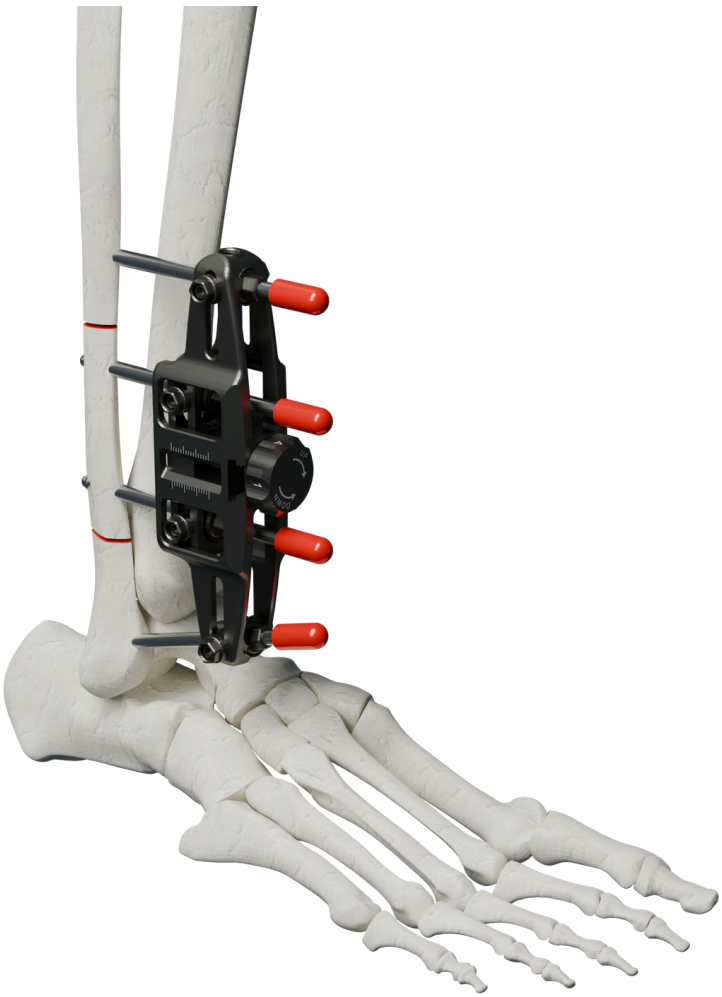
MicroLift® – F

Translation Fixator — Smart Fixator® System

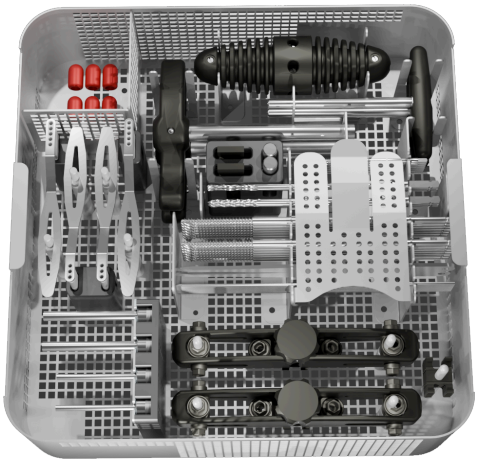
Surgical Technique & Ordering Information



RESPONSE ORTH

Response Ortho is a global orthopaedic trauma solutions manufacturer offering premium products created under its founding principles of innovation, excellence by design and functional superiority

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Introduction

The MicroLift® Translation Fixator is a component of the Response Ortho Smart Fixator® – Hexapod System. MicroLift® provides controlled, single-axis transverse translation of a bone segment. It can be applied to a cortical bone flap of the tibia or to a segment of the fibula, and is used within the indications for use of the Smart Fixator® – Hexapod System.

This guide describes MicroLift® F in the Transverse Fibula Transport (TFT) application: a fibular segment is cut and gradually translated transversely, then returned to its original position to keep bone contact and heal in place. The tibial application is described in the MicroLift® T guide.

Indications for Use

MicroLift® F is a component of the Smart Fixator® Circular and Hexapod Fixator System. It is suitable for hybrid use, combined with a circular or hexapod frame, and for individual use.

MicroLift® F is used within the indications for use of the Smart Fixator® – Hexapod System (FDA 510(k) K263083).

Within these indications, MicroLift® F is designed for fibular osteotomies and transverse fibular transport.

For the complete indications for use and the surgical technique of the frame, refer to the Smart Fixator® – Hexapod System surgical technique.

Prescription use only.

Contraindications

- Inability or unwillingness to follow postoperative instructions
- Active, uncontrolled systemic infection
- Severe proximal arterial inflow insufficiency
- Poor patient compliance
- Osteoporosis severe enough to compromise fixation stability

MicroLift® in the Smart Fixator® System

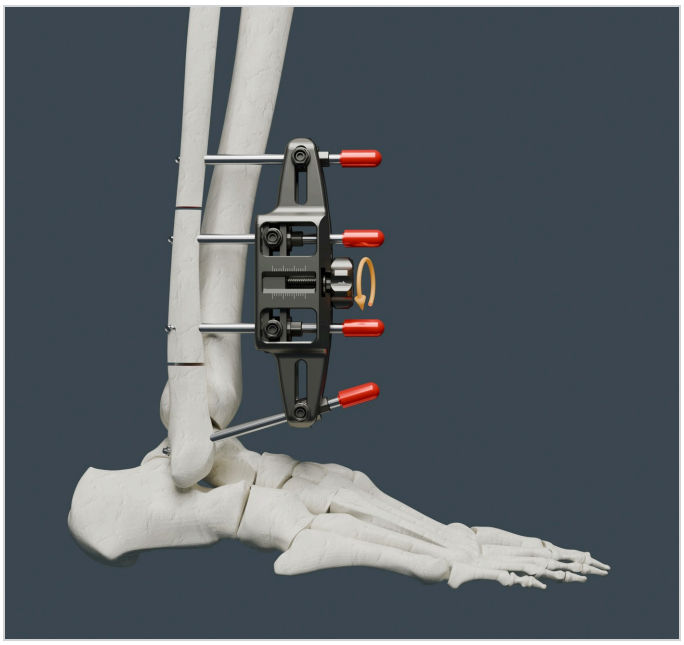
MicroLift® provides controlled, single-axis transverse translation of a bone segment. It can be applied to a cortical bone flap of the tibia or to a segment of the fibula, and is used within the indications for use of the Smart Fixator® – Hexapod System (page 4).

On Its Own

In TFT, MicroLift F is fixed to the fibula with its own pins: the transport segment and the device body are each fixed with 5 mm shank half pins, inserted bicortically.

With Smart Fixator Components

MicroLift is mounted together with Smart Fixator rings and struts when the treatment also needs a circular or hexapod frame, within the system's indications for use (page 4).



MicroLift F applied to the fibula on its own pins.

System Overview

The MicroLift body is a closed transport housing that minimizes mechanical play along a predefined linear distraction axis, with a 15 mm maximum transport capacity. A ratchet mechanism advances the transport segment 0.25 mm per click and locks automatically after each increment; UP/DOWN markings and a numbered indicator (1–4) let the patient track daily progress under the treating physician's prescribed rate.

Fixation (TFT)

- All pins: 5 mm shank half pins with 3, 4 or 5 mm thread diameter, selected according to the bone structure of the fibula
- All pins are inserted bicortically
- Pins are blunt-point — pre-drilling is mandatory
- Thread lengths 10–50 mm in 5 mm steps, 150 mm total length (page 17)
- Choose the thread length based on trajectory: about 15 mm for a perpendicular pin (10 mm where available), about 20 mm for an angled pin

Instrumentation

Part No	Description
00-7040-00	5.0 mm Osteotome
00-3201-01	Quick Release Drill Bit, 2.0mm, Short
00-3281-02	2.8mm Drill Bit
00-1902-20	2.0 mm Drill Guide
00-1902-28	2.8mm Drill Guide
00-1043-00	Multiple T-Handle (for 5 mm half pins)
00-1903-00	T-handle for Locking Nuts

2.0 mm drill bit and guide for 3.0 thread pins; 2.8 mm drill bit and guide for 4.0 and 5.0 thread pins.

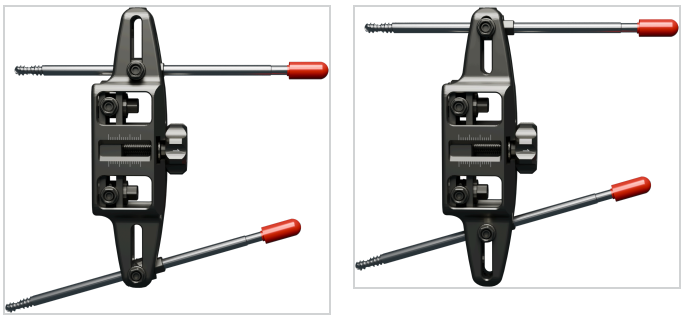
Full ordering information, page 16.

Mechanical Design

Controlled transverse transport depends on accurate single-axis motion, stable fixation of the bone segment, a controlled rhythm, and avoiding rotational displacement, stress concentration or pin pull-out.

MicroLift F's Design in TFT

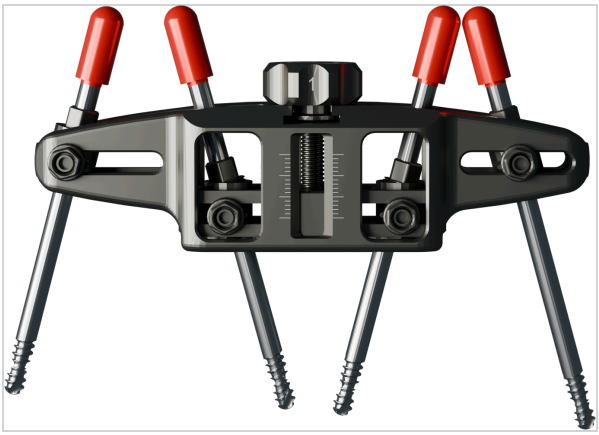
- Closed transport housing, minimizing mechanical play
- Predefined, single-axis distraction path
- **Adjustable after pin insertion:** with a pin in place, the device can still be slid up or down along the pins and then locked
- **Repositioning without new drill holes:** the locks can be released and the body slid along the inserted pins while the pins stay in place
- **Reversible pin orientation:** a pin can be inserted from the opposite side to avoid an adjacent half pin
- **Divergent distal pin:** lets the device sit away from the fibula, clear of the lateral soft tissue



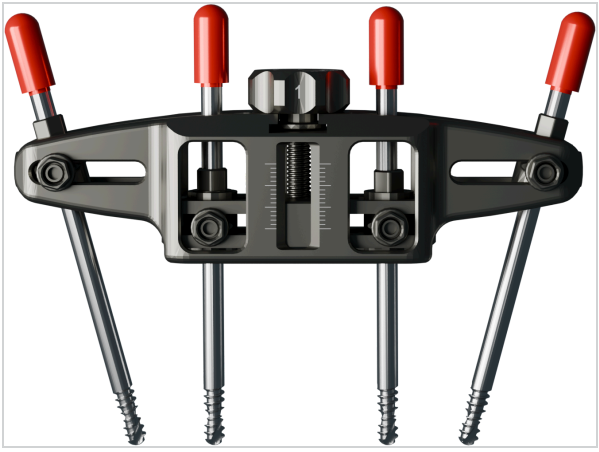
The device body can be slid along the inserted pins and locked: proximal end (left) and distal end (right) of the slide on the same two pins, a travel of 15 mm.

Pin Orientation

Each pin clamp lets its half pin be angled within the plane of the device. The outer pins can also be set anywhere along their slots. Two settings at the ends of this range:



A. Outer pins fully divergent, middle pins fully convergent: each pin 15° from the perpendicular, 30° between the two outer pins and 30° between the two middle pins. Proximal pin at the end of its slot, distal pin mid-slot.



B. Outer pins fully convergent at the outer ends of their slots, 30° between them; middle pins perpendicular. Slot travel of each outer pin: 15 mm.

Preoperative Planning

Patient Selection and Assessment

- Confirm the indication and that none of the contraindications on page 4 applies
- Vascular assessment
- Infection control
- Confirm that the patient can follow the postoperative instructions, including the daily adjustments
- Assess fibular bone quality to select the thread diameter (3, 4 or 5 mm)

Planning the Osteotomy Level

Identify the level of device placement and of the fibular osteotomy on fluoroscopy. The bottom of the device should be 20 mm away from the skin. The device offers a maximum transport of 15 mm.

Equipment Required

Provided by the surgical center:

- C-arm fluoroscope — position, bicortical pin purchase and alignment are confirmed under fluoroscopy
- Power drill for the 2.0 mm and 2.8 mm drill bits
- Mallet for the osteotome
- Pin cutter

The MicroLift F instruments and implants are listed in the step-by-step instructions.

Operative Technique

1. Device Positioning

Identify the correct position of the device under fluoroscopy. The bottom of the device should be 20 mm away from the skin (Figure 1).

**Technical Tip:* Dorsiflex the ankle before setting the most inferior position of the device (page 11).

2. First Pin

The first pin should be the most distal pin. Pre-drill, then insert the first 5 mm shank half pin bicortically: this is the first point of fixation. With one pin in place the device can still be moved up or down (Figure 2).

**Important Note:* The pins are blunt. Pre-drilling is mandatory for every pin.



INSTRUMENTS USED

00-3201-01	Quick Release Drill Bit, 2.0mm, Short
00-1902-20	2.0 mm Drill Guide
00-3281-02	2.8mm Drill Bit
00-1902-28	2.8mm Drill Guide
50-1083-1515B	Half Pin, 3.0/150/15mm, Blunt, SS
50-1084-1515B	Half Pin, 4.0/150/15mm, Blunt, SS
50-1085-1515B	Half Pin, 5.0/150/15mm, Blunt, SS
00-1043-00	Multiple T-Handle (for 5 mm half pins)

3. Most Proximal Pin & Device Adjustment

Insert the most proximal pin in the same way, straight or angled as needed, keeping enough room for each pin to be bicortical. Slide the device to its final position, lock it and check for construct stability (Figure 3).

4. Level Adjustment

If a pin is angled too much or would meet an adjacent half pin, release the lock and slide the device along the pins to a new position. The inserted pins stay in place, and no new holes are drilled (Figure 4). Until final locking the construct can be left slightly free perpendicular to the transport axis.



Figure 1. Planned level and pin sites marked on the skin



Figure 2. First pin: most distal, bicortical



Figure 3. Most proximal pin in; device locked



Figure 4. Level adjustment: the device slides along the outer pins

5. Transport Segment Pins

Insert the remaining pins through the sleeve and confirm bicortical purchase on fluoroscopy (Figure 5). Choose the thread length based on trajectory: about 15 mm for a perpendicular pin (10 mm where available), about 20 mm for an angled pin.

6. Osteotomy

Before the osteotomy, tighten all pin clamps and the outer locking nuts with the wrench.

With all pins in place, perform the fibular osteotomy. The transport segment then travels transversely along the device axis (Figure 6).



INSTRUMENTS USED

00-1903-00	T-handle for Locking Nuts
00-7040-00	5.0 mm Osteotome

7. Final Locking & Function Check

Lock all fixation bolts. Turn the knob UP for an acute distraction of 1–2 mm to confirm a complete osteotomy, then return the segment to its original position (Figure 7). Trim excess pin length and cap the pins with pin covers to prevent soft-tissue irritation (Figure 8).



INSTRUMENTS USED

00-1903-00	T-handle for Locking Nuts
55-1070-06	Pin Covers, 5mm

Technical Tip: Dorsiflex the Ankle (Step 1)

On the table the foot rests in plantar flexion, so the space below the device looks larger than it is when the patient stands. Before setting the most inferior position of the device, dorsiflex the ankle and check the soft-tissue clearance between the device and the ankle. This keeps the device from abutting the ankle during weight bearing.



Figure 5. All half pins inserted



Figure 6. Osteotomy: free segment on its pins



Figure 7. Acute 1–2 mm distraction confirms the osteotomy

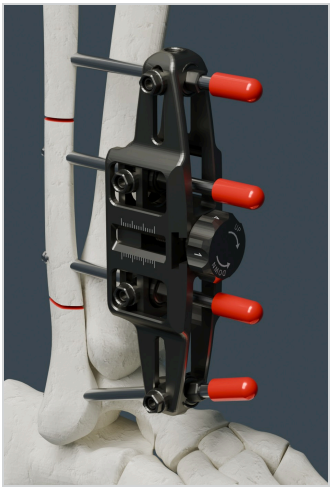


Figure 8. Final construct: locked, pins trimmed and capped

Postoperative Protocol

Phase	Schedule
Intraoperative	1–2 mm acute distraction to confirm the osteotomy, then return to the original position
Latency	7 days
Distraction	0.5 mm/day for 10–14 days, or until the device is under tension (likely from the syndesmosis)
Rest	3 days
Return to neutral	1 mm/day
Total treatment	4–6 weeks
Removal	In the office or in the OR. In the OR the fibula can be fixed with a percutaneous pin or screw if needed, or left in place until it has healed.

During reverse transport the segment slides back to its original position and keeps bone contact; it is left in place to heal.

The 7-day latency and 0.5 mm/day distraction follow the schedule of an experimental study of distraction osteogenesis (rat tibial lengthening; not clinical data of this device)[1].

Monitoring

- Skin evaluation
- Pin-site care
- Regular clinical and radiographic follow-up



Figure 9. End of distraction (0.5 mm/day × 14 days ≈ 7 mm), before the 1 mm/day return

1. Choi IH, Ahn JH, Chung CY, Cho TJ. Vascular proliferation and blood supply during distraction osteogenesis: a scanning electron microscopic observation. *J Orthop Res.* 2000;18(5):698–705. doi:10.1002/jor.1100180504

Complications & Risk Management

Potential complications include pin-site infection, segment instability, premature consolidation, incomplete transport and fracture (rare).

Risk Mitigation

- **Preoperative:** vascular assessment, infection control, patient selection
- **Intraoperative:** correct osteotomy level, pre-drilling of all pins, bicortical and stable fixation
- **Postoperative:** protocolized distraction, routine follow-up, multidisciplinary care

Removal

1. Loosen the fixation bolts and locking nuts
2. Remove the transport segment pins
3. Remove the device body
4. Remove the remaining half pins
5. If there is concern about the syndesmosis, a screw may be placed after device removal
6. Standard pin-site care

Clinical Case 1

Intraoperative views and postoperative fluoroscopy of a MicroLift F application to the fibula.

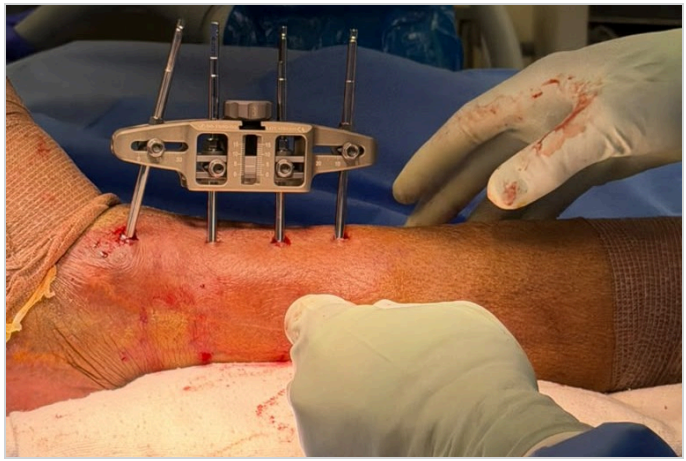
Case courtesy of Dr. Noman Siddiqui, Sinai Hospital, Baltimore.



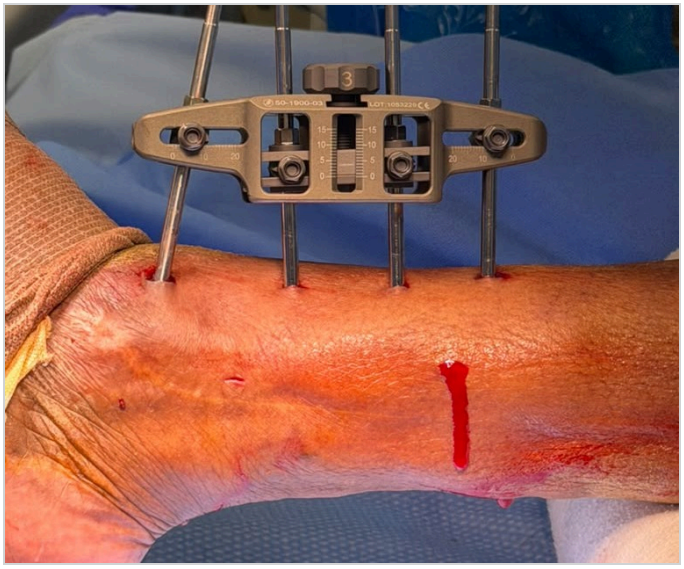
Power instrument in use with the device in place.



Most distal and most proximal pins in place.



All half pins inserted.



Device with four half pins.



Postoperative fluoroscopy: view through the device.



Postoperative fluoroscopy: the four half pins.

Clinical Case 2

Intraoperative views and postoperative fluoroscopy of a MicroLift F application to the fibula.

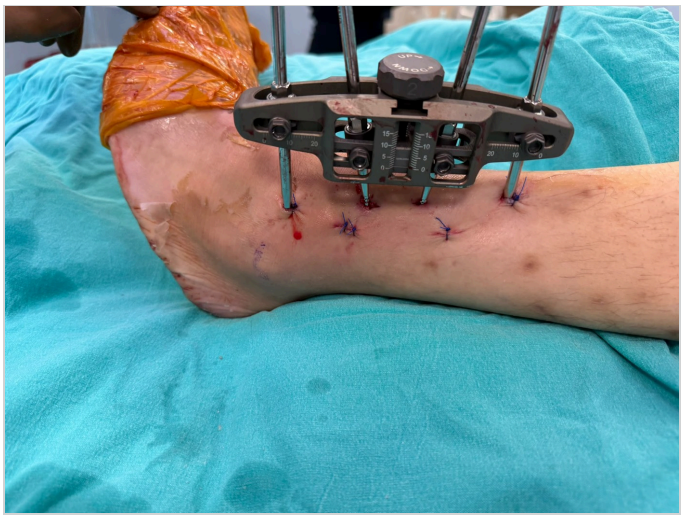
Case courtesy of Prof. Mehmet Ali Talmaç and Dr. Mete Özer, Başakşehir Çam and Sakura City Hospital, Istanbul.



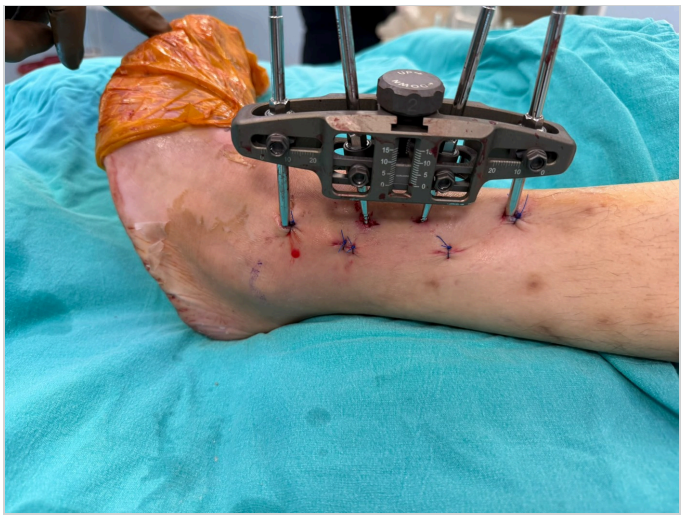
Device on the first pins.



Pin insertion with the device in place.



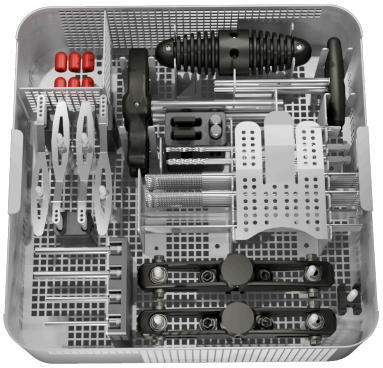
All half pins inserted.



Final construct.



Postoperative fluoroscopy.



	Device	
50-1900-03	MicroLift F Translation Fixator	
	Instrumentation	
00-7040-00	5.0 mm Osteotome	
	Drill Bits	
00-3201-01	Quick Release Drill Bit, 2.0mm, Short	
00-3281-02	2.8mm Drill Bit	
	Drill Guides	
00-1902-20	2.0 mm Drill Guide	
00-1902-28	2.8mm Drill Guide	
	Handles	
00-1043-00	Multiple T-Handle (for 5 mm half pins)	
00-1903-00	T-handle for Locking Nuts	
	Pin Covers	
55-1070-06	Pin Covers, 5mm	

	Half Pins	
50-1083-1510B	Half Pin, 3.0/150/10mm, Blunt, SS	
50-1083-1515B	Half Pin, 3.0/150/15mm, Blunt, SS	
50-1083-1520B	Half Pin, 3.0/150/20mm, Blunt, SS	
50-1083-1525B	Half Pin, 3.0/150/25mm, Blunt, SS	
50-1083-1530B	Half Pin, 3.0/150/30mm, Blunt, SS	
50-1083-1535B	Half Pin, 3.0/150/35mm, Blunt, SS	
50-1083-1540B	Half Pin, 3.0/150/40mm, Blunt, SS	
50-1083-1545B	Half Pin, 3.0/150/45mm, Blunt, SS	
50-1083-1550B	Half Pin, 3.0/150/50mm, Blunt, SS	

	Half Pins	
50-1084-1510B	Half Pin, 4.0/150/10mm, Blunt, SS	
50-1084-1515B	Half Pin, 4.0/150/15mm, Blunt, SS	
50-1084-1520B	Half Pin, 4.0/150/20mm, Blunt, SS	
50-1084-1525B	Half Pin, 4.0/150/25mm, Blunt, SS	
50-1084-1530B	Half Pin, 4.0/150/30mm, Blunt, SS	
50-1084-1535B	Half Pin, 4.0/150/35mm, Blunt, SS	
50-1084-1540B	Half Pin, 4.0/150/40mm, Blunt, SS	
50-1084-1545B	Half Pin, 4.0/150/45mm, Blunt, SS	
50-1084-1550B	Half Pin, 4.0/150/50mm, Blunt, SS	

	Half Pins	
50-1085-1510B	Half Pin, 5.0/150/10mm, Blunt, SS	
50-1085-1515B	Half Pin, 5.0/150/15mm, Blunt, SS	
50-1085-1520B	Half Pin, 5.0/150/20mm, Blunt, SS	
50-1085-1525B	Half Pin, 5.0/150/25mm, Blunt, SS	
50-1085-1530B	Half Pin, 5.0/150/30mm, Blunt, SS	
50-1085-1535B	Half Pin, 5.0/150/35mm, Blunt, SS	
50-1085-1540B	Half Pin, 5.0/150/40mm, Blunt, SS	
50-1085-1545B	Half Pin, 5.0/150/45mm, Blunt, SS	
50-1085-1550B	Half Pin, 5.0/150/50mm, Blunt, SS	

MicroLift® F

Surgical Technique & Ordering Information

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