



Test Monitoring Center

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T-10 INFORMATION LETTER 03-3
Sequence No. 5

October 28, 2003

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: Intake Manifold Pressure Specification

At the October 23, 2003 meeting of the Mack Surveillance Panel, average intake manifold pressure specifications were adopted for both phases of the T-10 test. The Phase I specification is 160 kPa minimum and the Phase II specification is 210 kPa minimum. These specifications are effective for all tests that start on or after October 24, 2003. The modified Tables 2 and A3.1 are attached. The updated version of the test procedure, Draft 10, is available in its entirety from the TMC web site (ftp://ftp.astmtmc.cmu.edu/docs/diesel/mack/procedure_and_ils/T-10) 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-10/il03-3.pdf

Distribution: Email

**TABLE 2
TEST CONDITIONS**

Parameters	Limits	
	Phase I	Phase II
Time, h	75	225 ^A
Injection Timing, °BTDC	Variable	18
CONTROLLED PARAMETERS^B		
Speed, r/min	1800	1200
Fuel Flow, kg/h (lb/h)	59.2 (130.5)	63.5 (140.0)
Intake CO ₂ Level, %	1.5 +/- 0.05	0.2 +/- 0.05
Inlet Manifold Temp., °C (°F)	70 (158)	66 (150)
Coolant Out Temp., °C (°F)	66 (150)	85 (185)
Fuel In Temp., °C (°F)	40 (104)	40 (104)
Oil Gallery Temp., °C (°F)	88 (190)	113 (235)
Intake Air Temp., °C (°F)	25 (77)	25 (77)
RANGED PARAMETERS^C		
Inlet Air Restriction, kPa (in. H ₂ O)	3.5 – 4.0 (14 - 16)	3.5 - 4.0 (14 – 16)
Inlet Manifold Pressure, kPa (in. Hg)	Minimum 160 (47.4)	Minimum 210 (62.2)
Exhaust Back Pressure, kPa (in. H ₂ O)	2.7 – 3.5 (11 - 14)	2.7 – 3.5 (11 – 14)
Crankcase Pressure, kPa (in. H ₂ O)	0.25 – 0.75 (1 – 3)	0.25 – 0.75 (1 – 3)
UNCONTROLLED PARAMETERS		
Power, kW (bhp)	~257 (~345)	~324 (~434)
Torque, N•m (lb•ft) ^C	Record ^D	Record ^D
Exhaust O ₂ Level, %	Record	Record
Exhaust Temp., °C (°F)		
Pre-turbine	Record	Record
Tailpipe	Record	Record
Oil Sump Temp., °C (°F)	Record	Record
Coolant In Temp., °C (°F)	Record	Record
EGR Cooler Inlet Temp. Front, °C (°F)	Record	Record
EGR Cooler Outlet Temp. Rear, °C (°F)	Record	Record
EGR Pre-Venturi Temp., °C (°F)	Record	Record
Inlet Air Dew Point, °C (°F)	Record	Record
Inlet Air Humidity, g/kg (gr/lb)	Record	Record
Blowby, L/min (ft ³ /min)	Record	Record
Pre-turbine Exhaust Pressure, kPa (in. Hg)	Record	Record
Main Gallery Oil Pressure, kPa (psi)	Record	Record
Oil Filter ΔP, kPa (psi)	Not to exceed 138 (20) ^E	Not to exceed 138 (20) ^E

A: Check valve lash after break-in.

B: All control parameters shall be targeted at the mean indicated.

C: All ranged parameters shall fall within the specified ranges.

D: At 98.2 kPa (29 in. Hg) and 29.5 °C (85 °F) dry air.

E: If oil filter ΔP exceeds 138 kPa (20 psi), change the two full flow filters. If the filters are changed, attempt to recover as much oil as possible by draining the filters. No new oil is to be added. The test report shall indicate if the filters are changed.

**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 ⁴	r/min	0.000	1802.5	1202.5	1797.5	1197.5	1063	1937
Fuel Flow ⁴	kg/h	0.000	60.20	64.50	58.20	62.50	4.4	118.3
Inlet Manifold Temp.	°C	0.000	70.8	66.8	69.2	65.2	22.2	113.8
Coolant Out Temp.	°C	0.000	66.9	85.9	65.1	84.1	16.7	134.3
Fuel In Temp.	°C	0.000	40.5		39.5		12.6	67.4
Oil Gallery Temp.	°C	0.000	88.6	113.6	87.4	112.4	55.1	145.9
Intake Air Temp.	°C	0.000	26.0		24.0		-29.8	79.8
Ranged Parameter	Units	Range				Over & Under Range Values		
Inlet Air Restriction	kPa	3.5 – 4.0				0	14	
Inlet Manifold Pressure	kPa	min 160	min 210			0	400	
Exhaust Back Pressure	kPa	2.7 – 3.5				0	16	
Crankcase Pressure	kPa	0.25 – 0.75				0	3	
Intake CO ₂	%	1.5 ± 0.05	0.2 ± 0.05			0	5	

⁴U and L values for speed, fuel flow, coolant out temperature, and oil gallery temperature are split by test phase.