



RIVAL™ REDUCE FRACTURE PLATING SYSTEM

**FOOT & ANKLE
TRAUMA PROCEDURES**

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The surgical technique shown is for illustrative purposes only.
The technique(s) actually employed in each case will always depend upon the medical judgment of the surgeon exercised before and during surgery as to the best mode of treatment for each patient. Please see the Instructions for Use for the complete list of indications, warnings, precautions, and other important medical information.

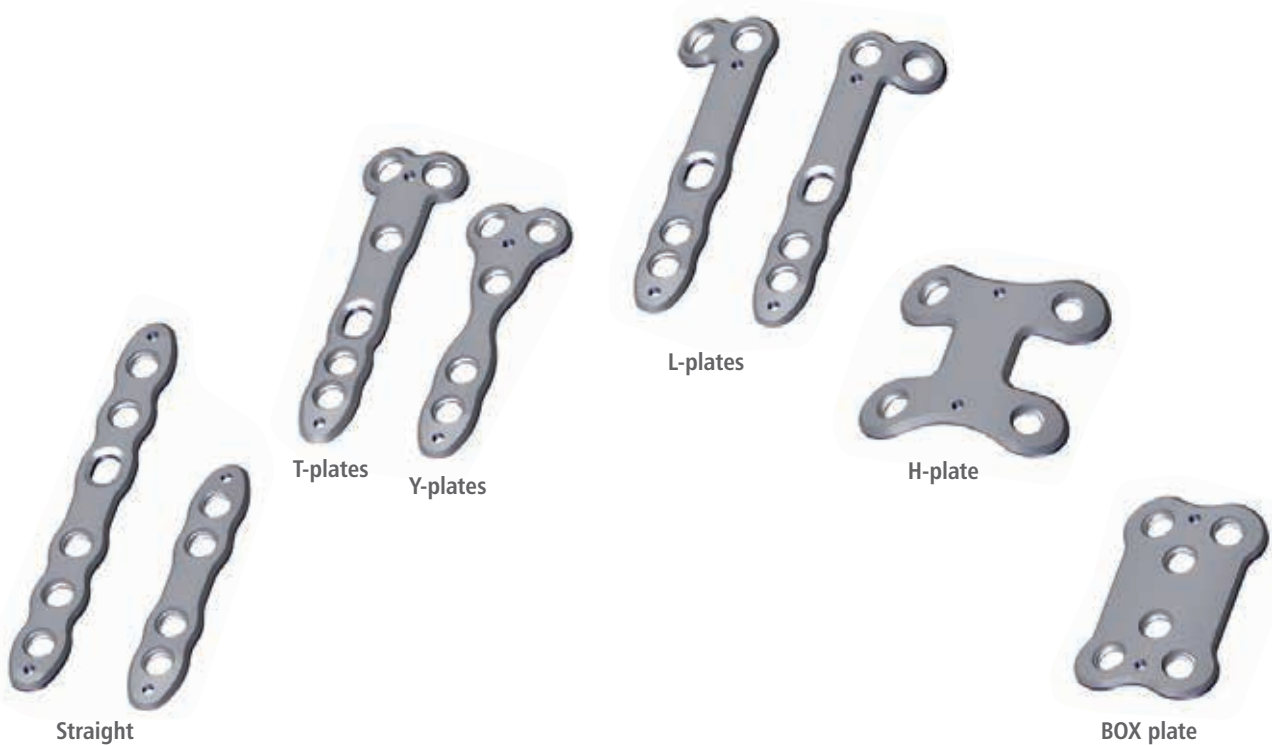
INTRODUCTION

This operative technique explains the recommended procedures for using the RIVAL™ REDUCE Fracture Plating System's devices and instruments. Please refer to the corresponding instructions below on specific steps.

The IFU (Instruction For Use) leaflet contains the indications for use as well as the contraindications and has been included in the packaging of all implants. It can also be found at <http://ifu.orthofix.it>.

SYSTEM DESCRIPTION

The RIVAL™ REDUCE Fracture Plating System includes titanium alloy, sterile and non-sterile packaged T, L, Y, Straight plates, H Plates and BOX plates along with sterile and non-sterile titanium alloy bone screws. The RIVAL™ REDUCE Fracture Plating System is offered in a variety of sizes for use with the RIVAL™ non-locking and locking bone screws. The screws are available in variety of diameters and lengths. The corresponding instrumentation necessary for insertion is found in Orthofix's RIVAL™ Instrumentation.



RIVAL™

○ REDUCE □ VIEW ▶ BITE

TECHNICAL DETAILS

Table 1: RIVAL™ REDUCE Fracture Plating System

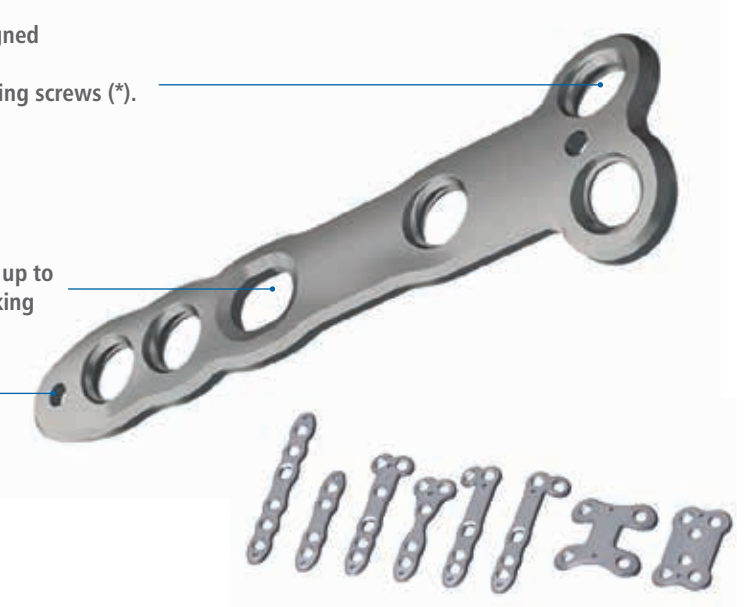
PLATES						
	Straight	T-Plate	Y-Plate	L-Plate	H-Plate	BOX Plate
Plate Sizes	3, 4 and 6 Hole	Small and Large	Small and Large	Left and Right	12mm, 15mm, 20mm, 25mm and 30mm	18mm, 22mm and 30mm

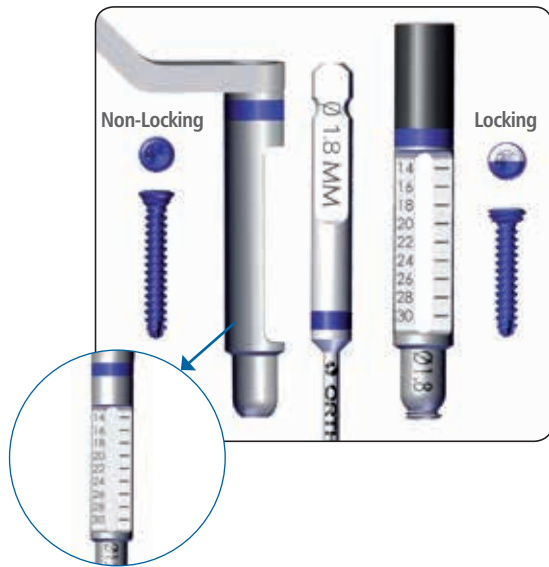
All plates are 1.3mm thick and are Gun Metal Gray anodized.

REDUCE Fracture Plates are designed to be used with 2.4mm, 2.7mm and 3.2mm locking and non-locking screws (*).

The REDUCE Fracture Plates include an oblong compression hole for intraoperative compression capabilities up to 1.1mm with the corresponding non-locking screws.

The REDUCE Fracture Plates are designed with guide wire holes for easy implant placement during surgery.

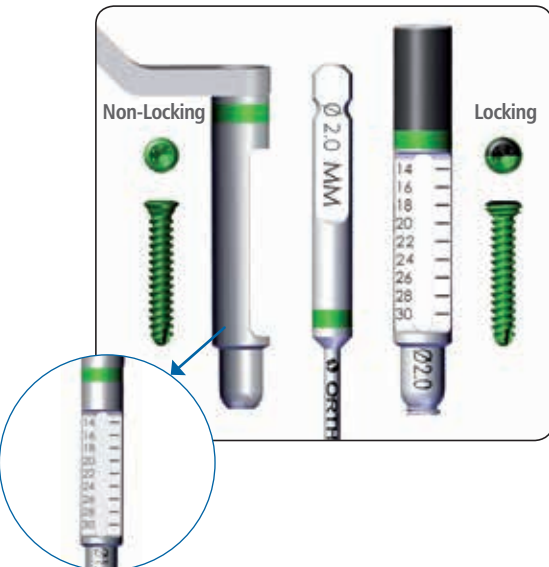




2.4mm BONE SCREWS

	2.4mm Locking	2.4mm Non-Locking
Size Range	8 to 30mm	8 to 30mm
Length Increments	2.0mm	2.0mm
Drill Size	1.8mm	1.8mm
Drill Guide	Rival Drill Guide Locking D1.8mm	Rival Drill Guide Non-Locking D1.8mm
Color code	Dark Blue	Dark Blue

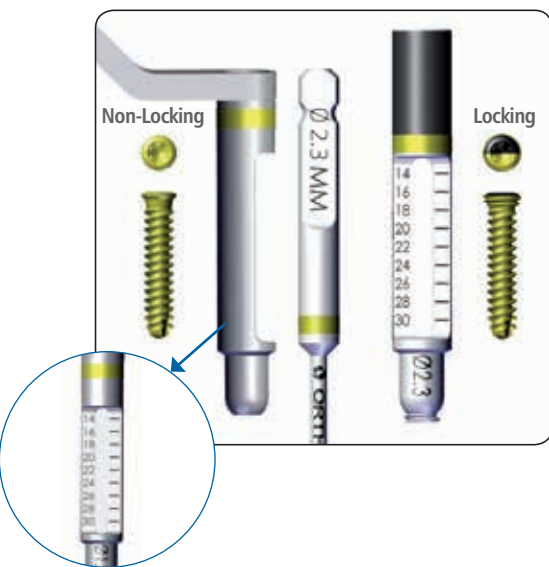
STERILE	LOCKING	002-L-242XX
	NON-LOCKING	002-N-242XX
NON STERILE	LOCKING	102-L-242XX
	NON-LOCKING	102-N-242XX



2.7mm BONE SCREWS

	2.7mm Locking	2.7mm Non-Locking
Size Range	8 to 40 mm	8 to 40 mm
Length Increments	2.0mm	2.0mm
Drill Size	2.0mm	2.0mm
Drill Guide	Rival Drill Guide Locking D2.0mm	Rival Drill Guide Non-Locking D2.0mm
Color code	Green	Green

STERILE	LOCKING	002-L-272XX
	NON-LOCKING	002-N-272XX
NON STERILE	LOCKING	102-L-272XX
	NON-LOCKING	102-N-272XX



3.2mm BONE SCREWS

	3.2mm Locking	3.2mm Non-Locking
Size Range	10 to 50mm	10 to 50mm
Length Increments	2.0mm	2.0mm
Drill Size	2.3mm	2.3mm
Drill Guide	Rival Drill Guide Locking D2.3mm	Rival Drill Guide Non-Locking D2.3mm
Color code	Gold	Gold

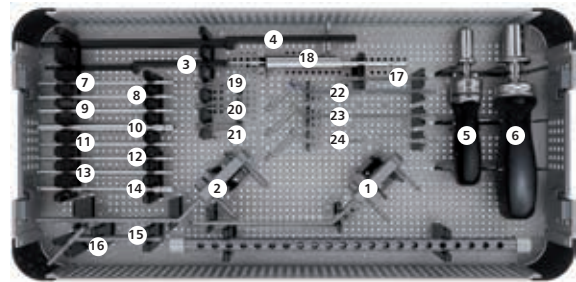
STERILE	LOCKING	002-L-322XX
	NON-LOCKING	002-N-322XX
NON STERILE	LOCKING	102-L-322XX
	NON-LOCKING	102-N-322XX

RIVAL™ Instrument Set - Tray

Part#	Description
001-A-11014	RIVAL™ Instrument Tray Complete
001-A-10014	RIVAL™ Instrument Tray Empty

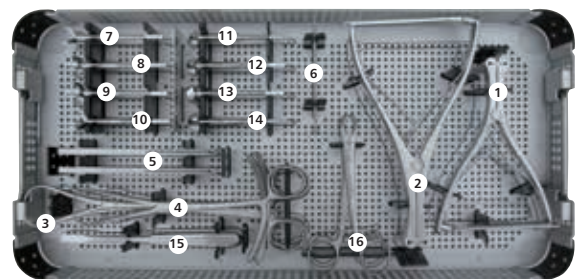
RIVAL™ Instrument Set - Top Tray

Part#	Description	Q.ty
001-A-40003	1 Parallel Wire Guide, 4.0/4.5mm Screw	1
001-A-65003	2 Paralle Wire Guide, 6.5/8.0mm Screws	1
001-A-20004	3 Small Depth Gauge, 0.9mm, 1.1mm and 1.5mm Guide Wires	1
001-A-65004	4 Large Depth Gauge, 2.8mm Guide Wire	1
001-A-01008	5 Small Ratcheting Handle, Cannulated, Quick Connect	1
001-A-03008	6 Large Ratcheting Handle, Cannulated, Quick Connect	1
001-A-20010	7 Cannulated Cruciform Driver, 2.0/2.5mm Headed Screw, Quick Connect	2
001-A-30010	8 Cannulated Cruciform Driver, 3.0/3.5mm Headed Screw, Quick Connect	2
001-A-40010	9 Cannulated Cruciform Driver, 4.0/4.5mm Headed Screw, Quick Connect	2
001-A-65010	10 Cannulated Cruciform Driver, 6.5/8.0mm Headed Screw, Quick Connect	2
001-A-20011	11 Cannulated Hex Driver, 2.0/2.5mm Headless Screw, Quick Connect	2
001-A-30011	12 Cannulated Hex Driver, 3.0/3.5mm Headless Screw, Quick Connect	2
001-A-40011	13 Cannulated Hex Driver, 4.0/4.5mm Headless Screw, Quick Connect	2
001-A-65011	14 Cannulated Hex Driver, 6.5/7.5mm Headless Screw, Quick Connect	2
001-A-20012	15 Pin Inserter, 0.9mm and 1.1mm Guide Wire	1
001-A-40012	16 Pin Inserter, 1.5mm Guide Wire	1
002-A-02003	17 T8 Screwdriver, Quick Connect	2
002-A-00009	18 Depth Gauge With Hook	1
002-A-20021	19 Rival Drill Guide Locking D1.8mm	1
002-A-20022	20 Rival Drill Guide Locking D2.0mm	1
002-A-20023	21 Rival Drill Guide Locking D2.3mm	1
002-A-00010	22 Rival Drill Guide Non-Locking D1.8mm	1
002-A-00011	23 Rival Drill Guide Non-Locking D2.0mm	1
002-A-00012	24 Rival Drill Guide Non-Locking D2.3mm	1



RIVAL™ Instrument Set - Middle Tray

Part#	Description	Q.ty
001-A-40006	1 Small Joint Distraction Forceps, 1.5mm Guide Wire	1
001-A-40007	2 Joint Compression Forceps	1
001-A-01007	3 Bone Reduction Forceps, 8	1
001-A-02007	4 Bone Reduction Forceps, 10	1
002-A-01003	5 Plate Bending Iron	2
002-A-00006	6 Plate Bending Joystick	2
002-A-14010	7 Cup Reamer D14mm Quick Connect	1
002-A-16010	8 Cup Reamer D16mm Quick Connect	1
002-A-18010	9 Cup Reamer D18mm Quick Connect	1
002-A-20010	10 Cup Reamer D20mm Quick Connect	1
002-A-14011	11 Cone Reamer D14mm Quick Connect	1
002-A-16011	12 Cone Reamer D16mm Quick Connect	1
002-A-18011	13 Cone Reamer D18mm Quick Connect	1
002-A-20011	14 Cone Reamer D20mm Quick Connect	1
003-A-00001	15 Soft Tissue Elevator	1
003-A-00002	16 Lobster Claw	1



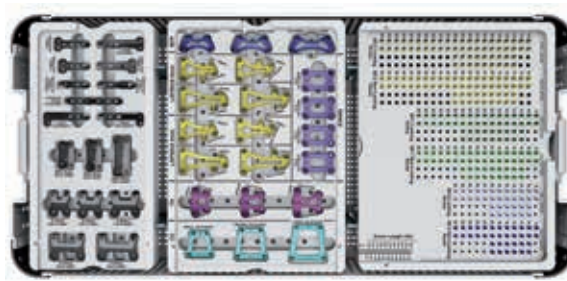
RIVAL™ - REDUCE - Trial Caddy

Part#	Description	Q.ty
003-A-01005	Rival Ti Trial Straight Plate 3 Hole	1
003-A-02005	Rival Ti Trial Straight Plate 4 Hole	1
003-A-03005	Rival Ti Trial Straight Plate 6 Hole	1
003-A-01003	Rival Ti Trial T-Plate Small	1
003-A-02003	Rival Ti Trial T-Plate Large	1
003-A-01004	Rival Ti Trial Y-Plate Small	1
003-A-02004	Rival Ti Trial Y-Plate Large	1
003-A-00006L	Rival Ti Trial L-Plate Left	1
003-A-00006R	Rival Ti Trial L-Plate Right	1
003-A-18007	Rival Ti Trial Box Plate 18mm	1
003-A-22007	Rival Ti Trial Box Plate 22mm	1
003-A-30007	Rival Ti Trial Box Plate 30mm	1
003-A-12008	Rival Ti Trial H-Plate 12mm	1
003-A-15008	Rival Ti Trial H-Plate 15mm	1
003-A-20008	Rival Ti Trial H-Plate 20mm	1
003-A-25008	Rival Ti Trial H-Plate 25mm	1
003-A-30008	Rival Ti Trial H-Plate 30mm	1

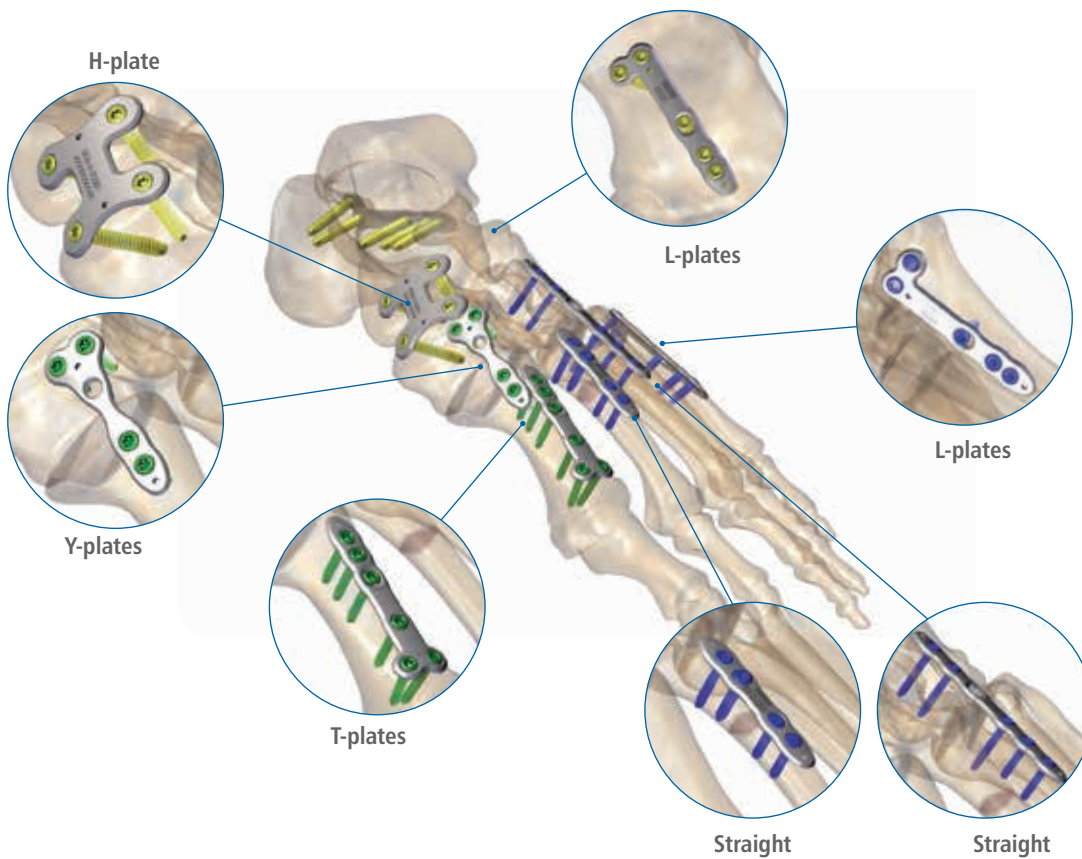


RIVAL™ - Implant Set-Tray

Part#	Description
001-A-11015	Rival Implant Set Tray Complete
001-A-10015	Rival Implant Set Tray Empty



Examples of RIVAL™ REDUCE Plates applications



OPERATIVE TECHNIQUE

Preoperative Planning

The RIVAL™ REDUCE Fracture Plating System is composed of a variety of plates and bone screws. Detailed preoperative planning is important for determining appropriate screw and plate size and location for the desired procedure(s) being performed.

Surgical Technique

The operative technique listed below is designed to provide general principles for the use of the RIVAL™ REDUCE Fracture Plating System.

Implantation Site Exposure

Expose the implantation site with the appropriate surgical approach specific to the procedure(s) being performed. The surgical approach should facilitate adequate visualization of important anatomic structures and facilitate use of instrumentation and implant placement.

Plate Selection

INSTRUMENTS

Part#	Description
BONE REDUCTION FORCEPS (optional)	
001-A-01007	Bone Reduction Forceps, 8inch
001-A-02007	Bone Reduction Forceps, 10inch
REDUCE TRIAL PLATES	
003-A-01005	Rival Ti Trial Straight Plate 3 Hole
003-A-02005	Rival Ti Trial Straight Plate 4 Hole
003-A-03005	Rival Ti Trial Straight Plate 6 Hole
003-A-01003	Rival Ti Trial T-Plate Small
003-A-02003	Rival Ti Trial T-Plate Large
003-A-01004	Rival Ti Trial Y-Plate Small
003-A-02004	Rival Ti Trial Y-Plate Large
003-A-0006L	Rival Ti Trial L-Plate Left
003-A-0006R	Rival Ti Trial L-Plate Right
003-A-18007	Rival Ti Trial Box Plate 18mm
003-A-22007	Rival Ti Trial Box Plate 22mm
003-A-30007	Rival Ti Trial Box Plate 30mm
003-A-12008	Rival Ti Trial H-Plate 12mm
003-A-15008	Rival Ti Trial H-Plate 15mm
003-A-20008	Rival Ti Trial H-Plate 20mm
003-A-25008	Rival Ti Trial H-Plate 25mm
003-A-30008	Rival Ti Trial H-Plate 30mm

Reduce and provisionally fix the fracture/osteotomy site with K-wires or bone reduction forceps. If the RIVAL™ REDUCE plates are provided in single sterile packaging, use the RIVAL™ REDUCE trial plates found in the RIVAL™ Instrumentation to confirm plate type and size that best achieves the goals of fixation (see Table 1 page 4) (Fig. 1).

NOTE: RIVAL™ REDUCE trial plates can be contoured by using plate bending irons and applied to the application site to identify the best fit.



Fig. 1

Temporary Fixation

INSTRUMENTS

Part#	Description
PLATE BENDING IRONS	
002-A-01003	RIVAL Plate Bending Iron
002-A-2P005	
	Olive Wires (Kit of 2)

If necessary, contour the selected plate to fit specific anatomy and fixation options by using plate bending irons available in the RIVAL™ Instrumentation. Place the plate on the bone, confirm appropriate contour and use olive wires to provisionally fix the plate to the bone (Fig. 2).

WARNING: Excessive bending and re-bending of titanium plates can lead to plate failure and is not recommended.

WARNING: Avoid using plate bending irons on screw holes as it will damage the locking threads precluding their use.

NOTE: Care must be taken to consider adjacent joints when planning plate positioning and screw placement not perpendicular to the plate.

Screw Selection

All screw holes on the RIVAL™ REDUCE plates accommodate RIVAL™'s locking and non-locking bone screws.

Select the appropriate screw diameter and type based upon patient's bone quality and anatomy.

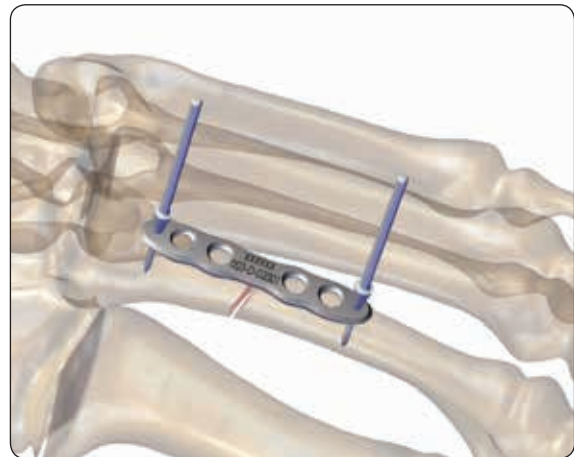


Fig. 2

Pre-drilling and Screw Length Determination

INSTRUMENTS

Part#	Description
002-A-18009	Rival Drill Bit D1.8mm With Depth Mark Quick Connect
002-A-20009	Rival Drill Bit D2.0mm With Depth Mark Quick Connect
002-A-23009	Rival Drill Bit D2.3mm With Depth Mark Quick Connect
002-A-20021	Rival Drill Guide Locking D1.8mm
002-A-20022	Rival Drill Guide Locking D2.0mm
002-A-20023	Rival Drill Guide Locking D2.3mm
002-A-00010	Rival Drill Guide Non-Locking D1.8mm
002-A-00011	Rival Drill Guide Non-Locking D2.0mm
002-A-00012	Rival Drill Guide Non-Locking D2.3mm
002-A-00009	Depth Gauge With Hook

Use appropriate sterile packed drill bits in conjunction with the appropriate drill guides found in the RIVAL™ Instrumentation (see pag. 5) to prepare proximal or distal screw holes depending on the procedures being performed (Fig. 3 and 4).

Locking and non-locking drill guides permit to determine the appropriate screw length during drilling. Place the tip of the drill bit on the first cortex and then start drilling. Ensure complete drilling through both cortices and note where the screw length reference on the drill meets the drill guide.

If the screw length reference does not meet the drill guide, the appropriate screw is shorter than 14mm or longer than 30mm, so insert the depth gauge through the pilot hole and hook the far cortex (Fig. 5).

Press the barrel of the depth gauge to the surface of the plate to determine the screw length. Image intensifier may be used to visualize the depth gauge and confirm correct screw position especially when screws are not placed perpendicular to the plate.

WARNING: Do not use the locking drill guides as bending irons for the plates as this may damage the threads and preclude the use of the locking mode.

PRECAUTION: It is particularly important to screen with an image intensifier to ensure complete drilling of both cortices and to avoid interference between converging screws.

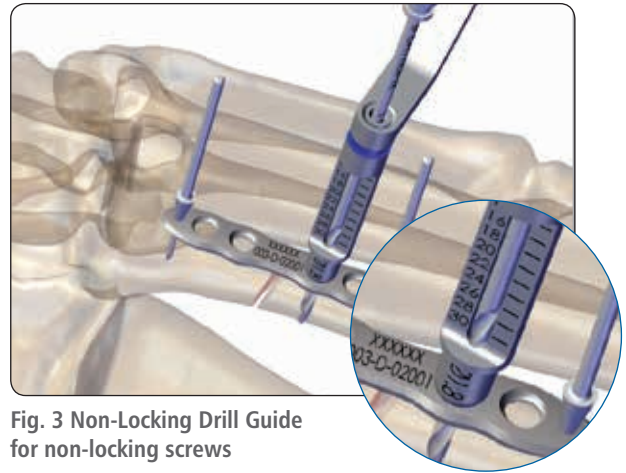


Fig. 3 Non-Locking Drill Guide for non-locking screws

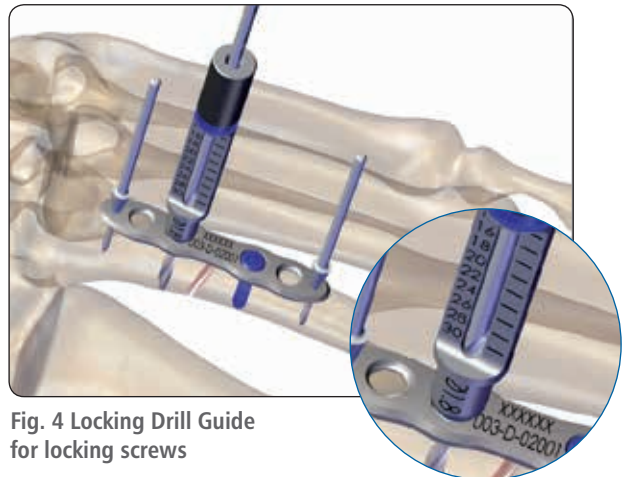


Fig. 4 Locking Drill Guide for locking screws

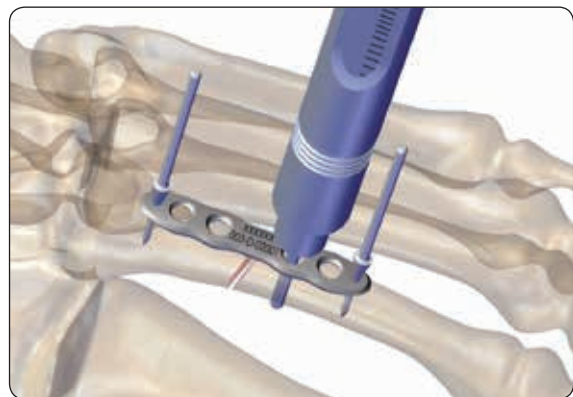


Fig. 5

Preliminary Screw Insertion

INSTRUMENTS

Part#	Description
002-A-02003	T8 Stardrive Screwdriver, Quick Connect
001-A-01008	Small Ratcheting Handle, Cannulated, Quick Connect

Once the appropriate screw length is determined open the corresponding screw.

Attach the screw driver found in the RIVAL™ instrumentation to the ratcheting handle to advance manually the screw into place (Fig. 6).

NOTE: Final screw tightening is not recommended until all desired screws have been inserted into the plate.

WARNING: Screws must not be over-tightened during insertion. Over-tightening may cause damage of the implant or bone stripping.

WARNING: In the event that locking bone screw head threads strip out, replace the locking screw with a non-locking screw.

PRECAUTION: It is particularly important to screen with an image intensifier to verify correct screw insertion.

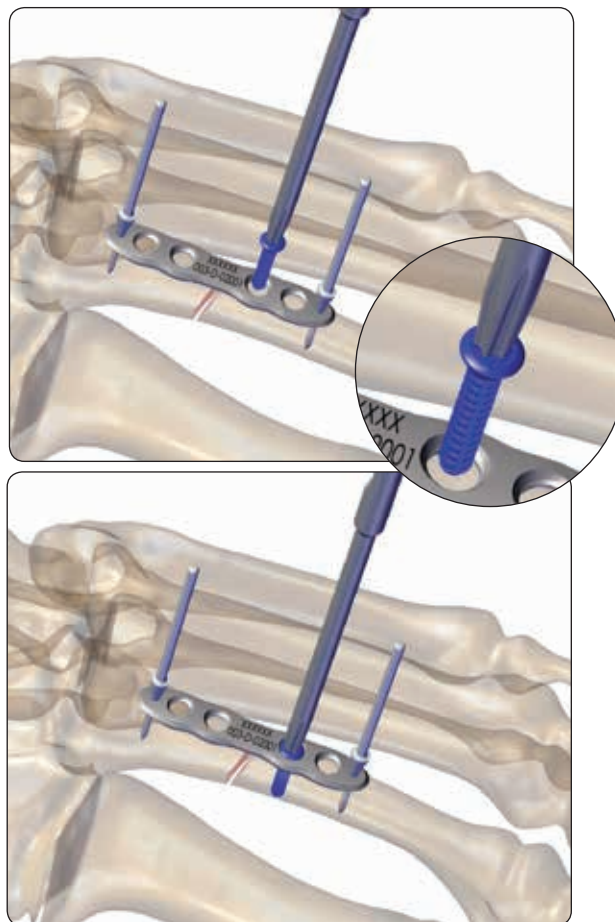


Fig. 6

Compression Feature

Compression across a fracture/osteotomy site can be achieved using the oblong compression screw slot on the RIVAL™ REDUCE plates.

Completion of Screw Insertion

Repeat drill, measuring, and placement of screws in the remaining holes as required.

NOTE: Remember to use the appropriate drill size for the desired screw diameter.

Final Screw Tightening

INSTRUMENTS

Part#	Description
002-A-02003	T8 Stardrive Screwdriver, Quick Connect
001-A-01008	Small Ratcheting Handle, Cannulated, Quick Connect

When all desired screws have been inserted into the plate, remove provisional fixation. To limit the amount of torque that is applied during final tightening, perform final manual tightening using a “two finger technique” as illustrated (Fig. 7a).

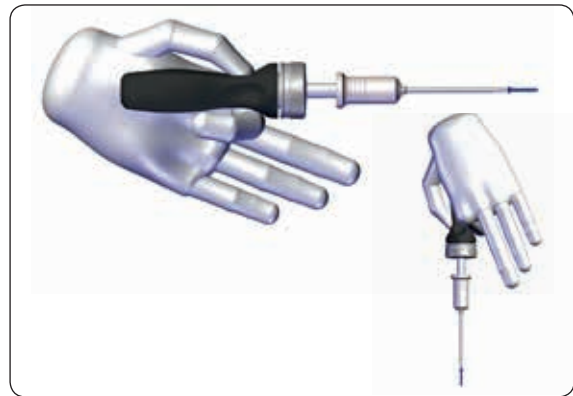


Fig.7a

Final fluoroscopic control

To ensure appropriate placement and size selection of the plate and screws, take a fluoroscopic image.



Fig.7b

Plate and Screw Removal

INSTRUMENTS

Part#	Description
001-A-01008	Small Ratcheting Handle, Cannulated, Quick Connect
002-A-02003	T8 Stardrive Screwdriver, Quick Connect
003-A-00001	Soft Tissue Elevator

If the plate and screws need to be removed, perform appropriate surgical incisions to adequately expose the implant.

If necessary, remove overgrown bone to expose entire screw heads.

Use the screwdriver found in the RIVAL™ Instrumentation to remove each screw from the plate (Fig. 8).

Use a soft tissue elevator or other general surgical instrument to lift off the plate from the bone (Fig. 9).

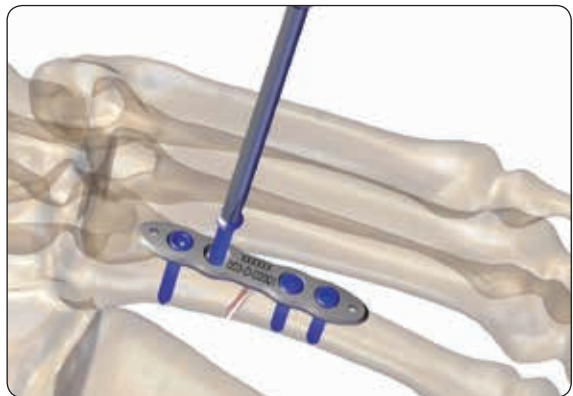


Fig. 8



Fig. 9

LIST OF CONSUMABLE ITEMS

IMPLANT- PLATES- STERILE

Code	Description
003-B-01001	RIVAL TI T-PLATE SMALL STERILE
003-B-02001	RIVAL TI T-PLATE LARGE STERILE
003-C-01001	RIVAL TI Y-PLATE SMALL STERILE
003-C-02001	RIVAL TI Y-PLATE LARGE STERILE
003-D-01001	RIVAL TI STRAIGHT PLATE 3 HOLE STERILE
003-D-02001	RIVAL TI STRAIGHT PLATE 4 HOLE STERILE
003-D-03001	RIVAL TI STRAIGHT PLATE 6 HOLE STERILE
003-E-00001L	RIVAL TI L-PLATE LEFT STERILE
003-E-00001R	RIVAL TI L-PLATE RIGHT STERILE
003-F-18001	RIVAL TI BOX PLATE 18MM STERILE
003-F-22001	RIVAL TI BOX PLATE 22MM STERILE
003-F-30001	RIVAL TI BOX PLATE 30MM STERILE
003-H-12001	RIVAL TI H-PLATE 12MM STERILE
003-H-15001	RIVAL TI H-PLATE 15MM STERILE
003-H-20001	RIVAL TI H-PLATE 20MM STERILE
003-H-25001	RIVAL TI H-PLATE 25MM STERILE
003-H-30001	RIVAL TI H-PLATE 30MM STERILE

IMPLANT- PLATES- NON-STERILE

Code	Description
103-B-01001	RIVAL TI T-PLATE SMALL
103-B-02001	RIVAL TI T-PLATE LARGE
103-C-01001	RIVAL TI Y-PLATE SMALL
103-C-02001	RIVAL TI Y-PLATE LARGE
103-D-01001	RIVAL TI STRAIGHT PLATE 3 HOLE
103-D-02001	RIVAL TI STRAIGHT PLATE 4 HOLE
103-D-03001	RIVAL TI STRAIGHT PLATE 6 HOLE
103-E-00001L	RIVAL TI L-PLATE LEFT
103-E-00001R	RIVAL TI L-PLATE RIGHT
103-F-18001	RIVAL TI BOX PLATE 18MM
103-F-22001	RIVAL TI BOX PLATE 22MM
103-F-30001	RIVAL TI BOX PLATE 30MM
103-H-12001	RIVAL TI H-PLATE 12MM
103-H-15001	RIVAL TI H-PLATE 15MM
103-H-20001	RIVAL TI H-PLATE 20MM
103-H-25001	RIVAL TI H-PLATE 25MM
103-H-30001	RIVAL TI H-PLATE 30MM

Sterile Instruments

Code	Description
002-A-2P005	OLIVE WIRES (KIT OF 2)
002-A-18009	RIVAL DRILL BIT D1.8MM WITH DEPTH MARK QUICK CONNECT
002-A-20009	RIVAL DRILL BIT D2.0MM WITH DEPTH MARK QUICK CONNECT
002-A-23009	RIVAL DRILL BIT D2.3MM WITH DEPTH MARK QUICK CONNECT

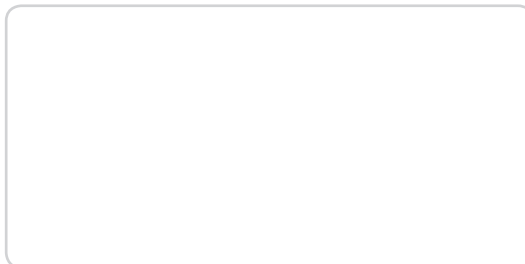
Electronic Instructions for use available at the website
<http://ifu.orthofix.it>

Electronic Instructions for use - Minimum requirements for consultation:

- Internet connection (56 Kbit/s)
- Device capable to visualize PDF (ISO/IEC 32000-1) files
- Disk space: 50 MBytes

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furnished as an informative guideline. Each surgeon must evaluate the appropriateness of a technique
based on his or her personal medical credentials and experience. Please refer to the "Instructions
for Use" supplied with the product for specific information on indications for use, contraindications,
warnings, precautions, adverse reactions and sterilization.

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