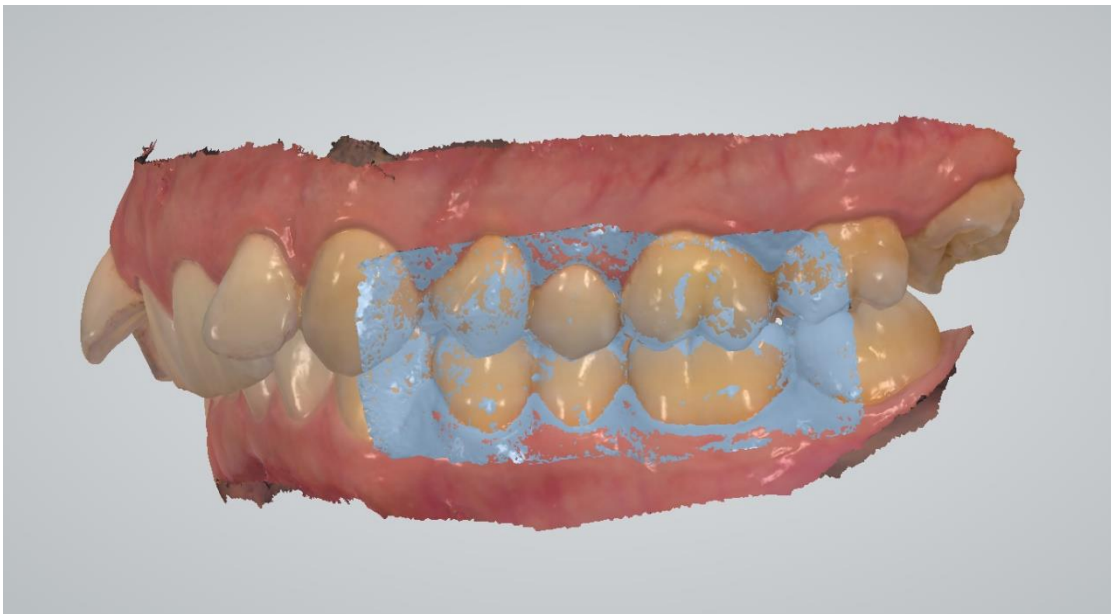


TRIOS[®] info pack: Bite Alignment

The 'Adjust' function and tips & tricks



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Introduction

This document describes how the bite alignment works in TRIOS® and outlines some good practices to follow, when making bite scans in TRIOS®. Some common pitfalls are highlighted, and it is shown how to avoid them.

Supported software versions

The information in this document describes the functionality for the TRIOS® (Classic) software from version 1.4.5.0 and higher.

It is also valid for the TRIOS® (Dental Desktop based) software version 1.17.0.0 and higher.

Supported scanners

The information in this document is valid for all 3Shape TRIOS® scanners.

How does the bite alignment work?

In most cases, the bite alignment happens automatically during scanning. It has two steps:

First, the arches snap together while scanning. The alignment observed at this point is a *preliminary* result. It is designed to work fast to give the user a live experience.

After a few seconds, a more accurate match is computed, and the user may observe that the arches move to the *optimal* position. This process requires more computations, which is why it cannot be performed while scanning.

In some cases, the arches will not snap together while scanning due to more complex anatomical shapes of the teeth, e.g. very small teeth. In such cases, use the manual bite alignment feature to align the bite.

The 'Adjust' function

The effect of the periodontal ligaments

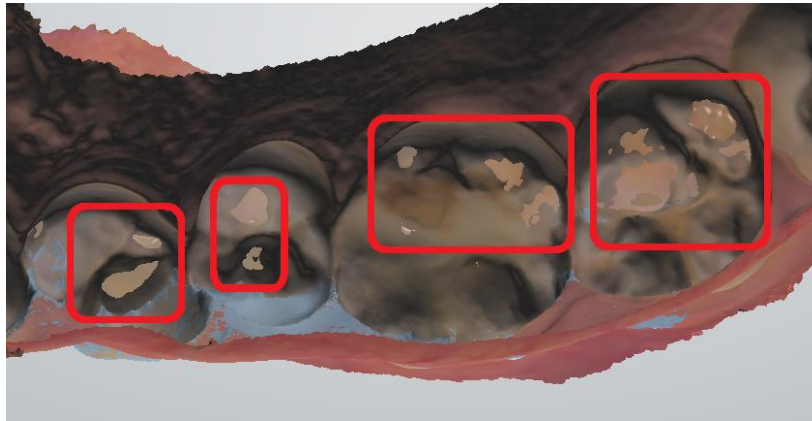
The individual arches are scanned in their relaxed state, as there is no pressure from the opposing arch during scanning.

However, when performing the bite scan, force is now applied to the teeth, depending on how hard the patient bites. Due to the flexibility in the periodontal ligaments, this will change the position of the teeth slightly, compared to the unloaded situation, when the arches were scanned.

Consequently, the scan captured during bite scanning cannot completely match the scans in the unloaded arches, as the teeth are now in slightly different positions. This is an effect that all

intraoral scanners have to deal with. The difference increases with the pressure applied by the patient and also depend on how loose the patient's teeth are.

This movement of teeth may cause the aligned arches to have some intersections or penetrations, at the occlusal surfaces, see image below.



Penetration caused by the flexibility of the periodontal ligaments

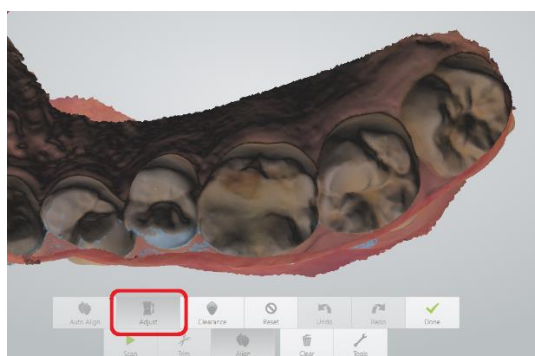
Compensating for the effect of the periodontal ligaments

In many cases it is desirable to remove the penetrations caused by the flexibility of the periodontal ligaments. The TRIOS® software provides a function, called 'Adjust', to 'mimic' the effect of matching two stone models, which physically cannot have any penetrations.

This function computes the occlusion of the arches that matches the bite scans to the arches as best as possible, while at the same time ensuring that no penetrations occur.

If there is only slight penetration, the occlusion will only be adjusted slightly, whereas cases with more significant teeth movement will generate more penetration, which again will cause more adjustment.

The function will seek to avoid penetrations, i. e. moving the arches apart. Important: It will *not* bring the arches in contact if there is no contact between the arches in the first place.



'Adjust' active. Penetrations are eliminated

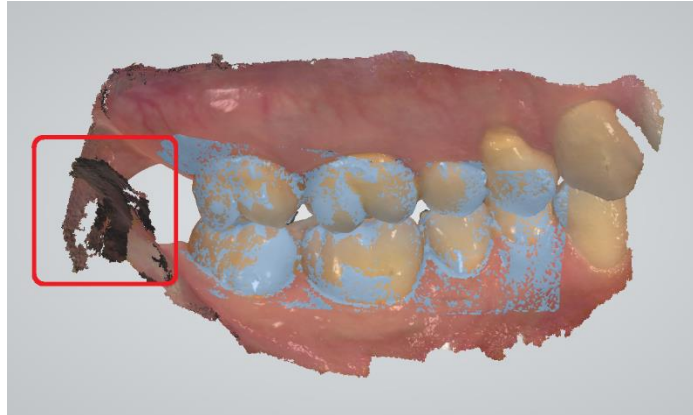


'Adjust' inactive. Penetration may occur

Natural limitations of the 'Adjust' function

The adjust function will react on anything that causes intersections of the scans. In this way it may bring arches apart due to artifacts on the occlusal surface, such as reminiscent of lips or tongue that was scanned in contact with the teeth or by saliva.

Similarly, scanning too much of the retro molar pad may cause the 'Adjust' function to adjust the bite to avoid penetration of the retro molar pads. The 'Adjust' function does not discriminate between teeth, gingiva, saliva etc. It will eliminate any penetration in the scan.



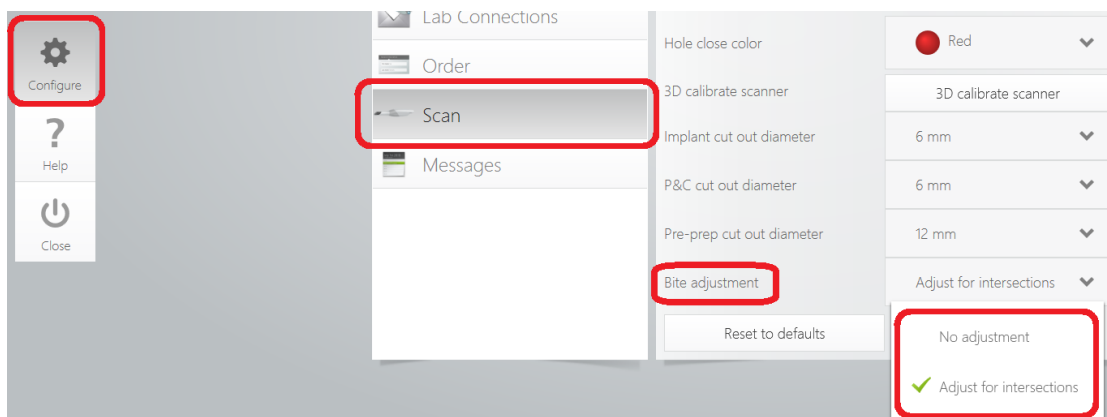
Scanning too much of the retro molar pad may cause the pads to intersect. This will cause the 'Adjust' to force the arches apart

TRIOS® settings to control the behavior of bite alignment

The TRIOS® system may be configured to use the 'Adjust' function or not, depending on personal preference or due to a specific condition in the mouth of the patient.

There are two ways to specify whether to use 'Adjust' or not.

The first method is to define a personal preference for each user. This will apply for all new cases created by that user. This preference will be loaded each time the user logs in. The user preference is set under Configure/Scan/Bite Adjustment, see figure below.



User preference for bite adjustment is found under Configure/Scan/Bite adjustment

The user's preference should reflect the user's agreement with the lab (many labs prefer to get the scans without potential penetrations) and the user's way of operating, including the instruction to the patient on how hard to bite, while doing the bite scan.

The second way to control the use of 'Adjust' is on a case-by-case basis. No matter how the personal preference is set, the user always has the option to turn the 'Adjust' on or off, on the individual case. This is controlled by the 'Adjust' button, located on the bite scan page, on the toolbar at the bottom of the screen, under the 'Align' button, see figure below.



When entering the 'Align' function, the state of the 'Adjust' button will be as defined by the personal preference for all new cases.

The capacity to change the setting case-by-case may come in handy in depending on the case.

Example:

The preference for all new cases is set to 'Adjust', i.e. to remove all intersections. In the case of a patient with periodontitis, the incisors may be pushed significantly forward by the lower centrals during the recording of the bite, due to the extraordinary mobility of the teeth. In this case the 'Adjust' will try to bring the arches significantly apart to eliminate penetrations, leaving the occlusion in a clearly suboptimal state. In this case a more correct bite could be obtained by allowing penetrations. This will give a good occlusion everywhere except at the centrals, where the lab may compensate for the obvious penetrations.

Good practices to follow

For the bite alignment to work correctly some rules apply. These are treated in the following sections

Instruction video

The following video contains the essence of what to observe when doing bite scans:

https://youtu.be/hIP1CbFnFPU?list=PLCWnYzDhJOgPPUSjTIKOF_Uh4DTCVvWVv

(You may also search YouTube with the keywords 'TRIOS scan strategy bite')

Summary

Soft tissue control

If you accidentally get soft tissue on the occlusal surface, be sure to trim it away and rescan.

If you accidentally scan too much soft tissue at the retro molar pad, be sure to trim it away.

Saliva control

If you accidentally get saliva on the occlusal surface, be sure to trim it away and rescan.

Bite pressure

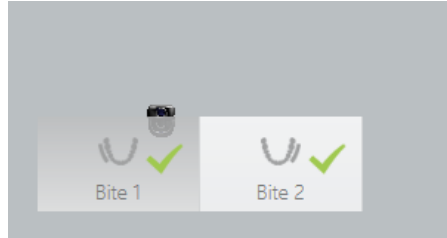
The patient should not bite excessively firm. Some users ask their patients to smile while biting, as it is not possible to bite hard, while smiling.

Maintain bite position

Instruct the patient to maintain the bite, while moving from the first bite scan to the second bite scan. Opening the mouth will result in two different occlusions.

Verify you have 2 bite scan on full arch cases

After having scanned the bite scan for a full arch case, make sure you have 2 green checkmarks in the lower left corner. This indicates that you have 2 bite scans registered. See figure below



Green checkmark indicate that bite scan was captured

Follow the official scan strategy

Always follow the official 3-pass scan strategy. This will give the best accuracy and hence provide the best foundation for a good occlusion. See link below (or search YouTube with keyword 'TRIOS scan strategy full arch')

https://www.youtube.com/watch?v=5_jq-vyvYew&list=PLCWnYzDhJOgPPUSjTIKOF_Uh4DTCVvWVv

Appendix

Bite alignment in earlier versions of the TRIOS® software

The 'Adjust' functionality has been present in the TRIOS® software for a long time. However, the default values and the capacity of user-specific preferences, as well as the capacity to change case-by-case has changed over the years. Also, earlier software versions named the functionality 'Optimize'.

The information in this document describes the functionality for the TRIOS® (Classic) software from version 1.4.5.0 and higher.

3 types of alignment in the Classic software

In the Classic software (not Dental Desktop based) 3 types of bite alignment exist: Manual, Automatic and Live. The default (and recommended) method is 'live', which causes the arches to snap together when matching is obtained. The 'Manual' and 'Automatic' modes correspond to earlier approaches, and will be discontinued when migrating to the Dental Desktop platform.

You can set the method under configure/scan/Bite alignment operation, see figure below

