

COMPANY CONFIDENTIAL

T.E. FORMAT REV. 5.0

WATERS CORPORATION

ENGINEERING TEST SPECIFICATION AND PROCEDURE

SYSTEM/ASSEMBLY/SUBASSEMBLY NAME: ALLIANCE PUMPTRAY

WATERS PART NUMBER AFFECTED: WAT271078, WAT270463, 289000526, 700001030

TEST EQUIPMENT NAME: ALLIANCE PUMPTRAY TESTER, PURGE MODULE

TEST EQUIPMENT NUMBERS: TE82526, TE82712

TEST EQUIPMENT PLANT LOCATION: MILFORD

TEST SPECIFICATION AND PROCEDURE DOCUMENT NUMBER: WAT210700

WRITTEN BY: MIKE COTTER

DATE: 4/30/98

APPROVED BY:

RALPH WELSCH
TEST ENGINEERING

DATE:

MARK MOELLER
ELEC./MECH. ENGINEERING

DATE:

BILL COOK
ASSEMBLY ENGINEERING

DATE:

REVISION HISTORY

<u>REV.</u>	<u>DWO/ECO #</u>	<u>DATE</u>	<u>ORIGINATOR</u>	<u>APPROVAL</u>	<u>DATE</u>
2	ECO-04523	02/18/99	M. COTTER		
3	ECO-06593	06/15/00	M. COTTER		
4	ECO-07629	02/22/01	M. MADYDA		
5	ECO08175	06/21/01	M. COTTER		

EQUIPMENT REQUIRED

Part Number	Qty	Description
TE82526	1	ALLIANCE PUMP TRAY TESTER
TE82712	1	PURGE MODULE
WAT027629	1	Syringe
WAT079700	1	Waters Inline Degasser Module
	1	5/16" Wrench
	1	½" Wrench
	1	5/8" Wrench
	A/R	Filtered and Degassed Methanol
	1	Waste Container
	1	Shop Air Supply (60 PSI min.)

REFERENCE DOCUMENTS

009026311	Test Proc. Purge Module
WAT270645	Performance Spec. 2690 Separations Module
WAT270698	Performance Spec. Pump Mechanics Assy.
ASSY PROCEDURES	D/P271078, D/P270463, D/P289000526, D/P700000713

Notes:

- I. Before recording a test failure, ensure that the unit under test (UUT) has been thoroughly conditioned by the following methods:
 - i. Introduce fully degassed solvent into the unit.
 - ii. Properly condition UUT before each test and re-run failed tests at least once.
 - iii. Adjust and tighten all critical fittings.
 - iv. Verify set-up parameters and connections.
- II. Sections of this procedure assume that the operator has a basic knowledge of personal computer operation in a Windows environment.
- III. To shut down the computer:
 - i. Close all programs (**File, Close**).
 - ii. Click on **Start, Shut Down**. Select **Shut Down the Computer?**. Click **Yes**.

Failure to follow these instructions may result in test station damage.

1. TESTER SETUP

- 1.1 Plug tester, scale, degasser and computer 120 VAC outlets (scale uses a power adapter).
- 1.2 Connect serial cable from **SERIAL**, on back of tester to **Comm port 3** on computer.
- 1.3 Connect serial cable from back of scale to **Comm port 2** on computer.
- 1.4 Connect cable from waste pump module to **WASTE PUMP** on back of tester.
- 1.5 Connect 0.020" tubing from top of scale to **BALANCE** on side of tester.
- 1.6 Connect 1/8" tubing from top of scale to **BALANCE** on front of waste pump module.
- 1.7 Connect shop air supply to **SHOP AIR**.
- 1.8 Connect Methanol supply to **SEALWASH IN** on rear of tester.
- 1.9 Connect solvent supply to inlet of vacuum degasser.
- 1.10 Connect outlet of vacuum degasser to **SOLVENT IN** on front of tester.
- 1.11 Run all **WASTE** lines from back of tester to a waste container.
- 1.12 Switch Tester **POWER** on.
- 1.13 Switch computer & CRT power on. Select **OK** at the 'Enter Network Password' screen. The computer will boot directly into the test program.

Notes:

- I. If the beaker contains >150 ml of solvent, empty it with the **EMPTY BEAKER** switch.
- II. Check the tubes entering the scale and ensure that they do not contact the beaker.

2. CONNECT UUT TO TESTER

- 2.1 Slide pump UUT into compartment in lower left front of tester. Use caution to avoid cable damage.
- 2.2 Connect **FAN**, **SERIAL** and **POWER** cables from tester to corresponding connectors on the UUT.
- 2.3 Connect transducer and encoder cables from pump tray to the corresponding **PRIMARY** and **ACCUMULATOR** connectors on Tester.

- 2.4 Connect the tube from **PUMP IN** on tester to the primary pump check valve.
- 2.5 Connect tube from **PUMP OUT** on tester to inline filter on UUT.
- 2.6 If UUT is equipped with the seal wash option, connect tube labeled SEAL WASH IN to the **SEAL WASH** port on Tester.
- 2.7 Run the UUT's PUMP WASH OUT line to a waste container.

3. PURGE PUMP TRAY

- 3.1 Disconnect tube from primary pump outlet port.
- 3.2 Disconnect tube from accumulator check valve housing and route tube into a waste container.
- 3.3 Connect tube from purge module **OUTLET** to the primary pump outlet tube disconnected in step 3.1.
- 3.4 Purge pump tray for 1-2 minutes per procedure 009026311.
- 3.5 When purge is complete, disconnect module and reconnect both tubes on UUT.

4. TEST

- 4.1 If the test program is closed, open it by double-clicking the TE82526 desktop icon.
- 4.2 Click on the white arrow in the upper left corner of screen to run the TE82526 test program. See Figure 1.

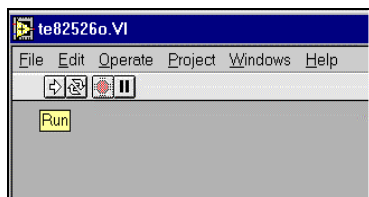


Figure 1

- 4.3 Click on .

- 4.4 Click on **TEST UUT** to begin test. See Figure 2.

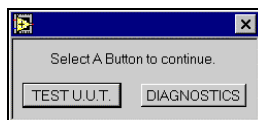


Figure 2

- 4.5 Select **Complete Test** from the Test Menu. See Figure 3.

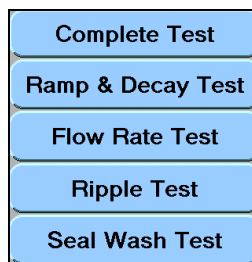


Figure 3

Specifications: Pressure Decay: ≤ 150 PSI
% CV: $\leq 20\%$
Pressure Ripple: $\leq 2.5\%$
Flowrate: 1 ± 0.01 ml/min

Notes:

- I. The 3 minute wet prime may be halted at any time by clicking on .
- II. Tests may be halted at any time by clicking on .
- III. If any test fails, repeat from step 4.4, but make the appropriate selection from the Test Menu to repeat only the required test(s).

4.6 *Record all test data on the Test Record.* **Note:** All entries must be in blue or black ink

4.7 Sign and date the Test Record.

Waters Corporation

SUBASSEMBLY TEST RECORD

Part Number: _____	Description: <u> Alliance Pump Tray </u>
Tested By: _____	Date: <u> </u> / <u> </u> / <u> </u>
Serial Number: _____	Control Number: <u> N/A </u>
Software Revision: <u> N/A </u>	Factory Order: _____

Seal Wash Functional Test

PASS ☐ FAIL ☐ see note # _____ PASS ☐

Decay Test – Accumulator

Specs: Decay ≤ 150 PSI Actual _____ PSI

PASS ☐ FAIL ☐ see note # _____ PASS ☐

CV $\leq 20\%$ **Actual** _____ **%**

PASS ☐ FAIL ☐ see note # _____ PASS ☐

Decay Test – Primary

Specs: Decay ≤ 150 PSI Actual _____ PSI

PASS ☐ FAIL ☐ see note # _____ PASS ☐

CV $\leq 20\%$	Actual	%
----------------	--------	---

PASS ☐ FAIL ☐ see note # _____ PASS ☐

Ripple Test

Spec: Ripple $\leq 2.5\%$ **Actual** _____ %

PASS ☐ FAIL ☐ see note # _____ PASS ☐

Flowrate Test

Spec: 1 ± 0.01 ml/min Actual _____ ml/min PASS ☐ FAIL ☐ see note # _____ PASS ☐

PumpTray Result: PASS ☐ FAIL ☐ Signed _____ Date: ____ / ____ / ____

Notes:

This image shows a blank sheet of white paper with horizontal ruling lines. The lines are evenly spaced and extend across the width of the page. There are no margins, text, or other markings on the paper.