OSTEOMED®

A TRADITION OF QUALITY AND INNOVATION


cmf trauma systems

# Surgical Instruments Technique Guide

TM

MFx MANDIBLE SYSTEM

trauma CFx TFx

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# Table of Contents

# Introduction

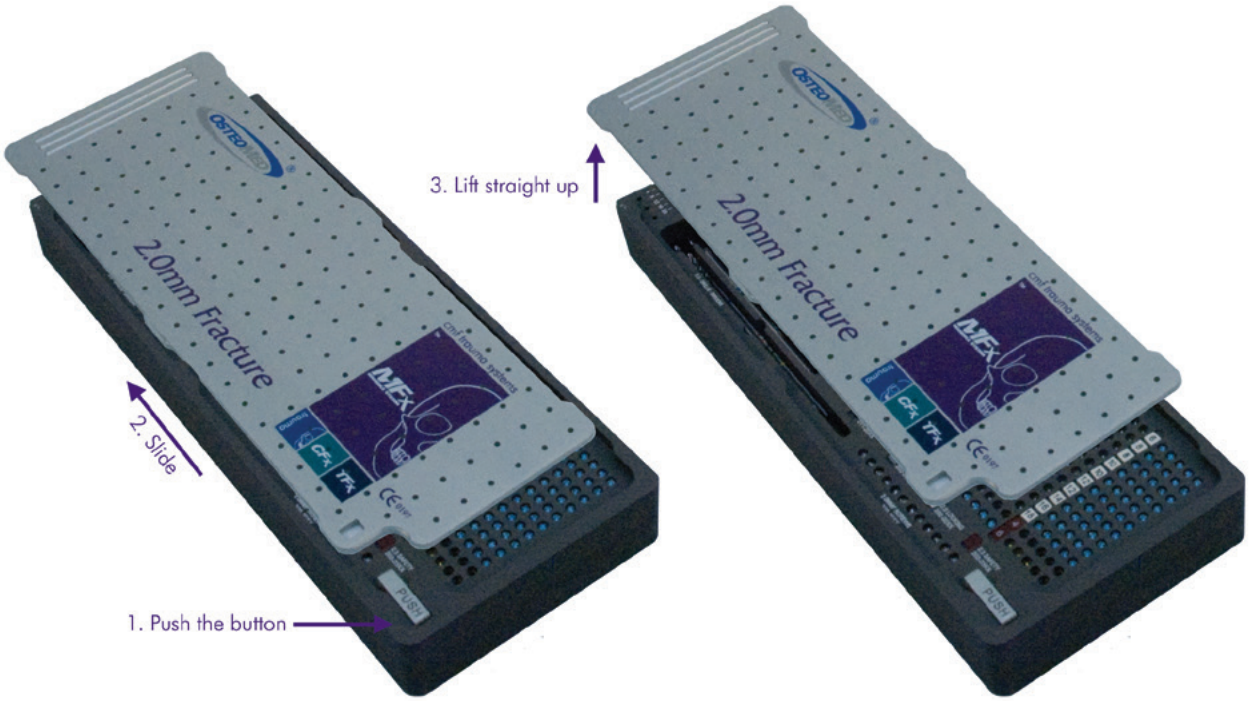
OsteoMed introduces the MFx™ Rigid Fixation System as the next step in the evolution of mandibular rigid fixation and reconstruction.

The system applies the best of OsteoMed innovation and design to a proven understanding of established, traditional mandible fixation & reconstruction techniques and principles.

The MFx™ system is intended for fracture fixation during orthognathic reconstruction, mandibular reconstruction and surgery involving osteotomies and trauma.

The system is simple, versatile, and dynamic in its application, incorporating the following screw technologies: standard, Auto-Drive®, locking, angulated locking, angulated locking Auto-Drive®, safety, MMF and lag screws.

The implants are made from titanium alloy (ASTM F-136) and/or commercially pure titanium (ASTM F-67) which are MRI compatible.



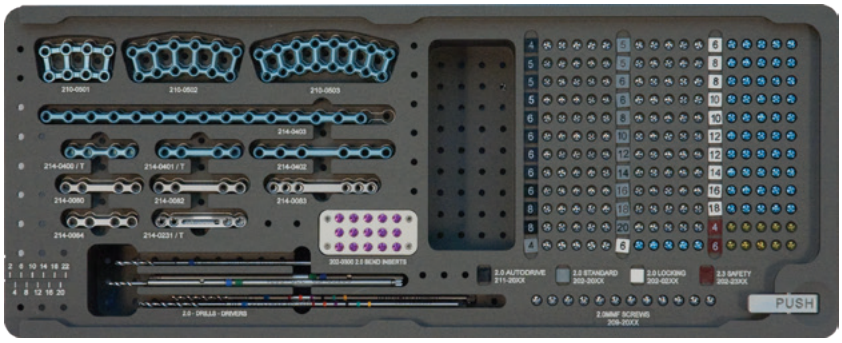

***Note:*** *Remove lid from block by holding down the button, pull and lift to open*

# System Overview

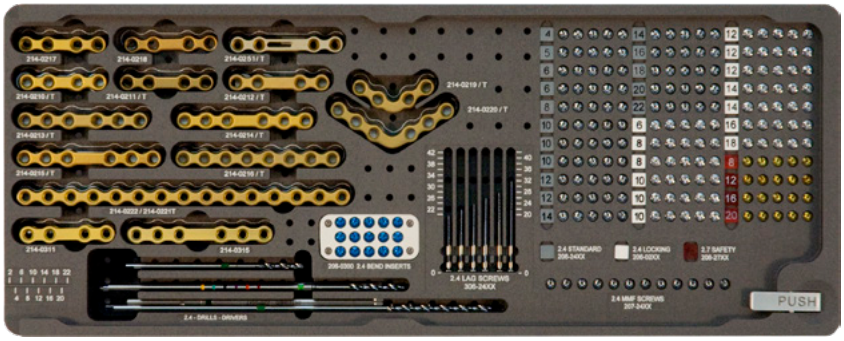
## Blocks

Standard Blocks

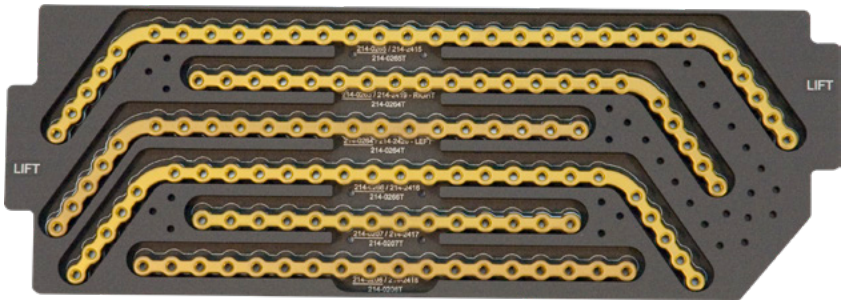
- MFx™ 2.0mm Fracture Organizer Block 220-0721




- MFx™ 2.4mm Fracture Organizer Block 220-0722




- MFx™ 2.4mm Reconstruction Organizer Block 220-0723

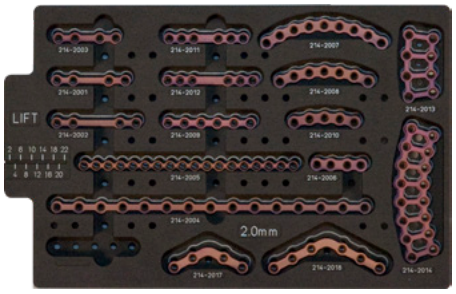


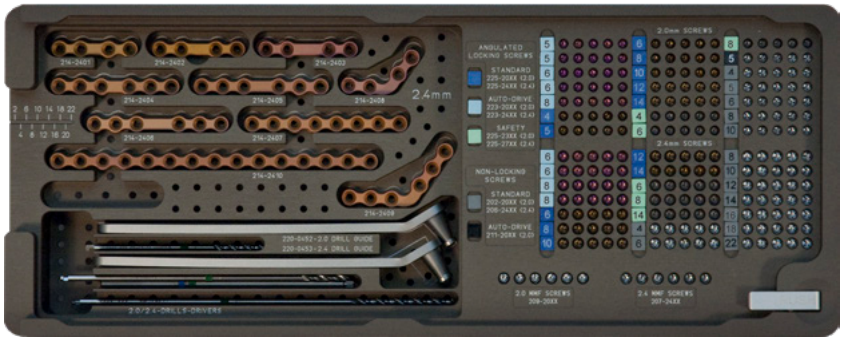

# System Overview

## Blocks

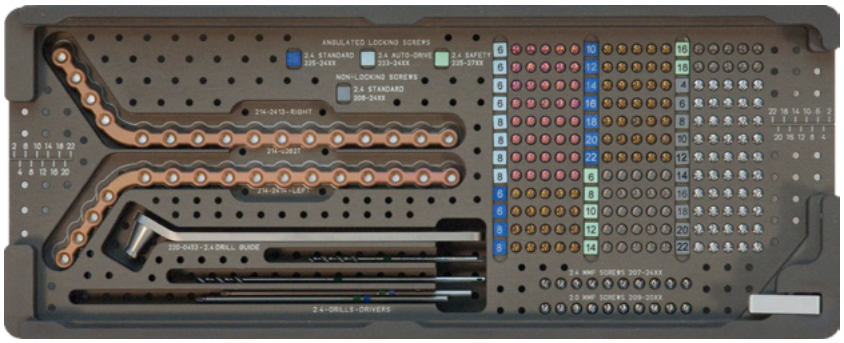
Optional Blocks

- MFx™ 2.0/2.4mm Facture Angulated Locking Organizer Block 220-0631




- MFx™ 2.4mm Reconstruction Angulated Locking Organizer Block 220-0632

# System Overview

## Screws*

Standard Screw
- 2.0mm 202-20XX (4-22mm)
- 2.4mm 206-24XX (4-22mm)

Standard Auto-Drive® Screw
- 2.0mm 211-20XX (4-8mm)

MMF Screw
- 2.0mm Auto-Drive® 209-20XX (8-14mm)
- 2.4mm 207-24XX (12-18mm)

Standard Safety Screw
- 2.3mm 202-23XX (4-6mm)
- 2.7mm 206-27XX (8-20mm)

Standard Locking Screw
- 2.0mm 202-02XX (6-18mm)
- 2.4mm 206-02XX (6-18mm)

Lag Screw
- 2.4mm 306-24XX (20-38mm)

Angulated Locking Auto-Drive® Screw
- 2.0mm 223-20XX (5-8mm)
- 2.4mm 223-24XX (6mm and 8mm)

Angulated Locking Standard Screw
- 2.0mm 225-20XX (4-18mm)
- 2.4mm 225-24XX (6-22mm)

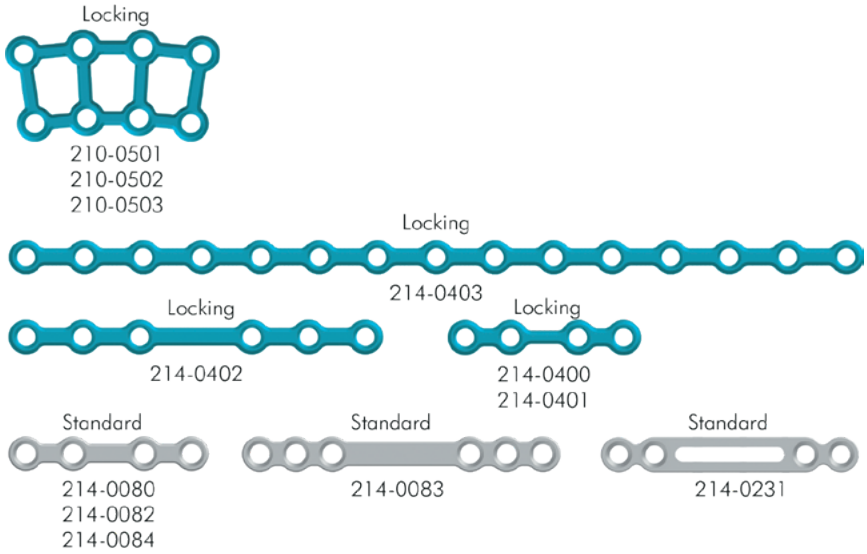
Angulated Locking Safety Screw
- 2.3mm 225-23XX (4-18mm)
- 2.7mm 225-27XX (6-22mm)

* not actual size

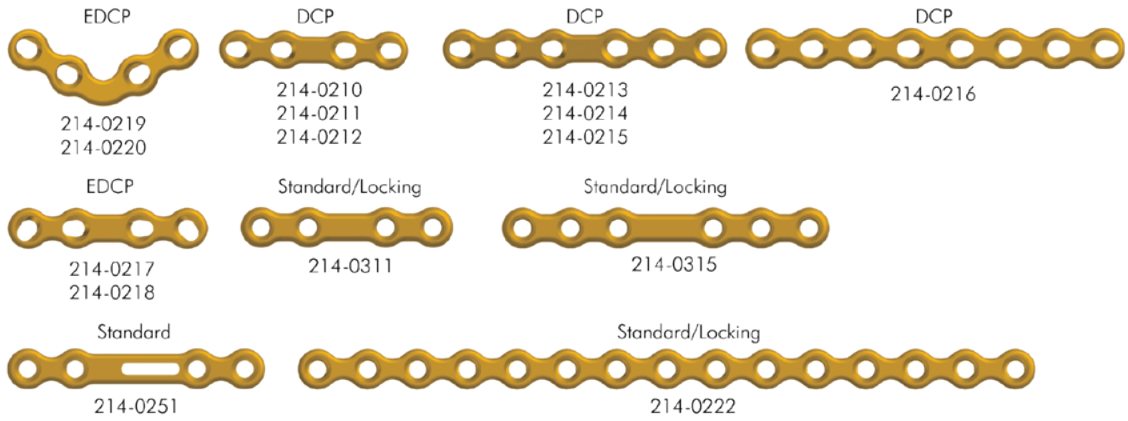
# System Overview

## Plates*

- 2.0mm Fracture Block




- 2.4mm Fracture Block



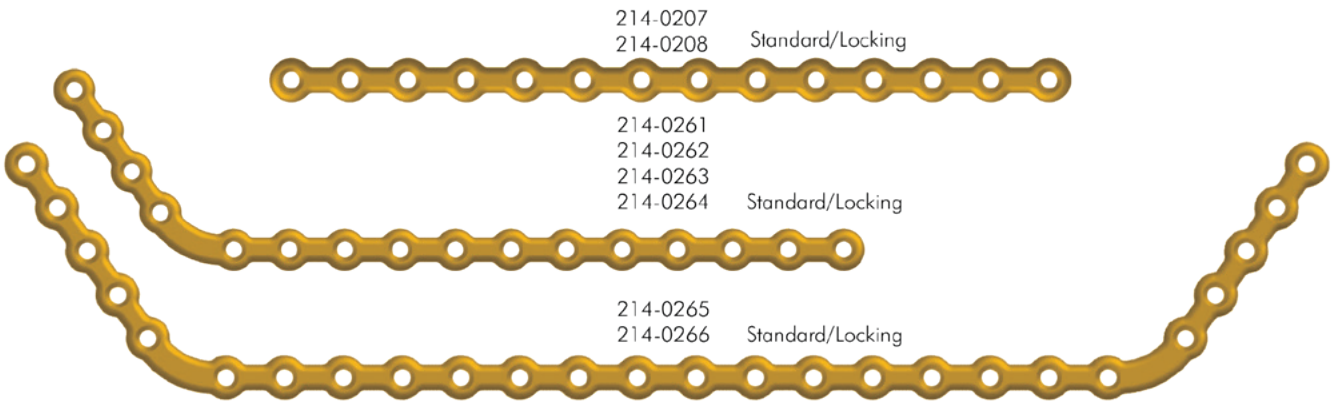



* not actual size

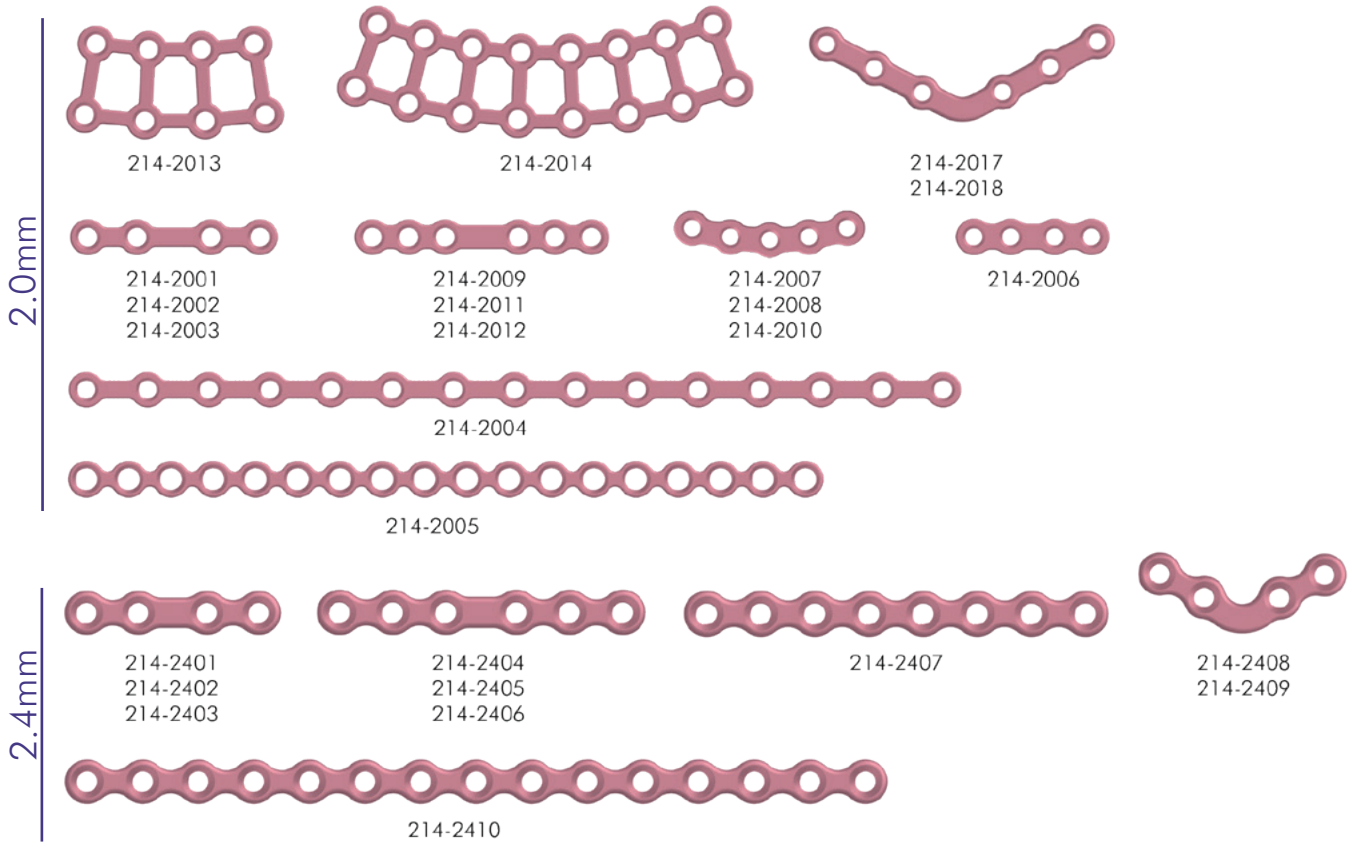
# System Overview

## Plates*

- 2.4mm Reconstruction Block




- 2.0/2.4mm Fracture Angulated Locking Fixation System

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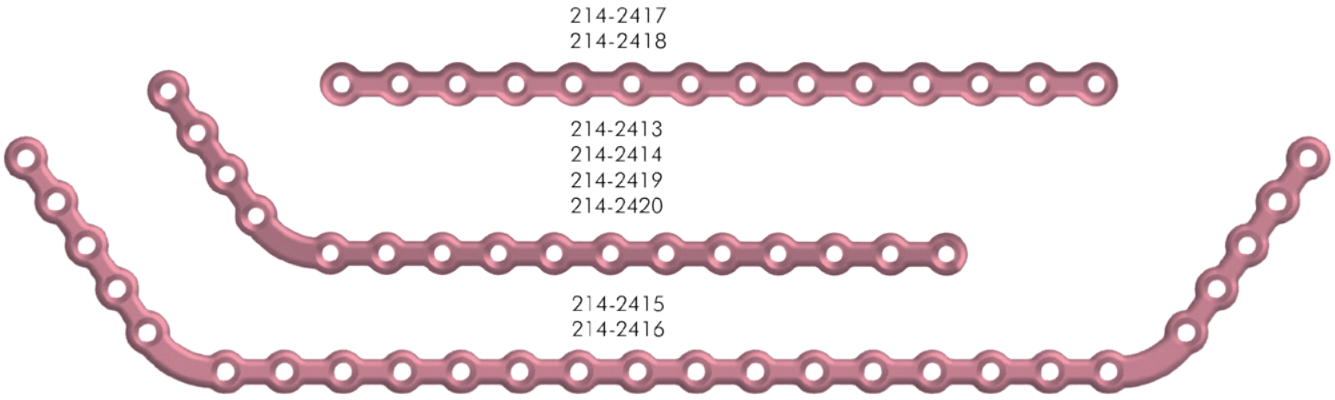
# System Overview

## Plates*

- 2.4mm Reconstruction Angulated Locking Fixation System




## Screws Tags

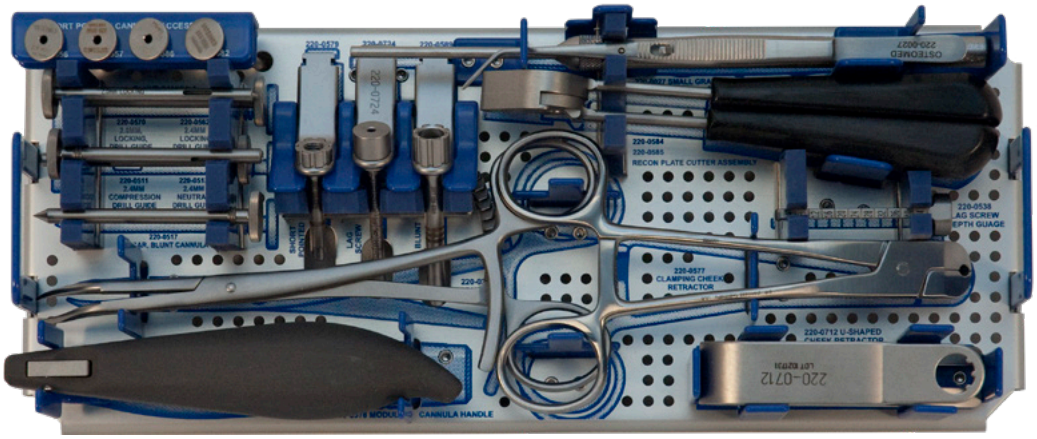
- 220-0616-XX (Black): Tag, Auto-Drive® Screw
- 220-0617-XX (Bone): Tag, Locking Screw
- 220-0614-XX (Gray): Tag, Standard Screw
- 220-0615-XX (Orange): Tag, Safety Screws
- 220-0613-XX (Dark blue) MFx™ Tag, Standard Angulated Locking Screw
- 220-0618-XX (Light blue) MFx™ Tag, Auto-Drive® Angulated Locking Screw
- 220-0619-XX (Light green) MFx™ Tag, Angulated Locking Safety Screw



* not actual size

# System Overview

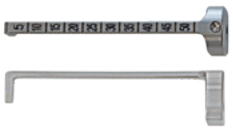
## Instruments



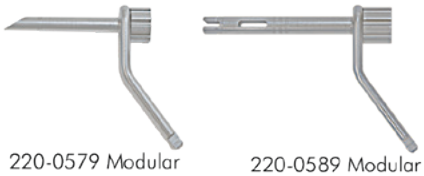
Tray 1

220-0578 Modular Handle, Cannula


220-0712 Cheek Retractor, U-Shaped



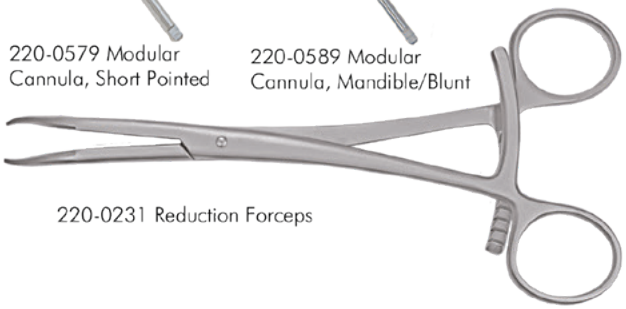
220-0538 Sliding Length Gauge, Lag Screw Depth Gauge



220-0579 Modular Cannula, Short Pointed

220-0589 Modular Cannula, Mandible/Blunt

220-0724 MFx™ Lag Screw Cannula



220-0231 Reduction Forceps



220-0577 Cheek Retractor, Clamp

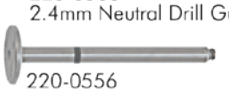
220-0584 Plate Cutter, Reconstruction, Unflanged

220-0572 Depth Gauge, M4/M3X/Mandible

220-0585 Plate Cutter, Reconstruction, with Flange

220-0027 Small Grasping Forceps

220-0586
2.4mm Neutral Drill Guide

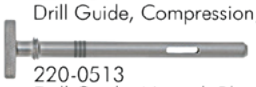


220-0556
2.4mm Locking Drill Guide CMF

220-0557
2.0mm Locking Drill Guide CMF

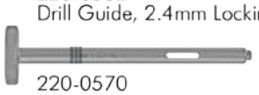
220-0582
Trocar, Short Pointed

220-0511
Drill Guide, Compression, Blunt Cannula

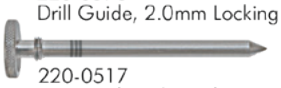


220-0513
Drill Guide, Neutral, Blunt Cannula

220-0562
Drill Guide, 2.4mm Locking Plate, Blunt Cannula

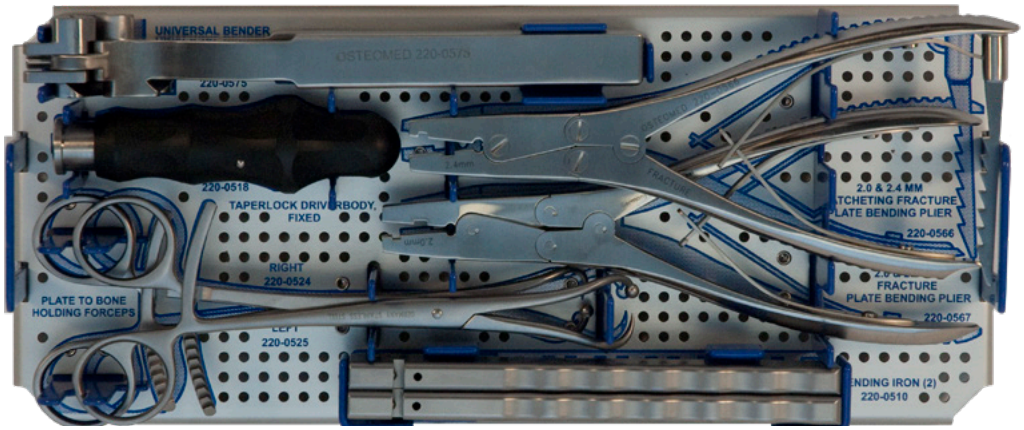


220-0570
Drill Guide, 2.0mm Locking Plate, Blunt Cannula



220-0517
Trocar, Blunt Cannula

## Instruments

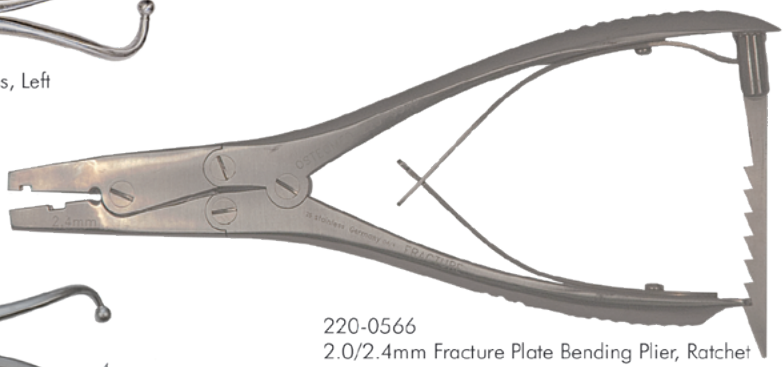



Tray 2

(2)


220-0510 Bending Iron, Recon Plates

220-0525 Plate to Bone Holding Forceps, Left

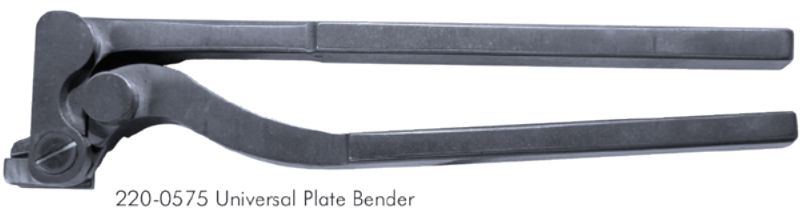


220-0566
2.0/2.4mm Fracture Plate Bending Plier, Ratchet

220-0524 Plate to Bone Holding Forceps, Right

220-0518 Taperlock Body, Mand, Fixed


220-0567
2.0/2.4mm Fracture Plate Bending Plier



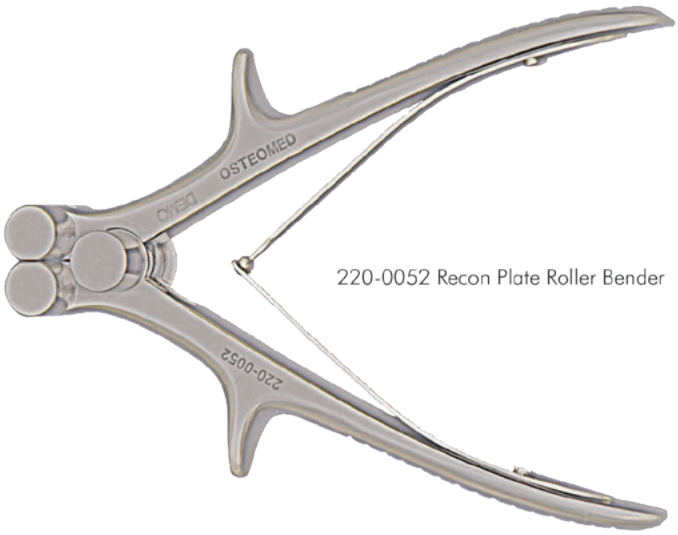
220-0575 Universal Plate Bender

# System Overview

## Instruments


Tray 3

220-0018 Ratcheting Screwdriver




220-0052 Recon Plate Roller Bender

220-0548
Reconstruction Plate Bending Plier, No Ratchet

220-0529
Reconstruction Plate Bending Plier, w/Ratchet

# Indications

- The OsteoMed MFx™ Mandibular Fracture / Reconstruction System is indicated for fracture fixation, mandibular reconstruction and surgery involving osteotomies and trauma.
- The OsteoMed 2.0 Locking Plate System is indicated for oral, maxillofacial surgery, trauma, reconstructive surgery and orthognathic surgery (surgical correction of dentofacial deformities).
- The OsteoMed MMF Screws are indicated for temporary ligature and wire lock fixation for temporary constriction and stabilization of fractured bone segments in the oral cavity in conjunction with primary fixation devices.
- The OsteoMed Angulated Locking Fixation System is indicated for mandibular trauma reconstruction, mandibular reconstruction and orthognathic reconstruction.
- The OsteoMed Reduction Plates and Forceps are intended for mandibular body fractures, symphysis fractures and parasyphysis for tension, compression or both.
- The OsteoMed implants, templates and drills are intended for single use only.


# General Surgical Technique Guide

## Pre Operative Planning

Fractures of the mandible will typically reveal a malocclusion (inability to bite down), pain at fracture site, significant internal bruising, or laceration with bleeding between teeth at the fracture site.

Reduction and stabilization of the mandible fracture is key to successful treatment. The method of management may vary based on the severity, location of the fracture, presence or absence of teeth and patient demographic. Mandible fractures may be treated by closed reduction with wiring of the teeth or open reduction with internal rigid fixation using plates and screws. The technique of closed reduction may involve wiring the teeth for up to 4 to 6 weeks.

Internal rigid fixation when performing open reduction requires exposure of the fracture sites and stabilization with screws and/or plates. Accurate reduction with good stabilization can frequently avoid complications and help to restore the patient's primary occlusion and facial appearance. In the following pages we will illustrate open reduction techniques[1].

[1] www.aona.org

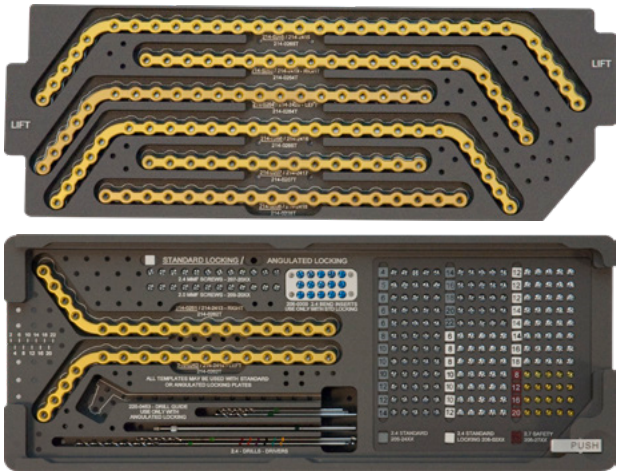
**1.** Reduce the fracture.

Use Reduction Forceps (220-0231):

- Pre-drill anchor holes within fracture segments and insert Reduction Forceps.
- Squeeze Reduction Forceps until fracture is reduced.

**2.** Select plates.

MFx™ 2.0mm Fracture Organizer Block
(220-0721)




MFx™ 2.4mm Reconstruction Organizer Block
(220-0723)

Technique Tip: Ensure the implants achieve the following:

- Adequately bridge the defect
- Provide stable fixation
- Fit structure of anatomical region
- Return form and function to fractured bone

# General Surgical Technique Guide

**3.** Select the template if applicable to plate selection.


Contour the template to match the defect.

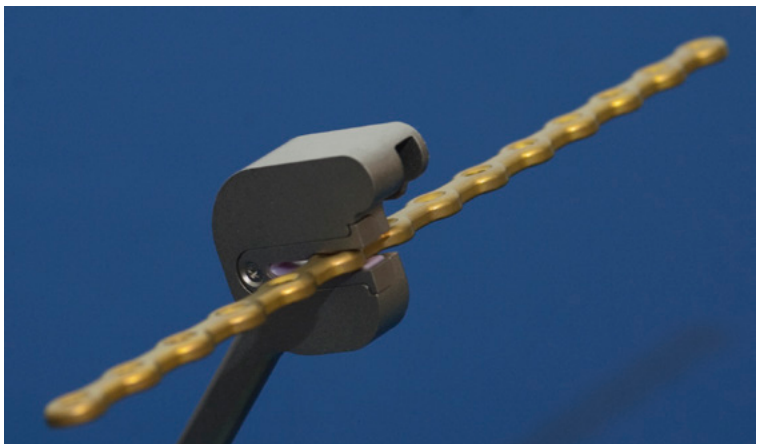
**4.** Cut the plate if necessary.

(220-0584)

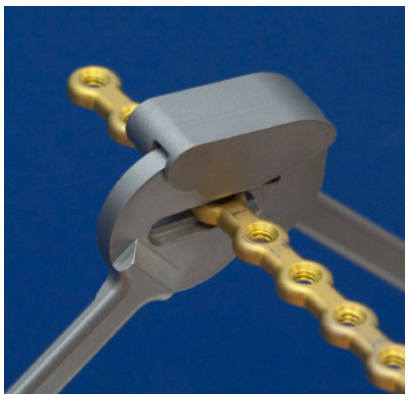
(220-0585)

Use Round Reconstruction Plate Cutter Assembly. (220-0584, 220-0585):

- Place plate into handle. (220-0585)



- Slide second handle into first handle until plate is secure.



- Rotate handles in towards each other and then back apart, repeat this until plate is separated into 2 pieces.

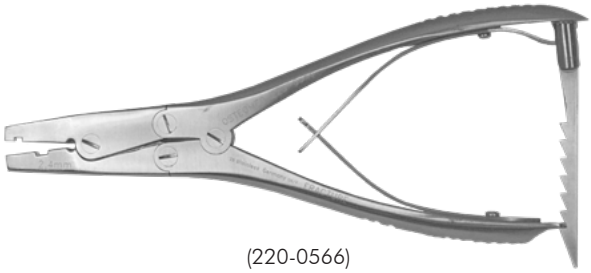
- Utilize diamond file on the handle to remove sharp edges on the plate. Located on 220-0584.

# General Surgical Technique Guide

**5.** Contour the plate.

Utilizing the contoured template, contour the plate to match the template.

## Instrumentation for Fracture Plates:



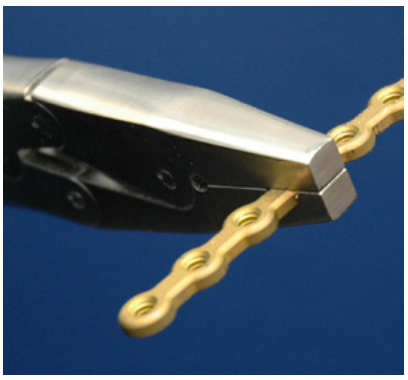
(220-0566)

(220-0567)

- Fracture Plate Bending Pliers (220-0566, 220-0567):
  - Use with appropriate plates- 2.0mm/2.4mm fracture plates.
  - Place plate in Fracture Plate Bending Pliers so the plate fits into recessed area.
  - Manipulate plate to desired shape.

***Note:*** *All standard locking plates require bending inserts.*
***Note:*** *Medial holes will not fit into recess.*
***Note:*** *Anterior flat in bending pliers is to be used to contour medial portion of plates.*
***Note:*** *If a Reconstruction Plate is selected for highly comminuted fractures or alblatives procedures the following instrumentation options are available*

- Reconstruction Plate Bending Pliers (220-0529, 220-0548):
  - Select appropriate plates - 2.4mm reconstruction plates
  - Place plate in Reconstruction Plate Bending Pliers so the plate fits in recessed area
  - Manipulate plate to desired shape



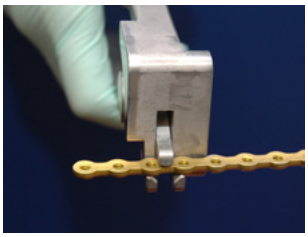
***Note:*** *When using a pre-bent reconstruction plate, screw holes in bend will not recess into pliers*

■ Universal Plate Bender (220-0575):

- Place plate in 1 of 3 options on Universal Plate Bender:

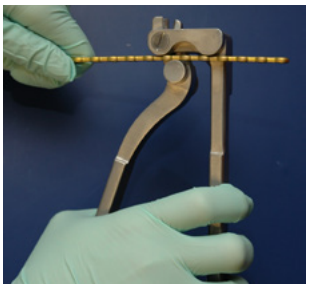
***Note:*** *Do not bend directly over the plate hole*

Option 1:
- Place plate between prongs
- Squeeze Universal Plate Bender until plate bends to desired angle



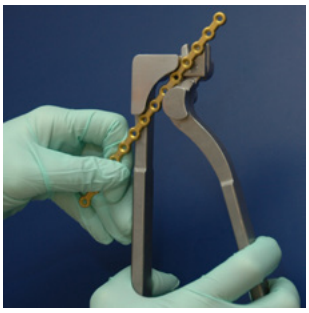
Option 1

Option 2:
- Place plate between full circle and 2 semi-circles
- Squeeze Universal Plate Bender until plate bends to desired angle



Option 2

Option 3:
- Place plate between semi-circle and concave surface (semi-circle)
- Squeeze until plate bends to desired angle



Option 3

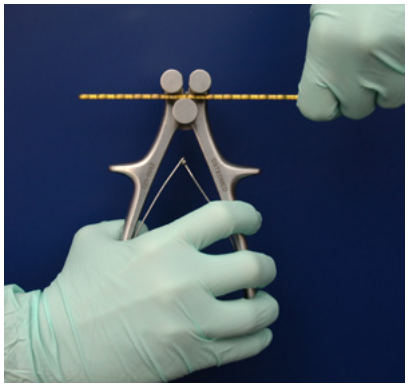
# General Surgical Technique Guide

- Reconstruction Roller Plate Bender (220-0052):
  - Select appropriate plates - 2.4mm reconstruction plates
  - Place plate in 1 of 2 options on Roller Plate Bender

***Note:*** *Do not bend directly over the plate hole*

Option 1:

- This option should be used to create bends in a plane perpendicular to the plate holes
- Place plate between 3 cylinders
- Squeeze Roller Plate Bender until plate bends to desired angle



Option 1

Technique Tip: To create smooth continuous bends, bend the plate partially then slide the plate slightly and bend more. Continue this process until the desired shape is acquired.

Option 2:

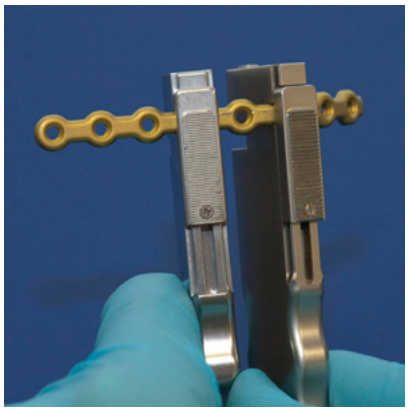
- This option should be used to create bends in the same plane as the plate holes
- Place plate between 2 cylinders and wedge step
- Squeeze Roller Plate Bender until plate bends to desired angle

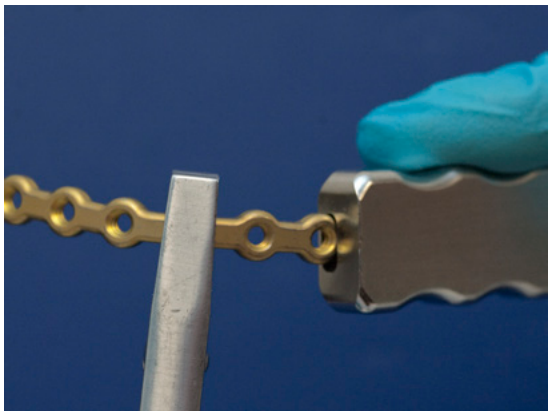
Option 2

***Note:*** *Bends greater than a few degrees should be created by bending at multiple locations*

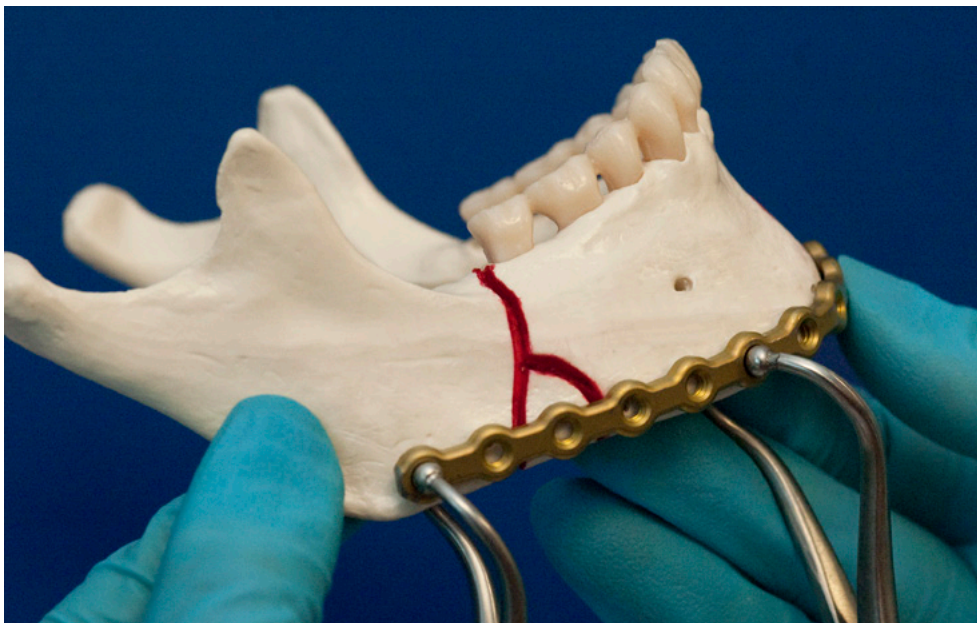
- Bending Iron (220-0510):


- Place plate into 1 of 3 recessed areas
- Manipulate plate to desired shape
- Use with appropriate plates - 2.4mm reconstruction plates





**6.** Place the plate.



# General Surgical Technique Guide

**7.** Drill Pilot Hole

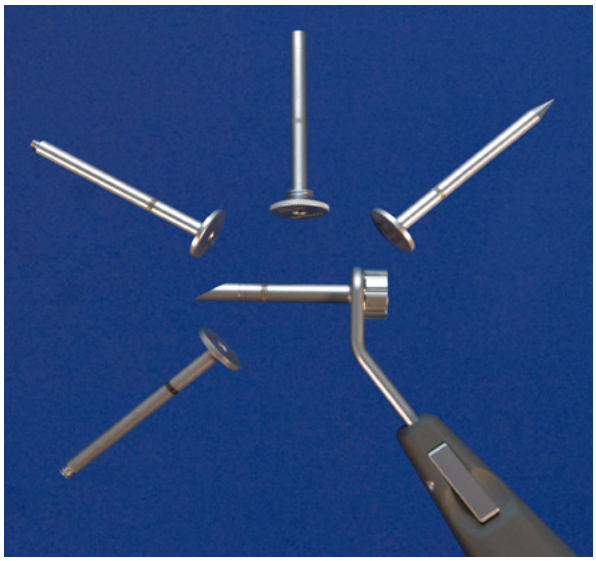
When a pilot hole is necessary, follow sequence below to achieve desired surgical results.

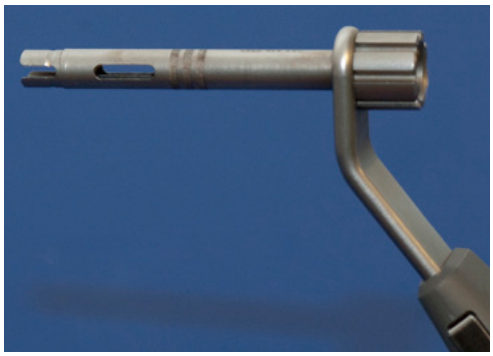
- Select appropriate diameter drill bit based on screw selection and surgical application.

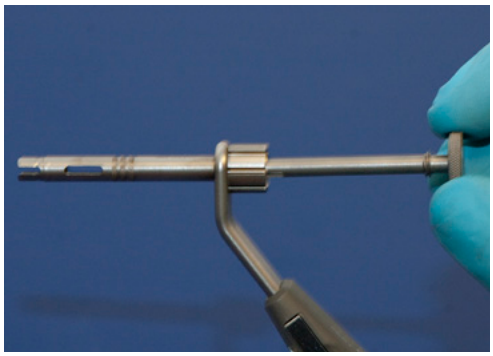
***Note:*** *Blue color bands denote drill for 2.0mm screws (1.6mm hole). Green color bands denotes drill for 2.4mm screws (2.0mm hole)*

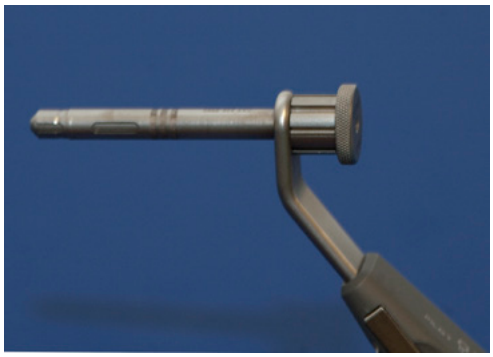
***Note:*** *Trocar system requires use of appropriate drill guide.*

- Select appropriate drill guide, cannula and attach to Modular Cannula Handle. 220-0578

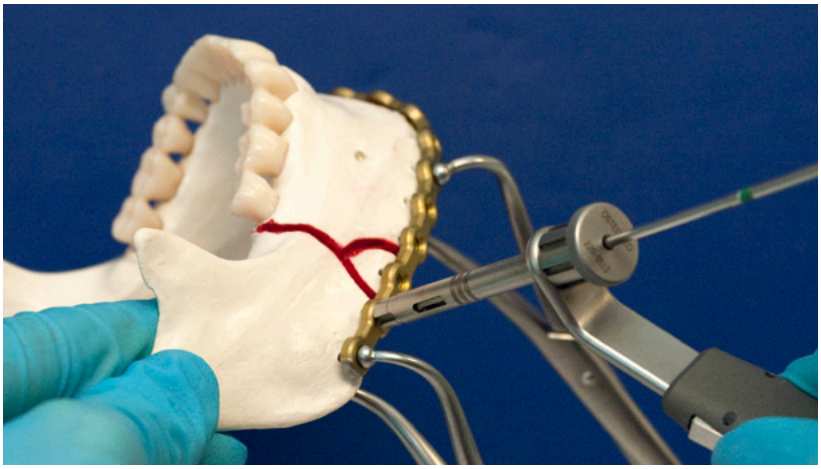








- Drill first pilot holes most proximal to fracture line/osteotomy



Technique Tip: Rainbow drill legend is located on the back of the organizer block lid.

Technique Tip: Single and triple bands on rainbow drills denote appropriate cannula systems


***Note:*** *Pilot hole depth should match or exceed the length of screw. Rainbow drills are in 4mm increments.*

***Note:*** *The proximal color bands on Rainbow Drills indicate the depth of pilot holes (220-0251, 220-0252, 220-0255, 220-0256)*

***Note:*** *Drill speed and torque must follow power system parameters*

***Note:*** *Use irrigation to prevent bone necrosis*

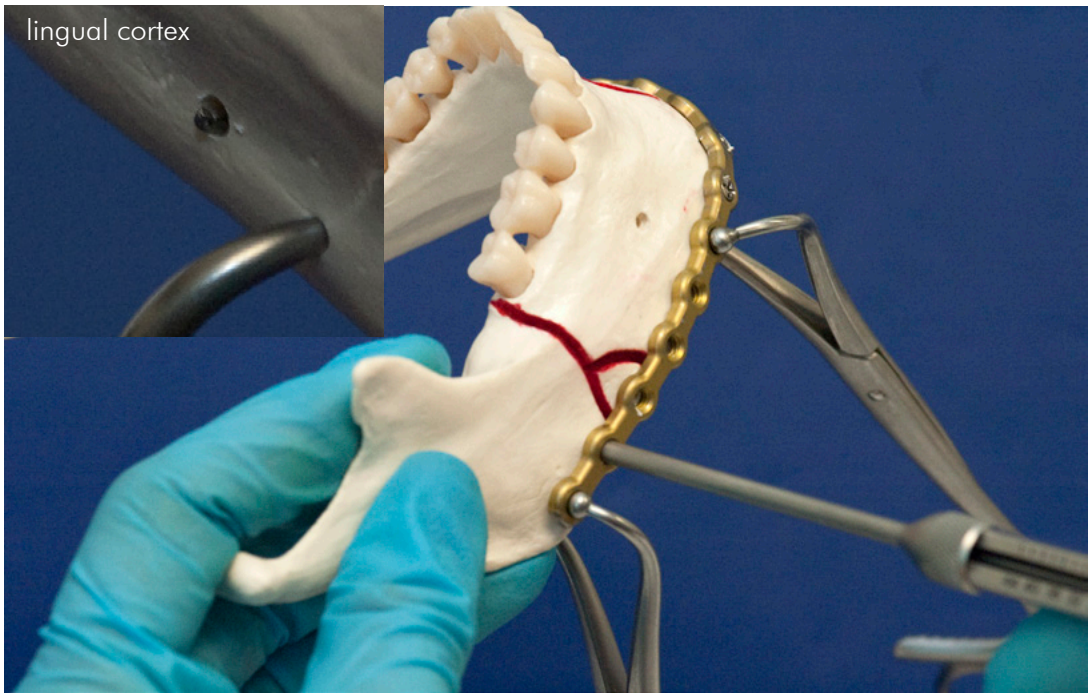
***Note:*** *When using a drill guide do not apply a side load on the drill. This may result in friction, which may generate a thermal burn. Axial loading should always be used.*

# General Surgical Technique Guide

**8.** Determine screw length

Use Depth Gauge (220-0572) in Mandible:

- Insert Depth Gauge into pilot hole until it engages lingual cortex




- Determine necessary screw length using scale marked on Depth Gauge.

***Note:*** *Always measure screw depth through the plate*

***Note:*** *When measurement falls between two markings, the longer length should be considered for screw selection*

**9.** Select desired screwdriver body
Screw Driver Options:

■ Ratcheting Screwdriver Body

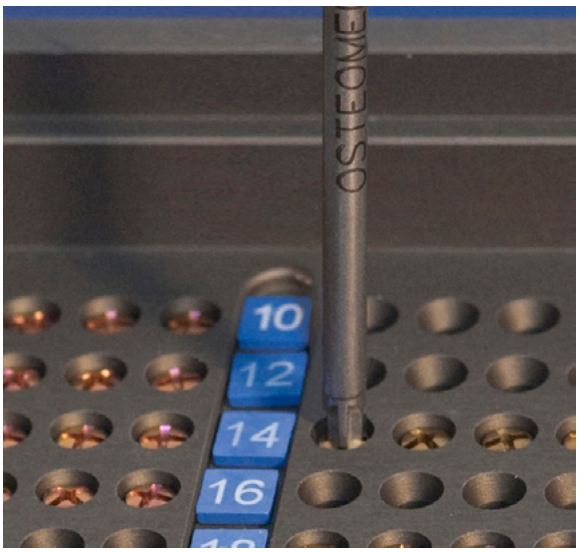
(220-0018)

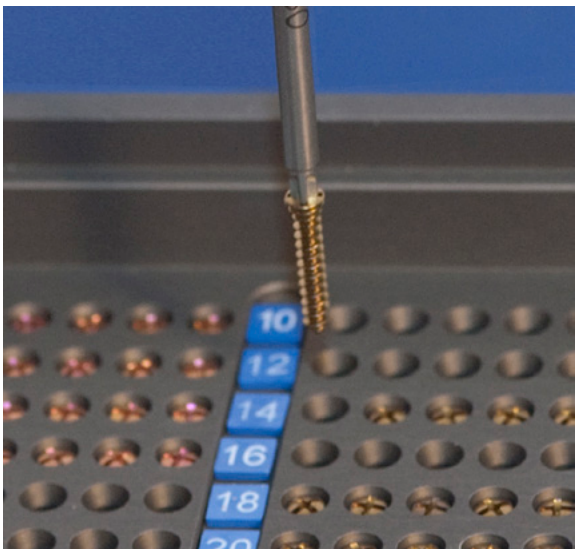
■ Taperlock™ Screwdriver Body

(220-0518)

**10.** Load screw on driver

- Insert appropriate driver shaft into appropriate screw, applying a perpendicular force that engages screw
- Lift straight up to remove screw from Organizer Block



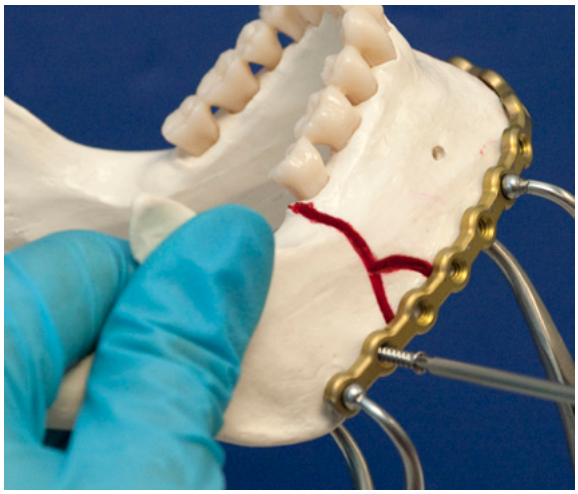

***Note:*** *Organizer Blocks have recessed screw holes to ease loading of screws and are customizable to meet surgeon's screw size needs*

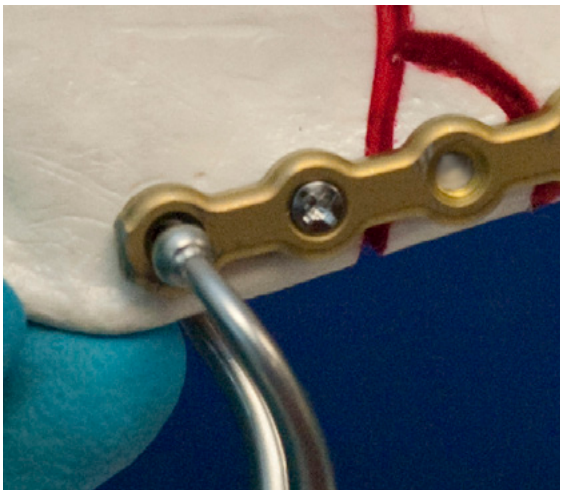
# General Surgical Technique Guide

**11.** Insert screw into bone

**Standard:**

- Drive first screw into pilot hole most proximal to fracture/osteotomy until screw is flush with surface of bone/plate





***Note:*** *the plate may be held in place using the Plate to Bone Holding Forceps (220-0525, 220-0524)*

- Drive second screw into most proximal pilot hole on opposite side of fracture/osteotomy until screw is flush with surface of bone/plate

- Drive remaining screws in same manner in a distal orientation from fracture line/osteotomy

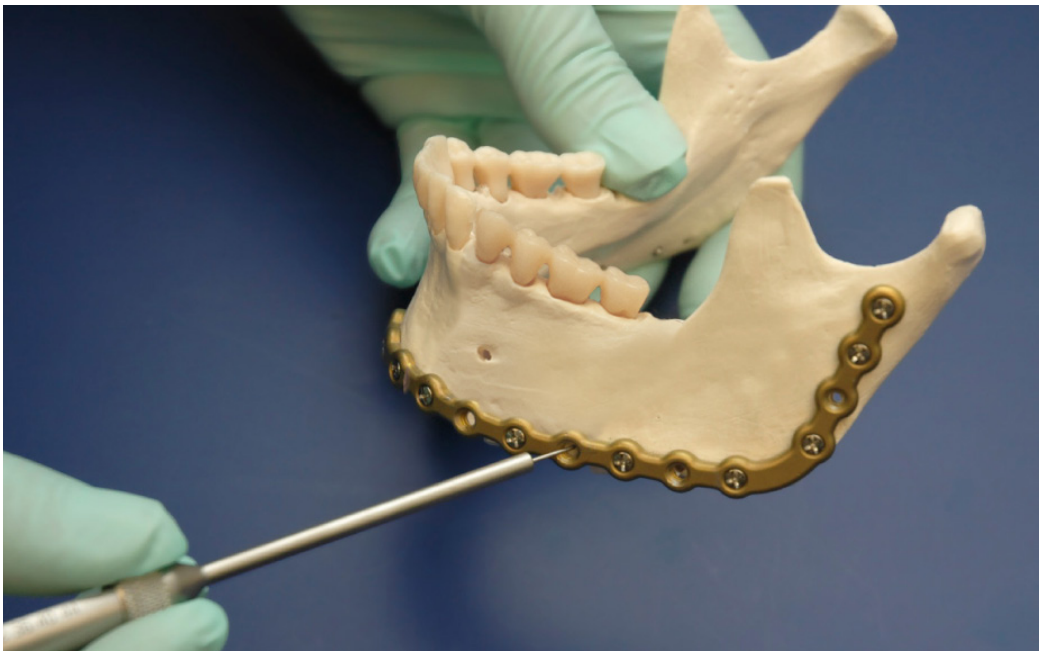
**Auto-Drive®:**

- Drive first screw into bone, most proximal to fracture.
  ***Note:*** *Drive the screw perpendicular to the bone until screw is flush with surface of plate/bone*
- Drive second screw into most proximal pilot hole on opposite side of fracture/osteotomy until screw is flush with surface of bone/plate
- Drive remaining screws in same manner in a distal orientation from fracture line/osteotomy

***Note:*** *Higher torque may be required to fully seat screws when using Auto-Drive® screws*

***Note:*** *In high density bone pilot drilling may be necessary*

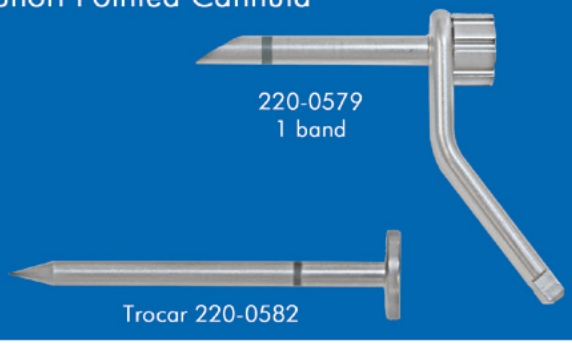
**12.** Close per standard practice



# Transbuccal Approach Surgical Technique Guide

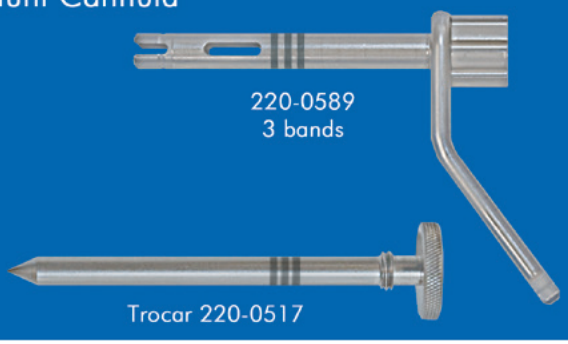
## MFx™ Modular Cannula Drill Guide Selection

### Short Pointed Cannula




| Technology | Drill Guide |
|---|---|
| Non Locking Plate w/ Standard Screw | 220-0586 |
| 2.0mm Locking Plate w/ Locking Screw | 220-0557 |
| 2.0mm Locking Plate w/ Standard Screw | 220-0586 |
| 2.4mm Locking Plate w/ Locking Screw | 220-0556 |
| 2.4mm Locking Plate w/ Standard | 220-0586 |
| 2.0mm Angulated Locking Plate w/ Agulated Locking Screw | 220-0586 |
| 2.0mm Angulated Locking Plate w/ Standard Screw | 220-0586 |
| 2.4mm Angulated Locking Plate w/ Agulated Locking Screw | 220-0586 |
| 2.4mm Angulated Locking Plate w/ Standard Screw | 220-0586 |

### Blunt Cannula




| Technology | Drill Guide |
|---|---|
| Non Locking Plate w/ Standard Screw | 220-0513 |
| 2.0mm Locking Plate w/ Locking Screw | 220-0570 |
| 2.0mm Locking Plate w/ Standard | 220-0513 |
| 2.4mm Locking Plate w/ Locking Screw | 220-0562 |
| 2.4mm Locking Plate w/ Standard Screw | 220-0513 |
| 2.0mm Angulated Locking Plate w/ Agulated Locking Screw | 220-0586 |
| 2.0mm Angulated Locking Plate w/ Standard Screw | 220-0586 |
| 2.4mm Angulated Locking Plate w/ Agulated Locking Screw | 220-0586 |
| 2.4mm Angulated Locking Plate w/ Standard Screw | 220-0586 |
| 2.4mm DCP or EDCP plate w/ Standard Screw | 220-0511 |

***Note:*** *Angulated Locking Plates are intended to be used with the Angulated Locking Drill Guide (220-0452 and 220-0453). If they are used with the Modular Cannula System the neutral drill guide must be used.*

**1.** Select trocar system

**2**. Select cheek retractor
Cheek retractor Options:

- Cheek Retractor, U-Shaped (220-0712)


- Cheek Retractor, Clamp (220-0577)

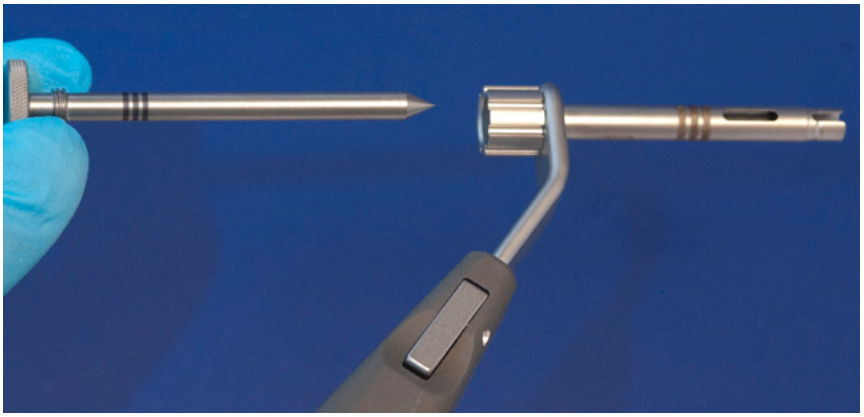
**3.** Select appropriate Modular Cannula and attach to Modular Cannula Handle

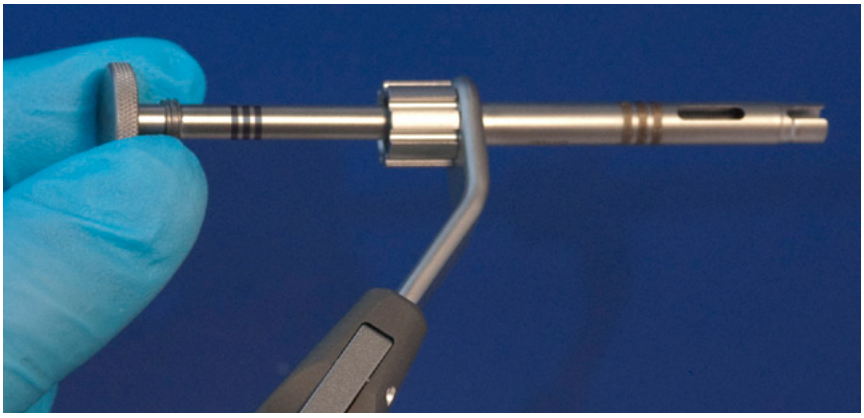

Cannula Options:

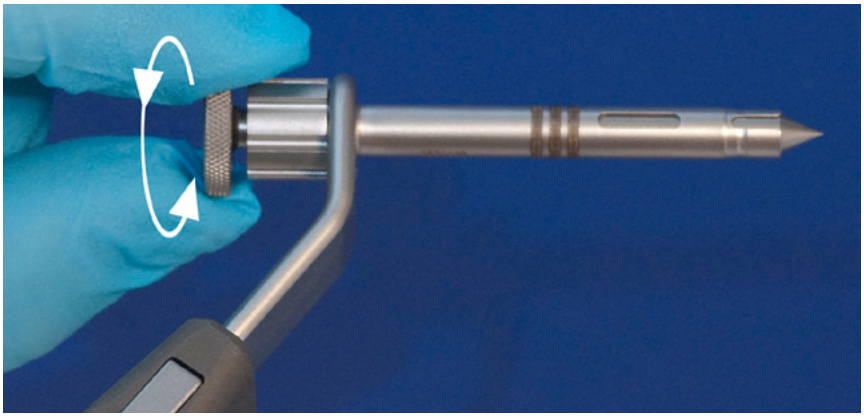
- Short Pointed Modular Cannula (220-0579) - see chart on page 27
- Modular Cannula, Mandible/Blunt (220-0589) - see chart on page 27

# Transbuccal Approach Surgical Technique Guide

**4.** Select appropriate Trocar by matching banding on Modular Cannula with banding on Trocar







**5.** Insert Trocar into Modular Cannula and punch through previously made stab incision in cheek

**6.** Remove Trocar from Modular Cannula

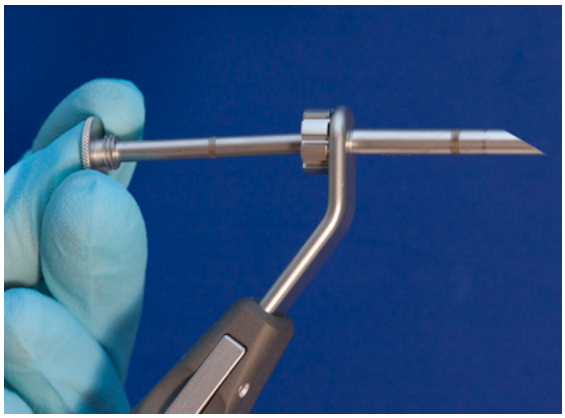
**7.** Attach Cheek Retractor to Modular Cannula
***Note:*** *Cannula is to never be used as a cheek retractor*

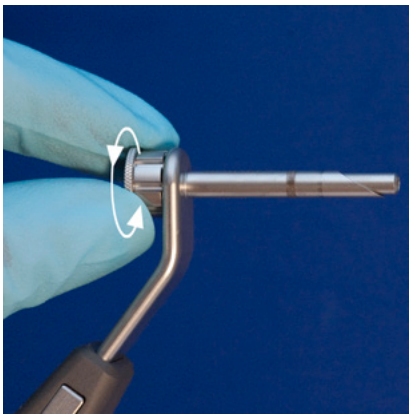

**8.** Position plate where desired

# Transbuccal Approach Surgical Technique Guide

**9.** Select appropriate Drill Guide by matching banding on Modular Cannula with banding on Drill Guide while selecting appropriate drill guide based on screw/plate technology


**10.** Insert Drill Guide into Modular Cannula



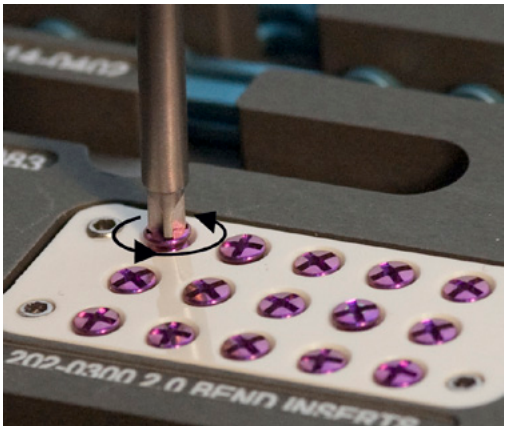


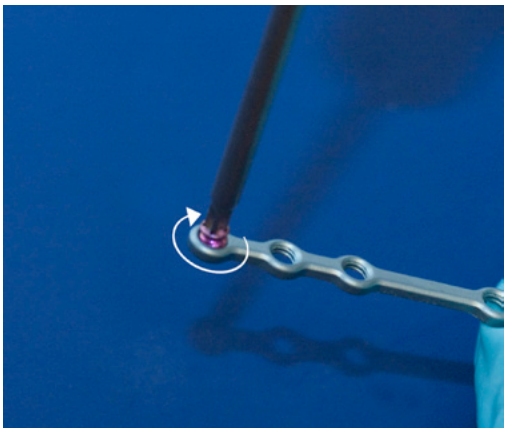
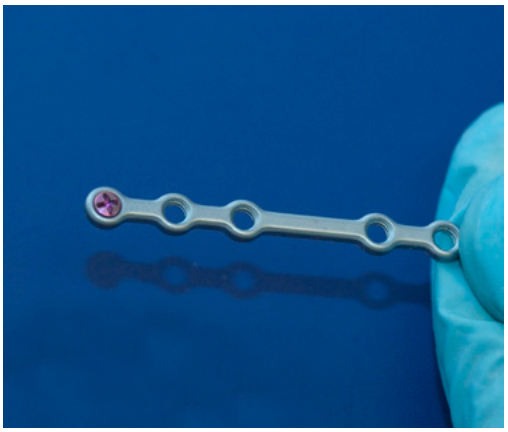
**11.** Select plate, contour and position on bone

**12.** Follow instructions for pilot hole drilling
**(Reference General STG pg 21-22, Step 7)**

**1.** Expose the defect, select and contour the appropriate template

***Note:*** *If contouring is necessary place Bending Inserts into the fracture plate*



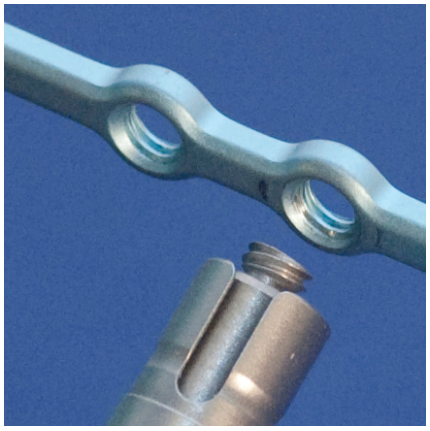



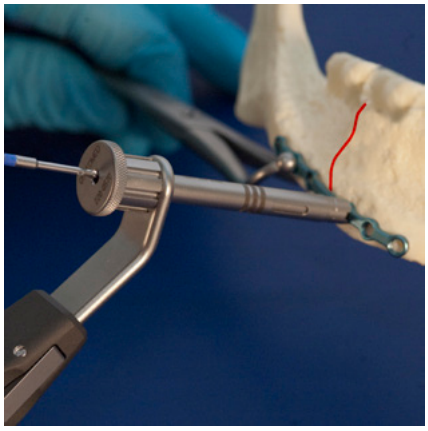
**2.** Contour the implant using the plate contouring instrumentations to match the template.
**(Reference General STG pg 17-20, Step 5)**
***Note:*** *remove bending inserts after contouring is completed*

**3.** Cut the fracture plate, if necessary, using the Round Reconstruction Plate Cutter Assembly (220-0584, 220-0585)
**(Reference General STG pg 15-16, Step 4)**

# Locking Screws
# Surgical Technique Guide

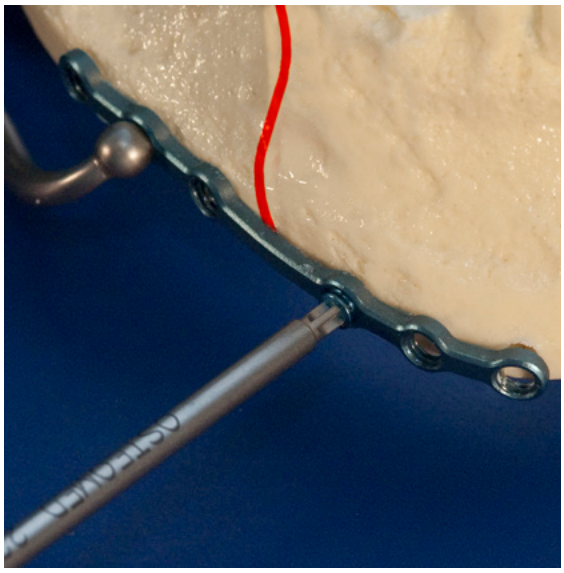
**4.** If transbuccal approach is needed, use the Trocar System with appropriate locking Drill Guide to drill the pilot holes, utilizing the proper technique as previously described. The Drill Guide is threaded to the plate to ensure perpendicular pilot hole drilling.
**(Reference General STG pg 22, Step 7)**

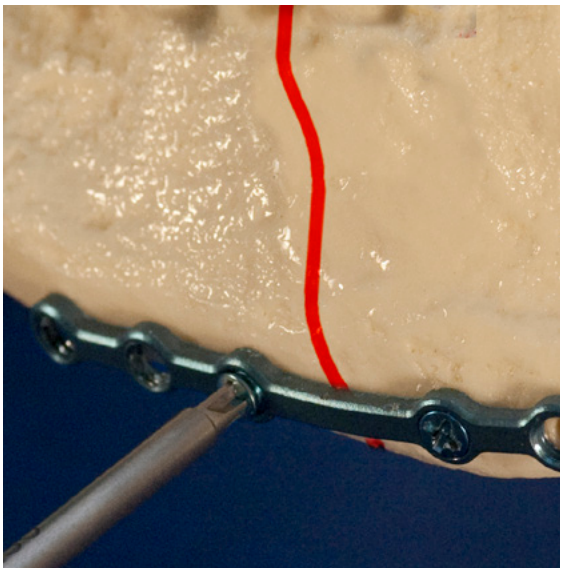


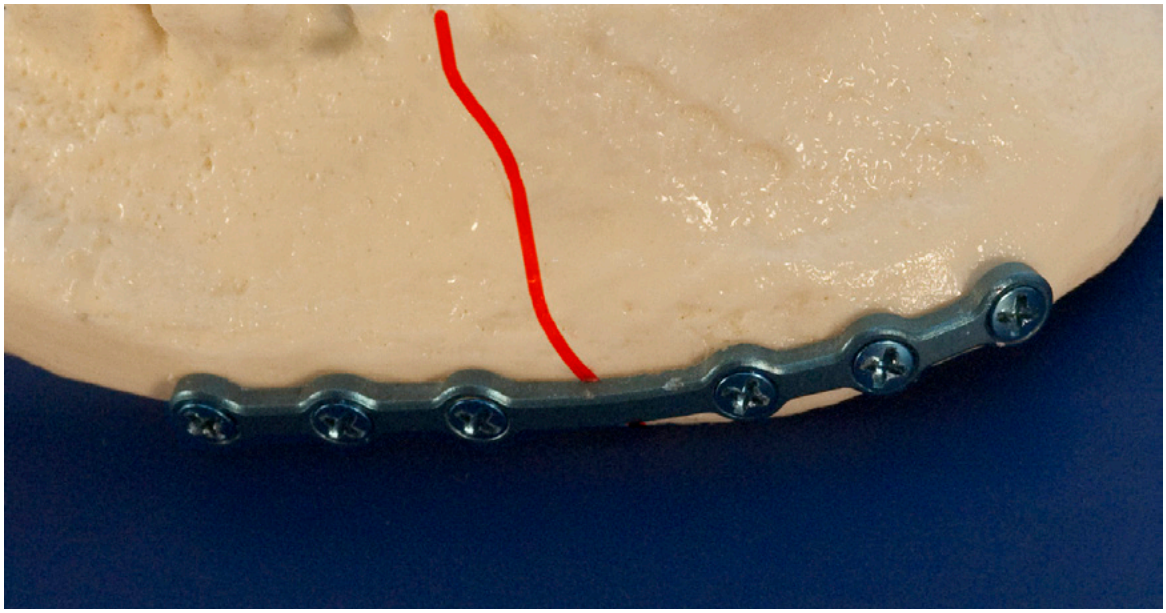


**5.** Use the Depth Gauge (220-0572) to determine the appropriate screw length.
**(Reference transbuccal approach for Cheek Retractor pg 30, step 7)**

**6.** Drive the first screw into proximal pilot hole until the screw is seated into the plate. Drive the second screw into the pilot hole on the opposing side of the fracture line/osteotomy until the screw is locked into the plate. Drive the remaining screws in a distal direction from fracture line/osteotomy.







# Angulated Locking Screws Surgical Technique Guide

**1.** Expose the defect

**2.** Select and contour the appropriate template

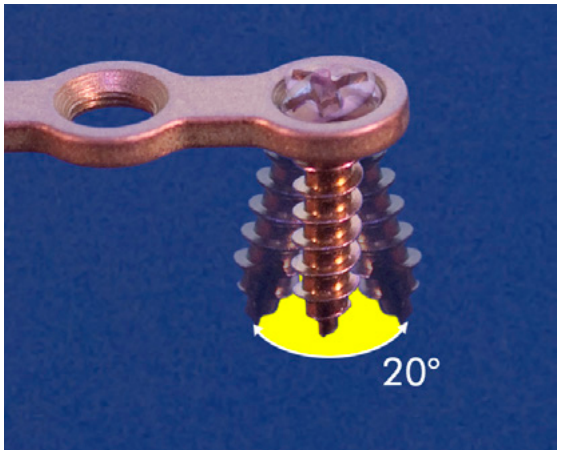
**3.** Select and contour appropriate angulated locking plate, utilizing the MFx™ contouring instrumentation **(Reference General STG pg 17-20, Step 5)**

Technique Tip: locking inserts are not necessary

***Note:*** *2.0/2.4mm Angulated Locking Plates are rose red*
***Note:*** *Angulated Locking Auto-Drive® Screws are pink*
***Note:*** *Angulated Locking Standard Screws are bronze*
***Note:*** *Angulated Locking Safety Screws are gray*

**4.** Cut the Angulated Locking Plate if necessary.
Use the Round Reconstruction Plate Cutter Assembly (220-0584, 220-0585).
**(Reference General STG pg 15-16, Step 4)**

**5.** Select first hole to be drilled and place Angulated Locking Drill Guide flush and perpendicular to the plate




Technique Tip: Select 2.0mm Angulated Locking Drill Guide (220-0452) or 2.4mm Angulated Locking Drill Guide (220-0453) depending on screw/plate selection

Technique Tip: Ensure Drill Guide cone is placed perpendicular and flush to the plate. Drill Guide will provide up to 10° degrees of angulation in any direction.

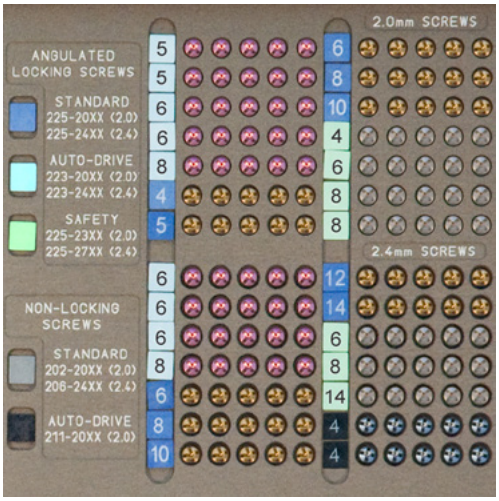
Technique Tip: If transbuccal approach is needed ensure only Neutral Drill Guide is used

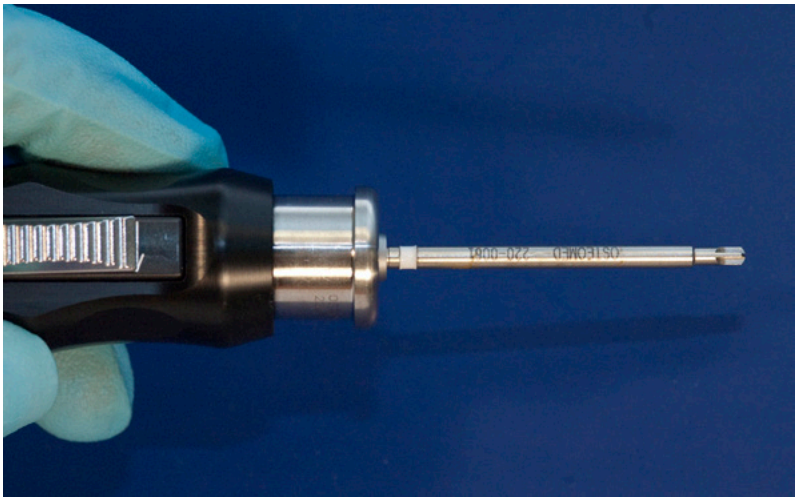
**6.** Drill the first hole proximal to the fracture line


**7.** Determine screw length
Use the Depth Gauge (220-0572) to determine the appropriate screw length.
**(Reference General STG pg 23, Step 8)**

**8.** Select the first screw

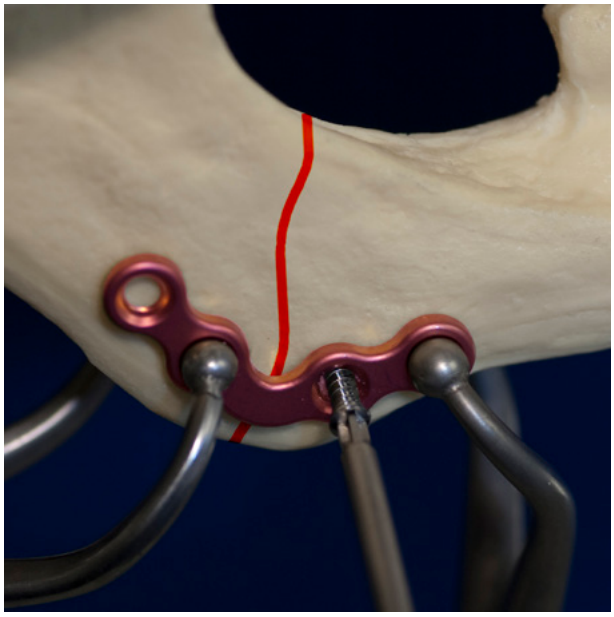
Technique Tip: 2.0mm Angulated Locking, Angulated Locking Auto-Drive® and Safety Angulated Locking screws require 1.6mm driver. The 1.6mm driver has a white band.



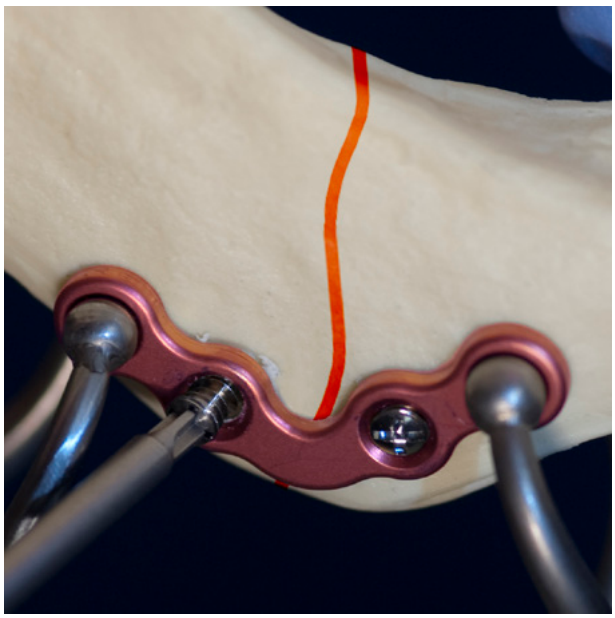



# Angulated Locking Screws Surgical Technique Guide

**9.** Drive the screw
Insert the first screw into proximal pilot hole until the screw is seated into the plate.



**10.** Insert remaining screws
Drive the second screw into the pilot hole on the opposing side of the fracture line/osteotomy until the screw is locked into the plate. Repeat screw insertion steps until all screws are placed in final fixation is achieved



***Note:*** *When placing additional screws, ensure that adjacent screw placements do not interfere with one another.*

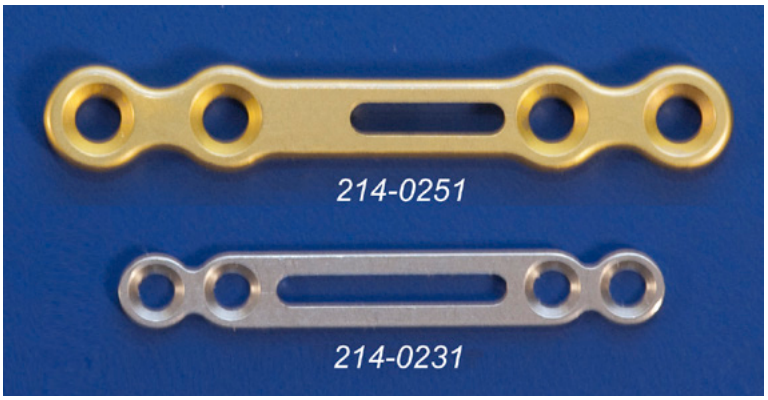
**11.** Close per standard practice

# Reduction Plates and Forceps Surgical Technique Guide

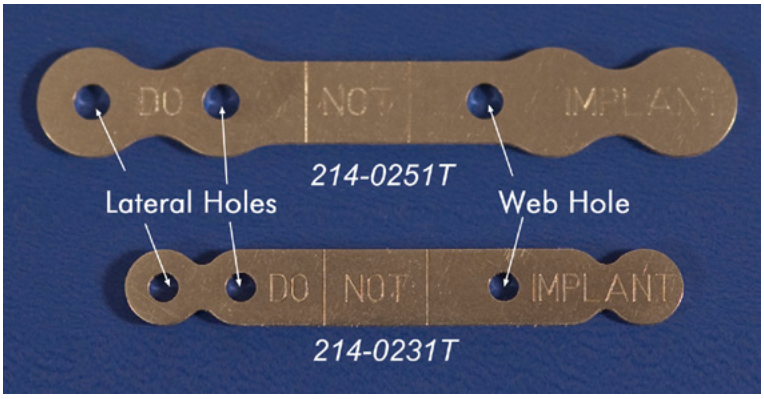
## For mandibular symphysis, parasymphysis and body fractures only

**1.** Expose the fracture

**2.** Select the appropriate plate




**3.** Select the corresponding template

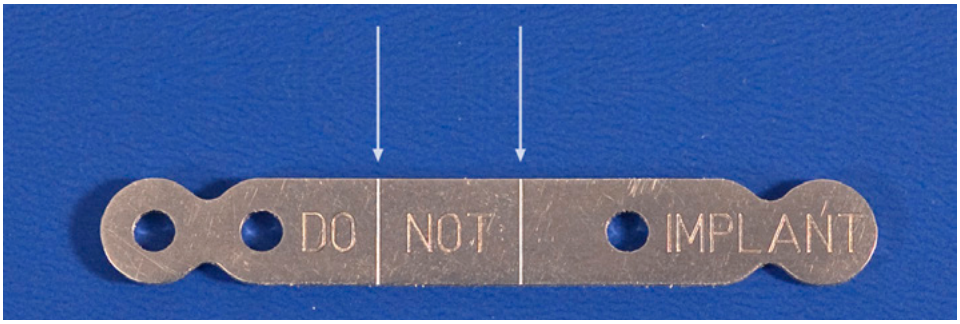



**4.** Drill forceps insertion holes

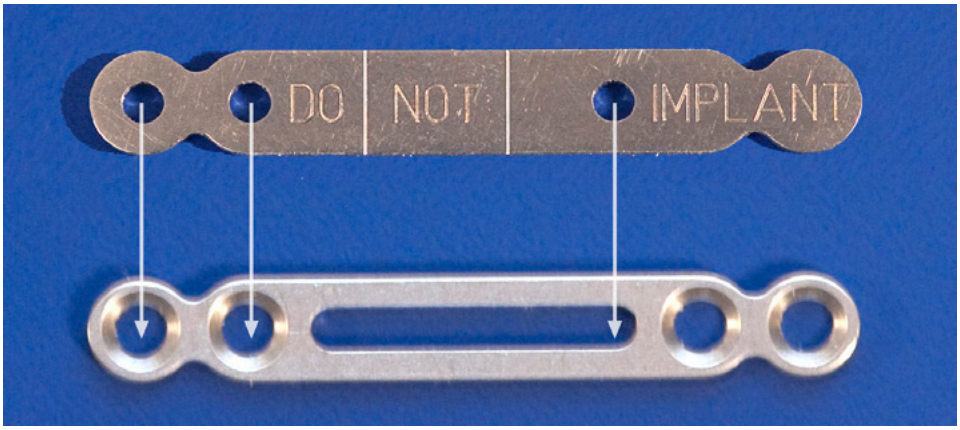
- Place the template across the fracture; ensure that the fracture lines fall entirely within the limit lines on the template.

- Drill the first insertion hole through the template's web hole and the second hole through one of the lateral holes.

***Note:*** *The etched lines present on the template indicate the maximum fracture displacement that can be reduced using this technique. If the fracture spans past the limit lines, conventional reduction methods must be used.*




***Note:*** *The lateral hole will align with the screw hole on the plate and serve as a pilot hole during screw placement. The other hole will fall within the slot on the plate.*




***Note:*** *The holes will be drilled with the pilot drill corresponding to the screws used with the plate.*

***Note:*** *Ensure that the template does not move location during the drilling of the holes. Ensure holes are drilled as close to parallel as possible.*

# Reduction Plates and Forceps Surgical Technique Guide

**5.** Remove the template

> Technique Tip : If little or no contouring of the plate is required go to Step 6, if significant contouring is required continue to Step 5.1

**5.1.** Reduce the fracture
Insert the forceps into the pre-drilled holes on the fragments and reduce the fracture.

**5.2.** Contour the template by placing above or below the forceps
***Note:*** *Plate must be flush with the bone to provide adequate contouring*

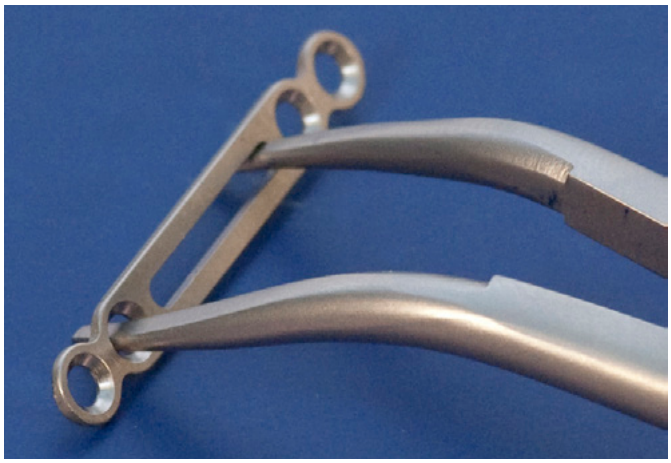
**5.3.** Contour the plate to match the template.

> Technique Tip: Utilize one of the OsteoMed plate contouring options.
> **(Reference General STG pg 17-20, Step 5)**

***Note:*** *Multiple bending of the plate may weaken the plate and could result in implant fracture and failure.*

**5.4.** Remove the forceps from the bone

**6.** Insert the forceps' tips into the plate until there is enough engagement between the tip of the forceps and the slot of the plate to adequately retain the plate.

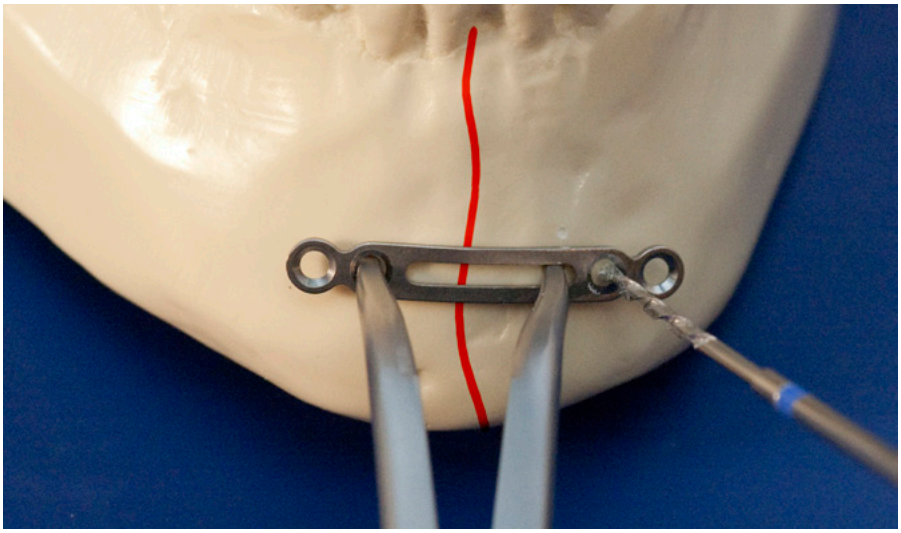


**6.1** One tip of the forceps must be placed in the slot and the second tip must be placed in one of the screw holes on the opposing side of the fracture.

***Note:*** *Do not use excessive force when lodging the tip into the slot*

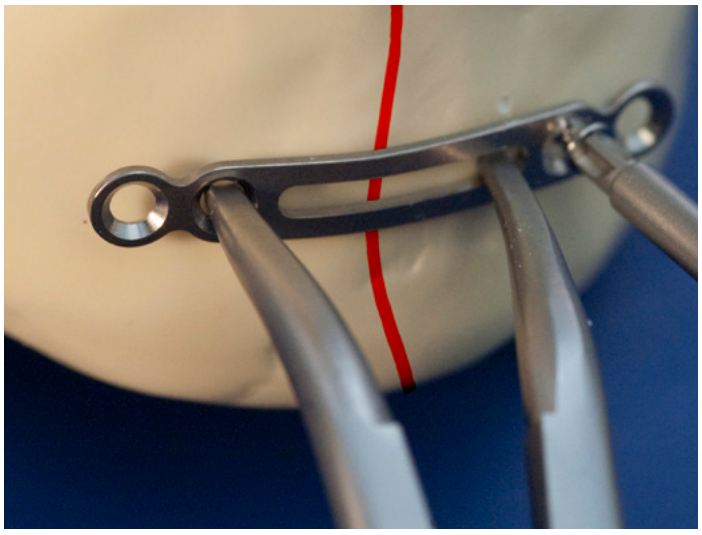
**7.** Engage the reduction forceps into the mandible fracture fragments, reduce the fracture.
***Note:*** *Forceps will continue to provide reduction/compression during screw placement.*

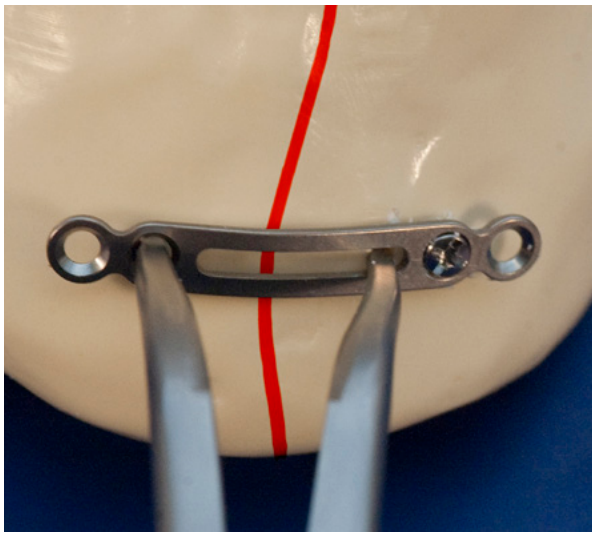
**8.** Push the plate flush with the bone and drill the first screw hole using the appropriate drill.



**9.** Use Depth Gauge to measure the screw length required.
**(Reference General Section pg 23, Step 8)**

**10.** Insert the required screw and drive until fully seated.



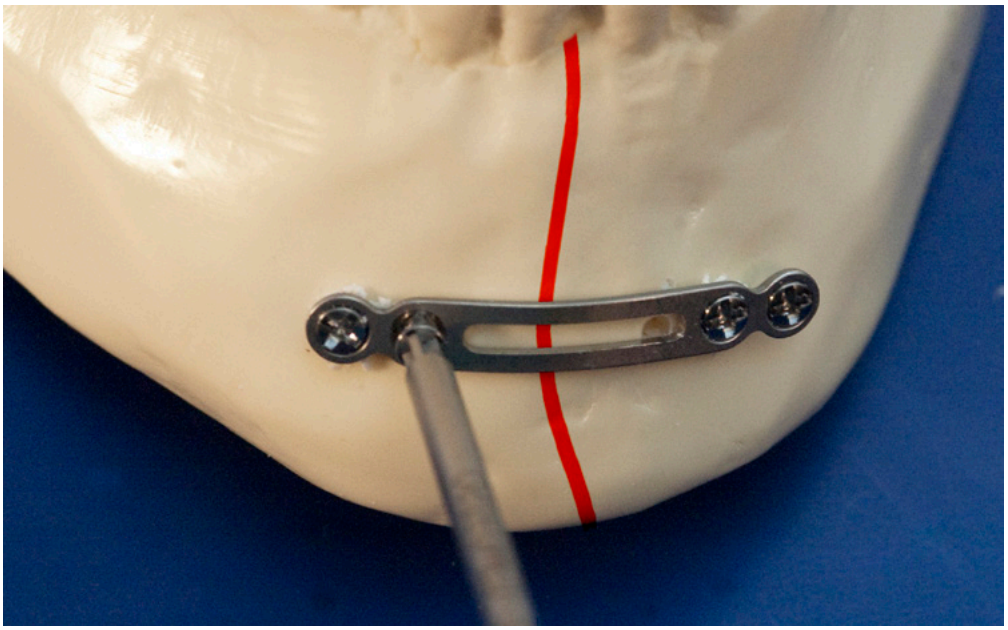


# Reduction Plates and Forceps Surgical Technique Guide

**11.** Place opposite side lateral screw to maintain reduction.

**12.** Remove forceps and place remaining screws.

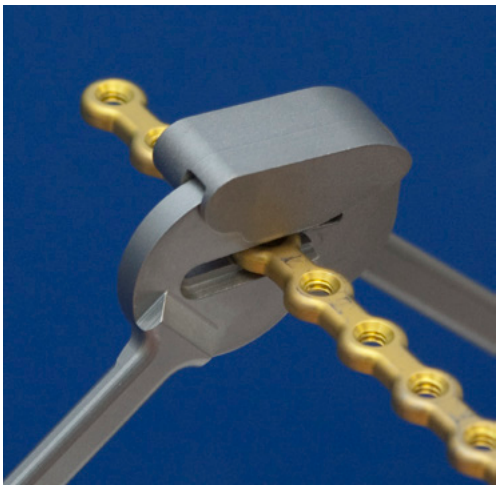
**13.** Close per standard practice.



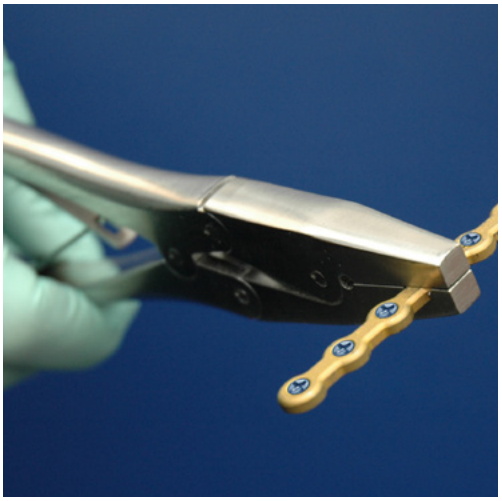
# Bone Resection (Ablative) Technique
# Surgical Technique Guide

**1.** Expose the defect and select and contour appropriate template.

**2.** Cut the reconstruction plate using the Round Reconstruction Plate Cutter Assembly. (220-0584, 220-0585)



**3.** Place bending inserts into the reconstruction plate and contour using reconstruction plate contouring options to match the template. After contouring is complete remove Bending Inserts.

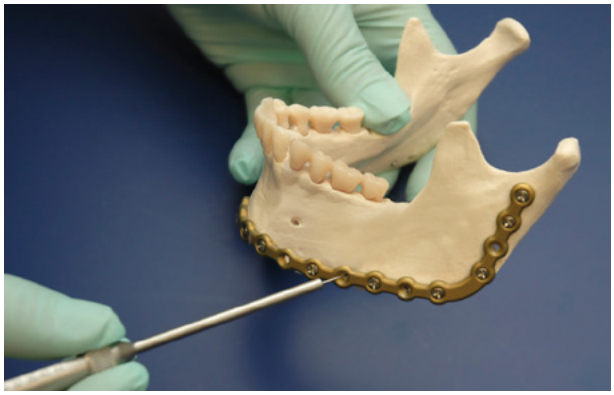


**(Reference General STG pg 17-20, Step 5)**

**4.** Drill pilot hole

# Bone Resection (Ablative) Technique Surgical Technique Guide

**5.** Use the Depth Gauge (220-0572) to determine the appropriate screw length and drive screws



**6.** Once plate is in place, remove screws and plate. After mandibular resection, replace plate and screws.

***Note:*** *Note screw location upon removal. Screws need to be returned to previous locations.*

**7.** Resect the mandible and replace implant

**8.** Resection is complete (If neccessary apply a bone graft)

# Lag Screw Device
# Surgical Technique Guide

## Indications

Indicated for symphyseal fracture fixation in the mandible

Lag Screw Device Instrumentation

- Modular Handle, Cannula: 220-0578
- MFx™ Lag Screw Cannula: 220-0724
- Sliding Depth Gauge, Lag Screw Depth Gauge: 220-0538
    - Length indicator slides along Lag Screw Cannula to determine screw length.
    - Utilized to predict exit point of drill on far cortex
- 2.4mm Lag Screws 20-38mm: 306-24XX
- Housed in the MFx™ Sterilization Tray: 220-0720

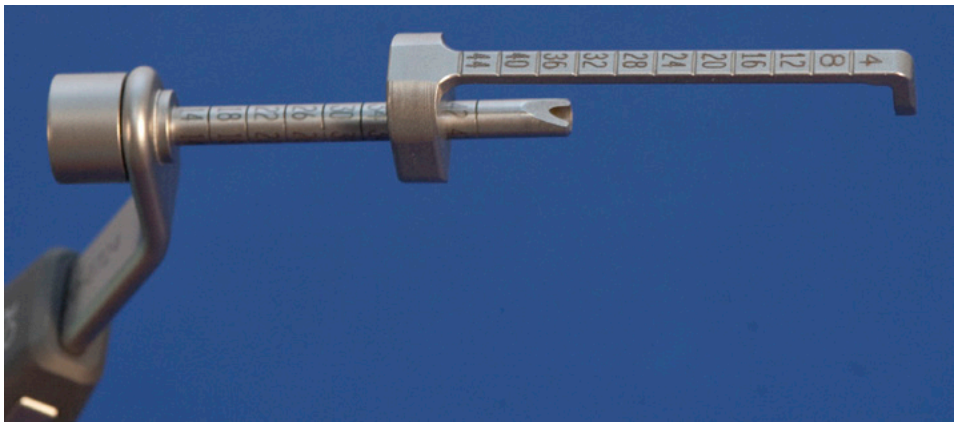
# Lag Screw Device
# Surgical Technique Guide

**1.** Reduce the fracture

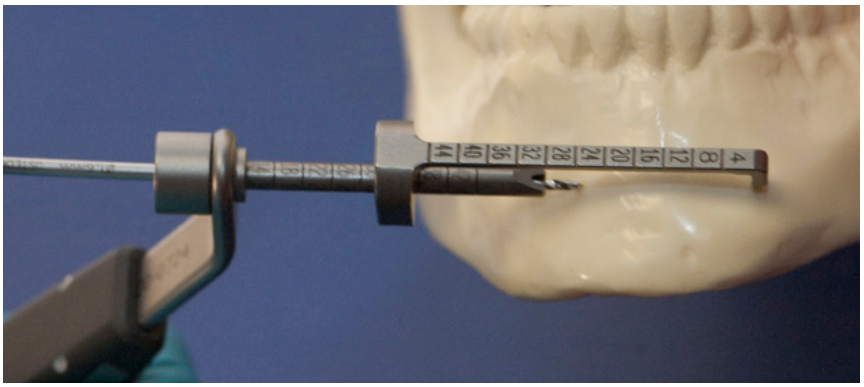
> Instrument Tip: The Bone Reduction Forceps (220-0231) may be necessary to reduce the fracture fragments. Pre-drill insertion holes for the forceps on either side of the fracture.

**2.** Assemble the Lag Screw Device

- Insert Lag Screw Cannula(220-0724) into Modular Cannula Handle (220-0578)
- Glide the Lag Screw Depth Gauge (220-0538) over the cannula



**3.** Drill the pilot hole



> Instrumentation Tip: Once device has been completely assembled, place lag screw device onto the mandible. Ensure device is placed perpendicular to the fracture line. If desired length is not achieved, adjustment of the device can be achieved by gliding the depth gauge along the cannula. This will provide the desired exit point of the screw.

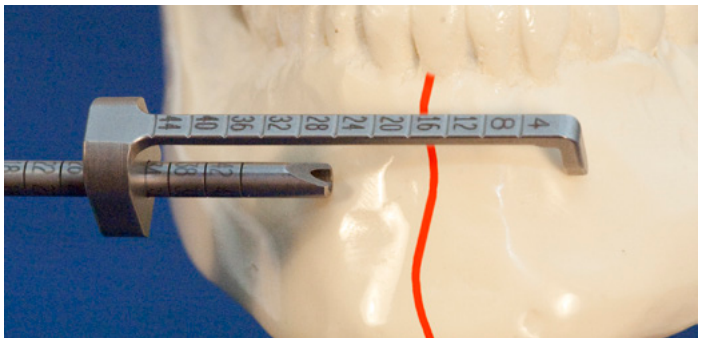
Caution: When utilizing this device make certain the device is placed in a fashion that avoids the path of the tooth roots.

Instrumentation Tip: Utilize either 220-0560 or 220-0563
- 220-0560, 2.0mm Pilot Drill, Long, Mandible System, J-latch
- 220-0563, 2.0mm Pilot Drill, Long, Mandible System, Drill bit, OsteoPower

Instrumentation Tip: Lag Screw Device must contact the bone at both the cannula and lag screw pointer tips. Drill entry point should be located approximately 12mm-15mm from the fracture line. Drill through the first cortex past the fracture line and through the distal cortex, utilizing the long mandibular drill bit and the MFx™ Lag Screw Cannula.

**4.** Determine length of lag screw

Option 1: Sliding Depth Gauge (220-0538) on Lag Screw Cannula
Ensure that the tip of sliding length gauge is fully contacting symphysis before reading




Option 2: Depth Gauge (220-0712)

**5.** Insert screw

***Note:*** *To prevent fragment rotation a secondary screw is recommended. To place additional screw repeat steps 3 -5, placing additional screw parallel to the initial screw.*


# MMF Screw System

## System Components

- 2.0mm MMF Screw (209-20XX) AutoDrive®
  Lengths: 8mm, 11mm, 14mm
- 2.4mm MMF Screw (207-24XX) Quick-Fix™
  Lengths: 12mm, 14mm, 16mm, 18mm
- Check on driver stem
- 2.0mm/2.4mm Screwdriver Shaft, Manual (220-0021)
- TaperLock™ Screwdriver Body (220-0019)
- 2.0mm Pilot Drill, J-latch (220-0005)
- 2.0mm Pilot Drill, Manual (220-0008)
- 24 ga. Stainless Steel Wire (207-0120)

## Features

- Streamlined system eliminating the need for arch bars, dramatically reducing application time for MMF
- Smooth screw posts minimizing soft tissue irritation
- Reduced intraoral hardware increasing patient comfort
- Wire passing holes providing secure ligature wire engagement
- TaperLock™ Cruciform Drive carries screws to the site with positive engagement

## Indications

- Orthognathic procedures
- Endentulous or partially endentulous
- Simple fracture patterns

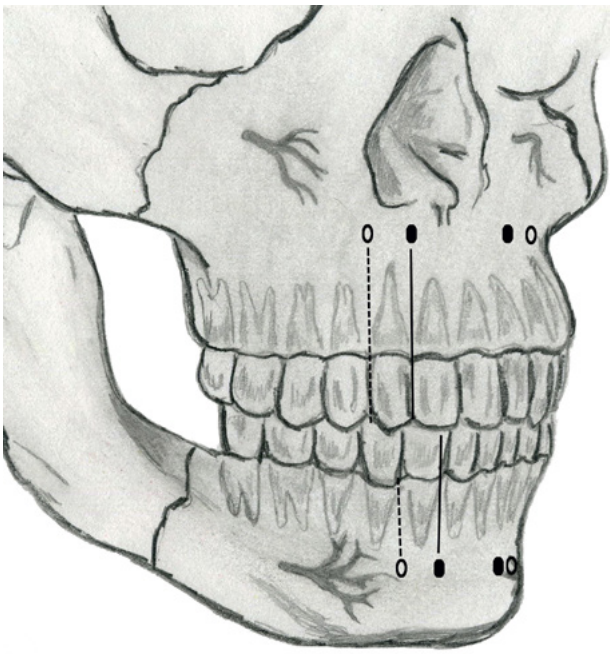
## Contraindications

- Comminuted fractures
- Unstable fracture segments
- Pediatric injuries

# MMF Screw System
# Surgical Technique Guide

**1.** Plan
Select the number and desired position of screw placement. This will be based on fracture pattern and anatomic location.

**2.** Locate maxillary tooth buds



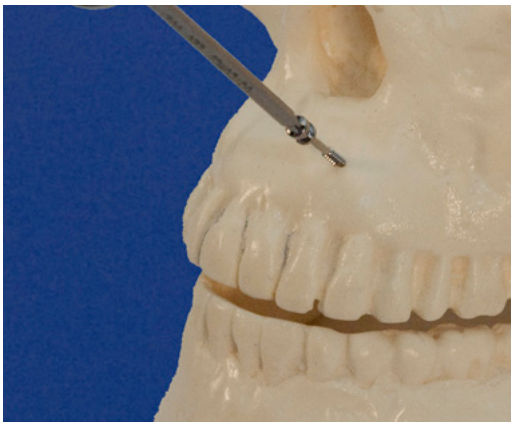
Technique Tips: Pay special attention to the canine tooth root, longest of all roots. Avoid all existing dentition while locating and avoiding the infraorbital and mental nerves. All dentition should be authenticated through the usage of the appropriate radiograph: panoramic X-ray.

***Note:*** *Maxillary MMF screws should be placed 5mm superiorly to the tooth root.*

**3.** Select appropriate MMF Screws
Based on fracture pattern, patient anatomy and anticipated patient compliance select either 2.0mm (209-20XX) or 2.4mm (207-24XX)

# MMF Screw System
# Surgical Technique Guide

**4.** Insert first MMF screw into the maxilla



Technique Tip: Screws may be placed through the mucosa without an incision. Insert either the 2.0mm or 2.4mm MMF screw into the maxilla, paying close attention not to apply unnecessary pressure to the mucosa. Drive the screw to the appropriate depth, leaving the wire-passing hole exposed. Do not over torque or bottom out the screw.

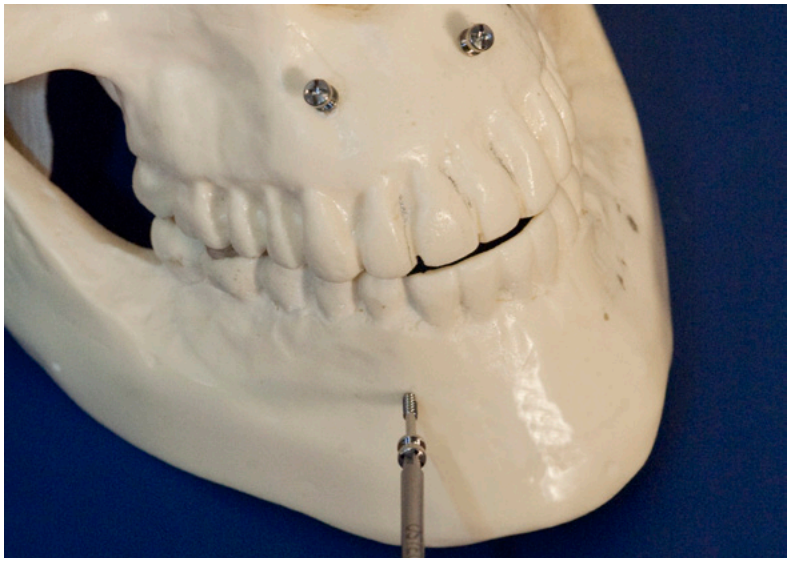
***Note:*** *When utilizing 2.4mm screws or when dense bone is encountered create a pilot hole*

***Note :*** *2.0mm MMF Auto-Drive® screws are self-drilling*

**5.** Insert MMF screw into the mandible
Start by identifying the necessary anatomic landmarks: tooth roots and mental nerve.

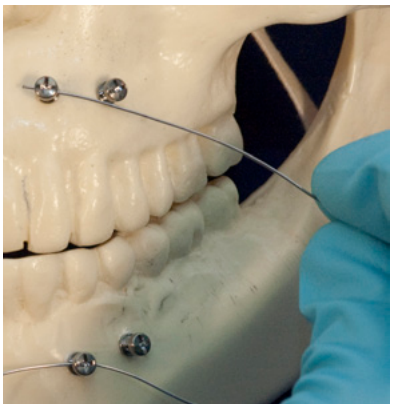
**6.** For secondary screw ensure placement in the mandible is 5mm inferior and medial or lateral to the canine tooth roots.

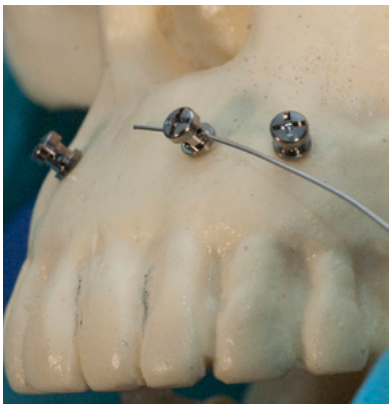
**7.** Insert additional screws
Follow the previously outlined procedure to place the remaining screws.

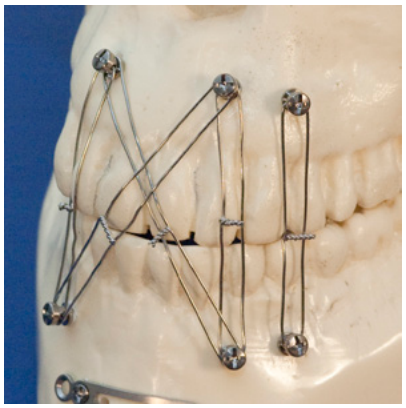


***Note:*** *A minimum of 3 pairs of MMF screws are recommended to ensure adequate stability. A pair constists of one screw in the mandible and an opposing screw in the maxilla.*

**8.** Insert Wire
Insert 24 gauge stainless steel wire (207-0120) through exposed wire passing holes into maxillary and opposing mandibular MMF screw heads in a vertical and "X" pattern. Tighten only enough to provide provisional fixation.







***Note:*** *Alternatively, wires may be wound around grooves in screw heads.*

# MMF Screw System
# Surgical Technique Guide


9. Establish occlusion
   ***Note:*** *Prior to securing all MMF screws, occlusion must be established*

10. Tighten wires fully

# MFx™
## MANDIBLE SYSTEM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