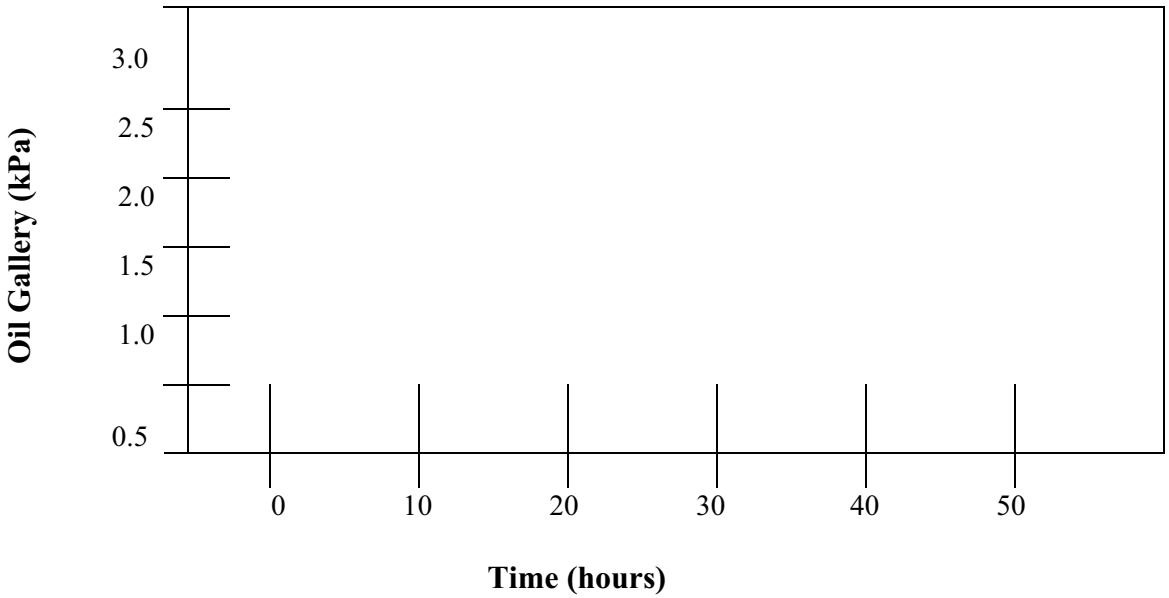


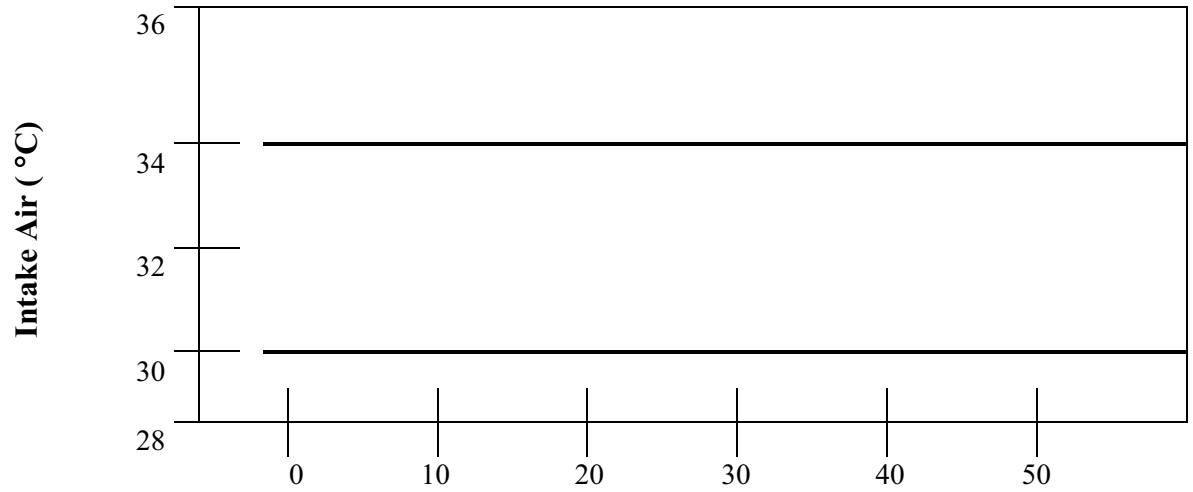
FIG. A5.10 Operational Data Summary – Oil Gallery Pressure

Roller Follower Wear Test

Laboratory:	
Test Number:	
Oil Code:	
Formulation/Stand Code:	

Intake Air Temperature

Process Mean
Xav =



Process Variability (s)
Sav =

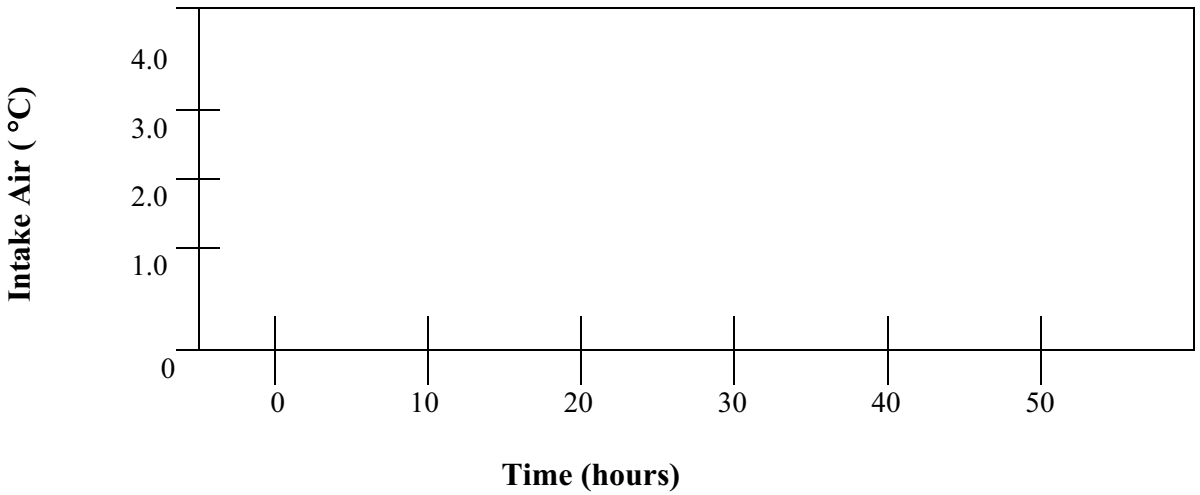


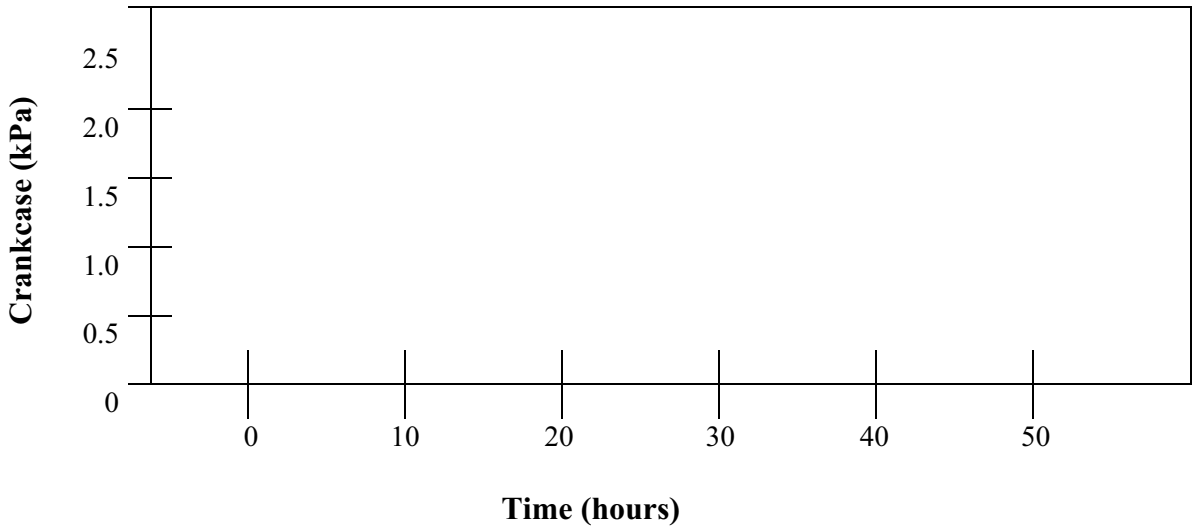
FIG. A5.11 Operational Data Summary – Intake Air Temperature

Roller Follower Wear Test

Laboratory:	
Test Number:	
Oil Code:	
Formulation/Stand Code:	

Crankcase Pressure

Process Mean
Xav =



Process Variability (s)
Sav =

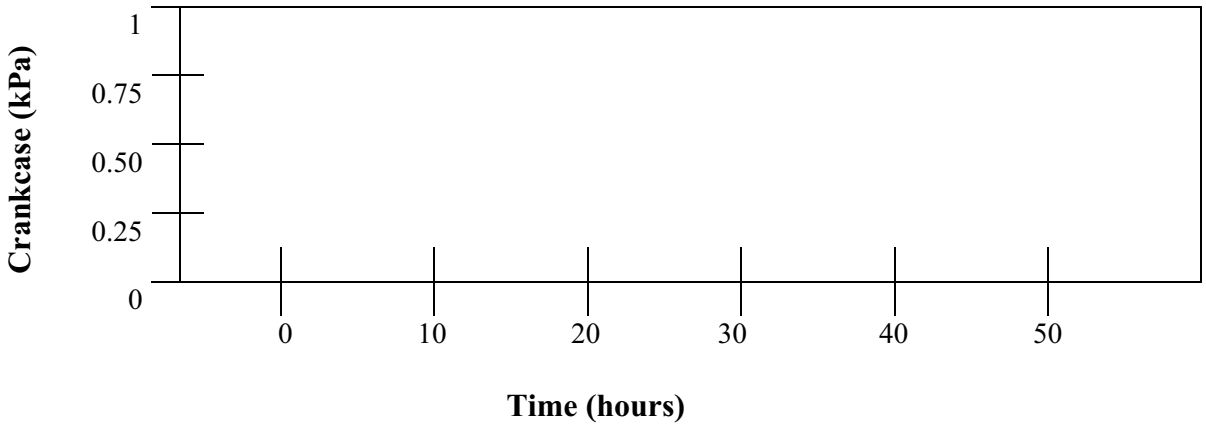


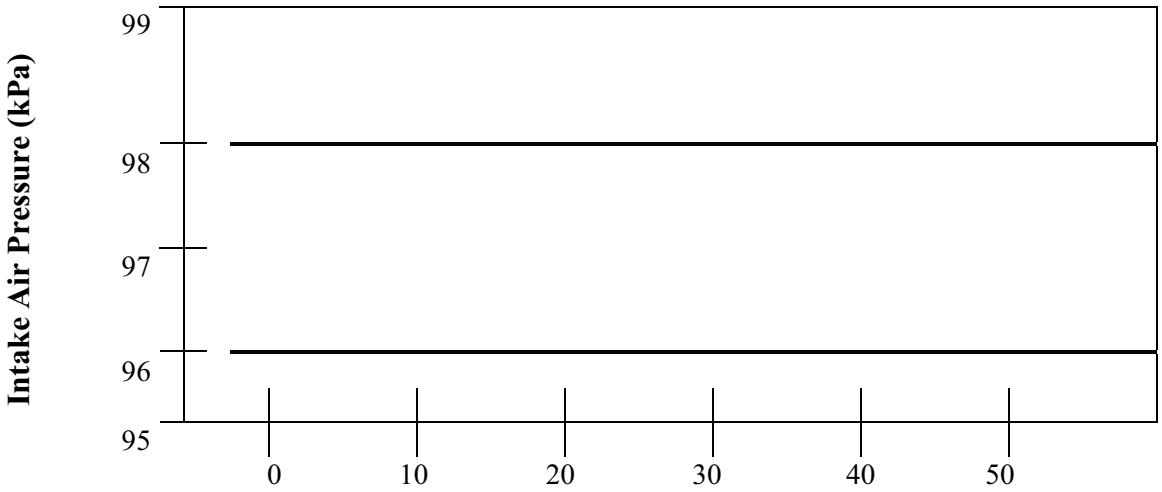
FIG. A5.12 Operational Data Summary – Crankcase Pressure

Roller Follower Wear Test

Laboratory:	
Test Number:	
Oil Code:	
Formulation/Stand Code:	

Intake Air Pressure

Process Mean
Xav =



Process Variability (s)
Sav =

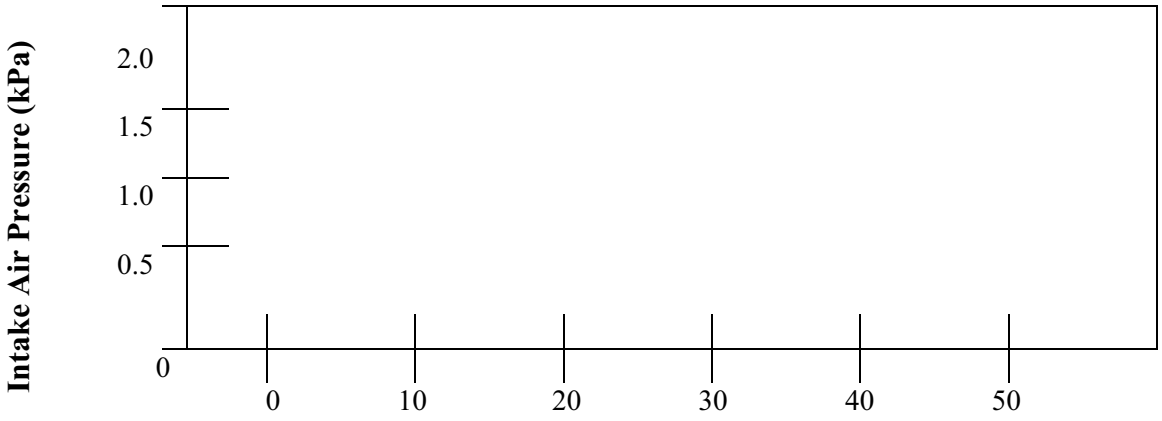


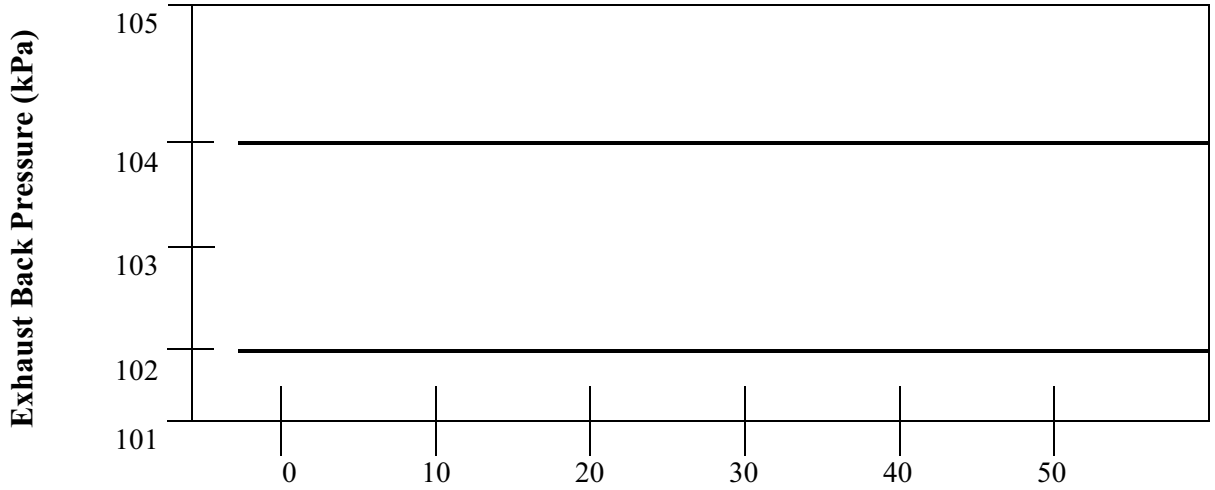
FIG. A5.13 Operational Data Summary – Intake Air Pressure

Roller Follower Wear Test

Laboratory:	
Test Number:	
Oil Code:	
Formulation/Stand Code:	

Exhaust Back Pressure

Process Mean
Xav =



Process Variability (s)
Sav =

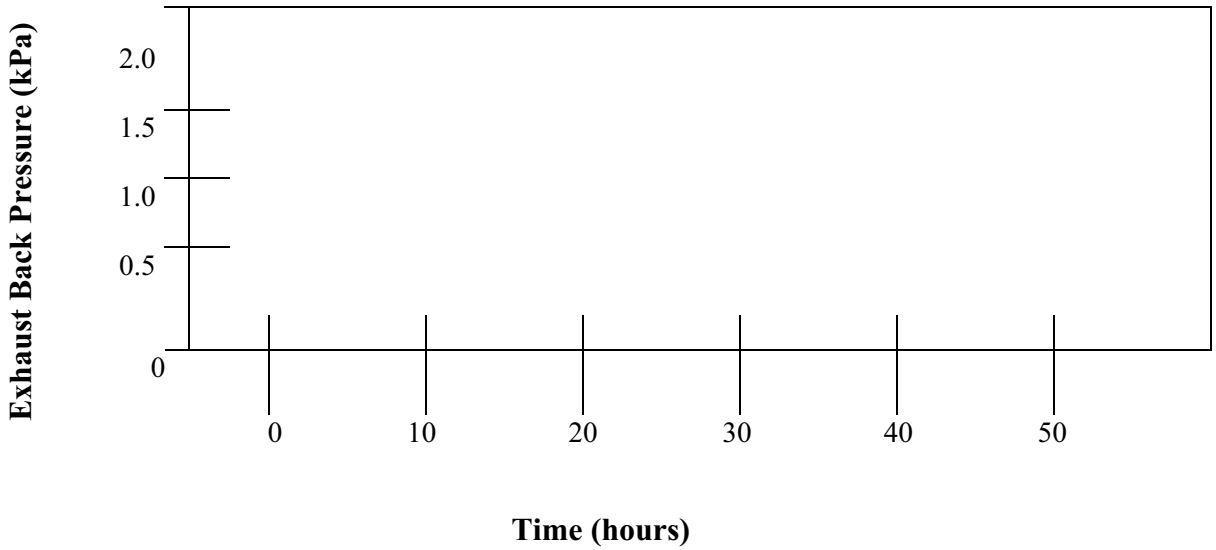


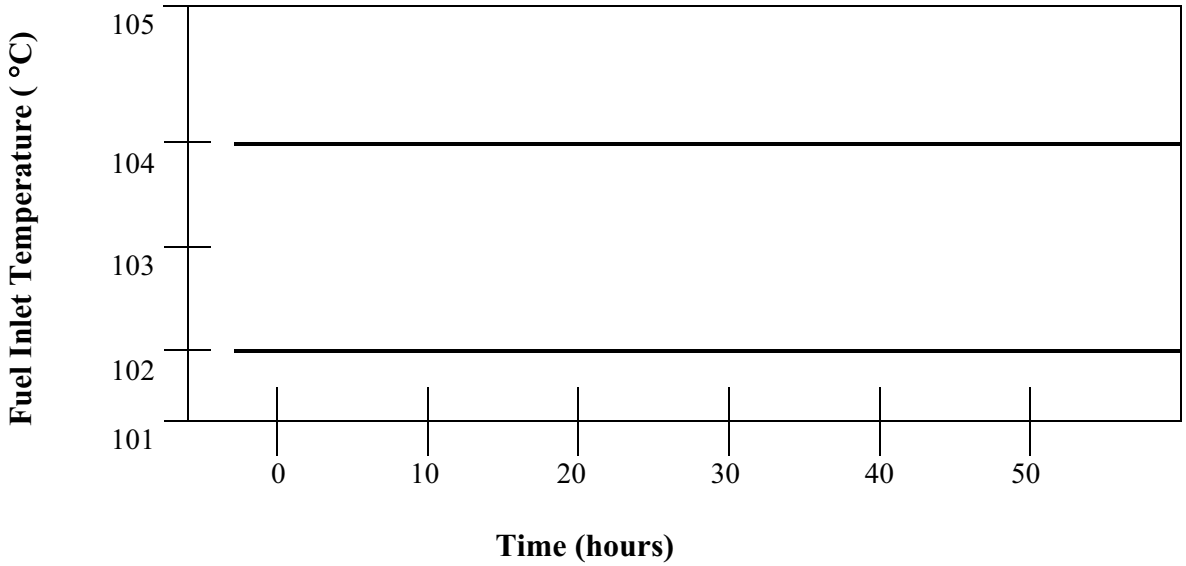
FIG. A5.14 Operational Data Summary – Exhaust Back Pressure

Roller Follower Wear Test

Laboratory:	
Test Number:	
Oil Code:	
Formulation/Stand Code:	

Fuel Inlet Temperature

Process Mean
Xav =



Process Variability (s)
Sav =

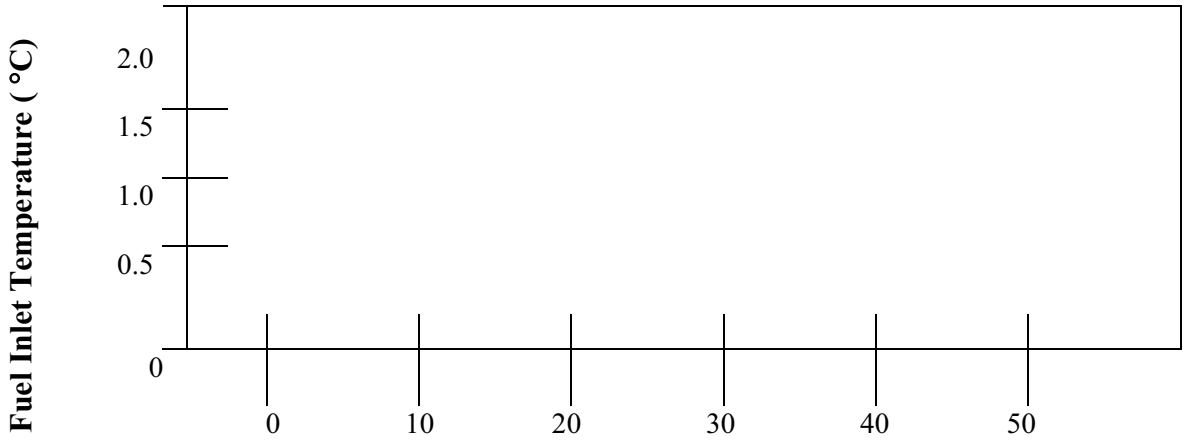


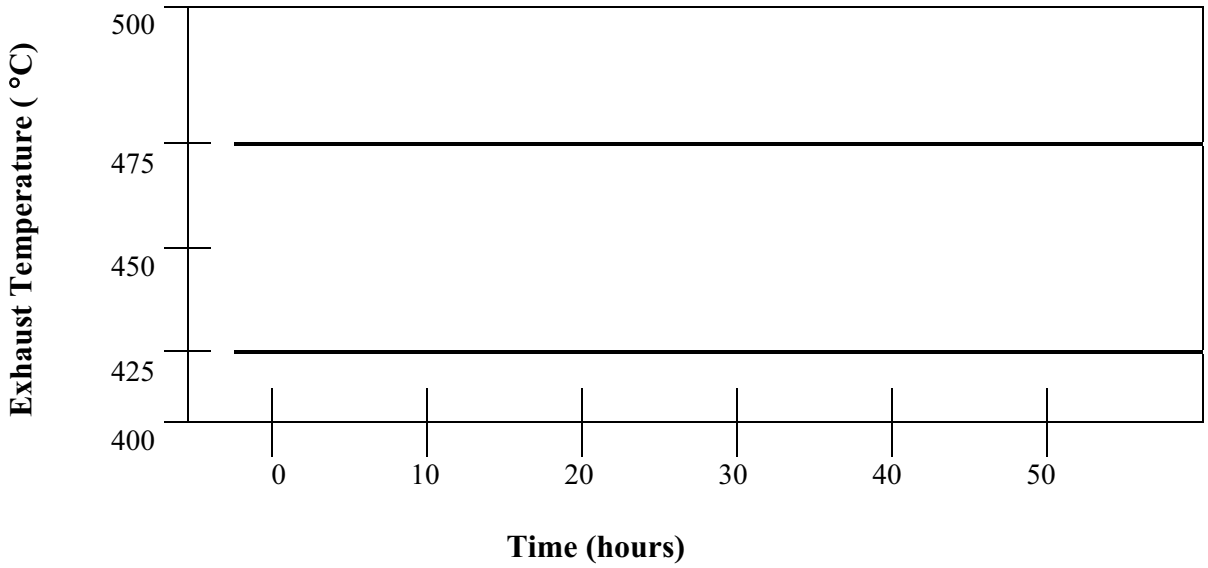
FIG. A5.15 Operational Data Summary – Fuel Inlet Temperature

Roller Follower Wear Test

Laboratory:	
Test Number:	
Oil Code:	
Formulation/Stand Code:	

Exhaust Temperature

Process Mean
Xav =



Process Variability (s)
Sav =

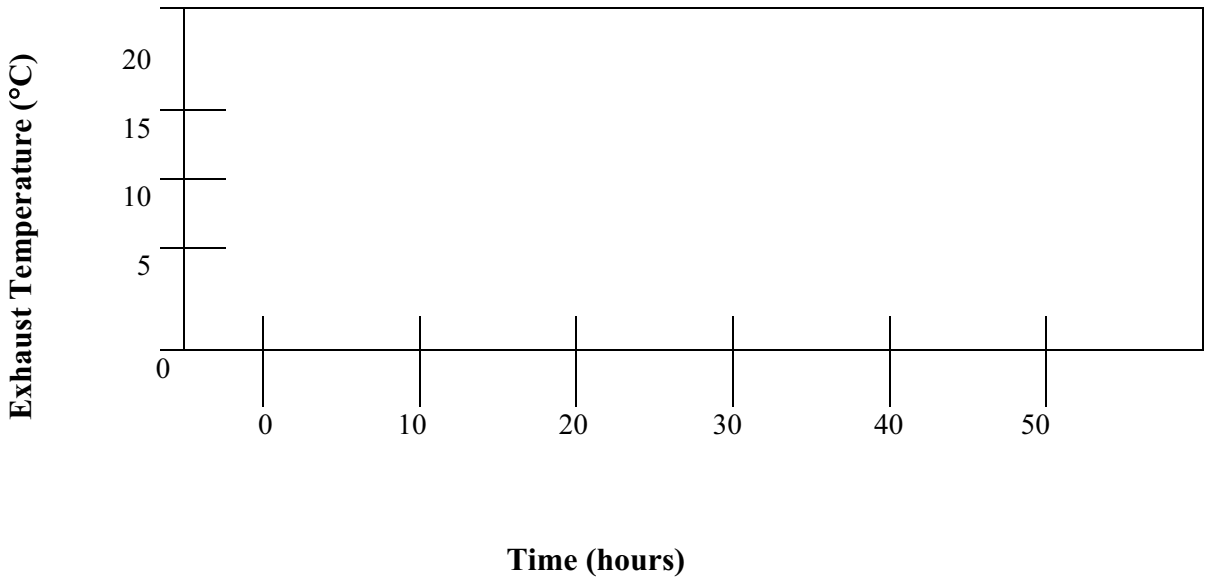


FIG. A5.16 Operational Data Summary – Exhaust Temperature

Roller Follower Wear Test

Laboratory:	
Test Number:	
Oil Code:	
Formulation/Stand Code:	

*** Test Number is: STAND – STAND RUN NO. – ENGINE NO. – ENGINE RUN NUMBER**

Specification						
Test Parameter	**6.2L Engine**	**6.5L Engine**	**Average**	**Std. Dev.**	**Minimum**	**Maximum**
Engine Speed r/min	**1000 ± 5**	**1000 ± 5**				
Torque N-m	**Record**	**Record**				
Fuel Flow kg/h	**9.0 ± 0.1**	**9.4 ± 0.1**				
Total Oil Consumption kg	**Record**	**Record**				

Temperatures	**Specification**	**Average**	**Std. Dev.**	**Minimum**	**Maximum**
Coolant Out °C	**120 ± 2**				
Coolant In °C	**Report Only**				
Main Oil Gallery °C	**120 ± 2**				
Fuel In °C	**35 ± 2**				
Intake Air °C	**32 ± 2**				
Oil Sump °C	**Report**				
Exhaust °C	**Report**				

Pressures	**Specification**	**Average**	**Std. Dev.**	**Minimum**	**Maximum**
Crankcase kPa	**Report**				
Back Pressure kPa	**103 ± 1**				
Intake Air kPa	**97 ± 1**				

FIG. A5.17 Operational Summary

Roller Follower Wear Test

Laboratory:	
Test Number:	
Oil Code:	
Formulation/Stand Code:	

Hours	Viscosity, cSt @ 100°C	% Soot

Hours	Elements						
	Al	Cr	Cu	Fe	Pb	Si	Sn

FIG. A5.18 Oil Analysis

Roller Follower Wear Test

Laboratory:	
Test Number:	
Oil Code:	
Formulation/Stand Code:	

Number of Downtime Occurrences			
Test Hours	**Date**	**Downtime**	**Reasons**
			Total Downtime

Other Comments	
Number of Comment Lines	

FIG A5.19 Unscheduled Downtime & Maintenance Summary

Roller Follower Wear Test

Laboratory:	
Test Number:	
Oil Code:	
Formulation/Stand Code:	

Number of Downtime Occurrences			
Test Hours	**Date**	**Downtime**	**Reasons**
			Total Downtime

Other Comments	
Number of Comment Lines	

FIG A5.19A Unscheduled Downtime & Maintenance Summary

Roller Follower Wear Test

Laboratory:	
Test Number:	
Oil Code:	
Formulation/Stand Code:	

Number of Downtime Occurrences			
Test Hours	**Date**	**Downtime**	**Reasons**
			Total Downtime

Other Comments	
Number of Comment Lines	

FIG A5.19B Unscheduled Downtime & Maintenance Summary

Roller Follower Wear Test

Laboratory:	
Test Number:	
Oil Code:	
Formulation/Stand Code:	

Supplier:	**Batch Identifiers:**

Measurement	Specs.	Analysis	Test Method
Total Sulfur, % Weight	0.03 - 0.05		D 2622
Gravity, °API	32 – 36		D 287 or D 4052
Hydrocarbon Composition			
Aromatics % Vol.	28 – 35		D 1319
Olefin	Report		D 1319
Saturates	Report		D 1319
Cetane Index	Report		D 4737
Cetane No.	42 - 48		D 613
Copper Strip Corrosion	3 Maximum		D 130
Flash Point, °C	54 Minimum		D 93
Cloud Point, °C	-12 Maximum		D 2500
Pour Point, °C	-18 Maximum		D 97
Carbon Residue on 10% Residium, %	0.35 Maximum		D 524 (10 % Bottoms)
Water & Sediment, % Vol	0.05 Maximum		D 2709
Ash, % Wgt.	0.01 Maximum		D 482
Viscosity, cSt @ 40°C	2.0 - 3.2		D 445
Distillation, °C			
IBP	177 - 199		D 86
10%	210 - 232		D 86
50%	249 - 277		D 86
90%	299 - 327		D 86
EP	327 - 360		D 86

FIG. A5.20 Test Fuel Analysis (Last batch)

Roller Follower Wear Test

Laboratory:	
Test Number:	
Oil Code:	
Formulation/Stand Code:	

Parameter (1)	Sensing Device (2)	Calibration Frequency (3)	Record Device (4)	Observation Frequency (5)	Record Frequency (6)	Log Frequency (7)	System Response (8)
Temperatures							
Main Oil G.							
Fuel In.							
Intake Air							
Oil Sump							
Exhaust							
Cool. Out							
Other							
Fuel Flow							
Engine Rpm							
Load							
Intake Pres.							
Exh. Press.							
Oil Gal Pres							

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

FIG. A5.21 Characteristics of the Data Acquisition System