

13.1 Planned Maintenance

WARNING Do not perform testing or maintenance on the anesthesia machine while it is being used on a patient. Possible injury can result.

Items can be contaminated due to infectious patients. Wear sterile rubber gloves. Contamination can spread to you and others.

Obey infection control and safety procedures. Used equipment may contain blood and body fluids.

13.1.1 Planned Maintenance Checklist

Use the Carestation 620/650/650c (A1/A2) Planned Maintenance Checklist to record the test results.

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The Planned Maintenance Checklist is included at the end of this Planned Maintenance Procedure.

Additional checklists are available to order.

13.1.2 Parts replacement

WARNING The system must be turned off before replacing any electrical components.

All parts should be replaced before performing the checks, tests, and calibrations.

Every twelve (12) months

- ☐ Replace the vaporizer port O-rings (Kit Stock Number 1102-3016-000).

Every twenty-four (24) months

In addition to the 12-month requirements, replace the following parts every 24 months.

Refer to "6.2 *Free breathing valve maintenance*" in the Technical Reference Manual; perform the following:

- ☐ Replace the free breathing flapper valve (Stock Number 0211-1454-100).
- ☐ Replace the free breathing valve O-ring (Stock Number 1503-3208-000).

Every forty-eight (48) months

In addition to the 24-month requirements, replace the following parts every 48 months.

Refer to "9.27.4 *Replacing the CPU "coin" battery*" in the Technical Reference Manual; perform the following:

- ☐ Replace the Display Unit battery (Stock Number 1009-5800-000).

Refer to "9.16.5 *Replacing the inspiratory/expiratory check valve*" in the Technical Reference Manual; perform the following:

- ☐ Replace the breathing system check valve kits (Stock Number 2071067-001-S) (Two check valve kits for each machine).

Refer to "9.8.3 *Replacing the batteries*" in the Technical Reference Manual; perform the following:

- ☐ Replace the system batteries* (Stock Number M1801706-S) (Two for each machine).

Note *: Perform the battery capacity test after replacement, refer to "6.9 *Battery capacity test*" in the Technical Reference Manual.

13.2 Planned maintenance checkout procedure

This procedure provides a sequential PM workflow.

Note These procedures are not intended for individual tests or calibrations outside of the sequential procedure. To perform an individual test or calibration, refer to the individual procedures in this manual or the User's Reference Manual.

This procedure is for all Carestation 620/650/650c (A1/A2) series factory trained personnel globally.

The following planned maintenance procedures are to be performed every 12 months, except where specifically stated differently.

It is strongly suggested to perform all the checks and tests in the sequences as listed in the Technical Reference Manual.

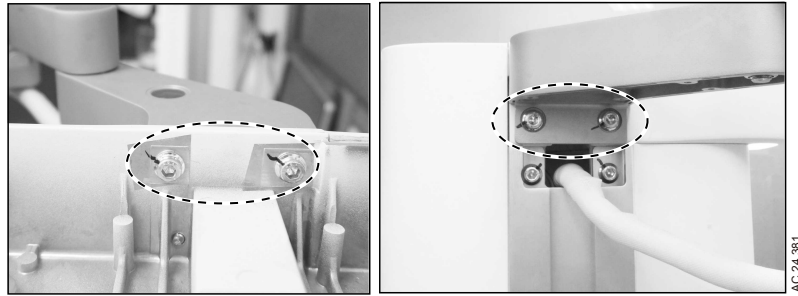
Note If any of the tests fail in this procedure, refer to the appropriate sections to perform calibrations or repairs.

There are many types of flow and pressure test devices available that can be used to complete the test procedures. Unless otherwise specified, the flow and pressure test devices should have an accuracy of $\pm 2.5\%$ of reading or better.

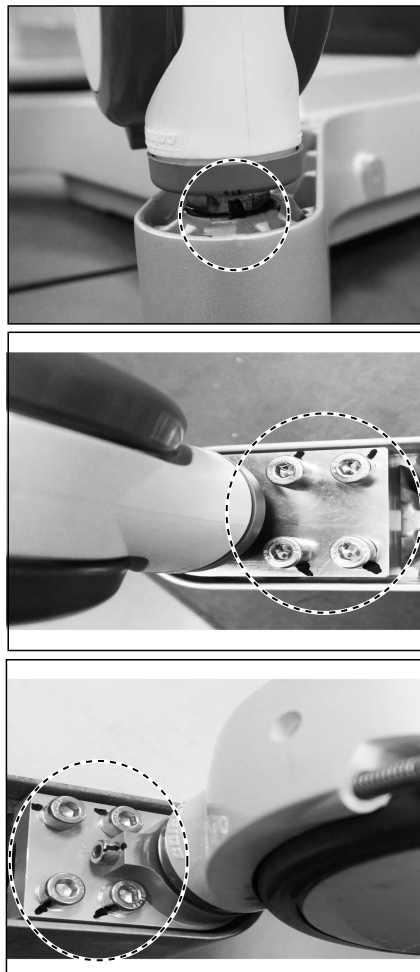
13.2.1 Visual inspection procedures

WARNING Tightness check of the screws with marks must be strictly implemented and the check result should be recorded.

1. Check the filter inside the lower rear cover. Replace as necessary.
2. Check the condition and tightness of the following: all display(s), frame, drawers, and top shelf PM mount parts.
3. Check the tightness of the four screws that fix the display arm to the frame:
 - remove the top shelf to check the upper two screws.
 - remove the plastic cover under the display arm to check the lower two screws.
 - verify that the marks on the screws and the adjacent surface are still aligned, tighten the screws if loose.



4. Check the casters for proper operation and mounting. DO NOT LUBRICATE THE CASTERS. Check the brakes for proper operation.
5. Check the tightness of the screws that fasten the casters, verify that the marks are still aligned. If any screw is loose, remove the screw, apply Loctite 243 to the threads, then tighten the screw again.



Note Mark locations vary for different caster configurations.

6. For Carestation 650c Pendant or Wall mount machine, check tightness of the screws with marks. If any screw is loose, tighten the screw to

required torque. Refer to related Installation Instructions for locations of the screws with marks and torque requirements (M1807013 - Installation and Service Instructions for Carestation 650c Pendant anesthesia machine, M1807015 - Installation and Service Instructions for Carestation 650c Wallmount anesthesia machine).

7. Verify that all labels are in place and are clearly legible.
8. Check any external tubing, including silicone tubes, hoses and pipeline hoses, and ensure there is no visible deterioration and that they are securely attached.
9. Check all external electrical cabling. Ensure all are correctly connected and are not deteriorated.

13.2.2 Verify annunciators

The system includes several annunciators (speakers) that produce audible tones in response to system alarms and other hardware or software fault conditions. Verify the integrity of the annunciators at system startup.

1. Press the On/Standby switch to turn on the system.
2. After several seconds into power-up:
Verify that an audible “chirp” is heard (Anesthesia Computer Board), then a second audible “chirp” is heard from the Display Unit (BIOS).
3. After the self-testing in the power-up process is completed:
Verify that an audible “beep” is heard from the Display Unit (Display Control Board).

13.2.3 Pipeline and cylinder tests

Cross-Connect and high pressure leak test

CAUTION To prevent damage:

- Open the cylinder valve slowly.
- Do not force the flow controls.

WARNING Do not leave gas cylinder valves open if the pipeline supply is in use. Cylinder supplies could be depleted, leaving an insufficient reserve supply in case of pipeline failure.

Ensure the Gas Supply window is visible on the screen.

1. Connect the pipeline supplies one at a time and ensure that the corresponding display indicates pipeline pressure.
2. Disconnect all pipeline supplies.
 - Open each cylinder valve.