



Test Monitoring Center

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1R Information Letter No. 03-1

Sequence No. 1

February 27, 2003

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

TO: Single Cylinder Diesel Mailing List

SUBJECT: Standard Draft and QI Calculation Constants

Draft 3 of the 1R standard has been approved by the Single Cylinder Surveillance Panel for use as the test procedure until the 1R standard is published by ASTM. A copy may be downloaded from the TMC website at:

ftp://ftp.astmtmc.cmu.edu/docs/diesel/scote/procedure_and_ils/1r/1R%20Test%20Method%20-%20Draft%203.pdf

Additionally, the panel revised Section 12.1.5 to delete the word “consecutive” and approved the QI calculation constants shown in the revised Table A2.6 (attached). Equation A2.1 has also been revised to match Table A2.6. These changes are in effect for all 1R tests starting on or after January 1, 2003.

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Attachment

c: ftp://ftp.astmtmc.cmu.edu/docs/diesel/scote/procedure_and_ils/1r/il03-01.pdf

Distribution: Email

Table A2.6 Quality Index Calculation Values and Plotting Axis Scale Definitions

Controlled Parameters	Units	Δ	Under-range ^A	Over-range ^A	Plot Axes Ranges ^B		
					Min	Max	Increment
Engine Speed	r/min	2.58	1708.4	1891.6	1770	1830	10
Fuel Flow	g/min	1.91	172.36	307.64	230	255	5
Humidity	g/kg	1.37	-30.7	66.3	5	40	5
Coolant Flow	L/min	3.36	-44.33	194.33	60	90	5
Coolant Out Temp	°C	0.48	88.06	121.94	90	120	5
Oil to Manifold Temp	°C	0.95	86.31	153.69	105	135	5
Inlet Air Manifold Temp	°C	1.09	21.28	98.72	50	70	5
Fuel Into Head Temp	°C	2.04	-30.56	114.56	30	60	5
Oil to Manifold Press	kPa	14.1	-85.64	915.64	380	450	10
Inlet Air Press	kPa(abs)	1.13	251.85	332.15	285	300	5
Fuel from Head Press	kPa	5.66	74.24	475.76	230	300	10
Exhaust Pressure	kPa(abs)	1.54	197.44	306.56	235	265	5
<u>Uncontrolled Parameters</u>							
Power	kW				62	72	1
Torque	Nm				335	375	10
Blowby	L/min				5	65	5
Coolant In Temp	°C				75	100	5
Coolant Delta T	°C				0	10	5
Oil Cooler In Temp	°C				110	140	5
Heating Oil Temp	°C				100	165	5
Exhaust Temp	°C				620	670	10
Crankcase Pressure	kPa				0.0	1.5	0.1
Coolant to Jug Pressure	kPa				60	95	5

^A For use in calculation of QI only. Do not replace overrange values on data plots.

^B Quality Index axes for all parameters are to range from -0.3 to 1.0 with increments of 0.1. The Text Time axis is from 0 to 504h in 36h increments. X-axis length should be at least 8.0 in. Y-axis length should be at least 5.5 in.

Equation A2.1

$$QI = 1 - \frac{1}{n} \sum_{i=1}^n \left(\frac{2\bar{X} - 2X_i}{\Delta} \right)^2$$

Where: \bar{X} = specification target
 X_i = measurement being made
 n = number of measurements made
 Δ = value from the table above

Section 12.1.5 If a test has greater than four hours without data acquisition on any controlled parameter.