1R SCOTE TEST PROCEDURE
FORM 1

METHOD *METHOD*

VERSION *20011129*

CONDUCTED FOR
TSTSPON1
TSTSPON2

LABVALID	V = VALID
	I = INVALID
	N = RESULTS CAN NOT BE INTERPRETED AS REPRESENTATIVE OF OIL PERFORMANCE (NON-REFERENCE OIL) AND SHALL NOT BE USED FOR MULTIPLE TEST ACCEPTANCE CRITERIA.

TSTOIL	RO = REFERENCE OIL TEST
	NR = ALL OTHER TESTS

CALDFLAG	WAS THIS TEST RUN UNDER A VALID CALIBRATION? (Y/N)

LABQIA	LAB IS CURRENTLY OPERATING UNDER AN LTMS PRECISION ALARM *
STANDQIA	STAND IS CURRENTLY OPERATING UNDER AN LTMS PRECISION ALARM *

* Check box only if YES

Test Number		
Test Stand: *STAND*	Engine Run *ENRUN*	
EOT Time: *EOTTIME*	EOT Date: *DTCOMP*	
Oil Code: *OILCODE*		
Formulation/Stand *FORM*		
Alternate Codes: *ALTCODE1*	*ALTCODE2*	*ALTCODE3*
SAE Viscosity Grade: *SAEVISC*		

In my opinion this test *OPVALID* been conducted in accordance with the 1R Test Procedure(Research Report) and the appropriate amendments through the information letter system. The remarks included in the report describe the anomalies associated with this test.

SUBMITTED BY:

SUBLAB
Testing Laboratory

SUBSIGIM
Signature

SUBNAME
Typed Name

SUBTITLE
Title

1R SCOTE TEST PROCEDURE
FORM 2
TEST REPORT SUMMARY

LAB: *LAB*	EOT DATE: *DTCOMP*	END TIME: *EOTTIME*	METHOD: *METHOD*
STAND: *STAND*	RUN NUMBER: *ENRUN*		
FORMULATION/STAND CODE: *FORM*			
OILCODE: *OILCODE*			

START DATE: *DTSTRT*	START TIME: *STRTTIME*	TOTAL TEST LENGTH: *TESTLEN*	TMC OIL *IND*
LAB INTERNAL OIL *LABOCODE*		ENGINE SERIAL NUMBER: *ENGSN*	

	CORRECTION EFFECTIVE DATE	WD	TGC	TLC	BOTOC g/h	EOTOC g/h	OIL CON. DELTA EOTOC–BOTOC g/h
UNADJUSTED LAB RATING		*WD*	*TGC*	*TLC*	*BOTOC*	*EOTOC*	*DOC*
INDUSTRY CORRECTION (IF ANY)	*DATECF*	*WDCF*	*TGCCF*	*TLCCF*	*BOTOCCF*	*EOTOCCF*	*DOCCF*
SUBTOTAL		*WDCOR*	*TGCCOR*	*TLCCOR*	*BOTOCCOR*	*EOTOCCOR*	*DOCCOR*
LAB SEVERITY ADJUSTMENT (IF ANY) [B]	*DATESA*	*WDSA*	*TGCSA*	*TLCSA*	*BOTOCSA*	*EOTOCSA*	*DOCSA*
TOTAL		*WDFNL*	*TGCFNL*	*TLCFNL*	*BOTOCFNL*	*EOTOCFNL*	*DOCFNL*

	EFFECTIVE DATE	WD	TGC	TLC	BOTOC g/h	EOTOC g/h	OIL CON. DELTA EOTOC–BOTOC g/h
TEST TARGET MEAN [A]	*EFFDATE*	*WDM*	*TGCM*	*TLCM*	*BOTOCM*	*EOTOCM*	*DOCM*
TEST TARGET STD [A]	*EFFDATE*	*WDS*	*TGCS*	*TLCS*	*BOTOCS*	*EOTOCS*	*DOCS*
API *CATEGORY* PASS LIMIT [B]	*DTCEFF*	*WDPL*	*TGCPL*	*TLCPL*	*BOTOCPL*	*EOTOCPL*	*DOCPL*

	REFEREE LAB	WD	TGC	TLC	
REFEREE RATINGS [A]	*RRLAB*	*RRWD*	*RRTGC*	*RRTLC*	

	TOP	INT. 1	OIL	PISTON CROWN	PISTON SKIRT	LINER
RING LOSS OF SIDE CLEARANCE (mm)	*LSCTOP*	*LSCINT1*	*LSCOIL*			
RING END GAP INCREASE (mm)	*RINGGTI*	*RINGGI1I*	*RINGGOI*			
IS THE RING STUCK?	*STUCKTOP*	*STUCKIN1*	*STUCKOIL*			
SCUFFED AREA %	*SCUFFTOP*	*SCUFFIN1*	*SCUFFOIL*	*SCUFCRON*	*SCUFSKRT*	*SCUFFLIN*
AVERAGE WEAR STEP (µm)						*AWEARST*
% BORE POLISH						*BOREPOL*

Notes: [A] Reference oil tests or as requested by test sponsor
[B] Non-reference oil tests only

1R SCOTE TEST PROCEDURE
FORM 3
OPERATIONAL SUMMARY

LAB: *LAB*	EOT DATE: *DTCOMP*	END TIME: *EOTTIME*	METHOD: *METHOD*
STAND: *STAND*		RUN NUMBER: *ENRUN*	
FORMULATION/STAND CODE: *FORM*			
OILCODE: *OILCODE*			

CONTROLLED PARAMETERS

OPERATING PARAMETER	QUALITY INDEX THRESHOLD	EOT QUALITY INDEX	PROCESS			TOTAL DATA POINTS		
			UNITS	TARGET	AVERAGE	SAMPLES [A]	BQD [B]	OVER/UNDER RANGE [C]
ENGINE SPEED	0.00	*QRPM*	r/min	1800	*ARPM*	*NRPM*	*BRPM*	*ORPM*
FUEL FLOW	0.00	*QFFLO*	g/min	240	*AFFLO*	*NFFLO*	*BFFLO*	*OFFLO*
HUMIDITY	0.00	*QHUMID*	g/kg	17.8	*AHUMID*	*NHUMID*	*BHUMID*	*OHUMID*
COOLANT FLOW	0.00	*QCOLFLO*	L/min	75	*ACOLFLO*	*NCOLFLO*	*BCOLFLO*	*OCOLFLO*
TEMPERATURE								
COOLANT OUT	0.00	*QCOLOUT*	˚C	105	*ACOLOUT*	*NCOLOUT*	*BCOLOUT*	*OCOLOUT*
OIL TO MANIFOLD	0.00	*QOMANTMP*	˚C	120	*AOMANTMP*	*NOMANTMP*	*BOMANTMP*	*OOMANTMP*
INLET AIR MANIFOLD	0.00	*QINAIRT*	˚C	60	*AINAIRT*	*NINAIRT*	*BINAIRT*	*OINAIRT*
FUEL INTO HEAD	0.00	*QFUELTMP*	˚C	42	*AFUELTMP*	*NFUELTMP*	*BFUELTMP*	*OFUELTMP*
PRESSURES								
OIL TO MANIFOLD	0.00	*QOMANPR*	kPa	415	*AOMANPR*	*NOMANPR*	*BOMANPR*	*OOMANPR*
INLET AIR (ABSOLUTE)	0.00	*QINAIRP*	kPa	292	*AINAIRP*	*NINAIRP*	*BINAIRP*	*OINAIRP*
FUEL FROM HEAD	0.00	*QFUELPR*	kPa	275	*AFUELPR*	*NFUELPR*	*BFUELPR*	*OFUELPR*
EXHAUST (ABSOLUTE)	0.00	*QEBP*	kPa	252	*AEBP*	*NEBP*	*BEBP*	*OEBP*

NON-CONTROLLED PARAMETERS

OPERATING PARAMETER	PROCESS			TOTAL DATA POINTS		
	UNITS	TYPICAL RANGE [D]	AVERAGE	SAMPLES [A]	BQD [B]	OVER/UNDER RANGE [C]
INTAKE AIR FLOW	kg/h	360–410	*AAIRFLO*			
POWER	kW	65–70	*APWR*	*NPWR*	*BPWR*	*OPWR*
TORQUE	Nm	330–350	*ATORQUE*	*NTORQUE*	*BTORQUE*	*OTORQUE*
BLOWBY	L/min	20–56	*ABLOBY*	*NBLOBY*	*BBLOBY*	*OBLOBY*
TEMPERATURE						
COOLANT IN	˚C	97–101	*ACOLIN*	*NCOLIN*	*BCOLIN*	*OCOLIN*
COOLANT DELTA T	˚C	4–8	*ACOLDT*	*NCOLDT*	*BCOLDT*	*OCOLDT*
OIL COOLER IN	˚C	120–124	*AOCOOLIN*	*NOCOOLIN*	*BOCOOLIN*	*OOCOOLIN*
HEATING OIL	˚C	165 max.	*AHEATOIL*	*NHEATOIL*	*BHEATOIL*	*OHEATOIL*
EXHAUST	˚C	590–620	*AEXHTMP*	*NEXHTMP*	*BEXHTMP*	*OEXHTMP*
PRESSURES						
CRANKCASE	kPa	0.09–0.3	*ACCV*	*NCCV*	*BCCV*	*OCCV*
COOLANT TO JUG	kPa	64–92	*ACOLPR*	*NCOLPR*	*BCOLPR*	*OCOLPR*
OIL FILTER DELTA P	kPa	30–85	*AOILDP*	*NOILDP*	*BOILDP*	*OOILDP*

A Total number of data points taken as determined from test length and procedural specified sampling rate.
B Number of Bad Quality Data points not used in the calculation of the statistical measures.
C Number of points clipped by over/under range limits of the statistical measures.
D Gathered from 1Q Matrix Test data.

1R SCOTE TEST PROCEDURE
FORM 4
ASSEMBLY MEASUREMENTS AND PART RECORD

LAB: *LAB*	EOT DATE: *DTCOMP*	END TIME: *EOTTIME*	METHOD: *METHOD*
STAND: *STAND*		RUN NUMBER: *ENRUN*	
FORMULATION/STAND CODE: *FORM*			
OILCODE: *OILCODE*			

ASSEMBLY MEASUREMENTS AND PARTS RECORD	
INJECTOR SETTING (GO / NO-GO)	*INJSET*
WAS TIMING INITIALIZED? (YES/NO)	*TINIT*
PISTON/HEAD CLEARANCE mm	*PISTONCL*
CAM GEAR BACKLASH mm	*CAMLASH*
DESIRED FUEL TIMING ˚BTC	*FUELTIM*
INTAKE VALVE OPEN ˚ATC	*INVALOPN*
INJECTOR PLUNGER LIFT mm @ 72˚	*PLUNLIFT*
INTAKE VALVE LIFT mm @ 456˚	*INLIFT*
EXHAUST VALVE LIFT mm @ 247˚	*EXLIFT*

	PART NUMBER	SERIAL NUMBER	DATE CODE	INSPECTION CODE
LINER	*LINERPN* [A]	*LINERSN* [B]	*LINERDC* [A]	
TOP RING	*TOPPN* [C]	*TOPSN* [E]		
INTERMEDIATE RING	*INTPN* [C]	*INTSN* [E]		
OIL RING	*OILPN* [C]	*OILSN* [E]		
PISTON CROWN	*CROWNPN* [D]	*CROWNSN* [D]	*CROWNDC* [F]	*CROWNIC* [G]
PISTON SKIRT	*SKIRTPN* [H]	*SKIRTSN* [I]		
FUEL INJECTOR	*NOZZLEPN* [J]	*NOZZLESN* [K]		
ECM EPROM	*ECMPN* [L]		*ECMDC*	
PISTON COOLING JET	*PTUBEPN*	*PTUBESN*		

[A] On liner O.D.

[B] On liner O.D. (NNNN)

[C] On box label

[D] On top of piston

[E] On paper envelope containing the ring

[F] Number below "E" located on piston top

[G] Number above "E" located on piston top

[H] On bottom surface of skirt rim

[I] On bottom surface under pin bore

[J] On top surface of plunger

[K] On top surface of plunger - 6 digits

[L] On ECAT software

1R SCOTE TEST PROCEDURE
FORM 5
PISTON RATING SUMMARY

TEST	LAB: *LAB*	EOT *DTCOMP*	END *EOTTIME*	STAND: *STAND*	RUN *ENRUN*	METHOD: *METHOD*
FORMULATION/STAND CODE: *FORM*				OILCODE: *OILCODE*		
TEST *TESTFUEL*	FUEL BATCH: *FUELBTID*		DATE RATED: *DTRATE*	RATER *RINIT*	VERIFIED *VRINIT*	
LAST STAND REFERENCE INFORMATION	DATE COMPLETED: *LRDTCOMP*		STAND #: *STAND*	RUN #: *LRENRUN*	TMC OIL CODE: *LIND*	

	WD	TGC	TLC	BOTOC g/h	EOTOC g/h
LAST REF. THIS STAND	*LRWD*	*LRTGC*	*LRTLC*	*LRBOTOC*	*LREOTOC*
INDUSTRY AVERAGE	*LRAWD*	*LRATGC*	*LRATLC*	*LRABTOC*	*LRAETOC*
INDUSTRY STD	*LRSWD*	*LRSTGC*	*LRSTLC*	*LRSBTOC*	*LRSETOC*

TOTAL PISTON RATINGS SUMMARY

		GROOVES				LANDS					GROOVE		LANDS							
	DEP. FACTOR	NO. 1		NO. 2		NO. 1		NO. 2		DEP. FACTOR	NO. 3		NO. 3		NO. 4		OIL COOLING		UNDER CROWN	
		A,%	DEM.	A,%	DEM.	A,%	DEM.	A,%	DEM.		A,%	DEM.	A,%	DEM.	A,%	DEM.	A,%	DEM.	A,%	DEM.
CARBON	HC – 1.0	*G1HCA*	*G1HCD*	*G2HCA*	*G2HCD*	*L1HCA*	*L1HCD*	*L2HCA*	*L2HCD*		*G3HCA*	*G3HCD*	*L3HCA*	*L3HCD*	*L4HCA*	*L4HCD*				
	MC – 0.5	*G1MCA*	*G1MCD*								*G3MCA*	*G3MCD*								
	LC – .25	*G1LCA*	*G1LCD*	*G2LCA*	*G2LCD*	*L1LCA*	*L1LCD*	*L2LCA*	*L2LCD*		*G3LCA*	*G3LCD*	*L3LCA*	*L3LCD*	*L4LCA*	*L4LCD*	*OGLCA*	*OGLCD*	*UCLCA*	*UCLCD*
	TOTAL	*G1ACTOT*	*G1DCTOT*	*G2ACTOT*	*G2DCTOT*	*L1ACTOT*	*L1DCTOT*	*L2ACTOT*	*L2DCTOT*		*G3ACTOT*	*G3DCTOT*	*L3ACTOT*	*L3DCTOT*	*L4ACTOT*	*L4DCTOT*	*OGACTOT*	*OGDCTOT*	*UCACTOT*	*UCDCTOT*
VARNISH	8 – 9	*G1V9A*	*G1V9D*	*G2V9A*	*G2V9D*	*L1V9A*	*L1V9D*	*L2V9A*	*L2V9D*											
	7 – 7.9	*G1V8A*	*G1V8D*	*G2V8A*	*G2V8D*	*L1V8A*	*L1V8D*	*L2V8A*	*L2V8D*	7.5	*G3V75A*	*G3V75D*	*L3V75A*	*L3V75D*	*L4V75A*	*L4V75D*	*OGV75A*	*OGV75D*	*UCV75A*	*UCV75D*
	6 – 6.9	*G1V7A*	*G1V7D*	*G2V7A*	*G2V7D*	*L1V7A*	*L1V7D*	*L2V7A*	*L2V7D*											
	5 – 5.9	*G1V6A*	*G1V6D*	*G2V6A*	*G2V6D*	*L1V6A*	*L1V6D*	*L2V6A*	*L2V6D*											
	4 – 4.9	*G1V5A*	*G1V5D*	*G2V5A*	*G2V5D*	*L1V5A*	*L1V5D*	*L2V5A*	*L2V5D*	4.5	*G3V45A*	*G3V45D*	*L3V45A*	*L3V45D*	*L4V45A*	*L4V45D*	*OGV45A*	*OGV45D*	*UCV45A*	*UCV45D*
	3 – 3.9	*G1V4A*	*G1V4D*	*G2V4A*	*G2V4D*	*L1V4A*	*L1V4D*	*L2V4A*	*L2V4D*											
	2 – 2.9	*G1V3A*	*G1V3D*	*G2V3A*	*G2V3D*	*L1V3A*	*L1V3D*	*L2V3A*	*L2V3D*											
	1 – 1.9	*G1V2A*	*G1V2D*	*G2V2A*	*G2V2D*	*L1V2A*	*L1V2D*	*L2V2A*	*L2V2D*	1.5	*G3V15A*	*G3V15D*	*L3V15A*	*L3V15D*	*L4V15A*	*L4V15D*	*OGV15A*	*OGV15D*	*UCV15A*	*UCV15D*
	>0 – 0.9	*G1V1A*	*G1V1D*	*G2V1A*	*G2V1D*	*L1V1A*	*L1V1D*	*L2V1A*	*L2V1D*											
	CLEAN	*G1VCLNA*	0	*G2VCLNA*	0	*L1VCLNA*	0	*L2VCLNA*	0	CLEAN	*G3VCLNA*	0	*L3VCLNA*	0	*L4VCLNA*	0	*OGVCLNA*	0	*UCVCLNA*	0
	TOTAL	*G1AVTOT*	*G1DVTOT*	*G2AVTOT*	*G2DVTOT*	*L1AVTOT*	*L1DVTOT*	*L2AVTOT*	*L2DVTOT*		*G3AVTOT*	*G3DVTOT*	*L3AVTOT*	*L3DVTOT*	*L4AVTOT*	*L4DVTOT*	*OGAVTOT*	*OGDVTOT*	*UCAVTOT*	*UCDVTOT*
RATING		*G1UWD*		*G2UWD*		*L1UWD*		*L2UWD*			*G3UWD*		*L3UWD*		*L4UWD*		*OGUWD*		*UCUWD*	
LOCATION FACTOR		2		3		1		3			20		20		60		0.5		1	
IND RATING		*G1WD*		*G2WD*		*L1WD*		*L2WD*			*G3WD*		*L3WD*		*L4WD*		*OGWD*		*UCWD*	

WD:	*WD*	TLHC %:	*TLHC*	TGF %:	*TGF*	IGF %:	*IGF*	TLFC %:	*TLFC*
UNWEIGHTED:	*UWD*	TLC:	*TLC*	TGC:	*TGC*	IGC:	*IGC*	UNDERCROWN CARBON:	*UCC*

1R SCOTE TEST PROCEDURE
Form 5A

LAB: *LAB*	EOT DATE: *DTCOMP*	END TIME: *EOTTIME*	METHOD: *METHOD*
STAND: *STAND*		RUN NUMBER: *ENRUN*	
FORMULATION/STAND CODE: *FORM*			
OILCODE: *OILCODE*			

RATEWSIM

Refer to Appendix A14 for an example of Piston Rating Worksheet.

1R SCOTE TEST PROCEDURE
FORM 6
SUPPLEMENTAL PISTON DEPOSITS (GROOVE SIDES AND RINGS)

LAB: *LAB*	EOT DATE: *DTCOMP*	END TIME: *EOTTIME*	METHOD: *METHOD*
STAND: *STAND*		RUN NUMBER: *ENRUN*	
FORMULATION/STAND CODE: *FORM*			
OILCODE: *OILCODE*			

DEPOSIT TYPE			CARBON			VARNISH									
			HC	MC	LC	8 – 9	7 – 7.9	6 – 6.9	5 – 5.9	4 – 4.9	3 – 3.9	2 – 2.9	1 – 1.9	>0 –	CLEAN
GROOVE TOP AND BOTTOM	1	T	G1THCA	G1TMCA	G1TLCA	G1T9A	G1T8A	G1T7A	G1T6A	G1T5A	G1T4A	G1T3A	G1T2A	G1T1A	G1TCLNA
		B	G1BHCA	G1BMCA	G1BLCA	G1B9A	G1B8A	G1B7A	G1B6A	G1B5A	G1B4A	G1B3A	G1B2A	G1B1A	G1BCLNA
	2	T	G2THCA	G2TMCA	G2TLCA	G2T9A	G2T8A	G2T7A	G2T6A	G2T5A	G2T4A	G2T3A	G2T2A	G2T1A	G2TCLNA
		B	G2BHCA	G2BMCA	G2BLCA	G2B9A	G2B8A	G2B7A	G2B6A	G2B5A	G2B4A	G2B3A	G2B2A	G2B1A	G2BCLNA
	3	T	G3THCA	G3TMCA	G3TLCA	G3T9A	G3T8A	G3T7A	G3T6A	G3T5A	G3T4A	G3T3A	G3T2A	G3T1A	G3TCLNA
		B	G3BHCA	G3BMCA	G3BLCA	G3B9A	G3B8A	G3B7A	G3B6A	G3B5A	G3B4A	G3B3A	G3B2A	G3B1A	G3BCLNA
TOP BOTTOM AND BACK OF RINGS	1	T	R1THCA	R1TMCA	R1TLCA	R1T9A	R1T8A	R1T7A	R1T6A	R1T5A	R1T4A	R1T3A	R1T2A	R1T1A	R1TCLNA
		B	R1BHCA	R1BMCA	R1BLCA	R1B9A	R1B8A	R1B7A	R1B6A	R1B5A	R1B4A	R1B3A	R1B2A	R1B1A	R1BCLNA
		BK	R1BKHCA	R1BKMCA	R1BKLCA	R1BK9A	R1BK8A	R1BK7A	R1BK6A	R1BK5A	R1BK4A	R1BK3A	R1BK2A	R1BK1A	R1BKCLNA
	2	T	R2THCA	R2TMCA	R2TLCA	R2T9A	R2T8A	R2T7A	R2T6A	R2T5A	R2T4A	R2T3A	R2T2A	R2T1A	R2TCLNA
		B	R2BHCA	R2BMCA	R2BLCA	R2B9A	R2B8A	R2B7A	R2B6A	R2B5A	R2B4A	R2B3A	R2B2A	R2B1A	R2BCLNA
		BK	R2BKHCA	R2BKMCA	R2BKLCA	R2BK9A	R2BK8A	R2BK7A	R2BK6A	R2BK5A	R2BK4A	R2BK3A	R2BK2A	R2BK1A	R2BKCLNA
	3	T	R3THCA	R3TMCA	R3TLCA	R3T9A	R3T8A	R3T7A	R3T6A	R3T5A	R3T4A	R3T3A	R3T2A	R3T1A	R3TCLNA
		B	R3BHCA	R3BMCA	R3BLCA	R3B9A	R3B8A	R3B7A	R3B6A	R3B5A	R3B4A	R3B3A	R3B2A	R3B1A	R3BCLNA
		BK	R3BKHCA	R3BKMCA	R3BKLCA	R3BK9A	R3BK8A	R3BK7A	R3BK6A	R3BK5A	R3BK4A	R3BK3A	R3BK2A	R3BK1A	R3BKCLNA

ADDITIONAL DEPOSIT & CONDITION RATINGS

PISTON CROWN	*CROWNAD*
PISTON SKIRT	*SKIRTAD*
RINGS	*RINGSAD*
LINER	*LINERAD*

1R SCOTE TEST PROCEDURE
FORM 6A
REFEREE RATING

TEST IDENTIFICATION							
LAB:	*LAB*	EOT DATE:	*DTCOMP*	END TIME:	*EOTTIME*	METHOD:	*METHOD*
STAND:	*STAND*	RUN #:	*ENRUN*				
FORMULATION/STAND CODE:	*FORM*						
OILCODE:	*OILCODE*						
REFEREE RATING INFORMATION							
COMPANY:	*RRLAB*	RATING NUMBER:	*RRNO*	DATE RATED:	*RRDATE*	RATER:	*RRINIT*

TOTAL PISTON RATINGS SUMMARY

		GROOVES				LANDS					GROOVES		LANDS				OIL COOLING		UNDER CROWN	
	DEP. FACTOR	NO. 1		NO. 2		NO. 1		NO. 2		DEP. FACTOR	NO. 3		NO. 3		NO. 4					
		A,%	DEM.	A,%	DEM.	A,%	DEM.	A,%	DEM.		A,%	DEM.	A,%	DEM.	A,%	DEM.	A,%	DEM.	A,%	DEM.
CARBON	HC-1.0	*RRG1HCA*	*RRG1HCD*	*RRG2HCA*	*RRG2HCD*	*RRL1HCA*	*RRL1HCD*	*RRL2HCA*	*RRL2HCD*		*RRG3HCA*	*RRG3HCD*	*RRL3HCA*	*RRL3HCD*	*RRL4HCA*	*RRL4HCD*				
	MC-0.5	*RRG1MCA*	*RRG1MCD*								*RRG3MCA*	*RRG3MCD*								
	LC-.25	*RRG1LCA*	*RRG1LCD*	*RRG2LCA*	*RRG2LCD*	*RRL1LCA*	*RRL1LCD*	*RRL2LCA*	*RRL2LCD*		*RRG3LCA*	*RRG3LCD*	*RRL3LCA*	*RRL3LCD*	*RRL4LCA*	*RRL4LCD*	*RROGLCA*	*RROGLCD*	*RRUCLCA*	*RRUCLCD*
	TOTAL	*RG1ACTOT*	*RG1DCTOT*	*RG2ACTOT*	*RG2DCTOT*	*RL1ACTOT*	*RL1DCTOT*	*RL2ACTOT*	*RL2DCTOT*		*RG3ACTOT*	*RG3DCTOT*	*RL3ACTOT*	*RL3DCTOT*	*RL4ACTOT*	*RL4DCTOT*	*ROGACTOT*	*ROGDCTOT*	*RUCACTOT*	*RUCDCTOT*
VARNISH	8 – 9	*RRG1V9A*	*RRG1V9D*	*RRG2V9A*	*RRG2V9D*	*RRL1V9A*	*RRL1V9D*	*RRL2V9A*	*RRL2V9D*											
	7 – 7.9	*RRG1V8A*	*RRG1V8D*	*RRG2V8A*	*RRG2V8D*	*RRL1V8A*	*RRL1V8D*	*RRL2V8A*	*RRL2V8D*	7.5	*RRG3V75A*	*RRG3V75D*	*RRL3V75A*	*RRL3V75D*	*RRL4V75A*	*RRL4V75D*	*RROGV75A*	*RROGV75D*	*RRUCV75A*	*RRUCV75D*
	6 – 6.9	*RRG1V7A*	*RRG1V7D*	*RRG2V7A*	*RRG2V7D*	*RRL1V7A*	*RRL1V7D*	*RRL2V7A*	*RRL2V7D*											
	5 – 5.9	*RRG1V6A*	*RRG1V6D*	*RRG2V6A*	*RRG2V6D*	*RRL1V6A*	*RRL1V6D*	*RRL2V6A*	*RRL2V6D*											
	4 – 4.9	*RRG1V5A*	*RRG1V5D*	*RRG2V5A*	*RRG2V5D*	*RRL1V5A*	*RRL1V5D*	*RRL2V5A*	*RRL2V5D*	4.5	*RRG3V45A*	*RRG3V45D*	*RRL3V45A*	*RRL3V45D*	*RRL4V45A*	*RRL4V45D*	*RROGV45A*	*RROGV45D*	*RRUCV45A*	*RRUCV45D*
	3 – 3.9	*RRG1V4A*	*RRG1V4D*	*RRG2V4A*	*RRG2V4D*	*RRL1V4A*	*RRL1V4D*	*RRL2V4A*	*RRL2V4D*											
	2 – 2.9	*RRG1V3A*	*RRG1V3D*	*RRG2V3A*	*RRG2V3D*	*RRL1V3A*	*RRL1V3D*	*RRL2V3A*	*RRL2V3D*											
	1 – 1.9	*RRG1V2A*	*RRG1V2D*	*RRG2V2A*	*RRG2V2D*	*RRL1V2A*	*RRL1V2D*	*RRL2V2A*	*RRL2V2D*	1.5	*RRG3V15A*	*RRG3V15D*	*RRL3V15A*	*RRL3V15D*	*RRL4V15A*	*RRL4V15D*	*RROGV15A*	*RROGV15D*	*RRUCV15A*	*RRUCV15D*
	>0 – 0.9	*RRG1V1A*	*RRG1V1D*	*RRG2V1A*	*RRG2V1D*	*RRL1V1A*	*RRL1V1D*	*RRL2V1A*	*RRL2V1D*											
	CLEAN	*RRG1VCLA*	0	*RRG2VCLA*	0	*RRL1VCLA*	0	*RRL2VCLA*	0		*RRG3VCLA*	0	*RRL3VCLA*	0	*RRL4VCLA*	0	*RROGVCLA*	0	*RRUCVCLA*	0
	TOTAL	*RG1AVTOT*	*RG1DVTOT*	*RG2AVTOT*	*RG2DVTOT*	*RL1AVTOT*	*RL1DVTOT*	*RL2AVTOT*	*RL2DVTOT*		*RG3AVTOT*	*RG3DVTOT*	*RL3AVTOT*	*RL3DVTOT*	*RL4AVTOT*	*RL4DVTOT*	*ROGAVTOT*	*ROGDVTOT*	*RUCAVTOT*	*RUCDVTOT*
RATING		*RRG1UWD*		*RRG2UWD*		*RRL1UWD*		*RRL2UWD*			*RRG3UWD*		*RRL3UWD*		*RRL4UWD*		*RROGUWD*		*RRUCUWD*	
LOCATION FACTOR		2		3		1		3			20		20		60		0.5		1	
IND RATING		*RRG1WD*		*RRG2WD*		*RRL1WD*		*RRL2WD*			*RRG3WD*		*RRL3WD*		*RRL4WD*		*RROGWD*		*RRUCWD*	

WD:	*RRWD*	TLHC %:	*RRTLHC*	TGF %:	*RRTGF*	IGF %:	*RRIGF*	TLFC %:	*RRTLFC*
UNWEIGHTED:	*RRUWD*	TLC:	*RRTLC*	TGC:	*RRTGC*	IGC:	*RRIGC*	UNDERCROWN CARBON:	*RRUCC*

1R SCOTE TEST PROCEDURE
FORM 7
OIL ANALYSIS DATA

TEST IDENTIFICATION			
LAB: *LAB*	EOT DATE: *DTCOMP*	END TIME: *EOTTIME*	METHOD: *METHOD*
STAND: *STAND*		RUN NUMBER: *ENRUN*	
FORMULATION/STAND CODE: *FORM*			
OILCODE: *OILCODE*			
TEST FUEL: *TESTFUEL*		FUEL BATCH: *FUELBTID*	

OIL ANALYSIS	NEW	*TST_H036*	*TST_H072*	*TST_H108*	*TST_H144*	*TST_H180*	*TST_H216*	*TST_H252*	*TST_H288*	*TST_H324*	*TST_H360*	*TST_H396*	*TST_H432*	*TST_H468*	*TST_H504*
VISC @ 100°C	*V100NEW*	*V100H036*			*V100H144*			*V100H252*			*V100H360*		*V100H432*		*V100H504*
VISC @ 40°C	*V40_NEW*	*V40_H036*			*V40_H144*			*V40_H252*			*V40_H360*		*V40_H432*		*V40_H504*
TBN D4739	*TBN_NEW*	*TBN_H036*			*TBN_H144*			*TBN_H252*			*TBN_H360*		*TBN_H432*		*TBN_H504*
TAN D664	*TAN_NEW*	*TAN_H036*			*TAN_H144*			*TAN_H252*			*TAN_H360*		*TAN_H432*		*TAN_H504*
TGA Soot %	*TGA_NEW*	*TGA_H036*			*TGA_H144*			*TGA_H252*			*TGA_H360*		*TGA_H432*		*TGA_H504*
WEAR METALS (ppm)															
Fe	*FEWMNEW*	*FEWMH036*			*FEWMH144*			*FEWMH252*			*FEWMH360*		*FEWMH432*		*FEWMH504*
Al	*ALWMNEW*	*ALWMH036*			*ALWMH144*			*ALWMH252*			*ALWMH360*		*ALWMH432*		*ALWMH504*
Si	*SIWMNEW*	*SIWMH036*			*SIWMH144*			*SIWMH252*			*SIWMH360*		*SIWMH432*		*SIWMH504*
Cu	*CUWMNEW*	*CUWMH036*			*CUWMH144*			*CUWMH252*			*CUWMH360*		*CUWMH432*		*CUWMH504*
Cr	*CRWMNEW*	*CRWMH036*			*CRWMH144*			*CRWMH252*			*CRWMH360*		*CRWMH432*		*CRWMH504*
Pb	*PBWMNEW*	*PBWMH036*			*PBWMH144*			*PBWMH252*			*PBWMH360*		*PBWMH432*		*PBWMH504*
FUEL DILUTION %		*FDILH036*									*FDILH360*				*FDILH504*
IR O_2		*IRO2H036*			*IRO2H144*			*IRO2H252*			*IRO2H360*		*IRO2H432*		*IRO2H504*
BLOWBY (L/min)		*BLBYH036*	*BLBYH072*	*BLBYH108*	*BLBYH144*	*BLBYH180*	*BLBYH216*	*BLBYH252*	*BLBYH288*	*BLBYH324*	*BLBYH360*	*BLBYH396*	*BLBYH432*	*BLBYH468*	*BLBYH504*
Oil Consumption g/h for hrs ending		*OCONH036*	*OCONH072*	*OCONH108*	*OCONH144*	*OCONH180*	*OCONH216*	*OCONH252*	*OCONH288*	*OCONH324*	*OCONH360*	*OCONH396*	*OCONH432*	*OCONH468*	*OCONH504*
Oil Consumption r^2		*OCRRH036*	*OCRRH072*	*OCRRH108*	*OCRRH144*	*OCRRH180*	*OCRRH216*	*OCRRH252*	*OCRRH288*	*OCRRH324*	*OCRRH360*	*OCRRH396*	*OCRRH432*	*OCRRH468*	*OCRRH504*
FUEL POSITION (mm)		*FPOSH036*						*FPOSH252*			*FPOSH360*				*FPOSH504*

NOTE:
(1) Total Oil In System 5800 ± 50 grams.
(2) Refill oil scale cart to full level every 36 hours. Take oil samples, as shown, before adding oil.

1R SCOTE TEST PROCEDURE
FORM 8
DOWNTIME SUMMARY

LAB: *LAB*	EOT DATE: *DTCOMP*	END TIME: *EOTTIME*	METHOD: *METHOD*
STAND: *STAND*		RUN NUMBER: *ENRUN*	
FORMULATION/STAND CODE: *FORM*			
OILCODE: *OILCODE*			

Number of Downtime Occurrences		*DWNOCR*	
TEST HOURS	**DATE**	**DOWNTIME**	**REASONS**
DOWNR001	*DDATR001*	*DTIMR001*	*DREAR001*
		TOTLDOWN	**TOTAL DOWNTIME (125 HR. MAX)**

Comments		
Number of Comment Lines	*TOTCOM*	
OCOMR001		

1R SCOTE TEST PROCEDURES
FORM 9
RING MEASUREMENTS

LAB: *LAB*	EOT DATE: *DTCOMP*	END TIME: *EOTTIME*	METHOD: *METHOD*
STAND: *STAND*		RUN NUMBER: *ENRUN*	
FORMULATION/STAND CODE: *FORM*			
OILCODE: *OILCODE*			

ALL RING MEASUREMENTS ARE MADE USING METRIC FEELER GAGES

RING GAPS (mm)	**1Y4014 TOP**	**1Y4013 INTERMEDIATE**	**1Y4012 OIL**
SPECIFICATIONS	0.350mm – 0.550mm	0.754mm – 0.906mm	0.400mm – 0.750mm
PRE-TEST	*RINGGTE*	*RINGGI1E*	*RINGGOE*
POST-TEST	*RINGGTO*	*RINGGI1O*	*RINGGOO*
INCREASE	*RINGGTI*	*RINGGI1I*	*RINGGOI*

RING SIDE CLEARANCE*		**A**	**B**	**C**	**D**	**AVG.**	**MIN.**	**SPECIFICATION**
TOP	PRE-TEST	*SIDETPE1*	*SIDETPE2*	*SIDETPE3*	*SIDETPE4*	*ASIDETPE*	*ISIDETPE*	0.090mm – 0.127mm
	POST-TEST	*SIDETPO1*	*SIDETPO2*	*SIDETPO3*	*SIDETPO4*	*ASIDETPO*	*ISIDETPO*	
	LSC	*LSCT1*	*LSCT2*	*LSCT3*	*LSCT4*	*LSCTOP*	*ILSCT*	
INT.	PRE-TEST	*SIDE1PE1*	*SIDE1PE2*	*SIDE1PE3*	*SIDE1PE4*	*ASIDE1PE*	*ISIDE1PE*	0.060mm – 0.110mm
	POST-TEST	*SIDE1PO1*	*SIDE1PO2*	*SIDE1PO3*	*SIDE1PO4*	*ASIDE1PO*	*ISIDE1PO*	
	LSC	*LSCI1*	*LSCI2*	*LSCI3*	*LSCI4*	*LSCINT1*	*ILSCINT*	
OIL	PRE-TEST	*SIDEOPE1*	*SIDEOPE2*	*SIDEOPE3*	*SIDEOPE4*	*ASIDEOPE*	*ISIDEOPE*	0.030mm – 0.080mm
	POST-TEST	*SIDEOPO1*	*SIDEOPO2*	*SIDEOPO3*	*SIDEOPO4*	*ASIDEOPO*	*ISIDEOPO*	
	LSC	*LSCO1*	*LSCO2*	*LSCO3*	*LSCO4*	*LSCOIL*	*ILSCO*	

* NOTES:

1. WRITE "STUCK" IN PLACE OF DIMENSION WHEN APPLICABLE

2. WRITE "<0.03 mm" FOR CLEARANCE WHEN APPLICABLE.

3. WRITE ">" BEFORE CALCULATED DECREASE OR AVERAGE DECREASE VALUES THAT INCORPORATE A "<0.03 mm" IN CALCULATION.

4 LSC = LOSS OF SIDE CLEARANCE

5. MIN: OIL RING MINIMUM SIDE CLEARANCE IS MEASURED 360˚AROUND PISTON.

1R SCOTE TEST PROCEDURE
FORM 10
LINER MEASUREMENTS

LAB: *LAB*	EOT DATE: *DTCOMP*	END TIME: *EOTTIME*	METHOD: *METHOD*
STAND: *STAND*		RUN NUMBER: *ENRUN*	
FORMULATION/STAND CODE: *FORM*			
OILCODE: *OILCODE*			

LINER SURFACE FINISH (µm)			
DISTANCE FROM TOP	TRANSVERSE	LONGITUDINAL	AVERAGE
130 mm	*BBLFINT1*	*BBLFINL1*	*BBLFINA1*
50 mm	*BBLFINT2*	*BBLFINL2*	*BBLFINA2*
25 mm	*BBLFINT3*	*BBLFINL3*	*BBLFINA3*
		TOTAL AVERAGE (Spec: 0.4 – 0.8 µm)	*BBLFIN*

% LINER BORE POLISH – GRID (ADD T/AT VALUES FROM GRID)	
THRUST	*BOREPT*
ANTI–THRUST	*BOREPAT*
TOTAL	*BOREPOL*

LINER BORE MEASUREMENT (137.154mm minimum)			
BEFORE TEST – DIAMETER (DIAL BORE GAGE)			
BORE HEIGHT	**LONGITUDINAL**	**TRANSVERSE**	**OUT OF ROUND** (0.038 mm max)
250 mm	*BBLONG1*	*BBTRAN1*	*OOR1*
210 mm	*BBLONG2*	*BBTRAN2*	*OOR2*
170 mm	*BBLONG3*	*BBTRAN3*	*OOR3*
130 mm	*BBLONG4*	*BBTRAN4*	*OOR4*
50 mm	*BBLONG5*	*BBTRAN5*	*OOR5*
25 mm	*BBLONG6*	*BBTRAN6*	*OOR6*
15 mm	*BBLONG7*	*BBTRAN7*	*OOR7*
TAPER (0.050 max)	*TAPRLONG*	*TAPRTRAN*	

AFTER TEST – (SURFACE PROFILE)				
	LONGITUDINAL µm		**TRANSVERSE µm**	
	FRONT	**REAR**	**T**	**AT**
WEAR STEP @ 13 mm	*AWEARLF*	*AWEARLR*	*AWEARTT*	*AWEARTAT*

1R SCOTE TEST PROCEDURE
FORM 11
CHARACTERISTICS OF THE DATA ACQUISITION SYSTEM

LAB: *LAB*	EOT DATE: *DTCOMP*	END TIME: *EOTTIME*	METHOD: *METHOD*
STAND: *STAND*		RUN NUMBER: *ENRUN*	
FORMULATION/STAND CODE: *FORM*			
OILCODE: *OILCODE*			

PARAMETER (1)	SENSING DEVICE (2)	CALIBRATION FREQUENCY (3)	RECORD DEVICE (4)	OBSERVATION FREQUENCY (5)	RECORD FREQUENCY (6)	LOG FREQUENCY (7)	SYSTEM RESPONSE (8)
OPERATION CONDITIONS							
ENGINE SPEED (r/min)	*RPMSENS*	*RPMCALF*	*RPMRECD*	*RPMOBSF*	*RPMRECF*	*RPMLOGF*	*RPMSYSR*
ENGINE POWER (kW)	*PWRSENS*	*PWRCALF*	*PWRRECD*	*PWROBSF*	*PWRRECF*	*PWRLOGF*	*PWRSYSR*
FUEL FLOW (g/min)	*FFLOSENS*	*FFLOCALF*	*FFLORECD*	*FFLOOBSF*	*FFLORECF*	*FFLOLOGF*	*FFLOSYSR*
HUMIDITY (g/kg)	*HUMSENS*	*HUMCALF*	*HUMRECD*	*HUMOBSF*	*HUMRECF*	*HUMLOGF*	*HUMSYSR*
TEMPERATURES (°C)							
COOLANT OUT	*COTSENS*	*COTCALF*	*COTRECD*	*COTOBSF*	*COTRECF*	*COTLOGF*	*COTSYSR*
COOLANT IN	*CONSENS*	*CONCALF*	*CONRECD*	*CONOBSF*	*CONRECF*	*CONLOGF*	*CONSYSR*
OIL TO MANIFOLD	*OBRGSENS*	*OBRGCALF*	*OBRGRECD*	*OBRGOBSF*	*OBRGRECF*	*OBRGLOGF*	*OBRGSYSR*
OIL COOLER IN	*OCOLSENS*	*OCOLCALF*	*OCOLRECD*	*OCOLOBSF*	*OCOLRECF*	*OCOLLOGF*	*OCOLSYSR*
INLET AIR	*AIRTSENS*	*AIRTCALF*	*AIRTRECD*	*AIRTOBSF*	*AIRTRECF*	*AIRTLOGF*	*AIRTSYSR*
EXHAUST	*EXTSENS*	*EXTCALF*	*EXTRECD*	*EXTOBSF*	*EXTRECF*	*EXTLOGF*	*EXTSYSR*
FUEL TO HEAD	*FUELSENS*	*FUELCALF*	*FUELRECD*	*FUELOBSF*	*FUELRECF*	*FUELLOGF*	*FUELSYSR*
PRESSURES (kPa)							
OIL TO MANIFOLD	*OBRPSENS*	*OBRPCALF*	*OBRPRECD*	*OBRPOBSF*	*OBRPRECF*	*OBRPLOGF*	*OBRPSYSR*
INLET AIR	*AIRPSENS*	*AIRPCALF*	*AIRPRECD*	*AIRPOBSF*	*AIRPRECF*	*AIRPLOGF*	*AIRPSYSR*
EXHAUST	*EXPSENS*	*EXPCALF*	*EXPRECD*	*EXPOBSF*	*EXPRECF*	*EXPLOGF*	*EXPSYSR*
FUEL FROM HEAD	*FFILSENS*	*FFILCALF*	*FFILRECD*	*FFILOBSF*	*FFILRECF*	*FFILLOGF*	*FFILSYSR*
CRANKCASE	*CCVSENS*	*CCVCALF*	*CCVRECD*	*CCVOBSF*	*CCVRECF*	*CCVLOGF*	*CCVSYSR*
FLOWS (L/min)							
BLOWBY	*BLBYSENS*	*BLBYCALF*	*BLBYRECD*	*BLBYOBSF*	*BLBYRECF*	*BLBYLOGF*	*BLBYSYSR*
COOLANT FLOW	*CFLWSENS*	*CFLWCALF*	*CFLWRECD*	*CFLWOBSF*	*CFLWRECF*	*CFLWLOGF*	*CFLWSYSR*

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 AREA OBSERVED BUT ONLY RECORDED IF OFF SPEC.
(6) DATA ARE RECORDED BUT ARE NOT REATINED 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

1R SCOTE TEST PROCEDURE
FORM 12
ENGINE OPERATIONAL DATA PLOTS

LAB: *LAB*	EOT DATE: *DTCOMP*	END TIME: *EOTTIME*	METHOD: *METHOD*
STAND: *STAND*		RUN NUMBER: *ENRUN*	
FORMULATION/STAND CODE: *FORM*			
OILCODE: *OILCODE*			

1R SCOTE TEST PROCEDURE
FORM 13
TORQUE AND EXHAUST TEMPERATURE HISTORY

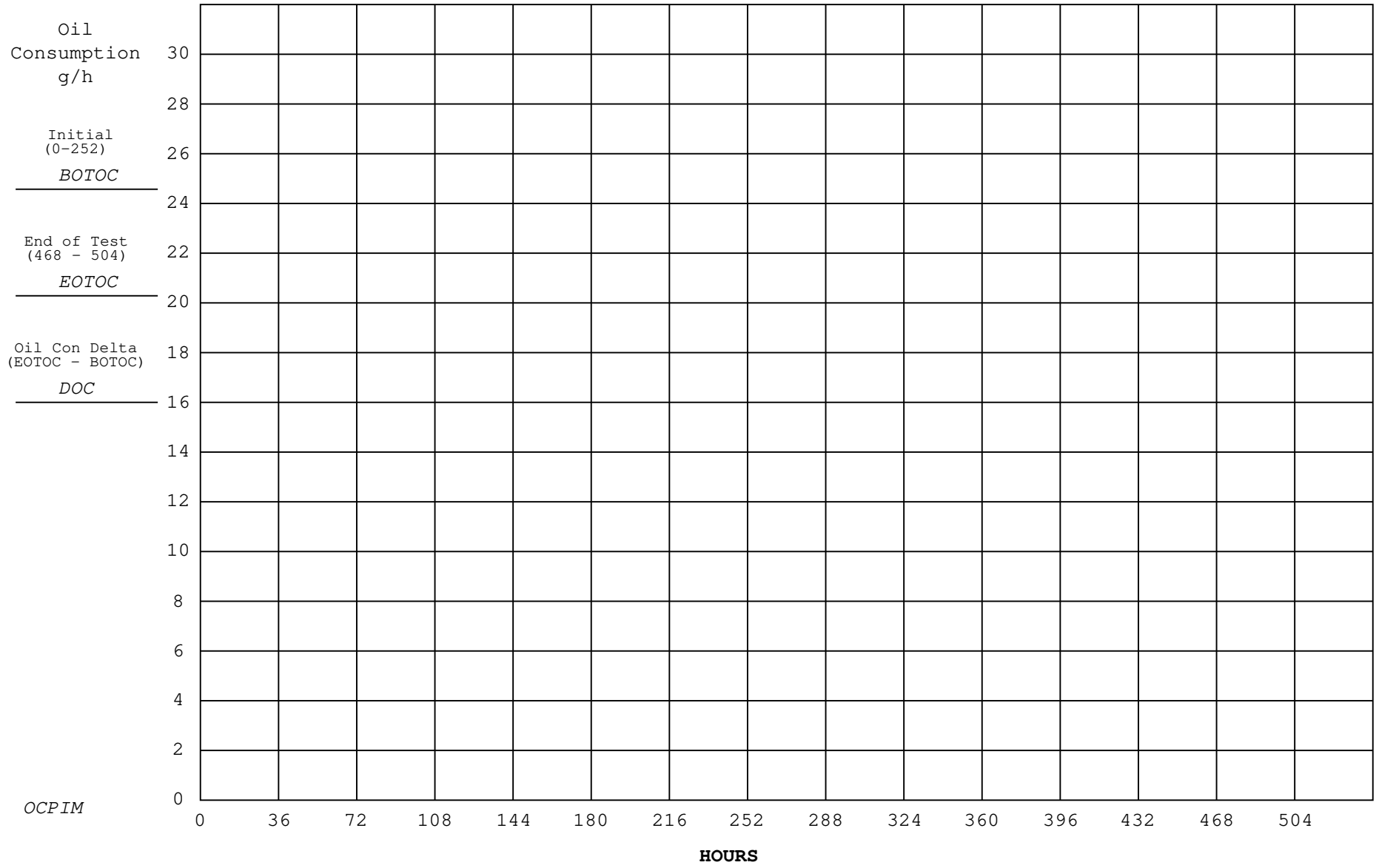
LAB: *LAB*	EOT DATE: *DTCOMP*	END TIME: *EOTTIME*	METHOD: *METHOD*
STAND: *STAND*		RUN NUMBER: *ENRUN*	
FORMULATION/STAND CODE: *FORM*			
OILCODE: *OILCODE*			

Data From Last 10 Tests

Test No.	1	2	3	4	5	6	7	8	9	10
Avg. Exh Temp.	*AEXHR001*									
Avg.Eng.Torque	*ATORR001*									

1R SCOTE TEST PROCEDURE
FORM 14
OIL CONSUMPTION

LAB: *LAB*	EOT DATE: *DTCOMP*	END TIME: *EOTTIME*	METHOD: *METHOD*
STAND: *STAND*		RUN NUMBER: *ENRUN*	
FORMULATION/STAND CODE: *FORM*			
OILCODE: *OILCODE*			



1R SCOTE TEST PROCEDURE
Form 15
PISTON, RING AND LINER PHOTOGRAPHS

LAB: *LAB*	EOT DATE: *DTCOMP*	END TIME: *EOTTIME*	METHOD: *METHOD*
STAND: *STAND*		RUN NUMBER: *ENRUN*	
FORMULATION/STAND CODE: *FORM*			
OILCODE: *OILCODE*			

PRLIM

Refer to Appendix A14 for example of Photo

1R SCOTE TEST PROCEDURE
FORM 16
SEVERITY ADJUSTMENT HISTORY

LAB: *LAB*	EOT DATE: *DTCOMP*	END TIME: *EOTTIME*	METHOD: *METHOD*
STAND: *STAND*		RUN NUMBER: *ENRUN*	
FORMULATION/STAND CODE: *FORM*			
OILCODE: *OILCODE*			

USAGE DATES		WDP		TGC		TLC		TRANSFORMED OC		TRANSFORMED EOTOC	
START	TIME	Zi	S.A.	Zi	S.A.	Zi	S.A.	Zi	S.A.	Zi	S.A.
DTSTR001	*DTTMR001*	*WDZIR001*	*WDSAR001*	*TGZIR001*	*TGSAR001*	*TLZIR001*	*TLSAR001*	*OCZIR001*	*OCSAR001*	*ETZIR001*	*ETSAR001*

1R SCOTE TEST PROCEDURE
Form 17
FUEL BATCH ANALYSIS

LAB: *LAB*	EOT DATE: *DTCOMP*	END TIME: *EOTTIME*	METHOD: *METHOD*
STAND: *STAND*		RUN NUMBER: *ENRUN*	
FORMULATION/STAND CODE: *FORM*			
OILCODE: *OILCODE*			

FUELIM

Refer to Appendix A14 for examples of appropriate Fuel Batch Analysis

1R SCOTE TEST PROCEDURE
Form 18
TMC CONTROL CHART ANALYSIS
(Reference Oil Tests Only)

LAB: *LAB*	EOT DATE: *DTCOMP*	END TIME: *EOTTIME*	METHOD: *METHOD*
STAND: *STAND*		RUN NUMBER: *ENRUN*	
FORMULATION/STAND CODE: *FORM*			
OILCODE: *OILCODE*			

CCHIM

Refer to Appendix A14 for example of Control Chart Analysis page.