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T-12 INFORMATION LETTER 07-1
Sequence No. 1
February 1, 2007

ASTM consensus has not been obtained on this information letter. An appropriate ASTM ballot will be issued in order to achieve such consensus.

TO: Mack Mailing List

SUBJECT: Deleted Fuel Sulfur Measurement Test Method
Deleted Piston Deposit Measurement Requirement
Updated Valve Guide Reaming Procedure
Operational Quality Index Assessment Added

The Mack Test Surveillance Panel approved the following changes to the T-12 test procedure:

Deleted Fuel Sulfur Measurement Test Method

Test Method D 129 has been removed from the list of substitute fuel sulfur measurement methods. Section 10.4.1.2 has been modified accordingly.

Deleted Piston Deposit Measurement Requirement

The requirement to perform piston deposit measurements has been removed. Section 10.2.1.1 has been deleted accordingly.

Updated Valve Guide Reaming Procedure

The valve guide reaming procedure has been updated. Section 8.2.1 has been modified accordingly.

Operational Quality Index Assessment Added

The use of Quality Index to determine operational validity was approved, effective February 1, 2007. Annex A3 has been modified accordingly.

The modified sections of the procedure are attached. The updated version of the test procedure, designated as "T-12 Draft 9", is available in its entirety from the TMC web site (www.astmtmc.cmu.edu/docs/diesel/mack/procedure_and_ils/T-12/) or by contacting the TMC for a hardcopy.

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Attachment
c: ftp://ftp.astmtmc.cmu.edu/docs/diesel/mack/procedure_and_ils/T-12/il07-1.pdf
Distribution: Email

Remove from Section 2.1:
D 129 Standard Test Method for Sulfur in Petroleum Products[4]

8.2.1 Use oil when reaming guides. Hone finish if desired. Valve stem to guide clearance shall be 0.0038 – 0.0089 cm (0.0015 – 0.0035 in.) for intake and 0.0064 – 0.0114 cm (0.0025 – 0.0045 in.) for exhaust.

Delete Section 10.2.1.1
~~10.2.1.1 Rate all six pistons for deposits according to Test Method D 6681. Use the 1P piston rating method. Report the results on the appropriate forms.~~

10.4.1.2 Total Sulfur, ppm, Test Method D 5453 (D 2622 or D 4294 can be substituted). Use one 120-mL (4-oz) sample for inspections.

A3. DETERMINATION OF OPERATIONAL VALIDITY

A3.1 *Quality Index Calculation*

A3.1.1 Calculate Quality Index (QI) for all control parameters according to the DACA II Report. Be sure to account for missing or bad quality data according to the DACA II Report as well.

A3.1.2 Use the U, L, Over Range, and Under Range values shown in Table A3.1 for the QI calculations.

A3.1.3 Do not use the data from the first six min of Phase II. This is considered transition time.

A3.1.4 Round the calculated QI values to the nearest 0.001.

A3.1.5 Report the QI values on Form5.

A3.2 *Averages*

A3.2.1 Calculate averages for all control, ranged, and non-control parameters and report the values on Form 5.

A3.2.2 The averages for control and non-control parameters are not directly used to determine operational validity but they may be helpful when an engineering review is required (refer to section A3.4).

A3.3 *Determining Operational Validity*

A3.3.1 QI threshold values for operational validity are shown in Table A3.1. Specifications for all ranged parameters are shown in Table A3.1.

A3.3.1.1 A test with EOT QI values for all control parameters equal to or above the threshold values and with averages for all ranged parameters within specifications is operationally valid, provided that no other operational deviations exist that may cause the test to be declared invalid.

A3.3.1.2 Conduct an engineering review (Section A3.4) to determine the operational validity of a test with any control parameter QI value less than the threshold value.

A3.3.1.3 With the exception of crankcase pressure, a test with a ranged parameter average value outside the specification is invalid. Conduct an engineering review to determine operational validity for a test with crankcase pressure outside the specification.

A3.4 *Engineering Review*

A3.4.1 Conduct an engineering review when a control parameter QI value is below the threshold value. A typical engineering review involves investigation of the test data to determine the cause of the below threshold QI. Other affected parameters may also be included in the engineering review. This can be helpful in determining if a real control problem existed and the possible extent to which it may have impacted the test. For example, a test runs with a low QI for fuel flow. An examination of the fuel flow data may show that the fuel flow data contains several over range values. At this point, an examination of exhaust temperatures may help determine whether the instrumentation problem affected real fuel flow versus affecting only the data acquisition.

A3.4.2 For reference oil tests, conduct the engineering review jointly with the TMC. For non-reference oil tests, optional input is available from the TMC for the engineering review.

A3.4.3 Determine operational validity based upon the engineering review and summarize the decision in the comment section on Form 11. It may be helpful to include any supporting documentation at the end of the test report. The final decision regarding operational validity rests with the laboratory.

TABLE A3.1
QUALITY INDEX AND AVERAGE CALCULATION VALUES

Control Parameter	Units	Quality Index Threshold	Quality Index U & L Values				Over & Under Range Values	
			U		L		Low	High
Speed[A]	r/min	0.000	1802.5	1202.5	1797.5	1197.5	1063	1937
Fuel Flow[A]	kg/h	0.000	60.20	64.50	58.20	62.50	4.4	118.3
Inlet Manifold Temp.	°C	0.000	90.8	80.8	89.2	79.2	33.4	126.5
Coolant Out Temp.	°C	0.000	66.9	108.9	65.1	107.1	16.7	157.3
Fuel In Temp.	°C	0.000	40.5		39.5		12.6	67.4
Oil Gallery Temp.	°C	0.000	88.6	116.6	87.4	115.4	55.1	148.9
Intake Air Temp.	°C	0.000	26.0		24.0		-29.8	79.8
Ranged Parameter	Units	Range					Over & Under Range Values Low	High
Inlet Air Restriction	kPa	3.5 – 4.0					0	14
Inlet Manifold Pressure	kPa	Tbd	Tbd				0	400
Exhaust Back Pressure	kPa	2.7 – 3.5					0	16
Crankcase Pressure	kPa	0.25 – 0.75					0	3
Intake CO_2	%	3.09±0.05	1.42 ± 0.05				0	5

[A] U and L values for speed, fuel flow, inlet manifold temperature, coolant out temperature, and oil gallery temperature are split by test phase.