4900 Maintenance Instruction
System Flush Procedure

LĮNX

Equipment Required

FA74005	Damper Drain Tube	
FA16005	4900 Cover Removal Tool	
FA900005	Beaker 0.25 Litre	
FA900003	Solvent Cleaning Bottle	
FA940021	Syringe Polypropylene 50 ml	as required
FA999045	Gloves Latex Medical (large)	)
FA999046	Gloves Latex Medical (medium)	) as required
FA999047	Gloves Latex Medical (small)	)
FA999076	Safety Spectacles Blue	
	Correct solvent for the ink used in the printer	as required
	Absorbent, lint-free paper towel	
	Waste container—15 litres capacity	
	Empty solvent bottle—base removed	

Introduction

This maintenance instruction provides the procedures to completely flush a 4900 printer in the following circumstances:

1. Before packing for shipping or storage.

2. To remove contaminated ink.

3. To convert an 'in use' printer to a new ink, in readiness for calibration.

4. To prepare a 'new', unused printer with new ink, in readiness for calibration.

The detailed '**System Flush**' process referred to within the individual procedures for the above circumstances, is provided separately in Part B of this maintenance instruction.

The procedure for purging the main ink filter is referred out to the '**Main Ink Filter Purging**' maintenance instruction provided earlier in Chapter 5.

It is important to ensure that the procedures outlined in this maintenance instruction are followed carefully to achieve reliable printer operation.

Printer Conditions during the Flush Cycle

- The Flush Cycle will not run if the pressure test at the beginning of the cycle fails

- The level of solvent in the ink tank is checked at each stage of the cycle, and the cycle terminates if the level is low. If this error is detected, the advisory message "Flush Cycle Stopped" is displayed in the status line

- The cycle terminates with all valves off and zero system pressure

- The cycle can be terminated by the operator at any stage by selecting the Stop option. This action takes immediate effect, so no advisory message, such as "Stopping Cycle : Please Wait", is displayed. It is used for speed in preference to the power switch in situations, for example, where a pressurized leak has occurred. Use of the Stop option may leave the ink system in an undefined state. If the cycle is terminated for any reason, the Flush Count is not incremented.

Procedures

WARNING: HAZARDOUS INKS AND SOLVENTS. SAFETY GLASSES AND SOLVENT-RESISTANT PROTECTIVE GLOVES MUST BE WORN THROUGHOUT THE FOLLOWING PROCEDURE. FAILURE TO COMPLY WITH THIS SAFETY WARNING COULD RESULT IN IRRITATION AND REVERSIBLE LOCAL DAMAGE TO THE EYES, AND NON-ALLERGIC CONTACT DERMATITIS.

Part A—System Flush Procedures

1. Before Packing for Shipping or Storage

CAUTION: In the following procedure, use the correct solvent type that corresponds to the ink type being used in the printer.

1   Shut down and switch off the printer. Ensure that it is switched off at the mains supply.

2   Remove the ink and solvent filler caps.

3   Unlock the security latch on the front of the top cover and remove the cover. Position the cover so that the keyboard and display can be accessed.

4   Carry out the System Flush process detailed in Part B of this maintenance instruction (i.e. Empty Tank sequence, Flush Cycle and Solvent Drain sequence).

5   Repeat Item **4** TWO more times before proceeding to Item **6**.

6   Carry out the Empty Tank part of the System Flush process once more. The solvent tank should be empty, but if it is not, syphon off any remaining solvent.

7   Reposition the damper back in its original location in the ink system enclosure.

8   Refit the top cover and secure the locking latch.

9   Refit the ink and solvent filler caps.

10   The printer is now flushed ready for packing.

2. To Remove Contaminated Ink

CAUTION: In the following procedure, use the correct solvent type that corresponds to the ink type being used in the printer.

1   Shut down and switch off the printer. Ensure that it is switched off at the mains supply.

2   Remove the ink and solvent filler caps.

3   Unlock the security latch on the front of the top cover and remove the cover. Position the cover so that the keyboard and display can be accessed.

4   Carry out the System Flush process detailed in Part B of this maintenance instruction (i.e. Empty Tank sequence, Flush Cycle and Solvent Drain sequence).

5   Repeat Item **4** TWO more times before proceeding to Item **6**.

6   Carry out the Empty Tank part of the System Flush process once more. The solvent tank should be empty, but if it is not, syphon off any remaining solvent.

7   Replace the main ink filter and the ink tank dip (pick-up) tube. Maintenance instructions for these tasks can be found earlier in Chapter 5.

8   The printer can now be recommissioned with fresh ink (one or two bottles, until the 'ink low' status warning has cleared) and fresh solvent (one or two bottles, until the 'solvent low' status warning has cleared).

9   Carry out the '**Main Ink Filter Purging**' maintenance instruction.

    NOTE: If the main ink filter or damper does not fill with ink, the pump needs to be primed. This must be done with the printer switched OFF. Insert the nozzle of the syringe (Linx part number FA940021—Syringe Polypropylene 50 ml) into the Luer fitting on the damper. Withdraw the syringe plunger to draw ink through the pump. Continue withdrawing the plunger until ink is present in the pipe on the outlet side of the pump. Note that the syringe is a disposable item, with a limited functional life of approximately two applications when used with solvent-based inks.

10   Carry out at least six Clear Nozzle sequences.

11   Reposition the damper back in its original location in the ink system enclosure.

12   Refit the top cover and secure the locking latch.

13   Refit the ink and solvent filler caps.

14   Start the jet using the [start] key.

15   The printer is now clear of contaminated ink and ready for use.

3. To Convert an 'In Use' Printer to a New Ink, in Readiness for Calibration

1   Shut down and switch off the printer. Ensure that it is switched off at the mains supply.

2   Remove the ink and solvent filler caps.

3   Unlock the security latch on the front of the top cover and remove the cover. Position the cover so that the keyboard and display can be accessed.

CAUTION: In the following operation, ensure that the solvent type added to the ink tank corresponds to the ink type being *cleared* from the printer.

4   Carry out the System Flush process detailed in Part B of this maintenance instruction (i.e. Empty Tank sequence, Flush Cycle and Solvent Drain sequence).

5   Repeat Item **4** TWO more times before proceeding to Item **6**.

6   Carry out the Empty Tank part of the System Flush process once more. The solvent tank should be empty, but if it is not, syphon off any remaining solvent.

7   Replace the main ink filter and the ink tank dip (pick-up) tube. Maintenance instructions for these tasks can be found earlier in Chapter 5.

CAUTION: In the following operation, ensure that the solvent type added to the ink tank corresponds to the ink type that will be *added* to the printer during the recommissioning process.

8   Carry out the System Flush process again (i.e. Empty Tank sequence, Flush Cycle and Solvent Drain sequence).

9   Repeat Item **8** TWO more times before proceeding to Item **10**.

10   Carry out the Empty Tank part of the System Flush process once more. The solvent tank should be empty, but if it is not, syphon off any remaining solvent.

11   The printer can now be recommissioned with the new ink (one or two bottles, until the 'ink low' status warning has cleared) and the new solvent (one or two bottles, until the 'solvent low' status warning has cleared).

12   Carry out the '**Main Ink Filter Purging**' maintenance instruction.

       NOTE: If the main ink filter or damper does not fill with ink, the pump needs to be primed. This must be done with the printer switched OFF. Insert the nozzle of the syringe (Linx part number FA940021—Syringe Polypropylene 50 ml) into the Luer fitting on the damper. Withdraw the syringe plunger to draw ink through the pump. Continue withdrawing the plunger until ink is present in the pipe on the outlet side of the pump. Note that the syringe is a disposable item, with a limited functional life of approximately two applications when used with solvent-based inks.

13   Carry out at least six Clear Nozzle sequences.

14   Start the jet using the Quick Start Jet option in the DIAGNOSTICS menu and run the jet for 10 minutes.

15   Stop the jet.

16   Carry out the Empty Tank part of the System Flush process once more.

☞   IMPORTANT: It is important to ensure that the ink tank, damper, and main ink filter are drained completely of ink.

17 The printer can now be recommissioned with **fresh**, new ink (one or two bottles, until the 'ink low' status warning has cleared), which must be of the **same batch and viscosity**, as marked on the ink bottle label.

☞ IMPORTANT: Items 11 to 17 **must** be carried out, despite the apparent duplication of ink commissioning. These steps help to remove traces of solvent remaining from the flushing process, which could decrease the viscosity of the ink and cause incorrect calibration.

18 Repeat the '**Main Ink Filter Purging**' maintenance instruction.

NOTE: If the main ink filter or damper does not fill with ink, the pump needs to be primed. This must be done with the printer switched OFF. Insert the nozzle of the syringe (Linx part number FA940021—Syringe Polypropylene 50 ml) into the Luer fitting on the damper. Withdraw the syringe plunger to draw ink through the pump. Continue withdrawing the plunger until ink is present in the pipe on the outlet side of the pump. Note that the syringe is a disposable item, with a limited functional life of approximately two applications when used with solvent-based inks.

19 Place an earthed container under the printhead as solvent will be present in the pipes.

20 Reposition the damper back in its original location in the ink system enclosure.

21 Refit the top cover and secure the locking latch.

22 Refit the ink and solvent filler caps.

23 The printer is now ready for calibration. Refer to the '**Ink Conversion Calibration (Offset Calibration)**' maintenance instruction, which follows this instruction.

4. To Prepare a 'New', Unused Printer with New Ink, in Readiness for Calibration

1   Shut down and switch off the printer. Ensure that it is switched off at the mains supply.

2   Remove the ink and solvent filler caps.

3   Unlock the security latch on the front of the top cover and remove the cover. Position the cover so that the keyboard and display can be accessed.

4   Replace the main ink filter and the ink tank dip (pick-up) tube. Maintenance instructions for these tasks can be found earlier in Chapter 5.

CAUTION: In the following operation, ensure that the solvent type added to the ink tank corresponds to the ink type that will be *added* to the printer during the recommissioning process.

5   Carry out the Flush Cycle and Solvent Drain parts of the System Flush process detailed in Part B of this maintenance instruction.

6   Carry out the Empty Tank part of the System Flush process.

CAUTION: In the following operation, ensure that the solvent type added to the ink tank corresponds to the ink type that will be *added* to the printer during the recommissioning process.

7   Repeat Items **5** and **6** TWO more times.

8   At this stage the solvent tank should be empty, but if it is not, syphon off any remaining solvent.

9   The printer can now be recommissioned with the new ink (one or two bottles, until the 'ink low' status warning has cleared) and the new solvent (one or two bottles, until the 'solvent low' status warning has cleared).

10   Carry out the '**Main Ink Filter Purging**' maintenance instruction.

     NOTE: If the main ink filter or damper does not fill with ink, the pump needs to be primed. This must be done with the printer switched OFF. Insert the nozzle of the syringe (Linx part number FA940021—Syringe Polypropylene 50 ml) into the Luer fitting on the damper. Withdraw the syringe plunger to draw ink through the pump. Continue withdrawing the plunger until ink is present in the pipe on the outlet side of the pump. Note that the syringe is a disposable item, with a limited functional life of approximately two applications when used with solvent-based inks.

11   Carry out at least six Clear Nozzle sequences.

12   Start the jet using the Quick Start Jet option in the DIAGNOSTICS menu and run the jet for 10 minutes.

13   Stop the jet.

14   Carry out the Empty Tank part of the System Flush process once more.

     IMPORTANT: It is important to ensure that the ink tank, damper, and main ink filter are drained completely of ink.

15 The printer can now be commissioned with **fresh**, new ink (one or two bottles, until the 'ink low' status warning has cleared), which must be of the **same batch and viscosity**, as marked on the ink bottle label.

☞ IMPORTANT: Items 9 to 15 **must** be carried out, despite the apparent duplication of ink commissioning. These steps help to remove traces of solvent remaining from the flushing process, which could decrease the viscosity of the ink causing incorrect calibration.

16 Repeat the '**Main Ink Filter Purging**' maintenance instruction.

NOTE: If the main ink filter or damper does not fill with ink, the pump needs to be primed. This must be done with the printer switched OFF. Insert the nozzle of the syringe (Linx part number FA940021—Syringe Polypropylene 50 ml) into the Luer fitting on the damper. Withdraw the syringe plunger to draw ink through the pump. Continue withdrawing the plunger until ink is present in the pipe on the outlet side of the pump. Note that the syringe is a disposable item, with a limited functional life of approximately two applications when used with solvent-based inks.

17 Place an earthed container under the printhead as solvent will be present in the pipes.

18 Reposition the damper back in its original location in the ink system enclosure.

19 Refit the top cover and secure the locking latch.

20 Refit the ink and solvent filler caps.

21 The printer is now ready for calibration. Refer to the '**Ink Conversion Calibration (Offset Calibration)**' maintenance instruction, which follows this instruction.

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Part B—System Flush Process

Precautions

During the system flush process, the solvent tank needs to contain only enough solvent (approximately 600 ml) to successfully complete the task. However, too much solvent in the solvent tank may result in the ink tank overflowing during the cycle, due to solvent being dumped into the ink tank as solvent is used to fill the system. Therefore, fill the solvent tank just until the System Warning message "3.04 Solvent Low" is cleared. This may necessitate drawing off some solvent first to see the warning message appear in the status line, and then refilling with solvent until the warning message clears.

As a precautionary measure, fit an empty solvent bottle (with its base removed) to the ink tank filler tube during flushing cycles in case the tank overflows. Also, it is advisable to place the printhead in a beaker to contain any spillage from the nozzle.

NOTE: The Flush Cycle part of the System Flush process thoroughly flushes all the valves and pipework with solvent.

Empty Tank

1   Switch on the printer and access the SYSTEM FLUSH menu (Setup menu > Diagnostics menu):

49290

```
                    SYSTEM  FLUSH

        > Flush  Cycle  /  Tank  Empty
        ● Valve  Dry


                                                    ⏎
```
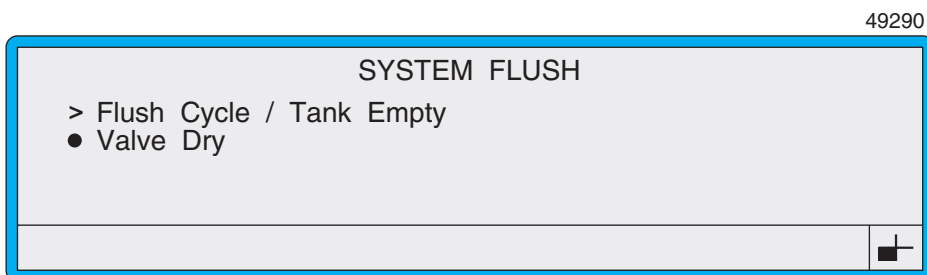
Figure 1. System Flush Menu: Process Options

NOTE: The Valve Dry option is for use only by Linx during the manufacturing process and is NOT to be used by service personnel.

2   Select the Flush Cycle / Tank Empty option. The following menu is displayed with the instruction "Check Solvent OK" in the status line:
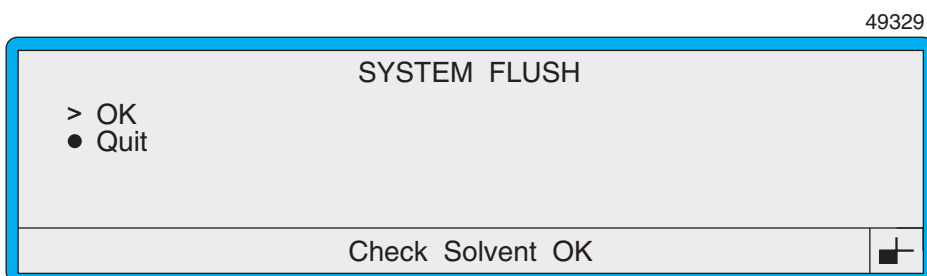
49329

```
                    SYSTEM  FLUSH

        > OK
        ● Quit


                    Check  Solvent  OK              ⏎
```

Figure 2. System Flush Menu: "Check Solvent OK" Instruction

3 To continue with the System Flush procedure it is necessary to perform a number of actions on the printer before the flushing cycles can begin. These required actions are displayed in the status line, and should be performed in accordance with the following expanded explanations for each instruction. Once each action has been completed, select the OK option by pressing the [enter] key, which displays the next instruction.

NOTE: To return to the initial SYSTEM FLUSH menu, select the Quit option and press the [enter] key. To return to the DIAGNOSTICS menu (System Flush option), press the [esc] key.

4 **Check Solvent OK**. Carry out the actions detailed in 'Precautions' above.

5 **Prop Up Printer**. Before commencing the ink draining procedure, the printer must be raised by approximately 50 mm at the front left-hand side to aid drainage of the ink, as the ink dip tube is situated at the rear right-hand side of the tank.

WARNING: LETHAL VOLTAGE. DANGEROUS VOLTAGES ARE PRESENT IN THIS EQUIPMENT WHEN ELECTRICAL POWER IS APPLIED. EXTREME CARE MUST BE TAKEN WHEN WORKING ON THE PRINTER WHILE POWER IS APPLIED TO IT AND THE TOP COVER IS REMOVED. THE CORRECT, STANDARD ELECTRICAL SAFETY PRECAUTIONS MUST BE TAKEN. THERE IS A DANGER OF DEATH OR INJURY FROM ELECTRIC SHOCK IF THE CORRECT ELECTRICAL SAFETY PRECAUTIONS ARE NOT TAKEN.

6 **Orientate Filter and Damper**. Ignore the instruction regarding the filter. Carefully lift the feed damper clear of the ink system enclosure. Hold the feed damper in the vertical position with the drain cap uppermost.

7 **Connect Bleed Line To Damper**. Remove the damper drain cap and connect the Damper Drain Tube Luer fitting (included in the Damper Drain Tube kit) to the damper drain. Insert the other end of the drain tube into a waste container of at least 5 litres capacity. Orientate the damper so that the drain is at the bottom, i.e. at its lowest position, as shown in the following illustration:
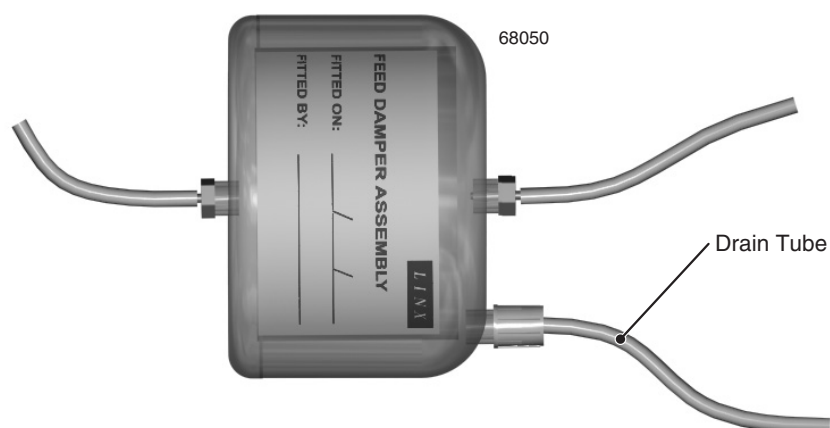

Figure 3. Feed Damper Orientation with Drain Tube Connected

LINX

8 **Turn On Tap On Bleed Line**. The bleed line tap is used in the Linx manufacturing process only. There is no bleed line in the service engineer's Damper Drain Tube kit, therefore, any action referring to the bleed line tap should be ignored. Simply press the [enter] key to continue the procedure.

9 When all the required actions have been completed, the following menu is displayed:

49330

```
                    SYSTEM  FLUSH

        >  Empty  Tank
        •  Access  Flushing  Cycle
        •  Solvent  Drain
        ○  Flush  Count                    :  0


                                                       ⏎
```
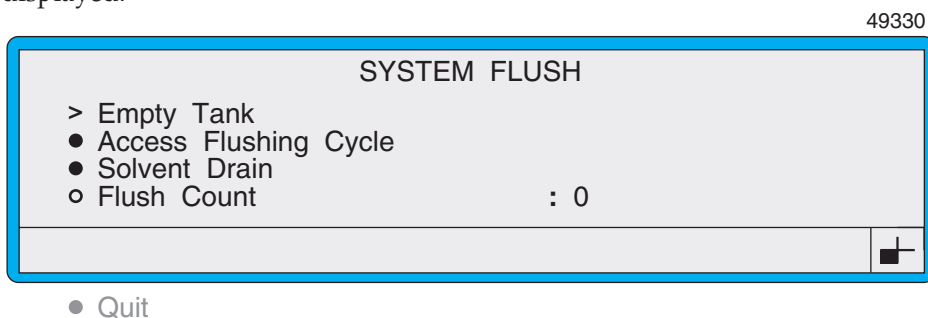
        • Quit

Figure 4. System Flush Menu: Sequence Options

CAUTION: Pump damage. Do not allow the ink system pump to run dry. Initiate the Empty Tank sequence only the number of times required to empty the system of ink. The pump must not be run for longer than 30 seconds after it becomes noisy through cavitation (ink starvation). Damage to the pump will result if it is allowed to run continuously in a dry condition.

10 Select the Empty Tank option, which starts the pump and displays the following screen with the "Empty Tank In Progress…" message displayed in the status line. The pump will run at maximum pressure for approximately 1 minute and 40 seconds, and then automatically stop on completion of the Empty Tank sequence. Select the Stop option if the audible pitch of the pump changes indicating that the ink tank is empty:
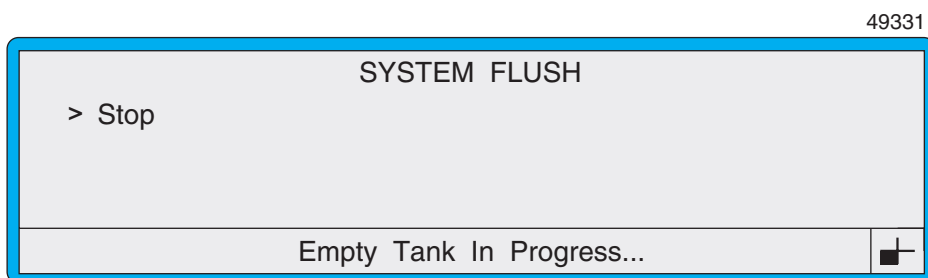
49331

```
                    SYSTEM  FLUSH

        >  Stop




                 Empty  Tank  In  Progress...           ⏎
```

Figure 5. System Flush Menu: "Empty Tank In Progress…"

11 At some point towards the end of the Empty Tank sequence the 'ink low' condition should be reached. Ensure that the System Warning message "3.03 Ink Low" is displayed in the status line.

12 On completion of the Empty Tank sequence, the display reverts to the sequence options menu (Figure 4).

13 If the tank is not empty after a single Empty Tank sequence, select the Empty Tank option again to repeat the sequence. Select the Stop option when the audible pitch of the pump changes indicating that the ink tank is empty.

14 Disconnect the drain tube from the damper and refit the drain cap.

Flush Cycle

15 Select the Access Flushing Cycle option. The following menu is displayed with the instruction "Turn Off Tap On Bleed Line" in the status line:

49337

```
                    SYSTEM  FLUSH
    >  OK
    ●  Quit



                Turn  Off  Tap  On  Bleed  Line            ⊥
```
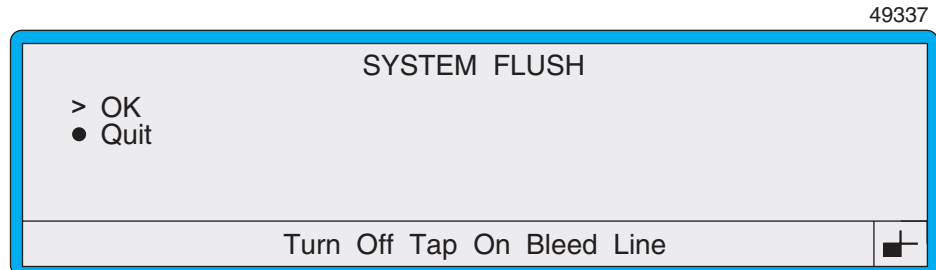
Figure 6. System Flush Menu: "Turn Off Tap On Bleed Line" Instruction

NOTE: To return to the initial SYSTEM FLUSH menu, select the Quit option and press the [enter] key. To return to the DIAGNOSTICS menu (System Flush option), press the [esc] key.

16 The bleed line tap is used in the Linx manufacturing process only. There is no bleed line in the service engineer's Damper Drain Tube kit, therefore, any action referring to the bleed line tap should be ignored. Simply select the OK option by pressing the [enter] key, which displays the next instruction:
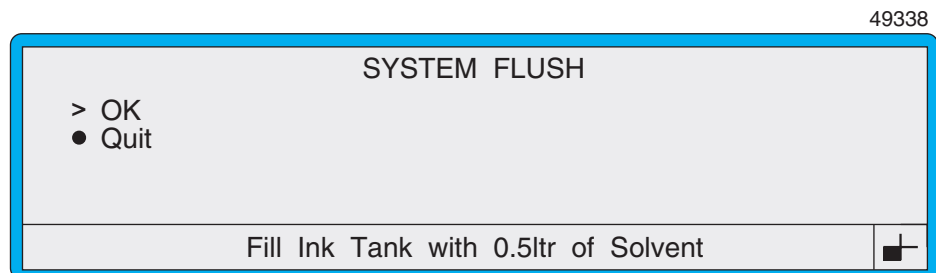
49338

```
                    SYSTEM  FLUSH
    >  OK
    ●  Quit



                Fill  Ink  Tank  with  0.5ltr  of  Solvent     ⊥
```

Figure 7. System Flush Menu: "Fill Ink Tank with 0.5ltr of Solvent" Instruction

17 It is necessary to add solvent to the ink tank before the Flush Cycle can begin. Add **1.0 litre** of solvent to the ink tank. If this is the first time the Flush Cycle has been run (Flush Count is 0) and a "3.04 Solvent Low" warning message is displayed, the Flush Cycle cannot proceed. If necessary, fill the solvent tank just until the "3.04 Solvent Low" warning message is cleared.

18 Once solvent has been added to the ink tank, select the OK option by pressing the [enter] key, which starts the Flush Cycle and displays the following screen and status line message. The Flush Cycle runs for approximately 1 minute and 40 seconds, and automatically stops on completion. The sequence can be stopped before completion by selecting the Stop option, in which case the Flush Count option in the sequence options menu (Figure 4) is not incremented:
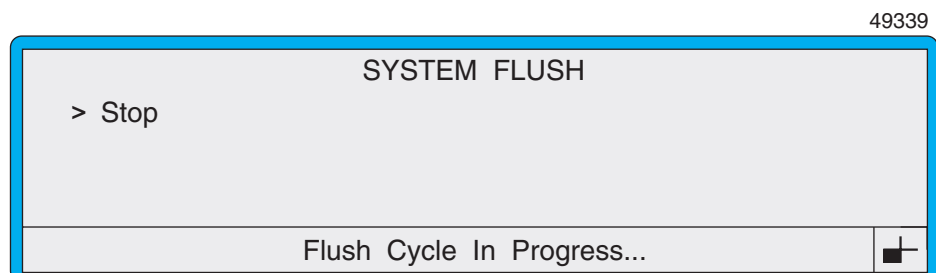
49339

```
                    SYSTEM  FLUSH
    >  Stop




                Flush  Cycle  In  Progress...                ⊥
```

Figure 8. System Flush Menu: "Flush Cycle In Progress…"

NOTE: The "3.04 Solvent Low" warning message may be reported during the Flush Cycle as solvent is used to fill the system. This warning can be ignored, except when the software will not allow the sequence to continue and action is required as detailed in Item 17.

19 On completion of the Flush Cycle, the display reverts to the 'OK/Quit' options menu with the instruction "Turn On Tap On Bleed Line" in the status line. Ignore this instruction and select the OK option by pressing the [enter] key, which displays the sequence options menu where the Flush Count has now incremented to '1':
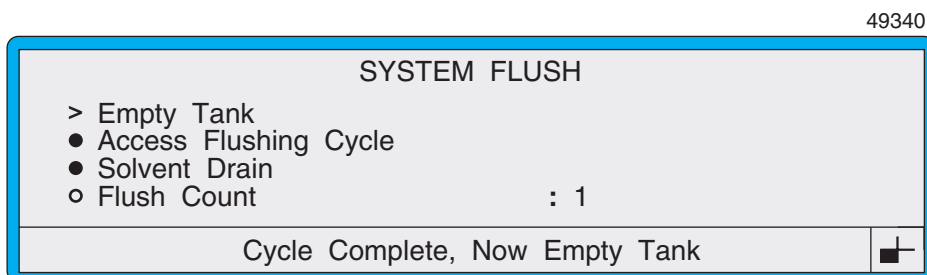
49340

```
                    SYSTEM  FLUSH
  >  Empty  Tank
  ●  Access  Flushing  Cycle
  ●  Solvent  Drain
  ○  Flush  Count                    : 1
         Cycle  Complete,  Now  Empty  Tank        ◄┘
```

Figure 9. System Flush Menu: Sequence Options

20 Ignore the status line instruction "Cycle Complete, Now Empty Tank".

Solvent Drain

21 Select the Solvent Drain option. The following menu is displayed with the instruction "Turn Off Tap On Bleed Line" in the status line:

49337

```
                    SYSTEM  FLUSH
  >  OK
  ●  Quit

         Turn  Off  Tap  On  Bleed  Line          ◄┘
```
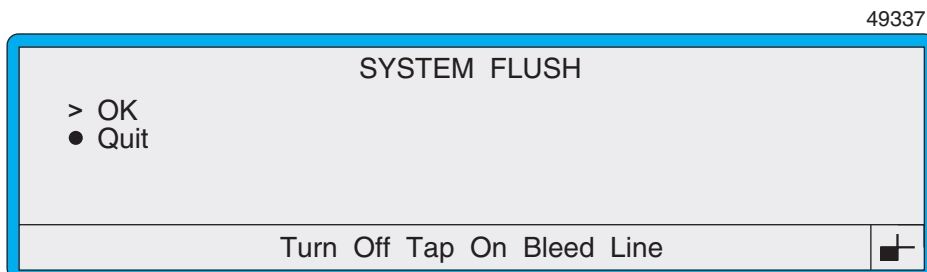
Figure 10. System Flush Menu: "Turn Off Tap On Bleed Line" Instruction

NOTE: To return to the initial SYSTEM FLUSH menu, select the Quit option and press the [enter] key. To return to the DIAGNOSTICS menu (System Flush option), press the [esc] key.

22 The bleed line tap is used in the Linx manufacturing process only. There is no bleed line in the service engineer's Damper Drain Tube kit, therefore, any action referring to the bleed line tap should be ignored. Simply select the OK option by pressing the [enter] key, which starts the Solvent Drain sequence and displays the following screen and status line message. The Solvent Drain sequence runs for approximately 10 minutes, and automatically stops on completion. The sequence can be stopped before completion by selecting the Stop option:
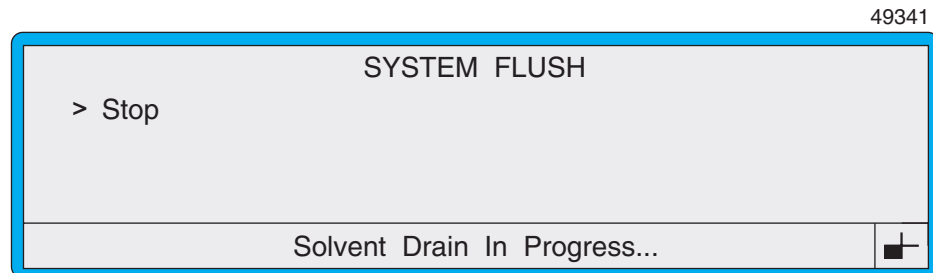
49341

```
                          SYSTEM  FLUSH
   >  Stop



                   Solvent  Drain  In  Progress...              ⇇
```

Figure 11. System Flush Menu: "Solvent Drain In Progress…"

23 On completion of the Solvent Drain sequence, the display reverts to the 'OK/Quit' options menu with the instruction "Turn On Tap On Bleed Line" in the status line. Ignore this instruction and select the OK option by pressing the [enter] key, which returns the display to the sequence options menu.

24 Now that the System Flush procedure is completed (i.e. Empty Tank sequence, Flush Cycle and Solvent Drain sequence), it is necessary to flush the gutter line (from the gutter through the gutter valve). To do this, first exit from the SYSTEM FLUSH menu to the DIAGNOSTICS menu by pressing the [esc] key.

25 Scroll up to the Set Pressure option.

26 Press the [enter] key, enter the maximum Set Pressure of 255 (65.00 p.s.i.), then press the [enter] key again.

27 Apply solvent to the gutter using the solvent cleaning bottle until the solvent in the gutter line flows clear. Note that a **minimum** of 250 ml of solvent must be used.

28 Set the Set Pressure to 0 in the DIAGNOSTICS menu.

29 Return to Part A of this maintenance instruction.