



Test Monitoring Center

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High Temperature Cyclic Durability Information Letter 03-1
Sequence No. 10
September 16, 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: High Temperature Cyclic Durability Mailing List

SUBJECT: 1. Cleaning Solvent Specification
2. Report Forms and Data Dictionary

1. At the August 27, 2003 High Temperature Cyclic Durability Surveillance Panel meeting, the panel approved a motion to revise the cleaning solvent specification to D 235 – Type II, Class C. Sections 7.2, 9.1.1, 9.1.2, and 9.1.3 of Test Method D 5579 have been revised. The effective date for this change is January 1, 2004.

2. The HTCT report forms and data dictionary have been removed from Test Method D 5579. The TMC will continue to maintain and revise the HTCT report forms and data dictionary as done in the past. The current report forms and data dictionary may be downloaded from the ASTM Test Monitoring Center web page at <http://astmtmc.cmu.edu/> or can be obtained in hardcopy format from the TMC. Attached are revised Sections 9.2.5.6, 9.2.6, 9.2.7.2, 11.2.4, 11.4, 12.2, 13.1 and Annex A3. A new Section 13.2 has been added. The old Section 13.2 has been revised and renumbered to 13.3 and the old Section 13.3 has been renumbered to 13.4. Annex A4 has been deleted and Annex A5 has been renumbered to A4.

Brian Koehler
Chairman
HTCT Surveillance Panel

John L. Zalar
Administrator
ASTM Test Monitoring Center

Attachment

c: ftp://ftp.astmtmc.cmu.edu/docs/gears/htct/procedure_and_ils/il03-1.pdf

Distribution: Email

(Revises Test Method D 5579-01 as amended by Information Letter 02-1)

7.2 *Cleaning Materials*—A solvent meeting Specification D 235 – Type II, Class C is required for cleaning parts.

9.1.1 *Transmission Case*—Thoroughly clean the transmission case with a cleaning solvent (see Section 7.2) to remove any oil, sludge, or varnish deposits remaining from the previous test and then air dry.

9.1.2 *Gears, Shafts, Synchronizer*—Remove all sludge, varnish, and deposits. Rinse with a cleaning solvent (see Section 7.2) and air dry.

9.1.3 *Heater, Oil-Circulating System*—Flush oil lines with a cleaning solvent (see Section 7.2) to remove any previous test oil and then air dry. Disassemble the heater, clean, and air dry after each test. Check the heater periodically for leaks and replace when necessary.

9.2.5.6 Repeat this procedure for the other two countershafts. Record the measurements on the form in Fig. A4.3 or an equivalent.

9.2.6 *Transmission Torque Measurement*—Rotate the transmission so that it is in the horizontal position. With the transmission in low range and dry, measure the break and turn torques by turning the output shaft clamp plate capscrew, with a torque wrench, in the normal direction of rotation. Make the measurements three times and report the average of both the break and turn values (see Fig. A4.3). Continue with the assembly of the test apparatus.

9.2.7.2 Start the drive motor and bring up to speed (countershaft at 1750 r/min). Turn off the motor and allow the transmission to coast down to at least 500 r/min. Electronically measure the time required for the countershafts speeds to decrease from 1500 to 500 r/min using a meter capable of measuring to 0.01 s. See Table 1 for a recommendation. Repeat the coast downs until five readings have been obtained. Calculate the average of these five readings, and record the readings and their average in the appropriate spaces in Fig A4.3.

11.2.4 Use the data log sheet shown in Fig. A4.4, or its equivalent, for recording all required operating conditions at least once each hour during the test.

11.4 *Transmission Disassembly*—Disassemble the transmission as specified in the Mack Service Manual and inspect for signs of unusual wear or parts failure. Measure the clutch plates and shifter fork (as described in 9.2.4), and record the measured wear and visual condition of the mating surfaces, using the forms shown in Figs. A4.1 and A4.2, or their equivalent.

12.2 *Shifter Fork Wear*—Measure shifter fork wear and report at the end of test (see Fig. A4.2).

13.1 For reference oil tests, the standardized report form set and data dictionary for reporting the test results and for summarizing the operational data are required. The final test report will include a complete report form package. See Annex A3 for information on obtaining report forms and data dictionary.

13.2 Plot the shift time scaling the Y-axis from 0 to 6 s on Form 5 (Annex A3). Plot at least one data point per test hour along the X-axis.

13.3 When reporting reference oil test results to the TMC, transmit by facsimile Forms 0 through 5 and any other supporting information to the ASTM TMC within five days of test completion. Mail a copy of the final test report within 30 days of test completion to the ASTM Test Monitoring Center, 6555 Penn Avenue, Pittsburgh, PA 15206-4489. Electronic transfer of test results is also permitted for approved laboratories (see Section 13.4).

Renumber old 13.3 to 13.4

Delete Annex A4

Renumber Annex A5 to Annex A4

A3. HTCT TEST REPORT FORMS and DATA DICTIONARY

A3.1 The required report forms and data dictionary are available on the ASTM Test Monitoring Center web page at <http://astmtmc.cmu.edu> or can be obtained in hardcopy format from the TMC.

Form 0	Test Report Cover
Form 1	Test Result Summary Page
Form 2	Test Conditions and Measurement Summary
Form 3	Downtime and Comments Sheet
Form 4	Shift Graphs
Form 5	Shift Time Graphs

A4. MANUAL TRANSMISSION CYCLIC DURABILITY TEST PARTS INSPECTION AND WEAR MEASUREMENTS

A4.1 Figs. A4.1 – A4.4 are examples of the necessary report forms

(Use these forms to document all required measurements. Some of these measurements may also appear on Forms referenced in Annex A3.)

Customer Oil Code _____ Test No. _____ EOT Date _____

Friction Disk Wear (in.)									
	Before Test				After Test				
Position	1	2	3	Average	1	2	3	Average	Average Wear
Plate 1									
Plate 2									
Plate 3									
Plate 4									
Plate 5									
Plate 6									
Plate 7									
Plate 8									

Range Fork Pre-test Hardness	
Location	Hardness, R _C
Front Left	
Front Right	
Rear Left	
Rear Right	

Range Fork Visual Inspection	
Fork Number	
Ridging of Pad Surfaces after Test	
Left Pad	
Right Pad	

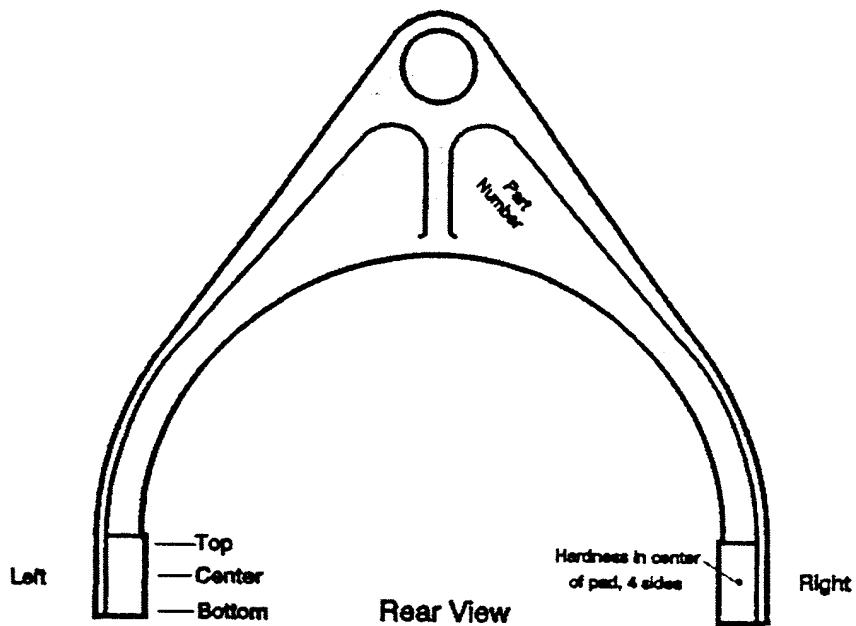
Note 1—Use one of the following terms to describe pad surface—none, light, medium, or heavy

FIG. A4.1 Typical Form for Recording Friction Disk Wear

Customer Oil Code _____ Test No. _____ EOT Date _____

Cycles at Wear Measurement _____ EOT Cycles _____

Fork Pad Thickness Wear Measurements (in.)								
	Left ¹				Right ¹			
	Top	Center	Bottom	Average	Top	Center	Bottom	Average
Pre-test								
Post-test								
Left Fork Pad Wear					Right Fork Pad Wear			



NOTE 1—Side of fork with forged angle and part number is the rear side. View the fork from this side to identify the pads as left and right.

NOTE 2—Post-test wear measurement may be made at EOT or at passing cycles. See “Cycles at Wear Measurement” for the point at which the post-test wear measurement was taken.

FIG. A4.2 Typical Form for Recording Fork Pad Thickness Wear Measurements

Customer Oil Code _____ Test No. _____ EOT Date _____

Preload Measurements (in.)			
	Countershaft Number		
	1A	2A	3A
Preload Measurement			

Pre-test Transmission Break and Turn Torque		
	Break	Turn
Torque, lbf-ft (low range)		

Pre-test Countershafts Coast Down Time	
Time 1, Coasting from 1500 to 500 r/min, s	
Time 2, Coasting from 1500 to 500 r/min, s	
Time 3, Coasting from 1500 to 500 r/min, s	
Time 4, Coasting from 1500 to 500 r/min, s	
Time 5, Coasting from 1500 to 500 r/min, s	
Average Time, s Coasting from 1500 to 500 r/min	

FIG. A4.3 Typical Form for Recording Preload Measurements

			1	2	3	4	5	6	7	8	9	10
Date		1										
Observer		2										
Time		3										
Hours on Test		4										
Hour Meter	Record	5										
Cycles	Record	6										
Cycle Time (12 s)		7										
Tailshaft, r/min	750 ± 10	8										
Counter haft, r/min	HI	9										
Countershaft, r/min	LO	10										
Trans Oil Sump, ° F	250 ± 5	11										
Oil Heater Out, ° F	Record	12										
Lock-up Time, s		13										
Air Pressure, psig	90 ± 2	14										
Oil Pressure, psig	20 ± 2	15										
			11	12	13	14	15	16	17	18	19	20
Date		1										
Observer		2										
Time		3										
Hours on Test		4										
Hour Meter	Record	5										
Cycles	Record	6										
Cycle Time (12 s)		7										
Tailshaft, r/min	750 ± 10	8										
Counter haft, r/min	HI	9										
Countershaft, r/min	LO	10										
Trans Oil Sump, ° F	250 ± 5	11										
Oil Heater Out, ° F	Record	12										
Lock-up Time, s		13										
Air Pressure, psig	90 ± 2	14										
Oil Pressure, psig	20 ± 2	15										

NOTE 1—Log all shutdowns and repairs on the back of the log sheet.

FIG. A4.4 Data Log Sheet