D 6483 MACK T-9
RING/LINER WEAR TEST

REPORT PACKET VERSION NO. T9 VERSION 20040727 BETA
CONDUCTED FOR:
TSTSPON1

TSTSPON2

LABVALID	V = VALID; THE REFERENCE OIL/NON-REFERENCE OIL WAS EVALUATED IN ACCORDANCE WITH THE TEST PROCEDURE.
	I = INVALID; THE REFERENCE OIL/NON-REFERENCE OIL WAS NOT EVALUATED IN ACCORDANCE WITH THE TEST PROCEDURE.
	N = RESULTS CANNOT BE INTERPRETED AS REPRESENTATIVE OF OIL PERFORMANCE (NON-REFERENCE OIL) AND SHALL NOT BE USED IN DETERMINING AN AVERAGE TEST RESULT USING MULTIPLE TEST CRITERIA.

STAND: STAND	STAND RUN NO.: RSTRUN STRUN	ENGINE NO.: ENGINE	ENGINE HOURS: RENHOURS ENHOURS
END OF TEST DATE: RDTCOMP DTCOMP		END OF TEST TIME: REOTTIME EOTTIME	
OIL CODE/CMIR [A]: CMIR OILCODE			
FORMULATION/STAND CODE: FORM			
ALTCODE1: ALTCODE1	ALTCODE2: ALTCODE2	ALTCODE3: ALTCODE3	

In my opinion this test OPVALID been conducted in a valid manner in accordance with Test Method D 6483 and the appropriate amendments through the information letter system. The remarks included in this report describe the anomalies associated with this test.

[A] CMIR or Non-Reference Oil Code

SUBMITTED BY:

SUBLAB
Testing Laboratory

SUBSIGIM
Signature

SUBNAME
Typed Name

SUBTITLE
Title

D 6483 MACK T-9
RING/LINER WEAR TEST
FORM 1 - NON-REFERENCE OIL TEST SUMMARY

FORMULATION/STAND CODE FORM			TEST LENGTH	TESTLEN
OIL CODE NO. OILCODE				
TEST LAB	TEST STAND NO.	TEST STAND RUN NO.	ENGINE BLOCK SERIAL NO.	ENGINE HOURS
LAB	STAND	STRUN	ENGINE	ENHOURS

DATE TEST STARTED:	DTSTRT
START TIME:	STRTTIME
DATE TEST COMPLETED:	DTCOMP
EOT TIME:	EOTTIME
STAND CALIBRATION EXPIRATION DATE:	DTCALEXP
LABORATORY OIL CODE	LABOCODE
SAE VISCOSITY	SAEVISC

AVERAGE TGA SOOT % AT 75 h	TGAAVG
AVERAGE TGA SOOT % 75 – 500 h	SOOTAVG
AVERAGE OIL CONSUMPTION (0.304 g/Kw-h max.)	OILCON
CENTRIFUGAL OIL FILTER MASS GAIN, g	MASSG
OIL FILTER DELTA P, kPa (138 max.)	XOILDP
EOT TBN	TBN500

	DELTA Pb @ EOT (ppm)	ADJUSTED AVG. LINER WEAR (μm)	AVG. TOP RING WEIGHT LOSS (mg)
ORIGINAL RESULT	DPBEOT	ALW	ATRWL
TRANSFORMED RESULT A	TRNDPB		
CORRECTION FACTOR A	DPBCF	ALWCF	ATRWLCF
CORRECTED TRANSFORMED RESULT A	DPBCOR	ALWCOR	ATRWLCOR
SEVERITY ADJUSTMENT A	DPB_SA	CLW_SA	ATRWL_SA
FINAL TRANSFORMED RESULT A	TDPBFNL	TCLWFNL	TTRWLFNL
FINAL ORIGINAL UNIT RESULT	DPBFNL	CLWFNL	ATRWLFNL

[A] Delta Pb Value in Transformed Units

D 6483 MACK T-9
RING/LINER WEAR TEST
FORM 1A - REFERENCE OIL TEST SUMMARY

CMIR CODE NO. CMIR			TEST LENGTH RTESTLEN	
TMC OIL NO. IND				
TEST LAB	TEST STAND NO.	TEST STAND RUN NO.	ENGINE BLOCK SERIAL NO.	ENGINE HOURS
LAB	STAND	RSTRUN	ENGINE	RENHOURS
DATE TEST STARTED:			RDTSTRT	
START TIME:			RSTRTIME	
DATE TEST COMPLETED:			RDTCOMP	
EOT TIME:			REOTTIME	
STAND CALIBRATION EXPIRATION DATE:			ENCALEXP	
LABORATORY OIL CODE			RLABOCOD	
SAE VISCOSITY			RSAEVISC	

AVERAGE TGA SOOT % AT 75 h	RTGAAVG
AVERAGE TGA SOOT % 75 – 500 h	RSOOTAVG
AVERAGE OIL CONSUMPTION (0.304 g/Kw-h max.)	ROILCON
CENTRIFUGAL OIL FILTER MASS GAIN, g	RMASSG
OIL FILTER DELTA P, kPa (138 max.)	RXOILDP
EOT TBN	RTBN500

	DELTA Pb @ EOT (ppm)	ADJUSTED AVG. LINER WEAR (μm)	AVG. TOP RING WEIGHT LOSS (mg)
ORIGINAL RESULT	RDPBEOT	RALW	RATRWL
TRANSFORMED RESULT [A]	RTRNDPB		
CORRECTION FACTOR [A]	DPBCF	ALWCF	ATRWLCF
FINAL TRANSFORMED RESULT [A]	RTDPBFNL	RTCLWFNL	RTTRWFNL
FINAL ORIGINAL UNIT RESULT	RDPBFNL	RCLWFNL	RTRWLFNL

[A] Delta Pb Value in Transformed Units

D 6483 MACK T-9
RING/LINER WEAR TEST
Operational Summary
FORM 2

Laboratory: LAB	EOT Date: RDTCOMP DTCOMP	EOT Time: REOTTIME EOTTIME
Test Number: TESTNUM		
Oil Code: CMIR OILCODE		
Formulation/Stand Code: FORM		

	Parameter	Units	QI Threshold	EOT QI [A]	Target		Average		Samples [B]	BQD [C]	Over/Under Range [D]
Controlled Parameters	Speed	r/min	0.000	QRPM	1800	1250	ARPM1	ARPM2	NRPM	BRPM	ORPM
	Fuel Flow	kg/h	0.000	QFFLO	63.28	55.00	AFFLO1	AFFLO2	NFFLO	BFFLO	OFFLO
	Coolant Out	°C	0.000	QCOLOUT	85		ACOLOUT		NCOLOUT	BCOLOUT	OCOLOUT
	Fuel In	°C	0.000	QFUELT	40		AFUELT		NFUELT	BFUELT	OFUELT
	Oil Gallery	°C	0.000	QINAIRT	25		AINAIRT		NINAIRT	BINAIRT	OINAIRT
	Intake Manifold	°C	0.000	QINMANT	43		AINMANT		NINMANT	BINMANT	OINMANT
	Exhaust	kPa	0.000	QEXHSTP	3.1		AEXHSTP		NEXHSTP	BEXHSTP	OEXHSTP
	Inlet Air Res.	KPa	0.000	QINAIRR	2.5		AINAIRR		NINAIRR	BINAIRR	OINAIRR

	Parameter	Units	Typical Values [E]		Average	
Non-controlled Parameters	Torque	N-m	1361 - 1457	2118 - 2208	ALOAD1	ALOAD2
	Power	kW	258 - 267	280 - 288	APWR1	APWR2
	Humidity	g/kg	4.2 – 78.6		AHUMID	
	Blowby	L/min	41.2 – 184.3	23.6 – 148.7	ABLOBY1	ABLOBY2
	Coolant In	°C	76 - 82		ACOLIN	
	Oil Gallery	°C	101 - 109		AOILT	
	Pre-Turb. (F)	°C	605 - 658		APTURFT	
	Pre-Turb. (R)	°C	613 - 674		APTURRT	
	Tailpipe	°C	428 - 474	514 – 559	ATAILPT1	ATAILPT2
	Oil Gallery	kPa	365 - 436	227-284	AOILPRS1	AOILPRS2
	Crankcase	kPa	0.27 – 0.60		ACCASEP	
	Intake Manifold	kPa	185 – 201	149 – 164	AINMANP2	AINMANP1
	Compressor Discharge	kPa	193 - 205	152 - 159	ACOMDIS1	ACOMDIS2
	Intercooler Delta	kPa	13.6 Maximum		AINCLDP	

A Q1 values above the threshold are acceptable by the Mack Surveillance Panel. QI values below the threshold may not be considered acceptable based on an engineering review. Refer to Annex A5
B Total number of data points taken. Minimum acceptable value is 3000
C Number of Bad Quality Data points not used in the calculation of the statistical measures.
D Number of points clipped by over/under range limits.
E Typical values determined from reference oil test database

D 6483 MACK T-9
RING/LINER WEAR TEST
Rod Bearing Weight Loss
Form 3

Laboratory: LAB	EOT Date: RDTCOMP DTCOMP	EOT Time: REOTTIME EOTTIME
Test Number: TESTNUM		
Oil Code: CMIR OILCODE		
Formulation/Stand Code: FORM		

Cylinder #	Location	SOT Weight, g	EOT Weight, g	Weight Change, mg
1	Upper	BWSOTU1	BWEOTU1	BWLU1
2	Upper	BWSOTU2	BWEOTU2	BWLU2
3	Upper	BWSOTU3	BWEOTU3	BWLU3
4	Upper	BWSOTU4	BWEOTU4	BWLU4
5	Upper	BWSOTU5	BWEOTU5	BWLU5
6	Upper	BWSOTU6	BWEOTU6	BWLU6

SUMMARY	As Measured	Outlier Screened
Upper Bearing Average Weight Loss, mg	ABWLU	OABWLU
Upper Bearing Weight Loss Std. Dev., mg	SBWLU	OSBWLU
Upper Bearing Minimum Weight Loss, mg	IBWLU	OIBWLU
Upper Bearing Maximum Weight Loss, mg	XBWLU	OXBWLU
Outlier Upper Rod Bearing [A]	BWLOUT	

[A] Cylinder number

Cylinder #	Location	SOT Weight, g	EOT Weight, g	Weight Change, mg
1	Lower	BWSOTL1	BWEOTL1	BWLL1
2	Lower	BWSOTL2	BWEOTL2	BWLL2
3	Lower	BWSOTL3	BWEOTL3	BWLL3
4	Lower	BWSOTL4	BWEOTL4	BWLL4
5	Lower	BWSOTL5	BWEOTL5	BWLL5
6	Lower	BWSOTL6	BWEOTL6	BWLL6
Upper Bearing Average Weight Loss, mg				ABWLL
Upper Bearing Weight Loss Std. Dev., mg				SBWLL
Upper Bearing Minimum Weight Loss, mg				IBWLL
Upper Bearing Maximum Weight Loss, mg				XBWLL

D 6483 MACK T-9
RING/LINER WEAR TEST
Ring Weight Loss
Form 4

Laboratory: LAB	EOT Date: RDTCOMP DTCOMP	EOT Time: REOTTIME EOTTIME
Test Number: TESTNUM		
Oil Code: CMIR OILCODE		
Formulation/Stand Code: FORM		

Cylinder #	Top Ring SOT Weight, g	Top Ring EOT Weight, g	Weight Loss, mg
1	TRWSOT1	TRWEOT1	TRWL1
2	TRWSOT2	TRWEOT2	TRWL2
3	TRWSOT3	TRWEOT3	TRWL3
4	TRWSOT4	TRWEOT4	TRWL4
5	TRWSOT5	TRWEOT5	TRWL5
6	TRWSOT6	TRWEOT6	TRWL6

SUMMARY	As Measured	Outlier Screened
Upper Bearing Average Weight Loss, mg	AMATRWL	RATRWL ATRWL
Upper Bearing Weight Loss Std. Dev., mg	AMSTRWL	STRWL
Upper Bearing Minimum Weight Loss, mg	AMITRWL	ITRWL
Upper Bearing Maximum Weight Loss, mg	AMXTRWL	XTRWL
Outlier Ring [B]	OUTTR	
Top Rings with Plasma Flaking [C]	FLKTR	

[A] Results calculated without rings with plasma flanking.
[B] Ring number wear results are not currently outlier screened.
[C] Ring numbers: 1,2, etc. separated by commas. Example: 2,3,5

Cylinder #	2nd Ring SOT Weight, g	2nd Ring EOT Weight, g	Weight Loss, mg
1	R2WSOT1	R2WEOT1	R2WL1
2	R2WSOT2	R2WEOT2	R2WL2
3	R2WSOT3	R2WEOT3	R2WL3
4	R2WSOT4	R2WEOT4	R2WL4
5	R2WSOT5	R2WEOT5	R2WL5
6	R2WSOT6	R2WEOT6	R2WL6
		2nd Ring Average Weight Loss, mg	AR2WL
		2nd Ring Weight Loss Std. Dev., mg	SR2WL
		2nd Ring Min. Weight Loss, mg	IR2WL
		2nd Ring Max. Weight Loss, mg	XR2WL

Cylinder #	2nd Ring SOT Weight, g	2nd Ring EOT Weight, g	Weight Loss, mg
1	ORWSOT1	ORWEOT1	ORWL1
2	ORWSOT2	ORWEOT2	ORWL2
3	ORWSOT3	ORWEOT3	ORWL3
4	ORWSOT4	ORWEOT4	ORWL4
5	ORWSOT5	ORWEOT5	ORWL5
6	ORWSOT6	ORWEOT6	ORWL6
		Oil Ring Average Weight Loss, mg	AORWL
		Oil Ring Weight Loss Std. Dev., mg	SORWL
		Oil Ring Minimum Weight Loss, mg	IORWL
		Oil Ring Maximum Weight Loss, mg	XORWL

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RING/LINER WEAR TEST
Oil Analysis Summary
Form 5

Laboratory: LAB	EOT Date: RDTCOMP DTCOMP	EOT Time: REOTTIME EOTTIME
Test Number: TESTNUM		
Oil Code: CMIR OILCODE		
Formulation/Stand Code: FORM		

HOURS	SOOT Wt.% TGA	Viscosity At 100°C cSt	Viscosity Increase cSt	TBN Annex A7	TBN D2896	TAN Annex A8	Metals in Parts per Millions							
							Elements							
							Fe	Pb	Cu	Cr	Al	Si	Sn	Na
NEW	TGA_NEW	V100NEW		TBN4NEW	TBN2NEW	TAN_NEW	FEWMNEW	PBWMNEW	CUWMNEW	CRWMNEW	ALWMNEW	SIWMNEW	SNWMNEW	NAWMNEW
TST_H025	TGA_H025	V100H025	IVISH025	TBN4H025	TBN2H025	TAN_H025	FEWMH025	PBWMH025	CUWMH025	CRWMH025	ALWMH025	SIWMH025	SNWMH025	NAWMH025
TST_H050	TGA_H050	V100H050	IVISH050	TBN4H050	TBN2H050	TAN_H050	FEWMH050	PBWMH050	CUWMH050	CRWMH050	ALWMH050	SIWMH050	SNWMH050	NAWMH050
TST_H075	TGA_H075	V100H075	IVISH075	TBN4H075	TBN2H075	TAN_H075	FEWMH075	PBWMH075	CUWMH075	CRWMH075	ALWMH075	SIWMH075	SNWMH075	NAWMH075
TST_H752	TGA_H752													
75 AVG	RTGAAVG TGAAVG													
TST_H100	TGA_H100	V100H100	IVISH100	TBN4H100	TBN2H100	TAN_H100	FEWMH100	PBWMH100	CUWMH100	CRWMH100	ALWMH100	SIWMH100	SNWMH100	NAWMH100
TST_H150	TGA_H150	V100H150	IVISH150	TBN4H150	TBN2H150	TAN_H150	FEWMH150	PBWMH150	CUWMH150	CRWMH150	ALWMH150	SIWMH150	SNWMH150	NAWMH150
TST_H200	TGA_H200	V100H200	IVISH200	TBN4H200	TBN2H200	TAN_H200	FEWMH200	PBWMH200	CUWMH200	CRWMH200	ALWMH200	SIWMH200	SNWMH200	NAWMH200
TST_H250	TGA_H250	V100H250	IVISH250	TBN4H250	TBN2H250	TAN_H250	FEWMH250	PBWMH250	CUWMH250	CRWMH250	ALWMH250	SIWMH250	SNWMH250	NAWMH250
TST_H300	TGA_H300	V100H300	IVISH300	TBN4H300	TBN2H300	TAN_H300	FEWMH300	PBWMH300	CUWMH300	CRWMH300	ALWMH300	SIWMH300	SNWMH300	NAWMH300
TST_H350	TGA_H350	V100H350	IVISH350	TBN4H350	TBN2H350	TAN_H350	FEWMH350	PBWMH350	CUWMH350	CRWMH350	ALWMH350	SIWMH350	SNWMH350	NAWMH350
TST_H400	TGA_H400	V100H400	IVISH400	TBN4H400	TBN2H400	TAN_H400	FEWMH400	PBWMH400	CUWMH400	CRWMH400	ALWMH400	SIWMH400	SNWMH400	NAWMH400
TST_H425								PBWMH425						
TST_H450	TGA_H450	V100H450	IVISH450	TBN4H450	TBN2H450	TAN_H450	FEWMH450	PBWMH450	CUWMH450	CRWMH450	ALWMH450	SIWMH450	SNWMH450	NAWMH450
TST_H475								PBWMH475						
TST_H500	TGA_H500	V100H500	IVISH500	RTBN500 TBN500	TBN2H500	TAN_H500	FEWMH500	PBWMH500	CUWMH500	CRWMH500	ALWMH500	SIWMH500	SNWMH500	NAWMH500

Summary	As Measured	Outlier Bearing Adjusted
Delta Pb @ EOT, ppm	AMDPBEOT	RDPBEOT DPBEOT

D 6483 MACK T-9
RING/LINER WEAR TEST
Liner Surface Roughness & Bore Diameter
Form 6

Laboratory: LAB	EOT Date: RDTCOMP DTCOMP	EOT Time: REOTTIME EOTTIME
Test Number: TESTNUM		
Oil Code: CMIR OILCODE		
Formulation/Stand Code: FORM		

LINER NO.	LOCATION	Ra (µm)	BORE DIAMETER (mm)		Ra (µm)	DIA. (mm)
1	Top Ring Travel @ 0˚C	LIN1RAA	LIN1IDA	AVG	ALIN1RA	ALIN1ID
	Top Ring Travel @ 90˚C	LIN1RAB	LIN1IDB	STD DEV	SLIN1RA	
	Top Ring Travel @ 180˚C	LIN1RAC		MIN	ILIN1RA	
	Top Ring Travel @ 270˚C	LIN1RAD		MAX	XLIN1RA	
2	Top Ring Travel @ 0˚C	LIN2RAA	LIN2IDA	AVG	ALIN2RA	ALIN2ID
	Top Ring Travel @ 90˚C	LIN2RAB	LIN2IDB	STD DEV	SLIN2RA	
	Top Ring Travel @ 180˚C	LIN2RAC		MIN	ILIN2RA	
	Top Ring Travel @ 270˚C	LIN2RAD		MAX	XLIN2RA	
3	Top Ring Travel @ 0˚C	LIN3RAA	LIN3IDA	AVG	ALIN3RA	ALIN3ID
	Top Ring Travel @ 90˚C	LIN3RAB	LIN3IDB	STD DEV	SLIN3RA	
	Top Ring Travel @ 180˚C	LIN3RAC		MIN	ILIN3RA	
	Top Ring Travel @ 270˚C	LIN3RAD		MAX	XLIN3RA	
4	Top Ring Travel @ 0˚C	LIN4RAA	LIN4IDA	AVG	ALIN4RA	ALIN4ID
	Top Ring Travel @ 90˚C	LIN4RAB	LIN4IDB	STD DEV	SLIN4RA	
	Top Ring Travel @ 180˚C	LIN4RAC		MIN	ILIN4RA	
	Top Ring Travel @ 270˚C	LIN4RAD		MAX	XLIN4RA	
5	Top Ring Travel @ 0˚C	LIN5RAA	LIN5IDA	AVG	ALIN5RA	ALIN5ID
	Top Ring Travel @ 90˚C	LIN5RAB	LIN5IDB	STD DEV	SLIN5RA	
	Top Ring Travel @ 180˚C	LIN5RAC		MIN	ILIN5RA	
	Top Ring Travel @ 270˚C	LIN5RAD		MAX	XLIN5RA	
6	Top Ring Travel @ 0˚C	LIN6RAA	LIN6IDA	AVG	ALIN6RA	ALIN6ID
	Top Ring Travel @ 90˚C	LIN6RAB	LIN6IDB	STD DEV	SLIN6RA	
	Top Ring Travel @ 180˚C	LIN6RAC		MIN	ILIN6RA	
	Top Ring Travel @ 270˚C	LIN6RAD		MAX	XLIN6RA	

	Ra (µm)	BORE DIAMETER (mm)
Average Surface Roughness & Bore Diameter	ALINRA	ALINID
Standard Deviation Surface Roughness & Bore Diameter	SLINRA	SLINID
Minimum Surface Roughness & Bore Diameter	ILINRA	ILINID
Maximum Surface Roughness & Bore Diameter	XLINRA	XLINID

D 6483 MACK T-9
RING/LINER WEAR TEST
Liner Wear Summary
Form 7

Laboratory: LAB	EOT Date: RDTCOMP DTCOMP	EOT Time: REOTTIME EOTTIME
Test Number: TESTNUM		
Oil Code: CMIR OILCODE		
Formulation/Stand Code: FORM		

POSITION	WEAR STEP (µm) Cylinder Number 1	2	3	4	5	6
1:00	C1LW1	C2LW1	C3LW1	C4LW1	C5LW1	C6LW1
2:00	C1LW2	C2LW2	C3LW2	C4LW2	C5LW2	C6LW2
3:00 (Thrust)	C1LW3	C2LW3	C3LW3	C4LW3	C5LW3	C6LW3
4:00	C1LW4	C2LW4	C3LW4	C4LW4	C5LW4	C6LW4
5:00	C1LW5	C2LW5	C3LW5	C4LW5	C5LW5	C6LW5
6:00 (Rear)	C1LW6	C2LW6	C3LW6	C4LW6	C5LW6	C6LW6
7:00	C1LW7	C2LW7	C3LW7	C4LW7	C5LW7	C6LW7
8:00	C1LW8	C2LW8	C3LW8	C4LW8	C5LW8	C6LW8
9:00 (Anti-Thrust)	C1LW9	C2LW9	C3LW9	C4LW9	C5LW9	C6LW9
10:00	C1LW10	C3LW10	C4LW10	C5LW10	C6LW10	C2LW10
11:00	C1LW11	C2LW11	C3LW11	C4LW11	C5LW11	C6LW11
12:00 (Front)	C1LW12	C2LW12	C3LW12	C4LW12	C5LW12	C6LW12
Average	C1ALW	C2ALW	C3ALW	C4ALW	C5ALW	C6ALW

Summary	As Measured	Outlier Screened	Adjusted to 1.75% Soot
Average, µm	AMACLW	ACLW	RALW ALW
Std. Dev., µm	AMSCLW	SCLW	
Minimum, µm	AMICLW	ICLW	
Maximum, µm	AMXCLW	XCLW	
Ring Flaked Outliers [B]	FLKLIN		
Outlier Liners [C]	OUTLIN		

[A] Do not use data from liners with top ring plasma flaking for determining "As Measured" result.
[B] Cylinder Number: 1,2, etc. separated by commas. Example: 2,3
[C] Cylinder Number.

D 6483 MACK T-9
RING/LINER WEAR TEST
Unscheduled Downtime & Maintenance Summary
Form 8

Laboratory: LAB	EOT Date: RDTCOMP DTCOMP	EOT Time: REOTTIME EOTTIME
Test Number: TESTNUM		
Oil Code: CMIR OILCODE		
Formulation/Stand Code: FORM		

Number of Downtime Occurrences		DWNOCR	
Test Hours	Date	Downtime	Reasons
DOWNR001	DDATR001	DTIMR001	DREAR001
DOWNR002	DDATR002	DTIMR002	DREAR002
DOWNR003	DDATR003	DTIMR003	DREAR003
DOWNR004	DDATR004	DTIMR004	DREAR004
DOWNR005	DDATR005	DTIMR005	DREAR005
DOWNR006	DDATR006	DTIMR006	DREAR006
DOWNR007	DDATR007	DTIMR007	DREAR007
DOWNR008	DDATR008	DTIMR008	DREAR008
DOWNR009	DDATR009	DTIMR009	DREAR009
DOWNR010	DDATR010	DTIMR010	DREAR010
DOWNR011	DDATR011	DTIMR011	DREAR011
DOWNR012	DDATR012	DTIMR012	DREAR012
DOWNR013	DDATR013	DTIMR013	DREAR013
DOWNR014	DDATR014	DTIMR014	DREAR014
DOWNR015	DDATR015	DTIMR015	DREAR015
		TOTLDOWN	Total Downtime (hours)

Other Comments		
Number of Comment Lines	TOTCOM	
OCOMR001		
OCOMR002		
OCOMR003		
OCOMR004		
OCOMR005		
OCOMR006		
OCOMR007		
OCOMR008		
OCOMR009		
OCOMR010		
OCOMR011		
OCOMR012		
OCOMR013		
OCOMR014		
OCOMR015		

D 6483 MACK T-9
RING/LINER WEAR TEST
Unscheduled Downtime & Maintenance Summary
Form 8A

Laboratory: LAB	EOT Date: RDTCOMP DTCOMP	EOT Time: REOTTIME EOTTIME
Test Number: TESTNUM		
Oil Code: CMIR OILCODE		
Formulation/Stand Code: FORM		

Number of Downtime Occurrences		DWNOCR	
Test Hours	Date	Downtime	Reasons
DOWNR016	DDATR016	DTIMR016	DREAR016
DOWNR017	DDATR017	DTIMR017	DREAR017
DOWNR018	DDATR018	DTIMR018	DREAR018
DOWNR019	DDATR019	DTIMR019	DREAR019
DOWNR020	DDATR020	DTIMR020	DREAR020
DOWNR021	DDATR021	DTIMR021	DREAR021
DOWNR022	DDATR022	DTIMR022	DREAR022
DOWNR023	DDATR023	DTIMR023	DREAR023
DOWNR024	DDATR024	DTIMR024	DREAR024
DOWNR025	DDATR025	DTIMR025	DREAR025
DOWNR026	DDATR026	DTIMR026	DREAR026
DOWNR027	DDATR027	DTIMR027	DREAR027
DOWNR028	DDATR028	DTIMR028	DREAR028
DOWNR029	DDATR029	DTIMR029	DREAR029
DOWNR030	DDATR030	DTIMR030	DREAR030
		TOTLDOWN	Total Downtime (hours)

Other Comments		
Number of Comment Lines	TOTCOM	
OCOMR016		
OCOMR017		
OCOMR018		
OCOMR019		
OCOMR020		
OCOMR021		
OCOMR022		
OCOMR023		
OCOMR024		
OCOMR025		
OCOMR026		
OCOMR027		
OCOMR028		
OCOMR029		
OCOMR030		

D 6483 MACK T-9
RING/LINER WEAR TEST
Unscheduled Downtime & Maintenance Summary
Form 8B

Laboratory: LAB	EOT Date: RDTCOMP DTCOMP	EOT Time: REOTTIME EOTTIME
Test Number: TESTNUM		
Oil Code: CMIR OILCODE		
Formulation/Stand Code: FORM		

Number of Downtime Occurrences		DWNOCR	
Test Hours	Date	Downtime	Reasons
DOWNR031	DDATR031	DTIMR031	DREAR031
DOWNR032	DDATR032	DTIMR032	DREAR032
DOWNR033	DDATR033	DTIMR033	DREAR033
DOWNR034	DDATR034	DTIMR034	DREAR034
DOWNR035	DDATR035	DTIMR035	DREAR035
DOWNR036	DDATR036	DTIMR036	DREAR036
DOWNR037	DDATR037	DTIMR037	DREAR037
DOWNR038	DDATR038	DTIMR038	DREAR038
DOWNR039	DDATR039	DTIMR039	DREAR039
DOWNR040	DDATR040	DTIMR040	DREAR040
DOWNR041	DDATR041	DTIMR041	DREAR041
DOWNR042	DDATR042	DTIMR042	DREAR042
DOWNR043	DDATR043	DTIMR043	DREAR043
DOWNR044	DDATR044	DTIMR044	DREAR044
DOWNR045	DDATR045	DTIMR045	DREAR045
		TOTLDOWN	Total Downtime (hours)

Other Comments		
Number of Comment Lines	TOTCOM	
OCOMR031		
OCOMR032		
OCOMR033		
OCOMR034		
OCOMR035		
OCOMR036		
OCOMR037		
OCOMR038		
OCOMR039		
OCOMR040		
OCOMR041		
OCOMR042		
OCOMR043		
OCOMR044		
OCOMR045		

D 6483 MACK T-9
RING/LINER WEAR TEST
Test Fuel Analysis (Last Batch)
Form 9

Laboratory: LAB	EOT Date: RDTCOMP DTCOMP	EOT Time: REOTTIME EOTTIME
Test Number: TESTNUM		
Oil Code: CMIR OILCODE		
Formulation/Stand Code: FORM		
Supplier: FUELSUP	Batch Identifiers: FUELBTID	

Measurement	Specs.	Analysis		Test Method
		NEW	EOT	
Total Sulfur, % Weight	0.03 – 0.05	FUELSNEW	FUELSEOT	D 2622
Gravity, °API	32 – 36	APIGRNEW	APIGREOT	D 287 or D 4052
Hydrocarbon Composition				
Aromatics % Vol.	28 – 35	FUELAROM		D 1319
Olefin	Report	FUELOLEF		D 1319
Saturates	Report	FUELSATU		D 1319
Cetane Index	Report	CETANEIN		D 976 & D 4737
Cetane No.	42 – 48	CETANENO		D 613
Copper Strip Corrosion	1 Maximum	FUELCU		D 130
Flash Point, °C	54 Minimum	FLASHPT		D 93
Cloud Point, °C	-12 Maximum	FUELCLOU		D 2500
Pour Point, °C	-18 Maximum	FUELPOUR		D 97
Carbon Residue on 10% Residuum, %	0.35 Maximum	FUELCRES		D 524 (10% Bottoms)
Water & Sediment, % Vol.	0.05 Maximum	FUELH2O		D 2709
Ash, % Wgt.	0.01 Maximum	FUELASH		D 482
Viscosity, cSt @ 40°C	2.0 – 3.2	KINVIS		D 445
Distillation, °C				
IBP	177-199	FUELIBP		D 86
10%	210-232	FUEL10		D 86
50%	249-277	FUEL50		D 86
90%	299-327	FUEL90		D 86
EP	327-360	FUELEP		D 86

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RING/LINER WEAR TEST
Characteristics of the Data Acquisition System
Form 10

Laboratory: LAB	EOT Date: RDTCOMP DTCOMP	EOT Time: REOTTIME EOTTIME
Test Number: TESTNUM		
Oil Code: CMIR OILCODE		
Formulation/Stand Code: FORM		

PARAMETER (1)	SENSING DEVICE (2)	CALIBRATION FREQUENCY (3)	RECORD DEVICE (4)	OBSERVATION FREQUENCY (5)	RECORD FREQUENCY (6)	LOG FREQUENCY (7)	SYSTEM RESPONSE (8)
Temperatures							
Oil @ Filt.	OTEMSENS	OTEMCALF	OTEMRECD	OTEMOBSF	OTEMRECF	OTEMLOGF	OTEMSYSR
Fuel In.	FTEMSENS	FTEMCALF	FTEMRECD	FTEMOBSF	FTEMRECF	FTEMLOGF	FTEMSYSR
Intake Air	AITSENS	AITCALF	AITRECD	AITOBSF	AITRECF	AITLOGF	AITSYSR
Intake Man.	IMANSENS	IMANCALF	IMANRECD	IMANOBSF	IMANRECF	IMANLOGF	IMANSYSR
Pre-Turb.	PTURSENS	PTURCALF	PTURRECD	PTUROBSF	PTURRECF	PTURLOGF	PTURSYSR
Cool. Out	COTSENS	COTCALF	COTRECD	COTOBSF	COTRECF	COTLOGF	COTSYSR
Other							
Fuel Flow	FFLOSENS	FFLOCALF	FFLORECD	FFLOOBSF	FFLORECF	FFLOLOGF	FFLOSYSR
Engine RPM	RPMSENS	RPMCALF	RPMRECD	RPMOBSF	RPMRECF	RPMLOGF	RPMSYSR
Load	LOADSENS	LOADCALF	LOADRECD	LOADOBSF	LOADRECF	LOADLOGF	LOADSYSR
Inlet Restr.	INRESENS	INRECALF	INRERECD	INREOBSF	INRERECF	INRELOGF	INRESYSR
Exh. Press.	EXPRSENS	EXPRCALF	EXPRRECD	EXPROBSF	EXPRRECF	EXPRLOGF	EXPRSYSR
Oil Gal. Press.	OILGSENS	OILGCALF	OILGRECD	OILGOBSF	OILGRECF	OILGLOGF	OILGSYSR

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 if recorded 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

D 6483 MACK T-9
RING/LINER WEAR TEST
Build-up and Hardware Information
Form 11

Laboratory: LAB	EOT Date: RDTCOMP DTCOMP	EOT Time: REOTTIME EOTTIME
Test Number: TESTNUM		
Oil Code: CMIR OILCODE		
Formulation/Stand Code: FORM		

STATIC INJECTION TIMING

Timing Hours	Timing (Deg)
SITHR001	SIT_R001
SITHR002	SIT_R002
SITHR003	SIT_R003
SITHR004	SIT_R004
SITHR005	SIT_R005
SITHR006	SIT_R006
SITHR007	SIT_R007
SITHR008	SIT_R008
SITHR009	SIT_R009
SITHR010	SIT_R010
SITHR011	SIT_R011
SITHR012	SIT_R012
SITHR013	SIT_R013
SITHR014	SIT_R014
SITHR015	SIT_R015
TOTSIT	Total Timing Changes

HARDWARE

Part	Part Number	Serial Number
Injection Pump	INJPMPPN	INJPMPSN
Secondary Charger	TRBCHGPN	
Cylinder Head (front)	CYLHFRPN	CYLHFRSN
Cylinder Head (rear)	CYLHRRPN	CYLHRRSN
Pistons	PISTONPN	
Injection Nozzles	INJNOZPN	
Rod Bearings	RODBRGPN	
Liners	LINERPN	
Ring Set	RINGSTPN	

Cylinder Kit Location	CPD ID Number
Cylinder 1	CPDIDC1
Cylinder 2	CPDIDC2
Cylinder 3	CPDIDC3
Cylinder 4	CPDIDC4
Cylinder 5	CPDIDC5
Cylinder 6	CPDIDC6

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RING/LINER WEAR TEST
Build-up and Hardware Information
Form 11A

Laboratory: LAB	EOT Date: RDTCOMP DTCOMP	EOT Time: REOTTIME EOTTIME
Test Number: TESTNUM		
Oil Code: CMIR OILCODE		
Formulation/Stand Code: FORM		

STATIC INJECTION TIMING

Timing Hours	Timing (Deg)
SITHR016	SIT_R016
SITHR017	SIT_R017
SITHR018	SIT_R018
SITHR019	SIT_R019
SITHR020	SIT_R020
SITHR021	SIT_R021
SITHR022	SIT_R022
SITHR023	SIT_R023
SITHR024	SIT_R024
SITHR025	SIT_R025
SITHR026	SIT_R026
SITHR027	SIT_R027
SITHR028	SIT_R028
SITHR029	SIT_R029
SITHR030	SIT_R030
TOTSIT	Total Timing Changes

HARDWARE

Part	Part Number	Serial Number
Injection Pump	INJPMPPN	INJPMPSN
Secondary Charger	TRBCHGPN	
Cylinder Head (front)	CYLHFRPN	CYLHFRSN
Cylinder Head (rear)	CYLHRRPN	CYLHRRSN
Pistons	PISTONPN	
Injection Nozzles	INJNOZPN	
Rod Bearings	RODBRGPN	
Liners	LINERPN	
Ring Set	RINGSTPN	

Cylinder Kit Location	CPD ID Number
Cylinder 1	CPDIDC1
Cylinder 2	CPDIDC2
Cylinder 3	CPDIDC3
Cylinder 4	CPDIDC4
Cylinder 5	CPDIDC5
Cylinder 6	CPDIDC6

D 6483 MACK T-9
RING/LINER WEAR TEST
Build-up and Hardware Information
Form 11B

Laboratory: LAB	EOT Date: RDTCOMP DTCOMP	EOT Time: REOTTIME EOTTIME
Test Number: TESTNUM		
Oil Code: CMIR OILCODE		
Formulation/Stand Code: FORM		

STATIC INJECTION TIMING

Timing Hours	Timing (Deg)
SITHR031	SIT_R031
SITHR032	SIT_R032
SITHR033	SIT_R033
SITHR034	SIT_R034
SITHR035	SIT_R035
SITHR036	SIT_R036
SITHR037	SIT_R037
SITHR038	SIT_R038
SITHR039	SIT_R039
SITHR040	SIT_R040
SITHR041	SIT_R041
SITHR042	SIT_R042
SITHR043	SIT_R043
SITHR044	SIT_R044
SITHR045	SIT_R045
TOTSIT	Total Timing Changes

HARDWARE

Part	Part Number	Serial Number
Injection Pump	INJPMPPN	INJPMPSN
Secondary Charger	TRBCHGPN	
Cylinder Head (front)	CYLHFRPN	CYLHFRSN
Cylinder Head (rear)	CYLHRRPN	CYLHRRSN
Pistons	PISTONPN	
Injection Nozzles	INJNOZPN	
Rod Bearings	RODBRGPN	
Liners	LINERPN	
Ring Set	RINGSTPN	

Cylinder Kit Location	CPD ID Number
Cylinder 1	CPDIDC1
Cylinder 2	CPDIDC2
Cylinder 3	CPDIDC3
Cylinder 4	CPDIDC4
Cylinder 5	CPDIDC5
Cylinder 6	CPDIDC6

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RING/LINER WEAR TEST
Form 12
American Chemistry Council Code of Practice
Test Laboratory Conformance Statement

Test Laboratory		SUBLAB			
Test Sponsor		TSTSPON1			
Formulation / Stand Code		FORM			
Test Number		TESTNUM			
Start Date	DTSTRT	Start Time	STRTTIME	Time Zone	TZONE

Declarations

No. 1 All requirements of the ACC Code of Practice for which the test laboratory is responsible were met in the conduct of this test. Yes YESRQMET No NORQMET*

No. 2 The laboratory ran this test for the full duration following all procedural requirements; and all operational validity requirements of the latest version of the applicable test procedure (ASTM or other) including all updates issued by the organization responsible for the test, were met. Yes YESFULL No NOFULL *

If the response to this Declaration is "No", does the test engineer consider the deviations from operational validity requirements that occurred to be beyond the control of the laboratory? Yes YESNODEC* No NONODEC

No. 3 A deviation occurred for one of the test parameters identified by the organization responsible for the test as being a special case. Yes YESDEV * No NODEV *(This currently applies only to specific deviations identified in the ASTM Information Letter System)*

Check The Appropriate Conclusion

INCLUDE	Operational review of this test indicates that the results should be included in the Multiple Test Acceptance Criteria calculations.
DONOTINC	*Operational review of this test indicates that the results should not be included in the Multiple Test Acceptance Criteria calculations.

Note: *Supporting comments are required for all responses identified with an asterisk.*

Comments
ACCCOMM1
ACCCOMM2
ACCCOMM3
ACCCOMM4

SUBSIGIM
Signature

SUBDATE
Date

SUBNAME
Typed Name

SUBTITLE
Title