

# DARCO<sup>®</sup>

## 7.0mm Headless Compression Screw

### SURGICAL TECHNIQUE





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Proper surgical procedures and techniques are the responsibility of the medical professional. The following guidelines are furnished for information purposes only. Each surgeon must evaluate the appropriateness of the procedures based on his or her personal medical training and experience. Prior to use of the system, the surgeon should refer to the product package insert for complete warnings, precautions, indications, contraindications and adverse effects. Package inserts are also available by contacting Wright Medical.

# Design Rationale



Designed in conjunction with:

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## Introduction

Large, headed screws have presented a challenge to the Foot and Ankle Specialist when performing hindfoot and ankle fusion procedures. Screw head prominence creates discomfort for the patient and often results in hardware removal.<sup>1</sup> Designed in conjunction with leading foot and ankle specialists, the DARCO® 7.0mm Headless Compression Screw offers a headless screw with excellent compression characteristics for use in hindfoot and ankle fusion procedures.

## Surgical Goals

- » To minimize screw prominence issues with a headless design.
- » To obtain stable fixation using a screw design with excellent strength and compression characteristics.
- » To streamline surgical technique with few steps and a power screw driver option

## System Basics

- » 7.0mm distal thread diameter, cannulated, titanium headless screws ranging in lengths from 40-110mm with short (16mm) and long (32mm) distal thread length options.
- » 2.5 x 230mm K-wire

### The instrument set includes:

- » 5.0mm Cannulated Drill and Countersink
- » K-wire Tissue Protector and Drill Tissue Protector to be used with Tissue Protector Handle
- » Depth Gauge
- » Hex Driver that may be used with power and Quick Connect and a standard Jacobs chuck if a Hudson-style adaptor is not available.
- » Parallel Drill Guide
- » 2.5mm Distractor maximum distraction of 12mm

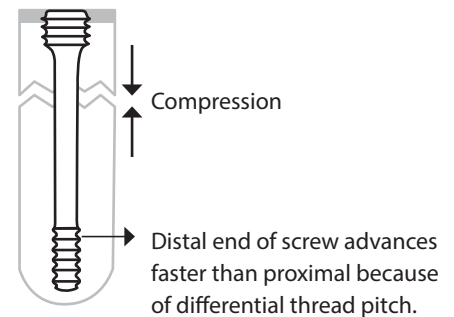
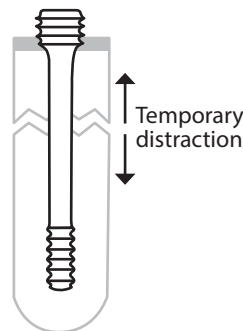
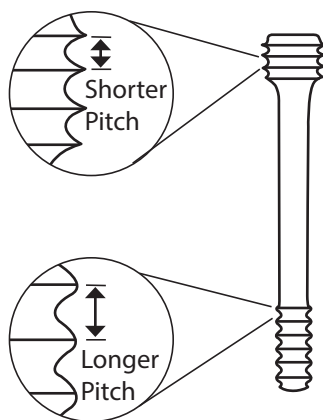
1. Easley, ME, Trnka, HJ, Schon LC, Myerson, MS. Isolated subtalar arthrodesis. *J Bone Joint Surg Am.* 2000 May;82(5):613-24.

# Screw Characteristics

Headless screws generate compression as a result of different thread pitch in the distal and proximal portion of the screw.

## Installation

Distraction is common when proximal threads begin to engage. This is not a problem as the fusion site will compress once head is completely installed. If preferred, use a clamp to hold fusion site together to prevent distraction.



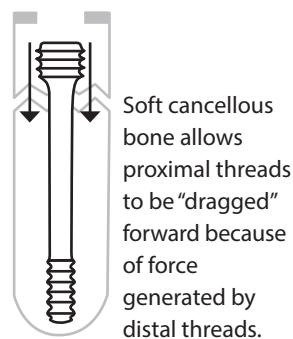
Pitch is the distance from the peak of one thread to the peak of the next thread, or the distance the screw travels in one full revolution.

*Shorter pitch = less distance traveled*  
*Longer pitch = more distance traveled*

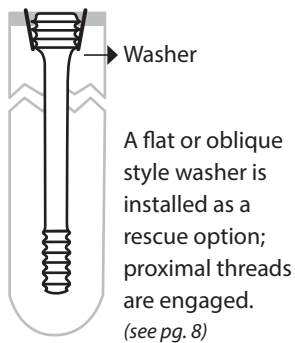
## Troubleshooting

Lack of compression results when screw is not well-engaged in bone either distally or proximally.

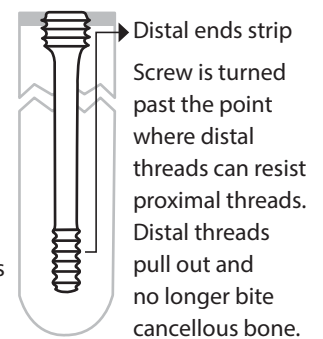
### Symptom



### Solution



### Symptom



### Solution

Use a longer screw or redirect screw so distal threads engage.

The CHARLOTTE™ Distractor is available in the DARCO® 7.0mm Headless Compression Screw System to aid in joint preparation. **Figures 1-4**



**Figure 1**



**Figure 2**



**Figure 3**



**Figure 4**

The joint to be fused is sharply debrided down to bleeding subchondral bone in the normal fashion. If necessary, the bone should be perforated with a K-wire to create bleeding surfaces prior to hardware fixation.

Using a powered drill, K-wire tissue protector with handle and small Jacobs chuck, drive the 2.5mm x 230mm K-wire into the bone across the fusion or osteotomy site. **Figures 5-6**



Figure 5



Figure 6

Create a 1-2cm incision around the K-wire. Measure screw length using the depth gauge and drill tissue protector with handle. **Figure 7**



**Figure 7**

If necessary, drill with power using the drill tissue protector, handle and 5mm cannulated drill. **Figure 8** (see *Procedure-Specific Recommendations*)



**Figure 8**



If necessary, break the proximal cortex using the cannulated countersink and quick connect handle. **This should be done by hand** requiring only a couple turns of the countersink. *Figures 9-10 (see Procedure-Specific Recommendations)*



Figure 9



Figure 10

Install the appropriate screw under power using the hex driver **Figures 11-12** until the head comes in contact with the cortex. Final tightening should be done manually using the hex driver and the ratcheting handle.

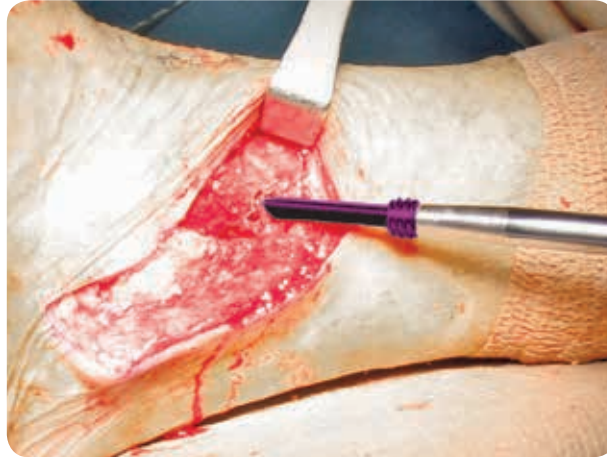
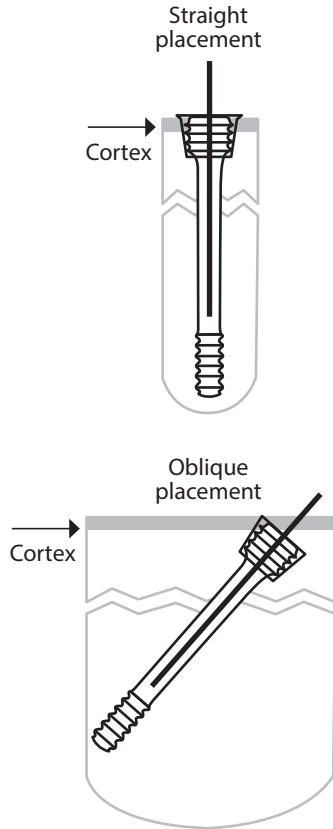


Figure 11

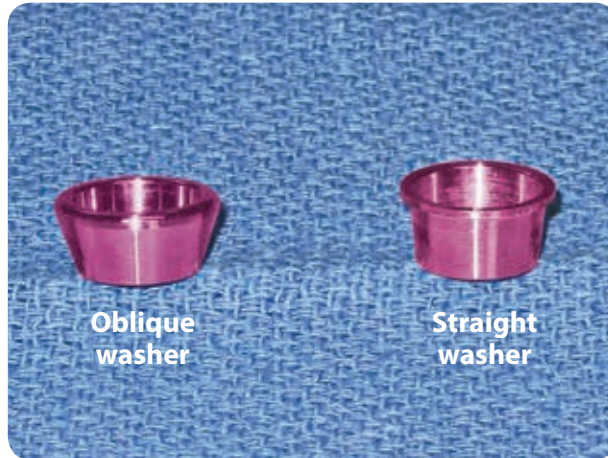


Figure 12

“Head Plunge” can usually be attributed to improper drilling or countersinking technique; see Procedure-Specific Recommendations for further info. In the event of a “Head Plunge”, the washers can be used to salvage screw fixation. Choose the perpendicular or oblique washer based on screw position relative to cortical bone. **Figure 13** Remove the screw, leaving the K-wire in place. Slide the washer over the screw, and re-install. **Figures 14-16**



**Figure 13**



**Figure 14**



**Figure 15**



**Figure 16**

The parallel wire guide is available if two screws will be used. Set the width of the guide no less than indicated by the line on the side of the guide handle. This will allow the use of a washer if necessary.

**Figures 17-18**



**Figure 17**



**Figure 18**

## Medial Displacement Calcaneal Osteotomy

as presented by Robert Anderson, MD

Create the osteotomy in the usual fashion and displace as required. Place the guide wire percutaneously, perpendicular to the osteotomy and in the mid-portion of the calcaneus. The guide wire should enter the posterior plantar aspect of the heel, and should extend to just short of the subchondral region of the subtalar joint. Confirm placement with lateral and axial fluoroscopic views. Use the depth gauge to measure appropriate screw length. The calcaneal bone is typically soft and no drilling is necessary. However, use the end mill by hand to open the initial cortical bone surface. Avoid plunging into the cancellous bone with the end mill. Select a short-threaded screw so that the threads just cross the osteotomy site. The tip of the screw should be well short of the subtalar joint subchondral region. Typical screw length for this indication is 45-50mm. Insert the screw until the head is flush with the cortical surface of the plantar heel.

Figure 19

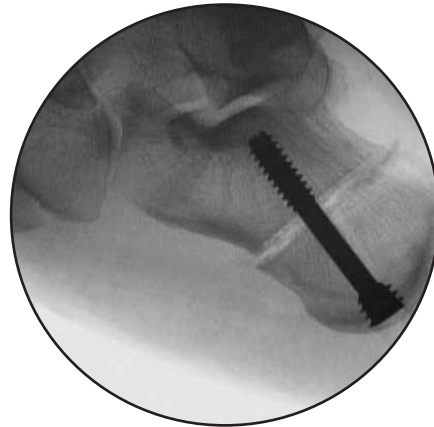


Figure 19

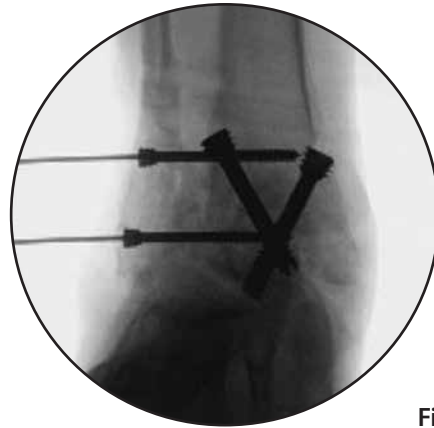
## Ankle Fusion

as presented by Hodges Davis, MD

When performing an ankle fusion I find it most successful to drill under power across the joint to approximately 5mm before the end of the guide wire. I then countersink by hand using just one or two turns of the handle. Finally, I place the screw using the power driver until all the threads are across the joint, and finish by hand.

The 4.3mm DARCO® Headless Screws work great for reattaching the fibula and the distal tibia-fibula fusion, which is often done in association with an ankle fusion. The 4.3 DARCO® Headless Screw is ideal for this application because of the great compression. The headless design is beneficial for use in this area because of the minimal subcutaneous tissue.

**Figures 20-21**



**Figure 20**



**Figure 21**

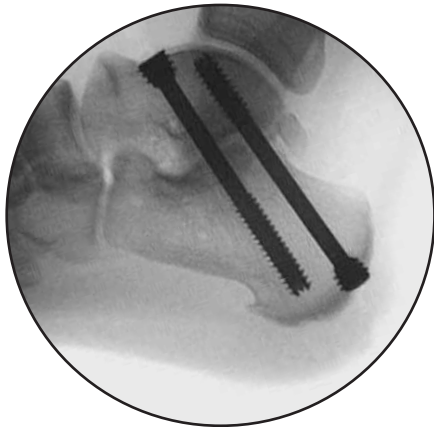
## Common Fusion Methods

## Subtalar Fusion

as presented by Bruce Cohen, MD



**Figure 22** Two DARCO® 7.0mm Headless Compression Screw, calcaneus to talus



**Figure 23** One DARCO® 7.0mm Headless Compression Screw, talus to calcaneus; one DARCO® 7.0mm Headless Compression Screw, calcaneus to talus

Fixation of a subtalar arthrodesis can be obtained through compression screw fixation from the calcaneal tuberosity up into the talar body, from the talar neck down into the calcaneus or a combination of both.

The most common approach is fixation from the calcaneal tuberosity up to the talar body. Direct the K-wire medially, into the talar neck; this will provide better screw purchase and ensure that all distal screw threads will cross the joint. An axial (oblique) view is helpful to assess guide wire placement. In hard bone, drill across the joint to penetrate the subchondral bone of the talus. Use the end-mill device to prepare the calcaneus, but avoid plunging. A few turns by hand is all that is required. A short-threaded screw is typically used with this approach. **Figure 22**

My preferred approach is to place a 7.0mm screw initially from the talar neck down into the calcaneus. In hard bone, drill across the joint to penetrate the subchondral bone. Use the end-mill device to prepare the talar neck. Check under fluoroscopy to ensure adequate depth of preparation, and do not plunge the end mill device. A long-threaded screw is typically used in this application. After the first screw is installed, drive the guide pin out the heel and use the parallel drill guide to place a second guide pin into the talar body. Once again I recommend drilling across the joint in hard bone. Use the end-mill to penetrate the outer cortex; it does not have to be fully seated. Typically a short-threaded screw is used in this application. **Figure 23**

I recommend inserting the screws with the screw driver handle in the ratcheting position until the head engages. Then switch the driver handle to the static mode for the full insertion of the screw. This provides better tactile compression feedback and helps avoid overpenetration of the screw.



## Ordering Information

*Sterile part numbers are available upon request for specific markets.*

### DARCO® 7.0mm Headless Compression Screws

NON-STERILE #	STERILE #	DESCRIPTION
DC001640	DCS01640	40MM X 16MM
DC001645	DCS01645	45MM X 16MM
DC001650	DCS01650	50MM X 16MM
DC001655	DCS01655	55MM X 16MM
DC001660	DCS01660	60MM X 16MM
DC001665	DCS01665	65MM X 16MM
DC001670	DCS01670	70MM X 16MM
DC001675	DCS01675	75MM X 16MM
DC001680	DCS01680	80MM X 16MM
DC001685	DCS01685	85MM X 16MM
DC001690	DCS01690	90MM X 16MM
DC001695	DCS01695	95MM X 16MM
DC016100	DCS16100	100MM X 16MM
DC016105	DCS16105	105MM X 16MM
DC016110	DCS16110	110MM X 16MM
DC003275	DCS03275	75MM X 32MM
DC003280	DCS03280	80MM X 32MM
DC003285	DCS03285	85MM X 32MM
DC003290	DCS03290	90MM X 32MM
DC003295	DCS03295	95MM X 32MM
DC032100	DCS32100	100MM X 32MM
DC032105	DCS32105	105MM X 32MM
DC032110	DCS32110	110MM X 32MM
DC007011	DCS07011	STRAIGHT WASHER
DC007012	DCS07012	OBLIQUE WASHER
DC007000	N/A	CANNULATED TAP 7.0

#### INSTRUMENTS

PRODUCT #	DESCRIPTION
44182523	K-WIRE 2.5MM X 230MM
44180010	5MM CANNULATED DRILL
44180015	CANNULATED COUNTERSINK
44180025	RATCHETING HANDLE
44180030	PARALLEL WIRE GUIDE
44180035	HEX DRIVER
44180040	2.5MM DISTRATOR
44180045	QUICK CONNECT
44180050	DEPTH GAUGE
44180055	HANDLE FOR TISSUE PROTECTOR
44180060	TISSUE PROTECTOR FOR K-WIRE
44180065	TISSUE PROTECTOR FOR DRILL











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