

Maxillo-mandibular Relationship

Jaw relation (Maxillomandibular relationship): any one of the infinite spatial relationships of the mandible to the maxilla.

Jaw relation record: It is a registration of any positional relationship of the mandible relative to the maxilla. These records may be made at any vertical, horizontal, or lateral orientation; it is also known as: *maxillomandibular registration*.

Types of Jaw Relations:

1- Orientation jaw relation

2- Vertical relation: a. Rest Vertical dimension (RVD).

b. Occlusion Vertical dimension (OVD).

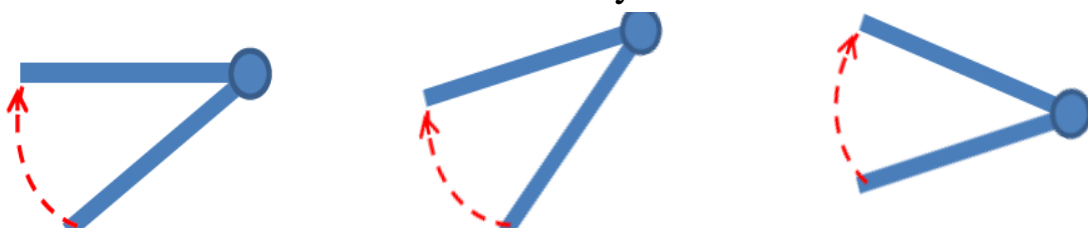
3- Horizontal relation: a. Centric jaw relation.

b. Eccentric jaw relation: I- Protrusive relation

II- Lateral jaw relation: a. right. b. left.

Orientation jaw relation

It is defined as the jaw relation when the mandible is kept in its most posterior position, it can rotate in the sagittal plane around an imaginary transverse axis passing through or near the condyles. This record gives the angulation of the maxilla in relation to the temporomandibular joint (opening and closing axis). It is necessary to do orientation jaw relation *before* carrying out other jaw relation. The casts on the articulator must relate to the hinge axis of the instrument in as nearly as possible the same way as the jaws relate to the patient's *arc of closure*. This relation can be recorded by mean of the face-bow.



Face-bow: It is a caliper-like device used to record the relationship of the maxillary arch to the temporomandibular joints or the opening axis of the jaws, and then transfer this relationship to the opening axis of the articulator.

Parts of face-bow:

1- U-frame: *it represents the plane of the cranium.* It is the main frame of the face-bow; all other components are attached to the frame. It should be large and wide enough to avoid contact with the sides of the face.

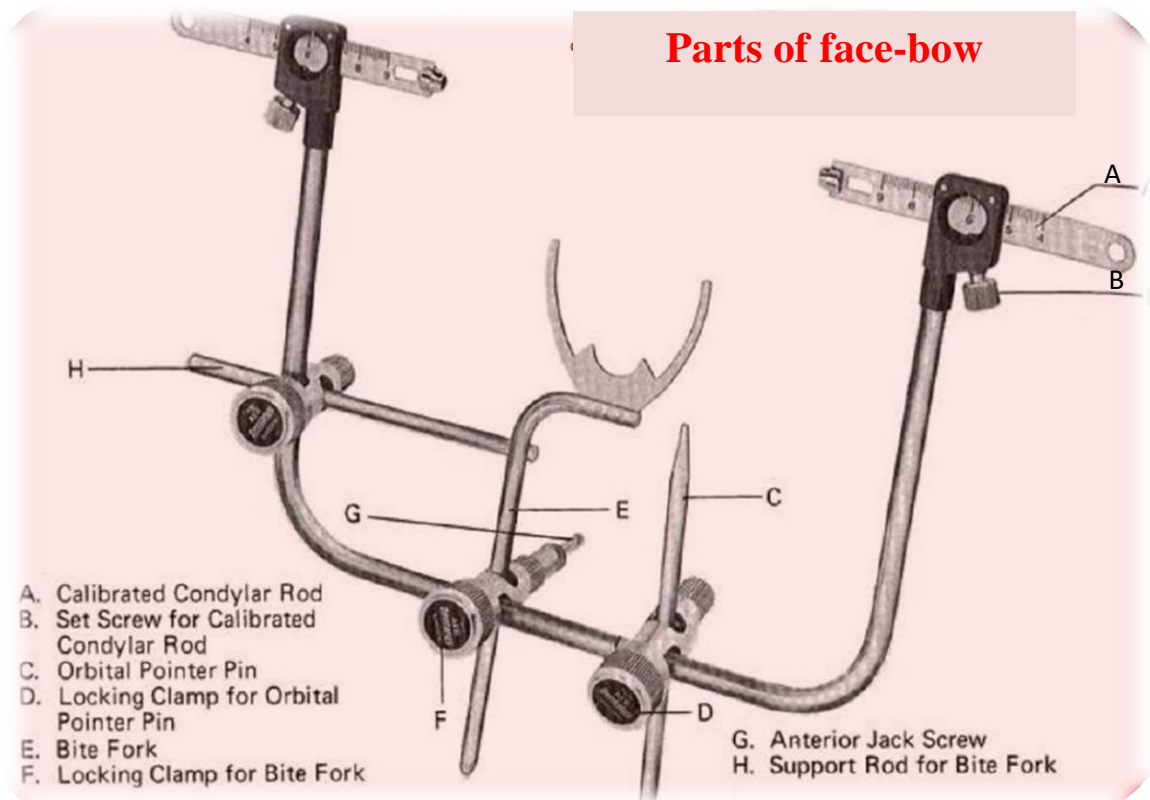
2- Bite fork: *it represents the plane of the maxilla.* It is a U-shaped plate, which is attached to the occlusal rims (3 mm below) while recording the orientation relation.

3- Locking device: it locks the first two sections without altering their plane.

4- Condyle rods: These are two small rods on either side of the free end of the frame that contacts the skin over the TMJ, over the hinge axis and transverse the hinge axis of TMJ by attaching to the condylar shaft in the articulator.

5- Orbital pointer with clamp: It is designed to mark the anterior reference point (infraorbital notch) and can be locked in position with a clamp. It is present only in the arbitrary face-bow.



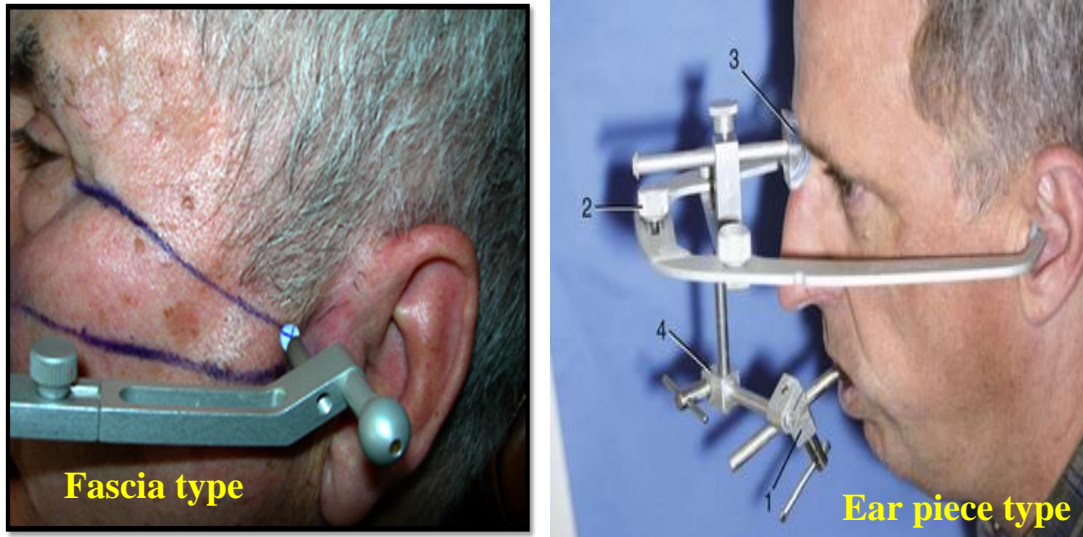


Types of face-bow:

1- **Arbitrary face-bow:** It is the most commonly used face-bow in complete denture construction. The hinge axis is approximately located, it orients the maxilla to an arbitrary hinge axis and transverse it to the articulator and it does not exactly match the articulator axis to the actual hinge axis. It is simplistic, less accurate, requires less complicated equipment and time. It is used with semiadjustable articulators.

- There are two types of Arbitrary face-bow:

A-Fascia type: It utilizes approximate points on the skin over the tempromandibular region as the posterior reference points. These points are located by the condylar rods are positioned approximately **13 mm** anterior to the posterior margin of the tragus of ear along a line drawn from the outer canthus of the eye to the center of the tragus (**cantho-tragus line**) this point called (**Beyron's point**). This type of face bow is placed on the skin which is movable there is a tendency for the condylar rods to displace. Also it requires an assistant to hold the face bow in place.



B-Ear piece type: It uses the external auditory meatus as an arbitrary reference point which is aligned with ear pieces similar to those on a stethoscope. The difference in the position of the earpiece is accommodated by the design of the articulator and its earpiece receiver points (*auditory pin*). This type of face bow is simple to use and not requires measurements on the face.

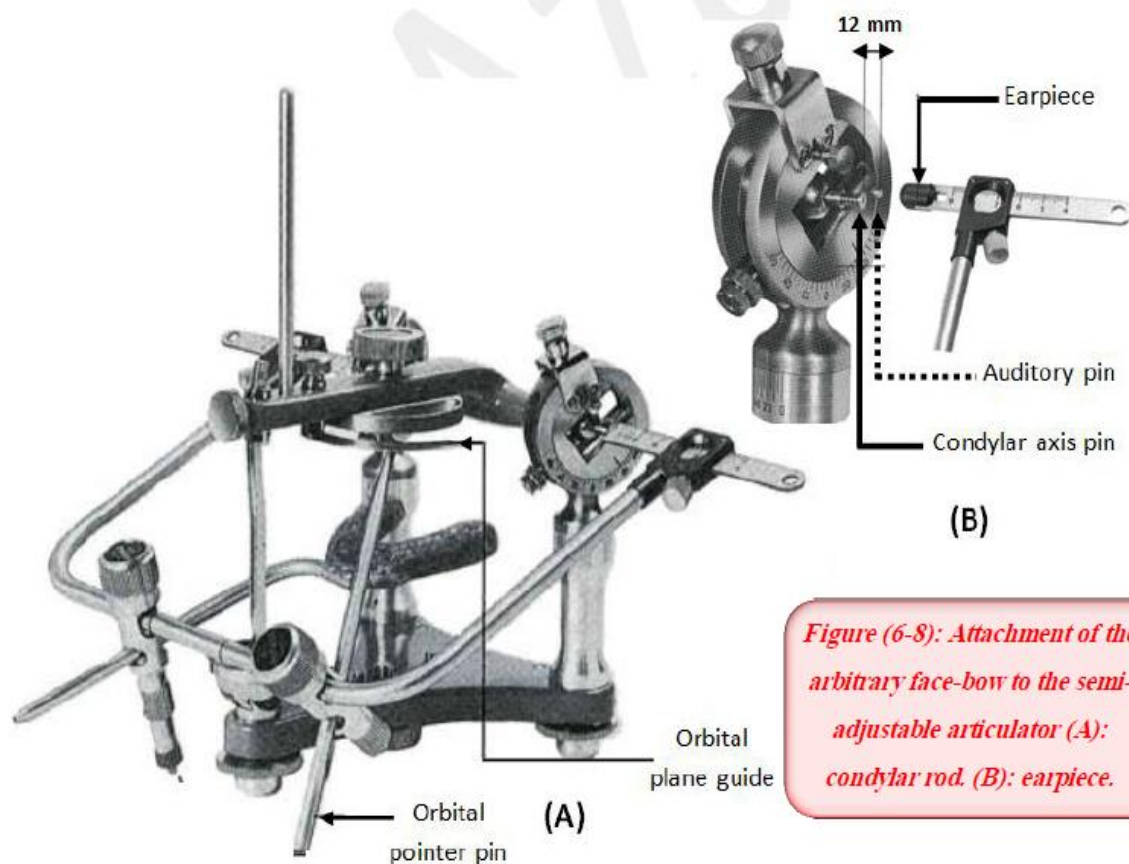


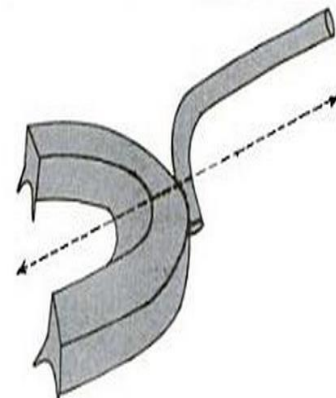
Figure (6-8): Attachment of the arbitrary face-bow to the semi-adjustable articulator (A): condylar rod. (B): earpiece.

2- Kinematic face-bow: A face-bow attached to the mandible with caliper ends (condyle rods) that can be adjusted to permit the accurate location of the true axis of rotation of the mandible. It is generally used for the fabrication of fixed partial denture and full mouth rehabilitation. It is generally not used for complete denture fabrication because it requires a long and complex procedure to record the orientation jaw relation.

It orients the maxilla to the actual hinge axis and transverse it to the articulator, it is most sophisticated, most accurate, required more elaborate equipment and time. It is used with fully-adjustable articulators.

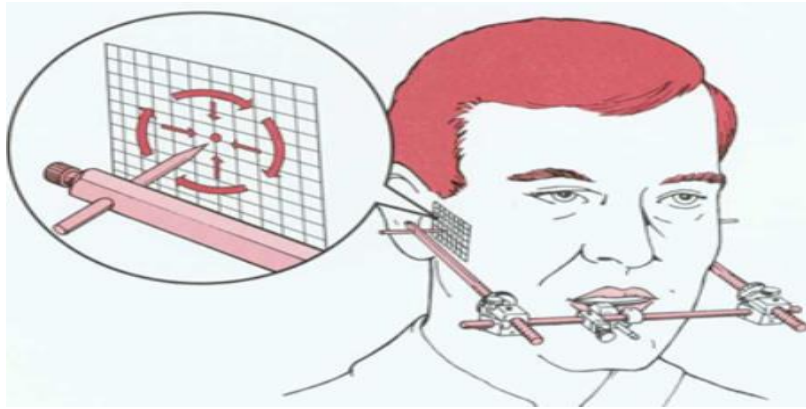


Mandibular clutch.



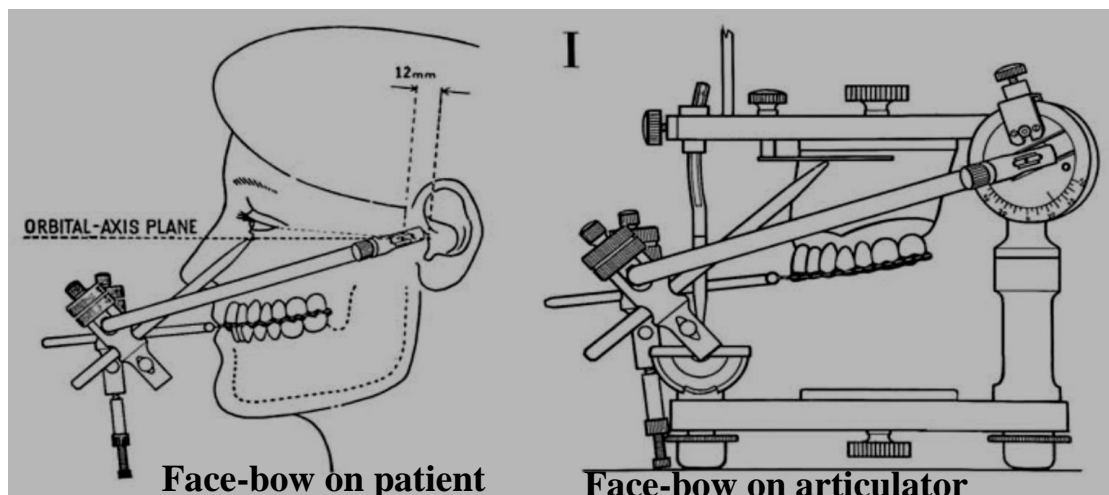
The first step involves the fabrication of **clutch** (*it is occlusal rim made of impression compound with a bite fork tightly attached to it*). Once the clutch has been attached to the mandible and hinge bow attached to it, guide the patient in making only hinge opening and closing movement.

Left and right styli are attached via a face-bow to a clutch, remain stationary (draw point) if aligned with the actual axis of rotation, if the stylus is positioned forward or backward, above or below the actual axis, it will travel one of the arcs indicated by the arrows when the mandible makes a rotational movement. Thus, the arc indicates in what direction an adjustment should be made to the stylus position.



Importance of the face-bow:

1. The mounting of maxillary cast without face-bow transfer can produce errors in the occlusion of the finished denture.
2. A face-bow transfer allows minor changes in the occlusal vertical dimension on the articulator without having to make new maxillomandibular records.
3. It is helpful in supporting maxillary cast while it is being mounted on the articulator.



3-The Virtual Face bow: Virtual face bow has been developed as an open-source tablet app that provides an alternative to the conventional face bow for the mounting of casts to an articulator.

