Test Method D5967 Mack T-8

Version	
v CI SIUII	

Method:

Conducted For

T-8A:	V = Valid	The Reference Oil/Non-Reference Oil was evaluated in accordance with the test procedure.
T-8:	I = Invalid	The Reference Oil/Non-Reference was not evaluated in accordance with the test procedure
T-8E:	N = Not Interpretable	The Non-Reference Oil results cannot be interpreted and shall not be used in determining an average test result using multiple test criteria.

Stand:	Stand Run No.:	Engine No.:	Engine Hours:	
End Of Tes	st Date:	End Of Test Time	:	
Oil Code/C	MIR: A			
T-8 Formu	lation/Stand Code:			
T-8E Form	T-8E Formulation/Stand Code:			
Alternate C	Codes:			

^A CMIR or Non-Reference Oil Code

	Submitted By:
Testing Laboratory	
Signature	
Typed Name	
Title	

Test Method D5967 - Mack T-8 **Test Result Summary**

T-8 Formulation/Stand Code: T-8E Formulation/Stand Code:	tion/Standlation/Sta	d Code: and Code:						Test Length: ^A	l; A	
		Reference Oil Test	Oil Test				No	Non-Reference Oil Test	Oil Test	
CMIR No.:						Oil Code:				
TMC		Test	Test	Engine Block	Rebuild		Test	Test	Engine	Engine
Oil	Test	Stand	Stand	Serial	Block	Test	Stand	Stand	Block	Block
No.	Lab	No.	Run No.	No.	Hours	Lab	No.	Run No.	Serial NO.	Hours
Date Test Started:	ırted:	Date Test Completed:	ompleted:	EOT Time:	ë	Date Test Started:	arted:	Date Test Completed:	ompleted:	EOT Time:
Laboratory Oil Code:	liC					Laboratory Oil Code:	Oil			
SAE Viscosity:	y:					SAE Viscosity:	ty:			

Viscosity Slope 100 - 150 h, cSt/h	Viscosity Slope 100 - 150 h, cSt/h
Viscosity Increase At 3.8% TGA, cSt	Viscosity Increase At 3.8% TGA, cSt
	Severity Adjustment For Viscosity Inc. At 3.8% TGA, cSt
	Adjusted Viscosity Increase At 3.8% TGA, cSt
Relative Viscosity At 4.8%, TGA (50% Loss) ^B	Relative Viscosity At 4.8%, TGA (50% Loss) ^B
	Severity Adjustment For Relative Viscosity
	Adjusted Relative Viscosity (50% Loss) B
Relative Viscosity At 4.8%, TGA (100% Loss) ^B	Relative Viscosity At 4.8%, TGA (100% Loss) ^B
	Severity Adjustment For Relative Viscosity
	Adjusted Relative Viscosity (100% Loss) B
TGA Soot % At 250 h	TGA Soot % At 250 h
TGA Soot % At 300 h	TGA Soot % At 300 h
Average Oil Consumption At 250 h (g/kW-h)	Average Oil Consumption At 250 h (g/kW-h)
Oil Filter Delta At 250 h, kPa	Oil Filter Delta At 250 h, kPA

^A Test length is discussed in sections 1.2, 4.1 A8.3.1 and A9.3.1 ^B Relative viscosities are calculated using shear loss determined by D6278

TEST METHOD D5967 FORM 2 OPERATIONAL SUMMARY A

Laboratory	Start Date
Test Number ^B	
Oil Code	
T-8 Formulation/Stand Code:	
T-8E Formulation/Stand Code:	

TEST PARAMETER	SPECIFICATION	AVERAGE	STD. DEV.	MINIMUM	MAXIMUM
Engine Speed, r/min	1800 + 5				
Torque, N-m	1369 – 1398				
Fuel Flow, kg/h	63.28 + 0.63				
Humidity, g/kg	Report				
Blowby, L/min	Report				
TEMPERATURES	SPECIFICATION	AVERAGE	STD. DEV	MINIMUM	MAXIMUM
Coolant Out, °C	85 <u>+</u> 3				
Coolant In. °C	Report Only				
Oil, °C	100 - 107				
Fuel In, °C	40 <u>+</u> 1				
Intake Air, °C	25 <u>+</u> 3				
Intake Manifold, °C	43 <u>+</u> 3				
Pre- Turb. (F), °C	602 - 632				
Pre-Turbo (R), °C	602 - 632				
TailPipe, °C	455 - 474				
PRESSURES	SPECIFICATION	AVERAGE	STD.DEV	MINIMUM	MAXIMUM
Oil Gallery, kPa	372 -441				
Crankcase, kPa	0.50 <u>+</u> 0.25				
Exhaust, kPa	3.1 <u>+</u> 0.4				
Oil Filter Delta, kPa	138 Max.				
Inlet Air Res., kPa	2.5 <u>+</u> 0.25				
Intake Manifold, kPa	186 - 199				
Compressor Discharge, kPa	Report				
Intercooler Delta, kPa	13.6 Maximum				

A ALL DATA VALUES SHOWN ARE BASED ON TEST LENGTH REPORTED ON FORM1 B TEST NUMBER IS: STAND – STAND RUN NO. – ENGINE SERIAL NO. – ENGINE HOURS

TEST METHOD D5967 FORM 3

VISCOSITY INCREASE VERSUS TIME

Laboratory	ory						Sta	Start Date					
Test Number ^B	mpe	ir B					Oil Code						
T-8 Fon	mula	T-8 Formulation/Stand Code:											
T-8E Fc)rmu	T-8E Formulation/Stand Code	e										
	08												
	92												
1 S	09												
ze, c	20												
CKE∀	9												
NI AJ	30												
LISOD	20												
SIA	10												
	0												
	-10												
		0 25	20	75	100	125	150 1	175	200	225	250	275	300

TEST HOURS

TEST METHOD D5967 FORM 4 OIL ANALYSIS SUMMARY

Laboratory	Start Date
Test Number B	
Oil Code	
T-8 Formulation/Stand Code:	
T-8E Formulation/Stand Code:	

Hours	Soot TGA%	Viscosity (cSt)	Viscosity Increase From Minimum (cSt)
250 (2.1)			
250 (2nd)			
250 (Average)			
1			

Viscosity Increase @ 3.8% TGA Soot Level	
D6278 Un sheared Viscosity (cSt), Vu	
D6278 Sheared Viscosity (cSt), Vs	
Relative Viscosity @, 4.8% TGA Soot Level (50% Loss) A	
Relative Viscosity @, 4.8% TGA Soot Level (100% Loss) A	

	Parts per million (ppm) at Test Hour		
ELEMENT			
Fe			
Pb			
Cu			
Cr			
Al			
Si			
Na			

	Pre-Test	Post-Test	Mass Gain
Centrifugal Oil Filter mass: grams			

^ARelative viscosities are calculated using shear loss determined by D5278.

TEST METHOD D5967 FORM 5

TEST FUEL ANALYSIS (LAST BATCH)

Laboratory	Start Date
Test Number ^B	
Oil Code	
T-8 Formulation/Stand Code:	
T-8E Formulation/Stand Code:	
Supplier:	Batch Identifiers:

Measurement	Specs.	An	alysis	Test Method
		NEW	EDT	
Total Sulfur, % wt	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 max			D 130
Flash Point, °C	54 min			D 93
Cloud Point °C	-12 max			D 2500
Pour Point °C	-18 max			D97
				D 524
Carbon Residue on 10% Residium, %	0.35 max			(10 % Bottoms)
Water & Sediment, % Vol	0.05 max			D 2709
Ash, % wt	0.01 max			D482
Viscosity, cSt @ 40 °C	2.0 - 3.2			D445
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

TEST METHOD D5967 FORM 6 DOWN TIME AND COMMENTS

boratory			Start Date
st Number ^B	y Start Date		
t Number			
Code	'~: 1 Code		
Formulation			
BE Formulatio	n/Stana Cou	<u>ie:</u>	
. CD	. 0		
Number of Do	owntime Occu	rrences	
Test Hours	Date	Downtime	Reasons
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TEST METHOD D5967 FORM 6A DOWN TIME AND COMMENTS

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Number ^B	ber B			
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ormulation/	/Stand Code:			
	on/Stand Code			
ımber of Do	wntime Occur	rrences		
Test	Date	Downtime	Reasons	
Hours	Duit	Downling	Rougons	
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TEST METHOD D5967 FORM 6B DOWN TIME AND COMMENTS

ratory			Start Date
Number B			
ode			
	/Stand Code:		
Formulatio	on/Stand Cod	le:	
	wntime Occur	rrences	
Test	Date	Downtime	Reasons
Hours			
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	Comments		
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TEST METHOD D5967 FORM 7 CHARACTERISTICS OF THE DATA ACQUISTION SYSTEM

Laboratory	Start Date
Test Number B	
Oil Code	
Γ-8 Formulation/Stand Code:	
T-8E Formulation/Stand Code:	

PARAMETER	SENSING DEVICE	CALIBRATION FREQUENCY	RECORD DEVICE	OBSERVATION FREQUENCY	RECORD FREQUENCY	LOG FREQUENCY	SYSTEM RESPONSE
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Temperatures							
OIL@ FILT.							
FUEL IN.							
INTAKE AIR							
INTAKE MAN							
PRE- TURB.							
COOL. OUT							
Other		•		•			
FUEL FLOW							
ENGINE RPM							
LOAD							
INLET RESTR							
EXH. PRESS.	-		·				
OIL GAL PRES							

LEUEND:

- (I) 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-HANDLOGSHEET

DL -AUTOMATIC DATA LOGGER

SC-STRIPCHARTRECORDER

C/M -COMPUTER, USING MANUAL DATA ENTRY

 $\mbox{C/D}$ -COMPUTER, USING DIRECT $\mbox{\it VO}$ 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

TEST METHOD D5967 FORM 8 BUILD-UP AND HARDWARE INFORMATION

Laboratory	Start Date
Test Number B	
Oil Code	
T-8 Formulation/Stand Code:	
T-8E Formulation/Stand Code:	

TIMING

Lite/HPC Offset (deg)	
Piston Travel to TDC (deg)	
Timing (deg)	

PARTS

Part	Part Number	Serial Number
Injection Pump		
Turbo Charger		
Cylinder Head (front)		
Cylinder Head (rear)		
Pistons		
Injection Nozzles		

TEST METHOD D5967 FORM 9 OPERATIONAL DATA

aboratory	Start Date
Гest Number ^В	
Oil Code	
7-8 Formulation/Stand Code:	
T-8E Formulation/Stand Code:	
	ENGINE SPEED (R/MIN) PLOT
	1
	TORQUE (N-M) PLOT
	FUEL FLOW (KG/H) PLOT
	AVERAGE PRE-TURBINE TEMPERATURE (°C) PLOT
	TAILPIPE TEMPERATURE (°C) PLOT

TEST METHOD D5967 FORM 10 OPERATIONAL DATA

aboratory	Start Date	
Test Number B Dil Code		
7-8 Formulation/Stand Code:		
7-8E Formulation/Stand Code:		
	COOLANT IN TEMPERATURE (°C) PLOT	
	COOLANT OUT TEMPERATURE (°C) PLOT	
	OIL TEMPERATURE (°C) PLOT	
	FUEL IN TEMPERATURE (°C) PLOT	

TEST METHOD D5967 FORM 11 OPERATIONAL DATA

aboratory	Start Date
est Number ^B il Code	
8 Formulation/Stand Code:	
8E Formulation/Stand Code:	
	INTAKE AIR TEMPERATURE (°C) PLOT
	INTAKE MANIFOLD TEMPERATURE (°C) PLOT
	OIL GALLERY PRESSURE (KPA) PLOT
	OIL FILTER PRESSURE (KPA) PLOT

TEST METHOD D5967 FORM 12 OPERATIONAL DATA

aboratory	Start Date
est Number ^B	
il Code	
8 Formulation/Stand Code:	
8E Formulation/Stand Code:	
	CRANKCASE PRESSURE (KPA) PLOT
	EXHAUST PRESSURE (KPA) PLOT
	INLET AIR RESTRICTION (KPA) PLOT
	INTAKE MANIFOLD PRESSURE (KPA) PLOT

TEST METHOD D5967 FORM 13 ROTATIONAL VISCOSITY ANALYSIS SUMMARY

Laboratory	Start Date
Test Number ^B	
Oil Code	
T-8 Formulation/Stand Code:	
T-8E Formulation/Stand Code:	

Hours	Viscosity at 100 deg C (mPa-s)		Rate Index	
	Increasing	Decreasing	Increasing	Decreasing

TEST METHOD D5967

Form 14

American Chemistry Council Code of Practice Test Laboratory Conformance Statement

Test Lab	oratory			
Test Spor	nsor			
T8E Form	nulation / Stand Cod	le		
Test Nun	nber			
Start Dat	e	Start Time	Time Zone	
	<u> </u>			
		Declara	tions	
No. 1	All requirements	of the ACC Code of Pract	cice for which the test laborate	orv is responsible were
110.1	-	et of this test. Yes		ory is responsible were
	mer m me conda			
No. 2	operational valid other) including	ity requirements of the late	tion following all procedural est version of the applicable to rganization responsible for the	est procedure (ASTM or
	operational valid	· ·	does the test engineer considerred to be beyond the control	
No. 3	the test as being	a special case. Yes	A Information Letter System)	nnization responsible for is currently applies only
		спеск Тпе Арргорг	tute Conclusion	
	Mult	iple Test Acceptance Crite		
			t indicates that the results sho	uld not be included in
	the N	Multiple Test Acceptance (Criteria calculations.	
Note: Suppo	orting comments are	1 , , ,	identified with an asterisk.	
		Comm	ents	
Signature			Da	te
Typed Name	e		Tit	le

TEST METHOD D5967

Form 14A

American Chemistry Council Code of Practice Test Laboratory Conformance Statement

		1		
Test Labor	ratory			
Test Spons	sor			
T8 Formu	lation / Stand C	Code		
Test Numl	oer			
Start Date		Start Time	Time Zone	
		Decl	arations	
No. 1			ractice for which the test labo No*	ratory is responsible were
No. 2	operational v other) includ	alidity requirements of the	duration following all procedulatest version of the applicable organization responsible for	le test procedure (ASTM or
	operational v		o", does the test engineer conc ccurred to be beyond the cont	
No. 3	the test as be	ing a special case. Yes	parameters identified by the o * No STM Information Letter Syste	(This currently applies only
		Check The Appr	opriate Conclusion	
	1	Multiple Test Acceptance (
		Operational review of this he Multiple Test Acceptan	s test indicates that the results ce Criteria calculations.	should not be included in
Note: Suppor	ting comments		nses identified with an asterisi	k.
		Con	nments	
Signature				Date
Typed Name				Title