

DENAR®

Mark 300

SERIES ARTICULATOR
SYSTEM



Models 310, 320, 330
Instruction Manual

TABLE OF CONTENTS

Introduction 3

Features 4

Mark 300 Series Articulator System 8

Mounting Casts 14

Accessories 18

Calibration Procedures 22

Care and Maintenance 23

Warranty 23

IMPORTANT:

Your Denar® Mark 300 Series Articulator is a precision instrument manufactured to precise tolerances and designed to give you years of trouble-free service. Like all precision instruments, it must be handled carefully to avoid damage. When transporting the articulator, always remove the upper member from the lower member and store separately in the instrument case. Please check online at www.whipmix.com for the most current instructions and parts list.

Introduction:

Who Should Use the Denar® Mark 300 System

Doctors Who Want:

- To mount casts quickly and easily on a semi-adjustable instrument that accurately reproduces mandibular movements.
- Confidence in creating repeatable movements when casts are mounted on another Mark 300 Series articulator.
- A complete system for determining the maximum accuracy of fit in developing well-functioning restorations.
- To produce restorations by means of checkbite records and/or the functionally generated path (FGP) techniques.
- A semi-adjustable articulator with adjustment capabilities for protrusive condylar inclination, progressive side shift, and immediate side shift.
- Casts mounted on a very rigid articulator in the position of maximum intercuspation.

Technicians Who Want:

- A practical, rigid, and easy to use articulator.
- To efficiently produce restorations that require fewer remakes.
- To receive mounted casts.
- Quality workmanship providing tightened tolerances and durable finishes.
- Ability to accurately replicate patient movements.

Educators Who Want:

- An economically priced articulator and facebow for student issue without violating sound anatomical principles.
- Occlusal instruments that fulfill the needs of all restorative departments.
- To avoid the need for the student to have a separate articulator for each restoration under construction.

Students Who Want:

- To study Occlusion and the movement of the temporomandibular joint.
- An instrument with intelligent modular design and ergonomic features

THE NEW DENAR® MARK 300 ARTICULATOR SYSTEM FEATURES:

Model 310



Protrusive Condylar Inclination:

Fixed at 25°

Progressive Side Shift:

Fixed at 15°

0° Immediate Side Shift

Model 320



Protrusive Condylar Inclination:

Adjustable 0 – 60°

Progressive Side Shift:

Fixed at 15°

0° Immediate Side Shift:

Model 330



Protrusive Condylar Inclination:

Adjustable 0 – 60°

Progressive Side Shift:

Adjustable 0-15°

Immediate Side Shift:

Adjustable 0 – 2 mm

Elastic Retainers hold upper and lower members together and assist in smooth operation of lateral excursions. (*Figure 1*)



Figure 1

Positive centric latch allows the upper and lower members to be separated or positively locked together in centric relation in both open and closed positions. (*Figure 2*)



Figure 2

Stable in 3 positions. (*Figure 3*)



Figure 3

Built-in magnetic mounting system. (*Figure 4*)



Figure 4

Durable anodized finish on all mechanical parts.

All adjustments secured by finger screws; no tools needed.

Mark 300 Articulator System

Articulator Manipulations

To attach the incisal pin, thread the top thumbscrew into the opening on the front of the upper member until it slides back as far as it goes. Tighten the top thumbscrew. (*Figure 5*)



Figure 5

To assemble the articulator, hold the upper member approximately parallel to the lower member and simply place it on the lower member.

Centric Latch Operation

When the articulator is closed it can be locked in the centric position by pushing the centric latch to the down position. (Figure 6)



Figure 6

Support Pin

The built-in support pin allows the upper member of the articulator to stand completely open while the articulator is setting flat. (Figure 7)



Figure 7

To ensure the support pin remains in position, use the red lock pin to hold the lifted support pin in place. With the articulator facing you, and before lifting the support pin, push the lock pin to your right, (black o-ring exposed), to lock in place. (Figure 8)



Figure 8

To lower the support pin, with the articulator facing you, and before lowering the support pin, push the lock pin to your left.

Articulator Adjustments

The articulator is a mechanical equivalent of the lower half of the head – a mechanical jaw so to speak. To discuss the adjustments of the articulator or specifically the fossa controls, it would be helpful to discuss the condylar paths of movement of the human mandible.

In a lateral mandibular movement, the condyle on the side toward which the mandible moves is termed the rotating condyle, (*Figure 9*). The condyle on the side opposite the side towards which the mandible moves is termed the orbiting condyle. In a lateral mandibular movement, the orbiting condyle moves inward, downward and forward and orbits about the rotating condyle which is simultaneously rotating and moving outward during the lateral mandibular movement.

- Orbiting path – the path of movement of the orbiting condyle.
- Rotating path – the path of movement of the rotating condyle.
- Protrusive path – the path of movement of the condyles in a straight protrusive movement.

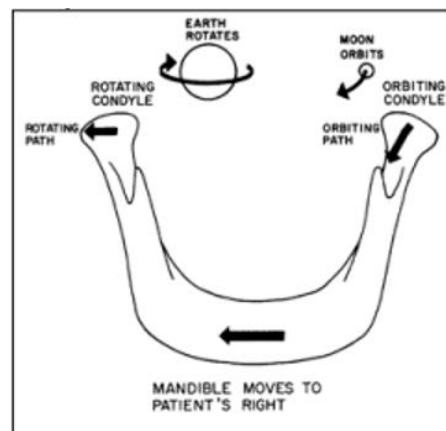


Figure 9

The Mark 300 System has been designed for simplicity and efficiency. The different models allow different levels of adjustment and enable clinicians to choose based on their needs.

Model 310 incorporates anatomical averages based on clinical research.

Protrusive movement is fixed at 25° and Progressive Side Shift is fixed at 15° . The angles were selected as offering the least amount of interference, based on studies by Dr. Harry Lundeen and Dr. Carl Wirth.

Model 320 allows protrusive adjustment, but progressive side shift is fixed at 15° thus eliminating any chance of balancing side occlusal contact.

Model 330 incorporates a complete range of adjustments:

Protrusive condylar inclination, immediate side shift and progressive side shift.

Protrusive Adjustments

Protrusive condylar inclination: the angle of the fossa in relation to the occlusal plane.

Model 320 Model 330

The inclination of the protrusive condylar path can be adjusted by loosening the protrusive adjustment thumbscrew. The protrusive condylar path inclination scale is below the protrusive adjustment thumbscrew and is calibrated in increments of 5° . The protrusive adjustment range is $0 - 6^{\circ}$. (*Figure 10*)



Figure 10

Immediate Side Shift Adjustment

Immediate side shift: a mandibular side shift in which the orbiting condyle moves essentially straight medially as it leaves centric relation. *Figure 11* shows an immediate side shift of 0 mm.

Model 330: The medial fossa wall can be displaced straight medially by means of the immediate side shift adjustment. The scale for the immediate side shift adjustment is lateral to the protrusive adjustment thumbscrew on top of the fossa. The scale is calibrated in 0.5 mm increments on the upper scale and 1 mm increments on the lower scale.

To set the immediate side shift, loosen the thumbscrew below the scale and align the marks of the lower scale with either the long mark of the upper scale for shifts of 1 or 2 mm, or with the smaller marks for shifts of 0.5 or 1.5 mm. The immediate side shift range is 0 – 2 mm.

Once you have set the immediate side shift, tighten down on the thumbscrew. This will hold immediate side shift in place as you use the Bennett lever to adjust to the progressive side shift



Figure 11

Progressive Side Shift Adjustment

Progressive Side Shift: the path the orbiting condyle follows on the medial wall of the fossa as it orbits around the rotating condyle.

Model 330: The angle of inclination of the medial fossa wall to the sagittal plane can be adjusted by moving the progressive side shift Bennett lever from 0 to 15°. The scale for the progressive side shift adjustment is beside the adjustment thumbscrew and is calibrated in 5° increments. Once immediate and progressive side shift are set, tighten the thumbscrew to ensure the settings stay as needed. (Figure 12)



Figure 12

Mounting a Cast on the Mark 300 Series

In addition to a facebow recording the only records needed for complete programming of the Mark 300 Series are:

- a lateral bite record
- a centric relation bite record
- a protrusive bite record

If anterior teeth are to be restored, a customized anterior guidance table is fabricated to precisely copy the desired guidance.

The Slidematic Facebow is used to record condylar axis. (*Figure 13*)



Figure 13

The upper cast is related to the condylar axis. The index for the facebow fork corrects the position of the cast to relate it to the condylar axis instead of the ear holes. This is an automatic correction. (*Figure 14*)



Figure 14

Make sure that mounting plate divots are clean of all dust, dirt or other debris before mounting casts. (*Figure 15*)



Figure 15

NOTE: To enhance accuracy, the mounting plates have been designed so that they do not fit perfectly flat against the articulator member. You may notice a slight gap. (*Figure 16*)



Figure 16

NOTE: It is recommended to make a centric relation bite record for mounting upper and lower casts. (see *Dawson's Functional Occlusion textbook*)

Setting the incisal guide pin using a CR Bite Record.

Using a pen, draw a thin line on the base of the upper and lower casts directly above the central incisors.

Carefully hand articulate the cast into the MIP position.

Using a millimeter ruler or Digital Boley Gage, measure the distance between the two lines.
(Figure 17)



Figure 17

Very carefully place the CR bite record onto the upper cast. (Figure 18)



Figure 18

Gently place the lower cast into the CR record. While holding the two cast together, measure the distance between the two lines. (*Figure 19*)



Figure 19

The difference between the two measurements will be the amount you will raise the incisal guide pin. (i.e. if the MIP measurement was 30 mm and with the CR Bite Record it was 32 mm, you would raise the pin 2 mm). Always raise the pin in a positive direction; above the zero mark. (*Figures 20a and 20b*)



Figure 20a

Figure 20b

Secure the two casts together with the CR record in place and complete mounting. (*Figure 21a and 21b*)



Figure 21a



Figure 21b

The completed mounting permits closure of the casts to contact in centric relation. (Figure 22)



Figure 22

Accessories:

Denar® Slidematic Facebow

The time-saving design of this device eliminates the need for transferring the entire facebow to the articulator. It is a fast, easy and accurate means of transferring the proper maxillary relationships. Transfer only the transfer jig assembly to the articulator thus freeing the measuring bow to be used for the next patient. (Figure 23)



Figure 23

Universal Occlusal Stand

Allows you to mount the working casts at Bonwill's Equilateral Triangle. Includes two interchangeable tables – flat and curved. The flat table accepts the Kois index tray. (*Figure 24*)



Figure 24

Centri-Check for the Mark 300 Series

Use in conjunction with centric relation bite records to verify accuracy, (*Figure 25*). Recommendation is to make 3 centri-check record bites to confirm correct CR position.



Figure 25

FlexTrack

Provides flexibility of movement in both open and closed condylar tracking. (*Figure 26*)
Fits Mark 310 and 320 instruments only.



Figure 26

Maxillary Cast Support

The adjustable “T” supports the bitefork and maxillary cast when mounting the facebow record on the articulator. (*Figure 27*)



Figure 27

Mark 300 Magnetic Mounting System

Provides magnetic retention without adding steps to the process, casts are mounted in one quick step. Compatible with Denar® Mark 300 Series only. (Figure 28)



Figure 28

Denar® Pins and Tables

All Denar® incisal pins and tables are interchangeable between articulators. Incisal pins can be raised and lowered on an arc, simulating the natural arc of closure. The pins and tables must be used in the combinations listed.

P4T4: Short Round Black with support and Custom Platform, flat. Item #20011386 and #110240. (Figure 29)



Figure 29

P6T6: Tapered and Adjustable. Items #20011397 and #110635. (*Figure 30*)



Figure 30

Field Calibration:

If you feel your Denar Mark 300 Series articulator has been dropped or damaged, it can be field calibrated using the Field Calibration Gage, item #20011660. (*Figure 32*)



Figure 32

If substantial damage has occurred, you can return your instrument to our factory for calibration on site. To have your articulator recalibrated, please call 800-626-5651 for a return authorization number.

Care and Maintenance:

Your Whip Mix articulator is a precision instrument and requires care and maintenance. Periodic cleaning and lubricating as described below will ensure prolonged life and dependable service from the instrument. Failure to follow these instructions will void your warranty.

Cleaning Procedure:

If there is any debris on the device, be sure to remove debris before the cleaning process. Use a soft bristle brush and cold running water to remove any debris. After debris removal follow the guidelines below.

- Use mild soap and water solution with the aid of a soft bristle brush to dissolve accumulations of wax and to wash away carborundum grit then air dry completely. DO NOT use strong detergents, alkalis, gasoline or naphtha as cleaning agents.
- Remove excess stone to prevent corrosion of articulator surfaces.
- (Whip Mix Branded only) Apply a light coating of silicone spray to articulator surface to prevent plaster or stone from sticking.
- (Hanau and Denar only) A thin coating of petroleum jelly must be applied to all articulator surfaces that will be contacted by the gypsum mounting material.
- Lubricate working and bearing components with a thin film of lubricant or silicone to the surface upon which the condylar elements move to provide a smooth action during movements.
- Use lint-free cloth to dry

Storage:

Store the articulator in a clean, dry atmosphere free of plaster and carborundum dust, away from acids, alkalis or corrosive medicaments. Wait a full day after mounting casts before storing the articulator in a carrying case or corrugated carton. Moisture dissipation from the stone in an enclosed area causes alkalinity of the stone mixture which can damage the articulator's surface.

Warranty:

Refer to the website: www.whipmix.com

Please check online at
www.whipmix.com
for the most current
instructions and parts list.

Symbols and Their Descriptions:

SYMBOL	DESCRIPTION
	Manufacture by
	Medical Device
	Lot number
	Item Number or Model Number
	eIFU- Electronic Instruction For Use
	Unique Device Identifier



Whip Mix Corporation, 361 Farmington Avenue, Louisville, Kentucky, USA, 40209
Phone: 502-637-1451, www.whipmix.com