

Pro Arch II EG

SEMI-ADJUSTABLE ARTICULATOR



Instructions for Use



Shofu Pro Arch III EG

SEMI-ADJUSTABLE ARTICULATOR

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Introduction

Shofu arcon-type articulators, Pro Arch series have been designed to facilitate fabrication of elaborate and accurate dental prostheses that match precisely with patient's natural jaw movement.

Unlike conventional semi-adjustable articulators, Shofu Pro Arch III EG has the angle adjustment structure for working side lateral condylar path, as well as for sagittal and balancing side lateral condylar path.

This additional structure provides adequate correspondence to lateral check bite and correct reproduction of each patient's unique lateral border movement, which enables to reproduce accurate lateral guidance that matches with patient's jaw movement.

The inverted-type adjustment feature enables convenient and accurate condylar path adjustment.

Angles of sagittal or lateral incisal path can be easily changed by replacing incisal tables.

The twin-plate mechanism at the condylar guidance combines the benefits of both box and slot type articulators.

In denture fabrication, this mechanism prevents condylar guidance and ball from being disengaged in the eccentric position and provides accurate denture occlusion.

Maxillary and mandibular jaws are easily separated, which provides excellent handling properties when fabricating crowns or bridges; it can be used just like an ordinary box-type articulator.

This instruction manual demonstrates the correct operation procedures and some important notes.

To use this articulator correctly and optimise its performance please read the Instructions for use carefully.

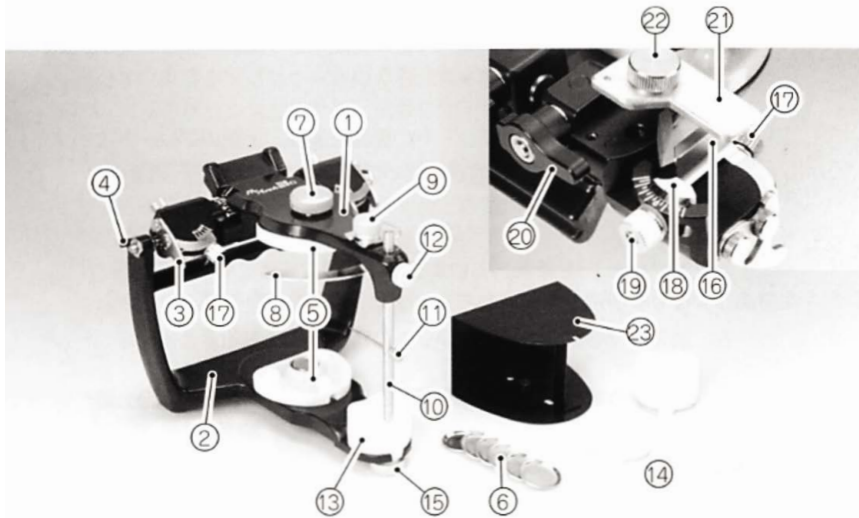
Features

- 1** Twin-plate mechanism at the condylar guidance combines the benefits of both box and slot type articulators.
 - When fabricating dentures this mechanism prevents the condylar guidance and ball from being dislodged in eccentric position to provide an accurate occlusion.
 - When fabricating crowns or bridges the maxillary and mandibular jaws can be easily separated for excellent handling while providing the flexibility to use as an ordinary box-type articulator when required.
- 2** Unlike conventional semi-adjustable articulators, Pro Arch III EG has an angle adjustment structure for working side lateral condylar path, as well as sagittal and balancing side lateral condylar path. This additional structure enables adequate lateral check bite registration and accurate reproduction of mandibular movement.
- 3** The inverted-type adjustment feature makes the condylar path adjustment easy and accurate.
- 4** This arcon-type articulator simulates the human jaw and provides easy comprehension of jaw movement with excellent handling properties.
- 5** Centric registration can be easily obtained with the secure locking system.
- 6** The Incisal Pin has a notch that precisely stops at 0 position to reproduce accurate centric occlusal position.
- 7** Angles of sagittal or lateral incisal path can be changeable by replacing Incisal Tables (0°, 5°, 10° and 15°).
- 8** The Ear Location Pin and Reference Indicator correctly transfer each patient's natural head position with a Face Bow.
- 9** The Occlusal Plate makes it easy to mount a cast using a mean value of head position.

Features

- 10 A cast can be easily mounted using the occlusal plane as reference. The guideline marked on the Occlusal Plate provides easy positioning of the cast.
- 11 Die-cast framework is lightweight with high precision. Its robust structure is free from flexure and the resin coating provides a durable surface finish. Its dark gray color of the body does not interfere with shade selection during the fabrication of prosthesis.
- 12 A mounting plate for lower jaw is 8mm behind the plate for upper jaw, which provides natural head position to mount a cast easily
- 13 Precise remounting and easy removal of cast can be achieved by using the Magnetic Split Cast Mounting Plate (MSMP). Ordinary Mounting Plates can also be used when required.
- 14 Upper and lower jaws can be easily separated when the Centric Lock Levers are released.
- 15 Upper jaw can be opened up to 120° and stays in place once open for easy access.
- 16 The Incisal Indicator can also be used as a reference during tooth arrangement.
- 17 The shape of the Incisal Table has been designed to easily determine the contact between the Incisal Pin and the Table.
- 18 Incisal Table can be replaced to change the incisal path angle.
- 19 Each part is ergonomically designed for superior handling and increased efficiency.

Identification of Parts

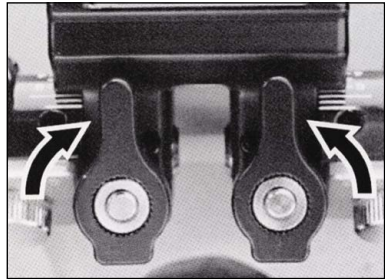


- | | |
|--|--|
| ① Upper Jaw | ⑮ Incisal Table Screw |
| ② Lower Jaw | ⑯ Balancing Side Lateral Condylar Guidance |
| ③ Centric Lock Lever | ⑰ Balancing Side Lateral Condylar Guidance Screw |
| ④ Ear Location Pin | ⑱ Working Side Lateral Condylar Guidance |
| ⑤ Magnetic Split Cast Mounting Plate (MSMP) single Mounting Ring | ⑲ Working Side Lateral Condylar Guidance Screw |
| ⑥ Cast Plates | ⑳ Sagittal Condylar Path Lock Lever |
| ⑦ Mounting Plate Screw | ㉑ Condylar Path Downward Guide Plate (“Twin Plates”) |
| ⑧ Reference Indicator | ㉒ Condylar Path Downward Guide Plate Screw |
| ⑨ Reference Indicator Screw | ㉓ Occlusal Plate (for IG, IIG, III EG) |
| ⑩ Incisal Pin | |
| ⑪ Incisal Indicator | |
| ⑫ Incisal Pin Screw | |
| ⑬ Incisal Table 10° | |
| ⑭ Incisal Table (0°, 5°, 15°) | |

Operating Procedures

1 Adjusting the sagittal condylar path angle

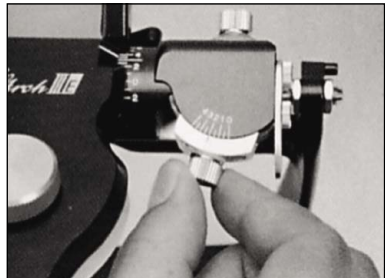
- Move the lever upward to release the lock.
- Move the lever downward to close the lock.



2 Adjusting lateral condylar path

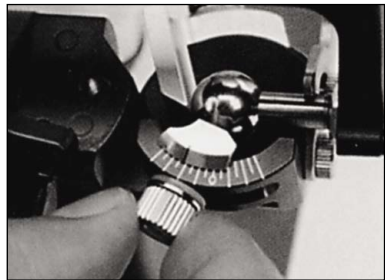
2.1 Adjusting balancing side of lateral condylar path angle

Loosen the screw 1/3 of a turn at the Balancing Side Lateral Condylar Guidance and move the guidance sideways to adjust its position.



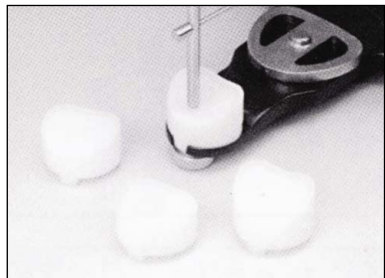
2.2 Adjusting working side of lateral condylar path angle

Loosen the screw 1/3 of a turn at the Working Side Lateral Condylar Guidance. Hold the screw and move it horizontally to adjust the position of the guidance.



3 Replacing the Incisal Table

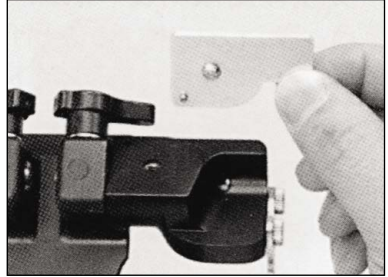
Take out the Incisal Table Screw and replace the table with the desired one (0°, 10°, option: 5°, 15°).



4 Twin-Plate mechanism

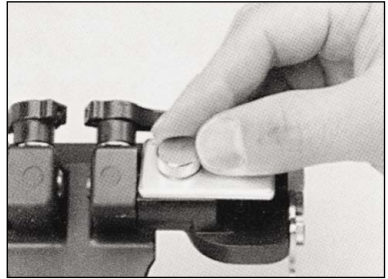
4.1 Detaching the Guide Plates

Loosen the Guide Plate Screw to detach the Condylar Path Downward Guide Plate (Twin Plates).



4.2 Mounting the Twin Plates

Insert the little projection (on the back of the plate) into the corresponding slot at the upper jaw frame and tighten the screw.

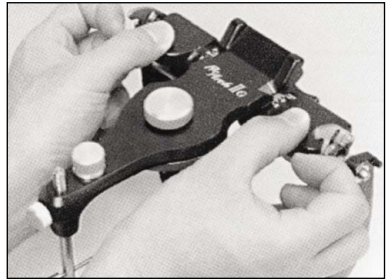


5 Using the Centric Lock

To release the Centric Lock, hold the upper jaw frame and lift the lever up. To close the lock, press the lever down firmly until the shaft snaps.

Ensure that both Centric Locks are being released when moving forward or laterally.

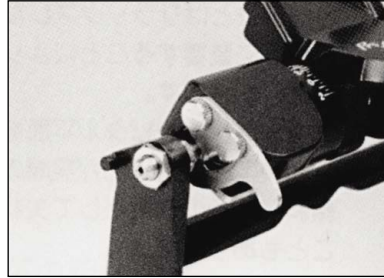
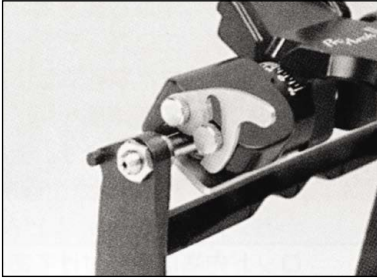
Releasing only one of the locks provides inaccurate reproduction of lateral movement and may damage the locks themselves.



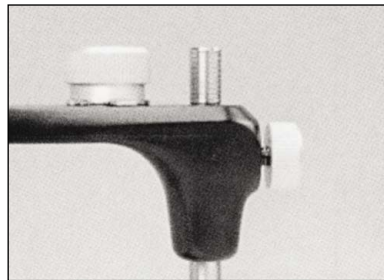
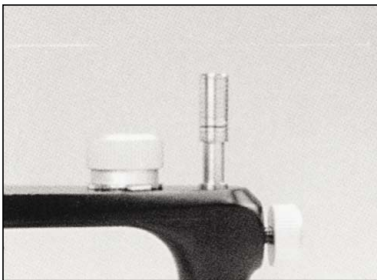
Directions for Use

STEP 1 Before mounting a cast

- 1 Lock in centric position using the Centric Lock Lever.



- 2 Check that the Incisal Pin scale is set to “0” (red line). A notch in the Incisal Pin helps the pin to stop precisely at “0” every time to ensure accurate occlusal position.



- 3 Set the angles as follows:
 - Sagittal condylar path: 30°
 - Balancing side of lateral condylar path: 15°
 - Working side of lateral condylar path: 0°

STEP 2 Positioning the upper cast

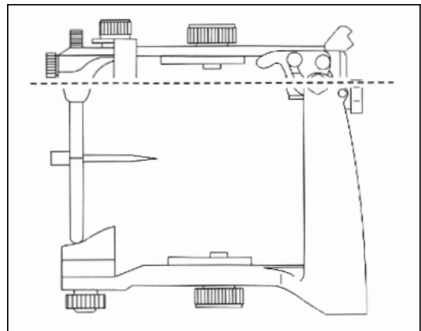
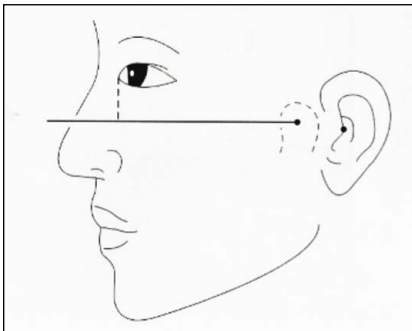
A. USING PRO ARCH FACE BOW

In the Pro Arch articulator series, each patient's maxillary dentition can be easily transferred with the use of Pro Arch Face Bow on the basis of patient's skull and mandibular joint.

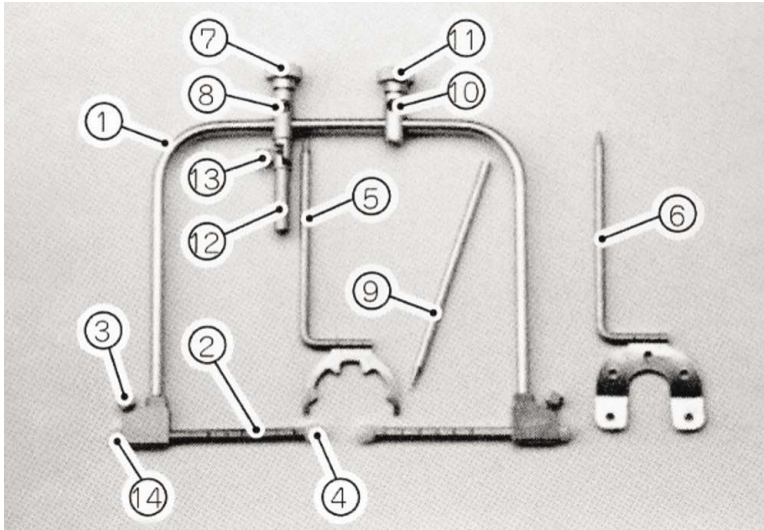
First, select either the horizontal reference plane in natural head posture or axis orbital plane to transfer with the Face Bow. When using horizontal reference plane patient's mandibular position is naturally transferred to the articulator. In this case, posterior reference point should be at the external auditory meatus, and anterior reference point should be 23mm below the inner canthus or 45 mm above the maxillary incisal edge. When using the axis orbital plane, remove the earpieces. Posterior reference point should be at the average condylar point and anterior reference point should be at the infraorbital canal.

"Natural head posture" is the head position obtained when one is relaxed. When mounting a cast in this posture, accurate adjustment of the articulator and precise fabrication of prostheses can be achieved.

Face bow transfer with axis orbital plane makes the occlusal plane of a maxillary model tilt further forward than that of the natural head posture, resulting in higher inclination of sagittal condylar path, which may make laboratory procedures more complicated.



PRO ARCH FACE BOW - IDENTIFICATION OF PARTS



- | | |
|--|--------------------------------|
| ① Face Bow main body | ⑧ Bite Fork Clamp |
| ② Ear Rod | ⑨ Anterior Reference Pin |
| ③ Ear Rod Screw | ⑩ Anterior Reference Pin Clamp |
| ④ Earpiece | ⑪ Anterior Reference Pin Screw |
| ⑤ Bite Fork for edentulous jaw | ⑫ Elevating Rod |
| ⑥ Bite Fork for dentulous jaw (option) | ⑬ Elevating Rod Screw |
| ⑦ Bite Fork Screw | ⑭ Ear Rod Stopper |

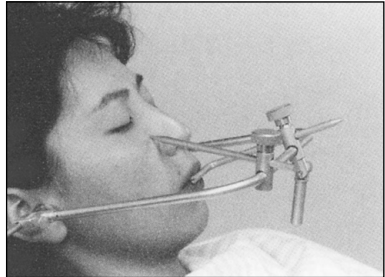
STEP 2 Positioning the upper cast

A. USING PRO ARCH FACE BOW

1 Registration of maxillary relation using Face Bow

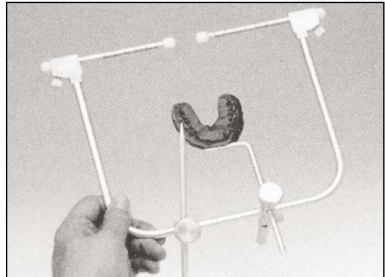
- 1.1 Insert Earpieces into each external auditory meatus to obtain a posterior reference point.

To get an anterior reference point, align the tip of the anterior reference pin to point 23mm below the inner canthus or 45mm above the maxillary incisal edge. This enables transfer of natural head posture to the articulator.



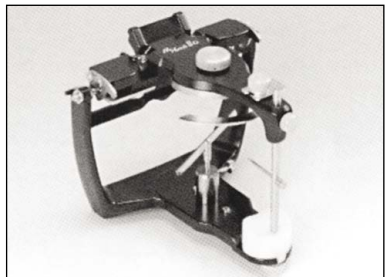
- 1.2 Registration with Face Bow has been completed.

(See the instruction manual for Pro Arch Face-Bow for further details.)



2 Attaching Reference Indicator and Cast Support

Attach the Reference Indicator to the upper jaw and Cast Support to the lower jaw respectively.



3 Transferring to the articulator

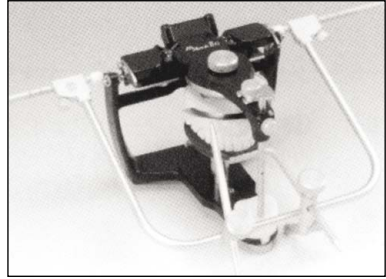
- 3.1 Attach the Face Bow Ear Rods to the Ear Location Pins on the articulator. To obtain posterior reference points.

- 3.2 To determine the vertical alignment at the front part of the Face Bow, place the tip of the Anterior Reference Pin to come in contact with the under surface of the Reference Indicator.

Then adjust the Elevating Rod and secure it with the Elevating Rod Screw.

- 3.3 Hold the Bite Fork of the Face Bow from below using the Cast Support.

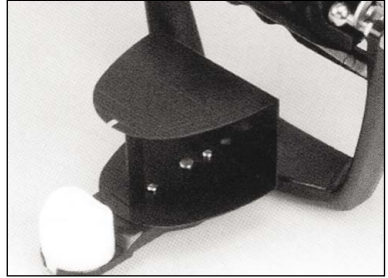
- 3.4 Match the registration on the upper surface of the Bite Fork with the occlusal surface of the maxillary cast in order to position it.



STEP 2 Positioning the upper cast

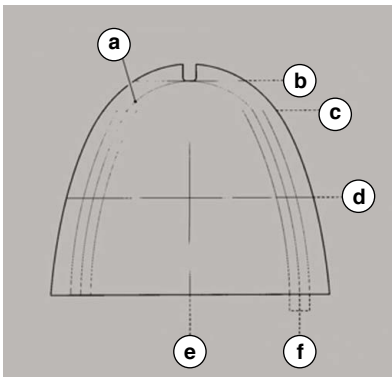
B. USING OCCLUSAL PLATE

1 The use of the Occlusal Plate with mean value is an easy alternative to the face bow. First, remove the Magnetic Split Cast Mounting Plate (MSMP) from the lower jaw Member and replace it with the Occlusal Plate provided.



2 The height of the Occlusal Plate is designed to be the average vertical position of the maxillary central incisal edge, which makes it easier to position the maxillary cast and occlusal rim.

3 On the upper surface of the Occlusal Plate: the median line, ideal arch for the maxillary anterior dentition, the average anteroposterior position of the cuspids and the center of the first molars are indicated.

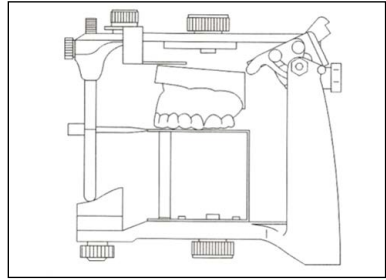


- a. Ideal arch for the upper anterior teeth
- b. Maxillary anterior incisal edge
- c. Cuspids
- d. Center of the first molars
- e. Median line
- f. Lines of reference for posterior wax occlusal rim (S, M, L)

4 Using the occlusal plane as a reference

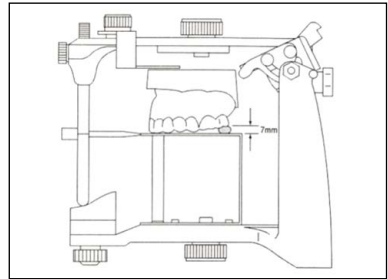
When positioning upper cast and wax occlusal rim with the occlusal plane as a reference plane, the ideal arch for the upper anterior teeth and the median line should be matched with upper labial side and median of the wax rim.

Based on one of the reference lines selected among S, M and L for posterior wax rim, the buccal side of wax rim should be symmetrically positioned. Check the position of the wax rim from above and behind.



5 Positioning the wax rim based on the mean value of natural head posture

When applying the mean value of natural head posture to position the wax rim, the Occlusal Plate is used. In this case, beading wax is used to raise the distobuccal cusps of the upper second molars about 7mm higher than the occlusal plate, to make the occlusal plane angle approximately 10°.

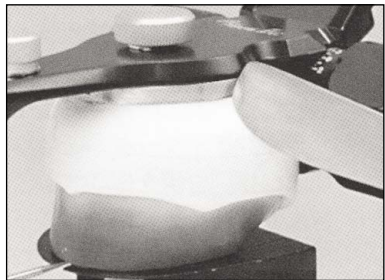
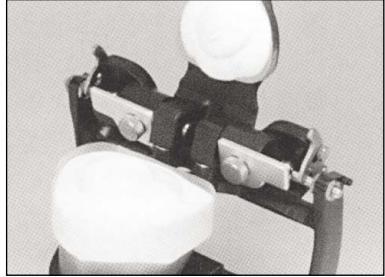


6 When the median lines of the articulator and the upper cast have been matched to mount the cast, arrangement of the upper central incisors can be checked with the Incisal Indicator. (Prior to checking, the Incisal Indicator should be pointed in the median direction using the Occlusal Plate).



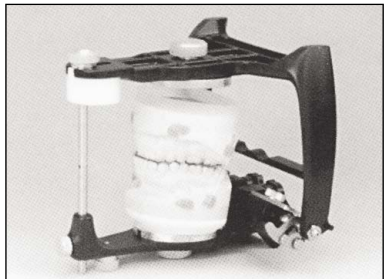
STEP 3 Mounting the upper cast

- 1 When the positioning of the upper cast is complete, moisten the basal surface of the cast sufficiently and place adequate amount of plaster.
- 2 Place plaster at the undercut of the Cast Plate.
- 3 Close the upper jaw gently until the Incisal Pin comes in contact with the Incisal Table. Remove the excess plaster and let plaster cure.



STEP 4 Mounting the lower cast

- 1 With the Centric Lock Lever fastened turn the articulator upside down, position the lower cast on the basis of centric occlusal registry.
- 2 Double investing technique is effective to minimize the distortion in centric occlusion due to expansion of cast during curing.
- 3 Close the articulator gently until the Incisal Pin comes in contact with the Incisal Table. Remove the excess plaster and let plaster cure. An elastic band can be used to minimize the expansion of cast during curing.



STEP 5 Mounting of the upper/lower cast is complete

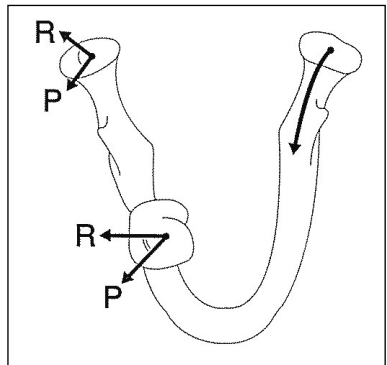
When mounting of both upper and lower casts are complete, put the articulator back in place and check if the Incisal Pin is in contact with the Incisal Table.



REPRODUCING MANDIBULAR MOVEMENT

In order to reproduce accurate lateral movements, which is a vital feature for fabrication of prosthesis, it is important to have an adjustable balancing and working side condylar path angles. In conventional semi-adjustable articulators, working side condylar path is not adjustable.

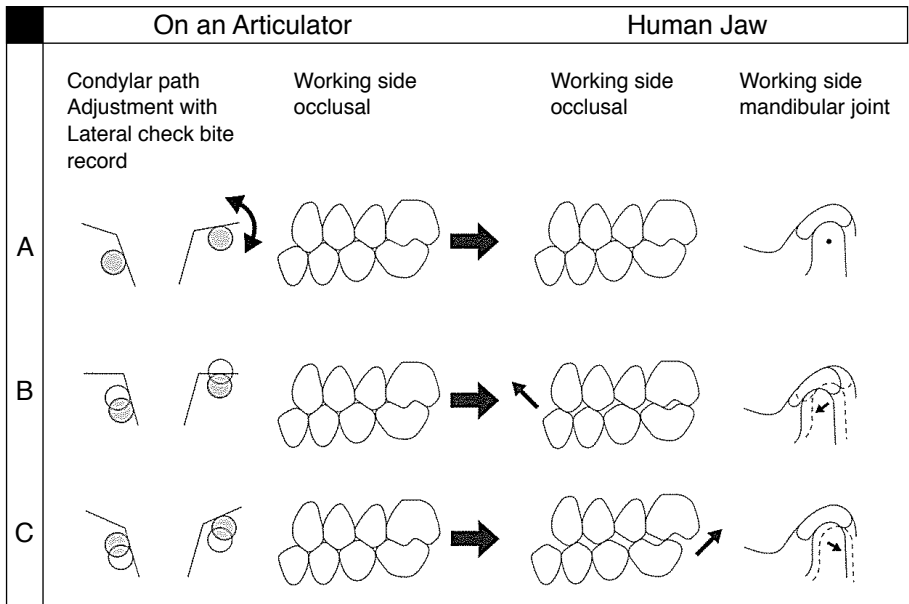
However, working side condylar path varies greatly among individuals and largely influences the occlusal surface of prosthesis in terms of cup position or ridge and angle of lateral guidance. Therefore, in order to reproduce accurate lateral movement on an articulator it is vital for the articulator to have a structure that can adjust sagittal condylar path, balancing side condylar path and working side condylar path angles (rear wall).



Conventional semi-adjustable articulators that do not have this feature cannot reproduce lateral movement even though an angle of the balancing side lateral condylar path is adjustable.

When fabricating prostheses that directly involve mandibular guidance, a well-balanced lateral guide must be created by adjusting the balancing and working side condylar path angles in order to reproduce precise lateral movement.

This will minimize intraoral adjustments and prevent detrimental effects on patient's stomatognathic system while restoring its function effectively.



- position of condylar ball using check bite record
- position of condylar ball when fabricating prosthesis

■ Effect of working side, lateral condylar path adjustment structure

“A” has working side of lateral condylar path adjustment structure.

“B” and “C” do not have the structure.

A: gives prosthesis an adequate bracing equalizer in front and rear, which matches mandibular function

B: is an articulator, which has angle of working side lateral condylar path (rear wall) fixed parallel to the intercondylar axis. Condylar path adjustment cannot be done because of the interference of condylar ball. Therefore, it does not give prosthesis bracing equalizer in front (“D”-type guide) that matches mandibular function.

C: is an articulator, which has angle of working side lateral condylar path (rear wall) released at the rear. Therefore, it does not give prosthesis bracing equalizer in rear (“M”-type guide), which may result in damage and dysfunction in mandibular joint.

1 Adjusting the articulator

1.1 Condylar path adjustment

Using check bite technique

- There are 3 typical methods to adjust condylar path of an articulator

- ① Sagittal condylar path angle
Balancing side lateral condylar path angle ► *Use lateral check bite*
Working side lateral condylar path angle
- ② Sagittal condylar path angle ► *Use anterior check bite*
Balancing side lateral condylar path angle
Working side lateral condylar path angle ► *Use posterior check bite*
- ③ Sagittal condylar path angle ► *Use anterior check bite*
Balancing side lateral condylar path angle ► **Use Hanau's formula***
H/8+12= angle of lateral condylar path
(H = angle of sagittal condylar path)

* **Hanau's formula** is to find the lateral condylar path angle using sagittal condylar path angle, however, these two angles do not necessarily correlate with each other. Therefore using lateral check bite is more appropriate for adjustment of lateral condylar path angle.

Since lateral movement is physiologically and functionally more essential than protrusive movement, it is less appropriate to use anterior check bite for lateral condylar path adjustment. Therefore it is more logical to apply the first method mentioned above, where lateral check bite is used to adjust sagittal and lateral condylar path angles (balancing/working side).

2 Procedures for condylar path adjustment

2.1 Preparation

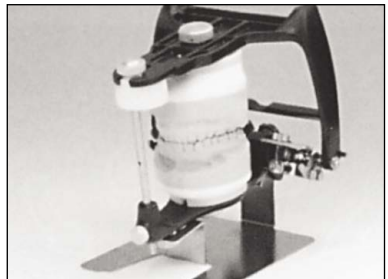
2.1.1 Loosen each screw on the articulator and set the calibrations as follows:

- sagittal condylar path angle: 0°
- balancing side lateral condylar path angle: 40°
- working side lateral condylar path angle: -40°

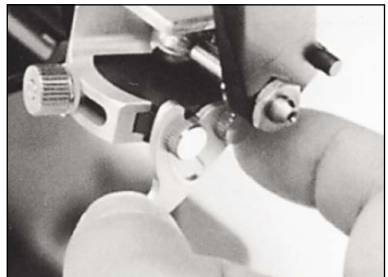
2.1.2 Turn the articulator upside down for condylar path adjustment. Use the Special Pedestal for condylar path adjustment (optional) for more stability and easy handling. Insert the pedestal between the Reference Indicator Screw and washer, then stabilize it with the screw.



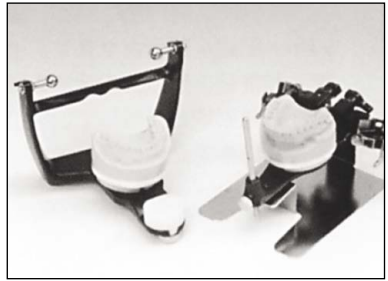
2.1.3 Place the articulator in an inverted position.



2.1.4 Release Centric Lock Levers on both sides.



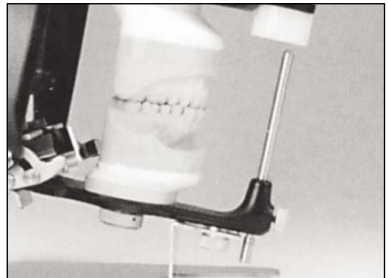
2.1.5 Separate the lower jaw.



2.1.6 Remove the Twin Plates.



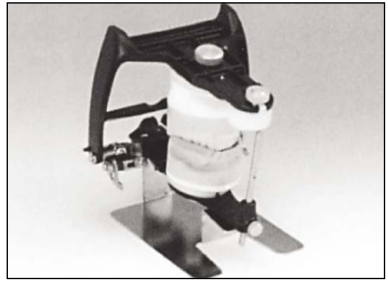
2.1.7 Loosen the Incisal Pin screw and lower the Incisal Pin to detach from the Incisal Table.



2.1.8 These are the bilateral check bite records.

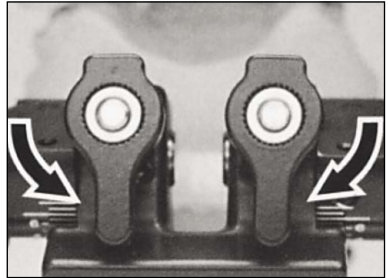


2.1.9 Place the check bite record so that the working side is on the left. Make sure that the Condylar Guidance is in contact with only the upper wall of the working side Condylar Ball.

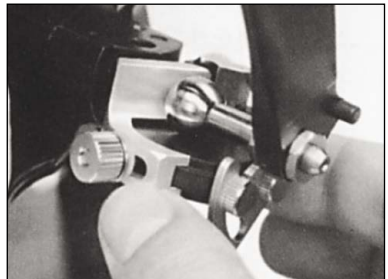


2.2 Adjusting the sagittal condylar path angle

2.2.1 Release both of Sagittal Condylar Path Lock Levers.

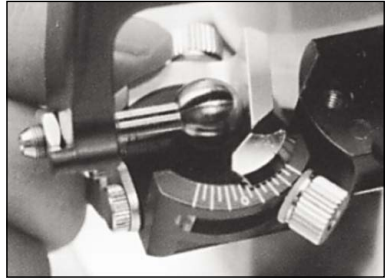


2.2.2 Since the Condylar Ball is detached from Sagittal Condylar Path Guide Plate on the balancing side, gradually increase the sagittal condylar path angle on the right and fasten the Lock Lever when the Sagittal Condylar Guide and Condylar Ball come in contact with each other. While performing this procedure make sure the articulator is stabilized.

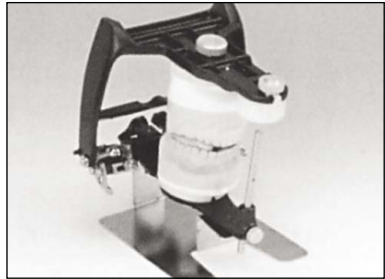


2.3 Adjusting the balancing side of lateral condylar path angle

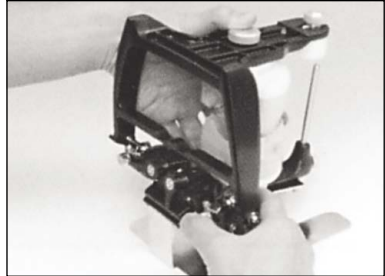
2.3.1 Decrease the balancing side of lateral condylar path angle on the right and tighten the screw when the guidance comes in contact with the condylar ball.



2.3.2 Replace the check bite record so that the working side is on the right.



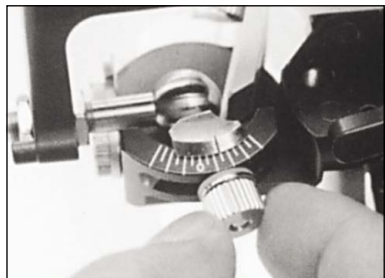
2.3.3 Adjust the sagittal and balancing side of lateral condylar path angles on the left in the same manner.



2.4 Adjusting the working side of lateral condylar path angle on the right

2.4.1 Hold the screw and move the working side lateral condylar guide on the right from – to + direction.

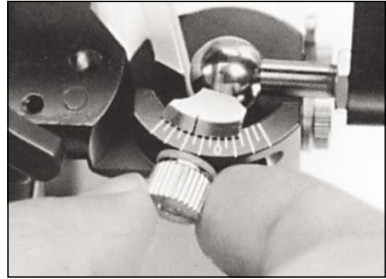
Tighten the screw when the Guidance comes in contact with the Condylar Ball.



2.5 Adjusting the balancing side of lateral condylar path angle

2.5.1 Put the working side check bite record on the left and adjust the working side of lateral condylar path angle on the left in the same manner as the right.

The working side of lateral condylar path angle should be adjusted at the end since it will be altered when the sagittal condylar path angle changes.



2.5.2 Remove the check bite record and place the Condylar Path Guide Plates (Twin Plates) downward.

Put the upper and lower jaws together and close the Centric Locks. Laboratory procedures can be performed with the Twin Plates left detached.



2.5.3 Put the articulator back in place, and set the Incisal Pin back to the "0" position. Detach the Pedestal.

The condylar path adjustment is now complete.



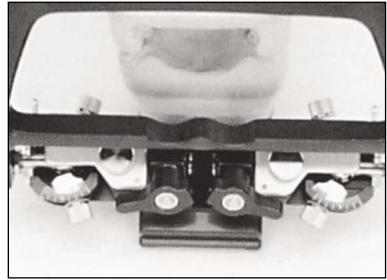
2.6 Example

After adjusting the sagittal and balancing side of lateral condylar path angles.



2.7 Example

after adjusting the working side of lateral condylar path angle.

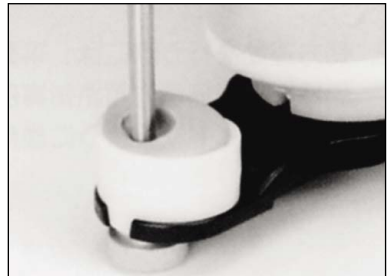


3 Producing incisal guidance

3.1 Place self-cured resin such as tray resin on the 0° Incisal Table.



3.2 With a sheet of polyethylene film placed between upper and lower casts, move the articulator forward and laterally until the resin is set to obtain patient's unique incisal guidance that matches the guidance of remaining upper/lower teeth.



4 Producing incisal guidance

- 4.1 In typical restorations for full denture and occlusal guidance using prosthetic appliance, select an Incisal Table (0° , 5° , 10° and 15°), which is most suitable to the case.

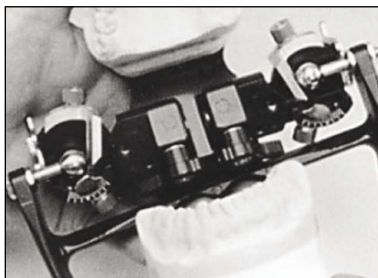


Caution

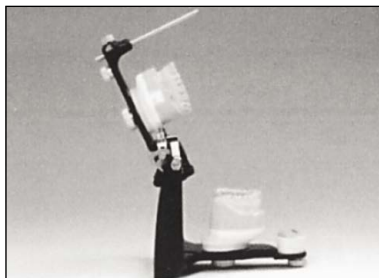
- 1 When releasing the Centric Lock Levers, make sure to release both left and right levers.



- ② Lateral movement should be performed with the balancing side condylar ball coming in contact with the balancing side lateral condylar guidance.



- ③ When the articulator is open with the Centric Lock Levers released, rest the rear end of the upper jaw on the stabilizer bar of the lower jaw to prevent the upper jaw from falling back.



- ④ Avoid contact of wax or plaster with the Condylar Ball and Condylar Guidance. In case of accidental contact, remove the wax or plaster immediately.

Spraying SHOFU HI-SOL on the working parts will prevent contact of wax or plaster. Regular cleaning and occasional lubrication of all working parts is recommended.

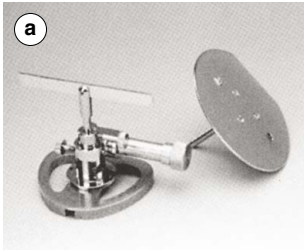
Specifications

Type	Arcon type
Distance between condyles	110mm
Distance between upper and lower jaws	110mm
Maximum opening angle	120°
Condylar Guidance Structure	Twin-Plate Structure (Condylar Upward Guide Plate and removable Condylar Downward Guide plate)
Sagittal condylar path angle	-20° ~ +80°
Balancing side lateral condylar path angle	0° ~ +40°
Working side lateral condylar path angle	-40° ~ +30°
Incisal Pin	with Incisal Indicator
Incisal Tables	4 types for anterior and lateral (0°, 5°, 10° and 15°)
Mounting / removal of cast	Magnetic Split Cast Mounting Plate (Mounting Rings can also be used)
Face Bow transfer mechanism	With Ear Location Pin Condylar Ball rod with a hole on the front edge

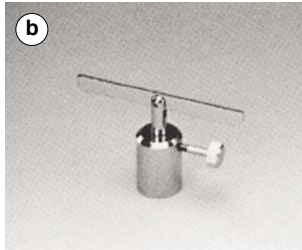
Accessories

- Incisal Tables 0°, 5°, 10° (pre-attached), 15°
- Occlusal Plates (for IG, IIG, III EG)
- Cast Plates (6 plates)

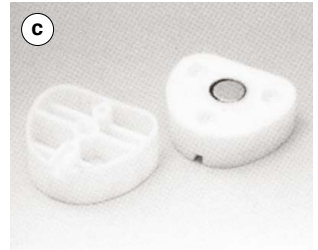
OPTIONAL ACCESSORIES



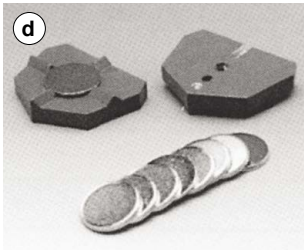
a
Gear-type Cast Support
/ with Occlusal Plate



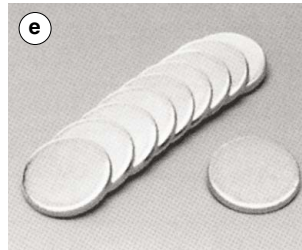
b
Handy Cast Support



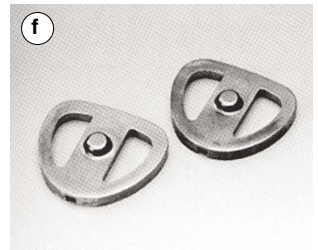
c
MSMP Double



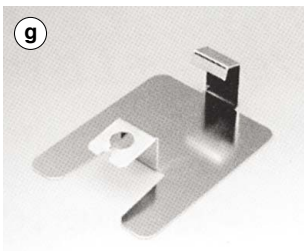
d
Pro Arch Split Cast
Plates



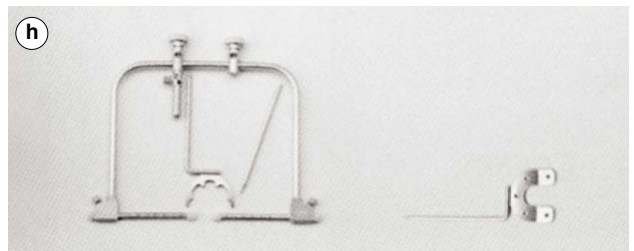
e
Steel Plates (10 plates)



f
Mounting Rings

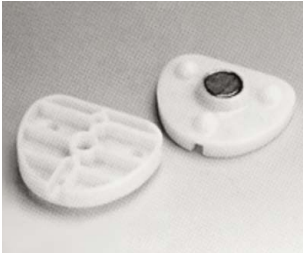


g
Condylar Path
Adjustment Pedestal



- Pro Arch Face Bow
(with Bite Fork for edentulous jaw and Anterior Reference Pin)
- Bite Fork for dentulous jaw *(optional)*

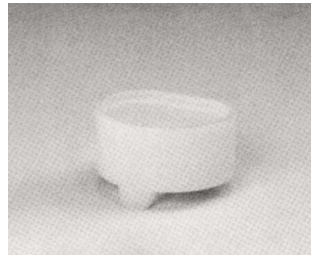
OPEN STOCK ITEMS



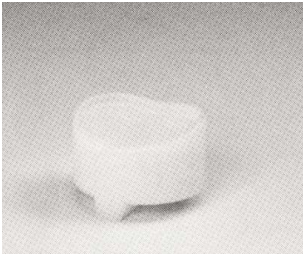
MSMP Single



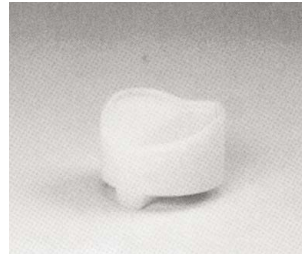
Cast Plates (10 plates)



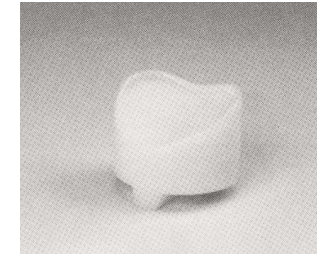
Incisal Table 0°



Incisal Table 5°



Incisal Table 10°



Incisal Tables 15°



SHOFU DENTAL ASIA-PACIFIC PTE. LTD.

10 Science Park Road, #03-12 The Alpha, Science Park II, Singapore 117684

Tel: +65 6377 2722 Fax: +65 63771121

eMail: mailbx@shofu.com.sg www.shofu.com.sg

