



Test Monitoring Center

6555 Penn Avenue
Pittsburgh, PA 15206-4489
(412) 365-1000

T-12 INFORMATION LETTER 07-2

Sequence No. 2

May 3, 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: T-10 Mack Merit Calculations Using T-12 Test Results

Appendix X1, detailing T-10 Mack Merit calculations using T-12 test results, has been added to the T-12 test procedure. The new Appendix X1 is attached. The updated version of the test procedure, designated as "T-12 Draft 10", 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.

Greg Shank
Manager, Engine Product Development
Volvo

John L. Zalar
Administrator
ASTM Test Monitoring Center

Attachment

c: ftp://ftp.astmtmc.cmu.edu/docs/diesel/mack/procedure_and_ils/T-12/il07-2.pdf

Distribution: Email

X1. T-10 MACK MERIT CALCULATIONS USING T-12 TEST RESULTS

X1.1 Various oil specifications may use T-12 test results to obtain T-10 Mack Merits, using the calculation methodology shown in X1.2 through X1.3.

X1.2 *Merit System Components:*

X1.2.1 *Anchors* – anchor performance level based on one test.

X1.2.2 *Maximums* – limit of acceptable performance.

X1.2.3 *Minimums* – best achievable result.

X1.2.4 *Weights* – relative contribution to total merit.

Table X1.1

Criterion	0-300 Hour Delta Pb	250-300 Hour Delta Pb	Cylinder Liner Wear	Top Ring Weight Loss	Oil Consumption
Weight	200	200	250	200	150
Maximum	42	18	26.0	117	95.0
Anchor	35	13	23.0	82	82.0
Minimum	10	0	12.0	47	50.0

X1.2.5 *Multipliers* – Using Table X1.1, determine the multiplier for each parameter as follows:

X1.2.5.1 If a result is at the anchor, multiplier is one. (e.g., Liner Wear = 23 yields multiplier = 1)

X1.2.5.2 If a result is at or below the minimum, multiplier is two (e.g., Liner Wear = 10 yields multiplier = 2)

X1.2.5.3 If a result is at the maximum, multiplier is zero (e.g., Liner Wear = 26.0 yields multiplier = 0)

X1.2.5.4 If a result is between minimum and anchor, linearly interpolate multiplier between 2 and 1. (e.g. Liner Wear = 14 yields multiplier = 1.82)

X1.2.5.5 If a result is between anchor and maximum, linearly interpolate multiplier between 1 and 0. (e.g. Liner Wear = 25 yields multiplier = 0.33)

X1.2.5.6 If a result is above the maximum, linearly extrapolate multiplier on the same line as between 1 and 0. (e.g. Liner Wear = 28.0 yields multiplier = -0.67)

X1.3 *Calculated Merit Result* – Sum the products of weights and multipliers across the five results. This is the calculated merit result. In equation form:

$$\text{Calculated Merit} = \sum_{i=1}^5 \text{Weight}_i$$

$$x \left\{ \begin{array}{l} \delta(\text{result}_i > \text{anchor}_i) \times (\text{max}_i - \text{result}_i) / (\text{max}_i - \text{anchor}_i) \\ + \delta(\text{min}_i < \text{result}_i \leq \text{anchor}_i) \times [1 + (\text{anchor}_i - \text{result}_i) / (\text{anchor}_i - \text{min}_i)] \\ + \delta(\text{result}_i \leq \text{min}_i) \times 2 \end{array} \right\}$$

where $\delta(x) = 1$ if x is true; 0 if x is false

X1.3.1 Report the results of the merit calculations on the appropriate form.