XO® 4 ARM SYSTEMS
ARM JOINT INSPECTION AND ADJUSTMENT OF FRICTION BRAKES

YB-772
Version 1.00

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1 INTRODUCTION

This document describes the mandatory yearly inspection of the XO 4 arm systems.

2 PURPOSE

The aim of this document is to provide a step-by-step procedure of how to inspect arm joints and how to adjust the balance and friction brakes in XO 4 arm systems.

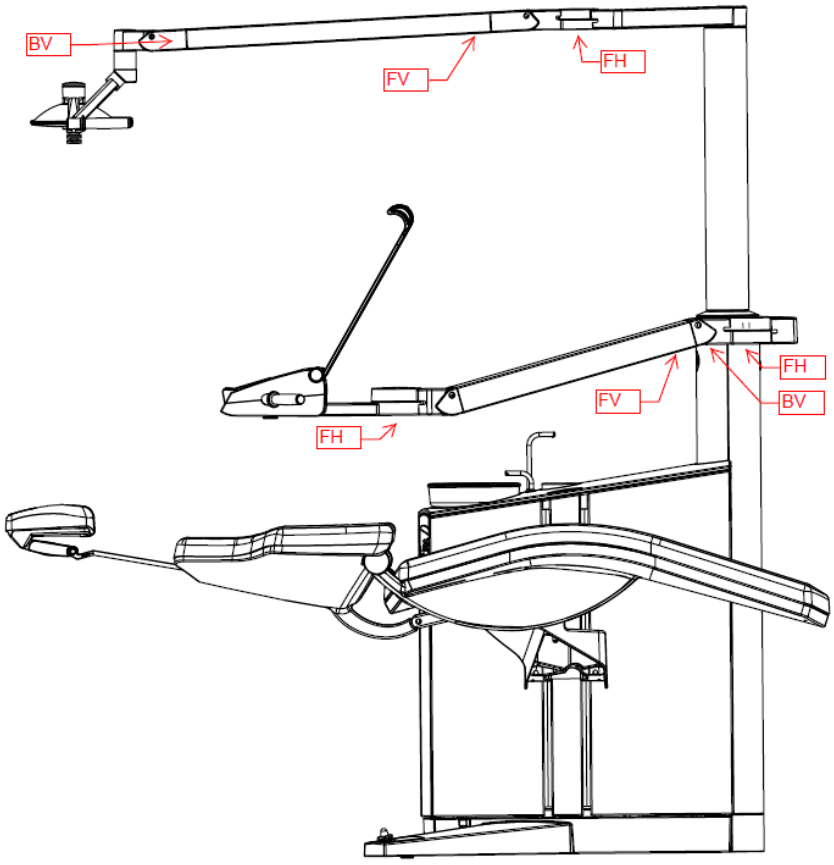
3 BALANCING AND FRICTION MECHANISMS, HOW IT WORKS!

All XO 4 arm systems are balanced using a mechanical spring, the build-in friction of the arm system and a friction brake.
The tension of the spring and the adjustment of the friction brake determines the upwards directed force at the end of the arm. The aim is that this force shall equalize gravity.

The effect of the spring. The balance of the arm depends primarily on the tension of the spring. Together with the build-in friction of the arm system, the spring is capable of balancing the arm in the vertical direction.

The effect of the friction brake. The purpose of the friction brake is to make minor adjustments to the balance. Tightening the friction brake will increase the required force to move the arm both up and down.
Therefore, a combination of a correct spring tension and a correct adjusted friction brake will make the arm balance and at the same time provide an easy movement of the arm.

Positions of adjustments:
FV: Adjustment of friction, vertical movement
FH: Adjustment of friction, horizontal movement
BV: Adjustment of balance, vertical movement



4 NEEDED TOOLS FOR INSPECTION AND ADJUSTMENT

Set of Allen keys

Calibrated Torque wrench(es) 0-10 Nm / Top, hex socket (Allen) 6 and 8 mm, Top, hex, 10 mm

WARNING: MECHANICAL HAZARD
Visible gaps or misalignment in the arm joints could be an early sign that the joint is failing. If a joint fails completely, the equipment mounted on the arm may fall.

If the inspection of the arm joints is failing (visible gaps or misalignment) – XO CARE, Technical Service shall be contacted immediately.

IMPORTANT:
This document contains important information and instructions regarding the safe use and maintenance of XO 4 arm systems. Failure to comply with these instructions may compromise the safety of patients and/or clinic personnel.

IMPORTANT:
Please read the instructions carefully before starting to perform any of the inspections and adjustment described.

IMPORTANT:
Please note that different torque values for tightening of the nuts and bolts are used for respectively bridge arm, Screen arm and OP lamp arm.

5 GENERAL INSPECTION, ALL ARMS

Faults in the arm joint assemblies may result in the arms coming apart at the joints, which will cause the arm to malfunction.

NOTE: The design of the bridge arm joints was updated in March 2010 to increase the strength. Workstations manufactured before this date have a slightly weaker design, which gives a potential risk of experiencing problems with the bridge arm joints.

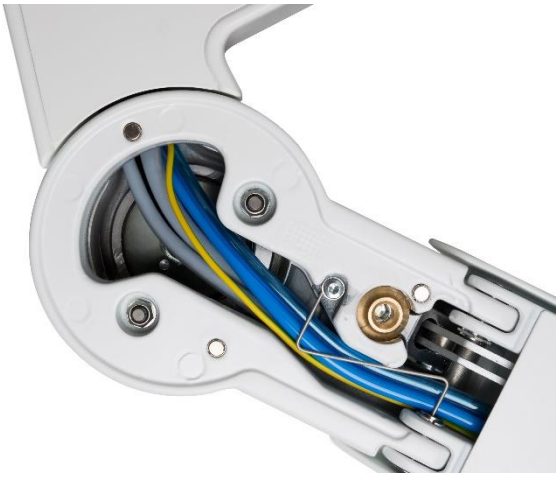
Inspection
Verify the joints by visual inspection and check that the upper and lower part of each joint are parallel and properly aligned both vertically and horizontally. If there is a gap or if the parts are misaligned then the joint is not acceptable. See pictures below.

ACCEPTABLE!
Upper and lower part are parallel

NOT ACCEPTABLE!
Upper and lower part are <u>not</u> parallel

Remove covers below all rotational joints and remove all yellow labels if present.

Inspect all pin-bolts. If one is broken please contact XO Technical service.



5.1 BRIDGE, FRONT ARM JOINT

1. Loosen the friction brake in the front joint until screw is loose. Move the arm from side to side and verify that equal force is required to move the arm in the complete range.

2. Support the bridge, to keep the joint unloaded.
3. Loosen the two M6 locking nuts a half rotation.

4. Check the alignment of the bearing parts before checking the center bolt.

   Check if the center bolt is loose by tightening to 4 Nm.

   If loose please tighten to 8 Nm using a torque wrench and a top for hex socket (Allen) width 8 mm.

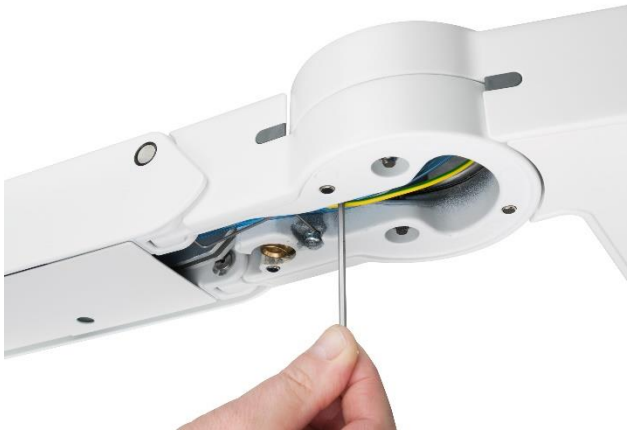
5. After checking the center bolt tighten the two M6 locking nuts.

a. Check that the bearing parts are aligned.
b. Tighten the two nuts equally and alternately until resistance is met.
c. Then tighten to 2 Nm.
d. While rotating the bridge, check that the friction is equal over the complete range.
e. Check that joint parts are parallel.

6. Place the labels from label kit (MG-966).

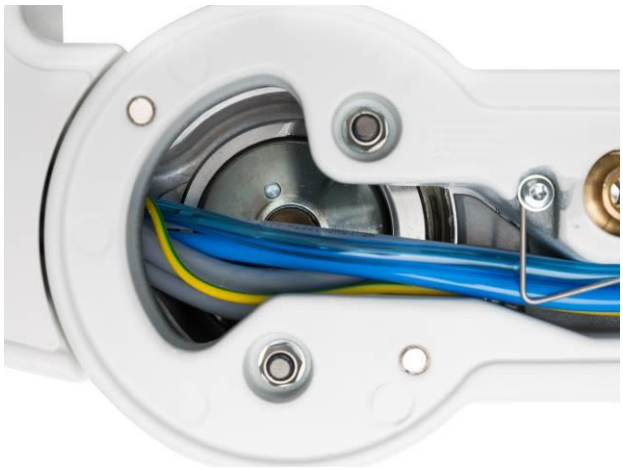
5.2 BRIDGE, REAR ARM JOINT

1. Loosen the friction brake in the rear joint.
2. Move the arm in all directions and verify that equal force is required to move the arm in the complete range.



Note:
Checking the centre bolt is not applicable for units manufactured after April 1. 2008.
These units have an improved design.

Units manufactured prior to this date shall be inspected as described below.



After April, 2008

3. Loosen the two M6 locking nuts a half rotation.

4. Check the alignment of the bearing parts before checking the centre bolt.

   Check if the center bolt is loose by tightening to 4 Nm using a torque wrench and a top for hex socket (Allen) width 8 mm.

   If loose please contact XO Technical Service.

5. After checking the center bolt tighten the two M6 locking nuts.
   a. Check that the bearing parts are aligned.
   b. Tighten the two nuts equally and alternately until resistance is met.
   c. Then tighten to 2 Nm.
   d. While rotating the bridge, check that the friction is equal over the complete range.
   e. Check that joint parts are parallel.

6. Place the label from label kit (MG-966). Refit covers on bridge arm.

5.3 OP LAMP/SCREEN ARM JOINTS

Note: Inspections are identical for OP lamp and Screen arm if mounted

1. Loosen the friction brake in the rear joint.
2. Move the arm in all directions and verify that equal force is required to move the arm in the complete range.

3. Support the front part of the arm system to keep the joint unloaded.
4. Loosen the two M6 locking nuts a half rotation.

5. Check the alignment of the bearing parts before checking the center bolt.

   Check if the center bolt is loose by tightening to 4 Nm.

   If loose please tighten to 8 Nm using a torque wrench and a top for hex socket (Allen) width 6 mm.

6. After securing the center bolt tighten the two M6 locking nuts.
   f. Check that the bearing parts are aligned.
   g. Tighten the two nuts equally and alternately until resistance is met.
   h. Then tighten to 0,7 – 0,9 Nm.
   i. While moving the arm system, check that the friction is equal over the whole movement.
   j. Check that joint parts are parallel.

7. Place the labels from label kit (MG-966).

8. Refit covers at arm system(s).

6 ADJUSTMENT OF OP LAMP ARM BALANCING MECHANISMS

1. Remove the cover below the arm and loosen the friction brake using a 4 mm hex key.

2. Re-attach all covers. It is important that the balance is tested with the covers mounted.
3. Move the OP lamp arm to the top position, bottom position and the center position and check its balance. The arm should be able to stay in position. Verify that the same amount of force is required, to move the arm upwards and downwards.
4. If the lamp arm moves upwards or downwards by itself then the balance should be adjusted.
5. Remove the covers again to get access to the lamp head fixation and disconnect the two cables going to the OP lamp head. Dismount the complete lamp head carefully.
6. Use one hand to move the arm down into its lowest position to gain access to the adjustment screw for the balance (spring tension).
   The adjustment screw can be reached using a top wrench with a prolonged top (20-25 cm) and a 5 mm Hex.

   Turning CW will increase the tension and turning CCW will decrease the tension.

   Note: If the arm have a tendency to move upwards the tension should be decreased and if the arm have a tendency to move downwards the tension should be increased.

   Note: One revolution of the screw equals a change of roughly 200 g in the force needed to move the arm up or down.

7. Re-attach the OP lamp head carefully and check that the arm is able to stay in position.
8. Re-connect the electrical cables and attach all covers.
9. Check the balance and repeat above if necessary.

7 ADJUSTMENT OF FRICTION BRAKES IN OP LAMP/ SCREEN ARM

1. Adjusting friction brake in OP lamp/screen arm, vertical movement.

2. Adjusting friction brake in OP lamp/screen arm rotational joint, horizontal movement.

3. Adjust the friction brake in the tower if the arm cannot be placed in a horizontal position without drifting.

8 ADJUSTMENT OF BALANCE AND FRICTION BRAKE IN BRIDGE ARM

NOTE: When testing the balance of the bridge arm, it is important that the weight of the bridge is roughly the same as it would be during treatment.
The dentist determines the type of instruments that need to be available on the bridge. Install instruments with hand pieces and, if necessary, with tray.

1. Move instrument bridge to the left and right side. The instrument bridge must be able to remain in these positions, or the friction brake should be adjusted with a 3 mm Allen key.

2. Move bridge arm to the left and right side. The bridge arm must be able to remain in these positions, or the friction brake should be adjusted with a 3 mm Allen key.

3. Loosen the friction brake in bridge arm (for vertical friction).

4. Move bridge arm to the top, middle and lower vertical position. The bridge arm must be able to remain in these positions, or the balance should be adjusted with a 6 mm Allen key - Verify that equal force is required to move the arm up and down.

5. Adjust the friction brake for vertical movement if necessary.

6. Adjust the friction brake in the tower.