

# Field Verification Procedures

## For Teledyne Isco Syringe Pumps

### Overview

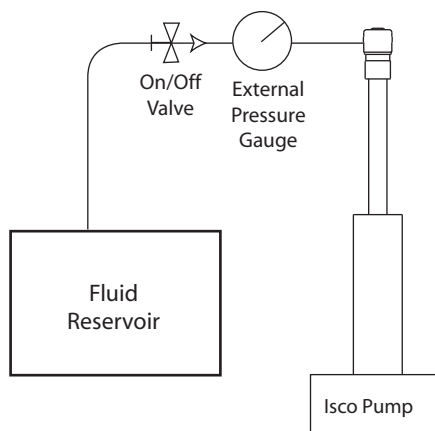
The following procedures are **recommended** for incorporation into your particular system tests. In the event that a problem is suspected in the operation or performance of an Isco syringe pump, following these steps can often help to isolate and correct a problem in the field, eliminating the time and expense of returning the unit to the factory for servicing.

Syringe pump users who regularly pump caustic or viscous substances should perform these procedures periodically to ensure uninterrupted operation.

### Pressure Check

#### Setup

Connect a fill line to the pump inlet with an on/off valve and calibrated external pressure gauge. With the valve open, fill the cylinder ( **REFILL** ) to at least 50ml with at least 95% distilled and degassed water, and 5% Iso-propyl alcohol.




**Figure 1: Setup for Pressure Check**

Perform the following steps to verify proper operation of the pressure transducer:

1. Press **CONST PRESS** ( **CONST PRESS** ).
2. Enter a pressure setpoint of 1,000 psi (500 psi for 1000D pumps).
3. Purge air from the system by opening the fill line and running the pump.
4. Press **STOP** ( **STOP** ).
5. Zero the transducer by pressing **ZERO PRESS** ( **ZERO PRESS** ) > A ( **A** ).
6. Close the valve and press **RUN** ( **RUN** ).

**Table 1: Pressure Check Specifications**



65D	1000 ±100 psi
100DM/DX	1000 ±50 psi
260D	1000 ±37.50 psi
500D/SP	1000 ±18.75 psi
1000D	500 ±10 psi

7. Relieve the pressure by pressing **REFILL** ( **REFILL** ) until the pressure is at 0 psi.

### Leak Check

Perform the following steps to verify that the cylinder is in satisfactory condition.

1. Close the refill valve and pressurize the pump to the maximum pressure by pressing:


**CONST PRESS** ( **CONST PRESS** ) > **PRESSURE** ( **A** )

> **MAX** ( **C** ) > **RUN** ( **RUN** ).

2. Allow the pump to stabilize for 15 minutes. Then record an initial reading of the remaining volume.
3. After a minimum run time of 30 minutes, record a second reading of the volume.
4. Calculate the flow rate using the following formula:

$$FlowRate = \frac{Volume2 - Volume1}{Time}$$

**Table 2: Leak Check Specifications**

















65D	≤ 1 µl/minute
100DM/DX	
260D	≤ 1.5 µl/minute
500D/SP	
1000D	

- Relieve the pressure by pressing **REFILL** ( **REFILL** ) until the pressure is at 0 psi.

## Flow Rate Check


Perform the following steps to verify proper operation of the cylinder drive mechanism.

Place a metric beaker or burette under the refill tube, and program the controller to fill the beaker at a flow rate of 25ml/min for 1 minute.

1. Press PGM GRAD (  ).
2. Press 3 (  ).  
(Single pump programming)
3. Press CONTINUE (  ).
4. Press PROGRAM (  ).
5. The screen will display: ENTER FILE# [X].
  - a. Select any number from **1** to **99** to name the program file, then press ENTER (  ).
6. Press FLOWRATE (  ), **27.76**, and ENTER.
7. Press STEP FWD (  ) to enter program step 1.
  - a. Press **1** > **0** > ENTER
  - b. Press **2** > **100** > ENTER
  - c. Press **4** > **.1** > ENTER
8. Press INSERT (  ) to enter program step 2.
  - a. Press **2** > **100** > ENTER
  - b. Press **4** > **.8** > ENTER
9. Press INSERT (  ) to enter program step 3.
  - a. Press **2** > **0** > ENTER
  - b. Press **4** > **.1** > ENTER
10. Press STORE (  ).
11. Press OPTION (  ).
12. Press NEXT ACTION (  ) repeatedly until the screen displays: RETURN TO INITIAL AND HOLD (top line).
13. Press PREVIOUS (  ) to return to the main menu.
14. Press RUN (  ) two times.

15. If necessary, press RUN (  ) again to repeat this sequence.

**Table 3: Flow Rate Check Specifications**

	65D	Volume in the beaker after one minute should be: 25 ml ±0.25 ml. (Use a scale for greater accuracy).
	100DM/DX	
	260D	
	500D/SP	
	1000D	

### Tips:

- Dry the beaker or burette between runs.
- To minimize drips, the outlet tubing should be 0.020" to 0.031" inside diameter.

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# Field Verification Checklist

## For Teledyne Isco Syringe Pumps

Print a hard copy of this checklist. For each Field Verification check, record the date and time, test results, whether or not the pump passed the test, and your initials.



<b>Pressure Check</b>					
verify Pressure Transducer					
Pass = 1000 ±50 psi (500 ±50 psi for 1000D)					
Date/ Time	Gauge (Actual psi)	Pump (Display psi)	Diff (< ± 50psi)	pass / fail	Initials



<b>Leak Check</b>			
verify Cylinder Condition			
Calculation: Flow rate (µl/min) = (Volume2 - Volume1)/60			
Pass = 1 µl/minute ( 1.5 µl/minute for 1000D)			
Date/ Time	Flow rate (µl/min)	pass/ fail	Initials



<b>Flow Rate Check</b>			
verify Cylinder Drive Mechanism			
Pass = 25ml ± 0.25ml			
Date/ Time	Actual Volume (ml)	pass / fail	Initials

<b>Technician:</b>	
<b>Company / Address:</b>	
<b>Phone:</b>	
<b>Email:</b>	