

4.5MM LCP® T-PLATE

For the treatment of physal fractures
of the proximal tibia in foals.



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INTRODUCTION

4.5MM LCP[®] T-PLATE

For the treatment of proximal tibia fractures in foals.

The DePuy Synthes Vet 4.5mm LCP[®] T-Plate is part of a stainless steel plate and screw system that merges locking screw technology with conventional plating techniques. The technical innovation of locking screws provides the ability to create a fixed-angle construct while following standard AO plating principles.

Features:

- Proximal screws converge to maximize screw purchase in bone.
- Uses locking or cortex screws
- Compatible with Large Fragment System

PLATE DESIGN

Screw Holes

All holes accept 4.0mm locking screws, 5.0mm locking screws, 4.5mm cortex screws or 5.5mm cortex screws.

Fixed angle stability

The threads on the head of the locking screws lock into the threaded plate holes to form a fixed-angle construct that will increase load transfer between the plate and bone. When compared to conventional plate-and-screw constructs, the angular and axial stability of locking screws increases the strength of the construct under load without requiring precise anatomical contouring.



LOCKING SCREWS

Screwhead

The tapered, double-lead machine thread on the head of the locking screw engages the threads of the locking plate holes. The resulting fixed-angle construct provides stable fixation of the bone fragments without having to compress the plate to the bone. A perfectly contoured plate is therefore not required to achieve fixation and maintain proper alignment.

Thread profile

Because locking screws do not compress the plate to the bone, the “pull-out” mode of failure is not applicable to locking screws. For this reason, locking screws are made with a smaller thread profile and a larger core diameter. This results in increased mechanical strength over comparably sized cortex screws.*

Drive mechanism

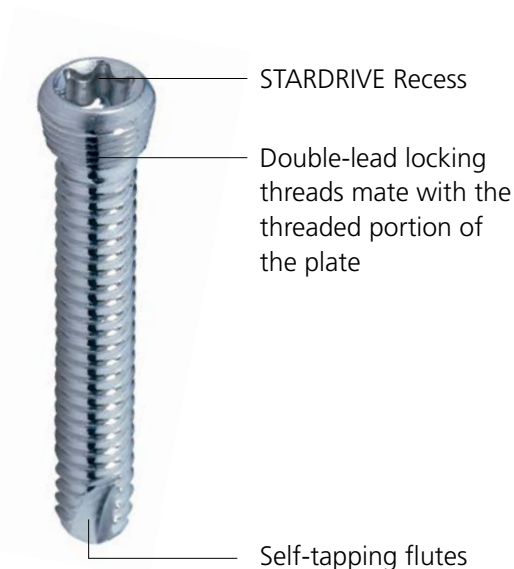
The STARDRIVE™ Recess of a locking screw provides three significant improvements over an internal hex drive:

- “Stripping” of the screw head is minimized as a failure mode, which results in a much higher tolerance to wear for the screwdriver.*
- The tapered STARDRIVE Recess provides automatic screw retention without the need for an additional screw holding mechanism.
- The more efficient STARDRIVE Recess allows a smaller screw head and allows the screw head to sit flush with the plate.

Caution:

DePuy Synthes Companies of Johnson & Johnson implants and instruments are manufactured with proprietary processes that produce superior products to those created by conventional manufacturing processes. Though other companies may be able to estimate the DePuy Synthes Companies general product design, DePuy Synthes Companies product dimensions are proprietary. The precision design of DePuy Synthes Companies products is very important for long-term product function and optimal fit between implants.

Only the finest quality materials are used to manufacture DePuy Synthes Companies implants. The metals DePuy Synthes Companies uses have been scientifically proven to be of the best biocompatibility and quality available today.



With these features and qualities, the mixing of DePuy Synthes Companies implants with the implants from other companies is not recommended. The overall performance may be compromised due to differences in design, chemical composition, mechanical properties, and quality.

Given these qualities are trade-secret, no competitor of DePuy Synthes Companies can make a genuine claim “the same as DePuy Synthes Companies.” Combining implants from other companies with DePuy Synthes Companies implants could reduce product performance. Consequently, it is strongly recommended to not mix parts from different manufacturers.

*Test data on file at DePuy Synthes Vet (Ref. Reports #SETSET_20110610, MT01-258)

AO PRINCIPLES

In 1958, the AO formulated four basic principles, which have become the guidelines for internal fixation.^{1,2} They are:

Anatomic Reduction

Fracture reduction and fixation to restore anatomical relationships.

Stable Fixation

Stability by fixation or splintage, as the personality of the fracture and the injury requires.

Preservation of Blood Supply

Preservation of the blood supply to soft tissue and bone by careful handling.

Early, Safe Mobilization

Early, safe mobilization of the part and patient

1. Müller ME, Allgöwer M, Schneider R, Willenegger H. *Manual of Internal Fixation: Techniques Recommended by the AO-ASIF Group*. 3rd ed. Berlin: Springer-Verlag; 1991.

2. Rüedi TP, Buckley RE, Moran CG (eds). *AO Principles of Fracture Management*. 2nd ed. Stuttgart, New York: Thieme. 2007.

INDICATIONS

The DePuy Synthes Vet 4.5mm LCP T-Plate is intended for treatment of physeal fractures of the proximal tibia in foals.

SURGICAL TECHNIQUE

PLATE CONTOURING AND POSITIONING

1

Position plate

Instruments

329.30	Plate-Bending Press
511.701	Compact Air Drive II
511.791	Quick Coupling for K-Wires
VW2003.15	2.0 mm Kirschner Wire, 150 mm
311.449	Push-Pull Reduction Device, for 4.5mm LCP Plates
03.100.049	Bending Template for 4.5mm and 5.5mm LCP and LC-DCP Plates, 16 Holes



Figure 1

1a.

Reduce the fracture. If a tension band is to be used to assist the reduction, ensure that there is sufficient room to allow placement of the head of the plate on the epiphysis.

1b.

Contour the plate as needed. Screw position in the tibial epiphysis must be considered when contouring of the plate.

Note: Please be aware that contouring the head of the plate changes the locking screw trajectories (maximal screw lengths that can be used without the screws interfering with each other). This may also occur inadvertently when the shaft of the plate is contoured near the head of the plate or if the head of the plate is placed in the bending press. See Figure 1.

In addition, the vertical alignment of the head of the plate must allow for locking screws to be placed in the epiphysis, avoiding the joint and physis. See Figure 2.

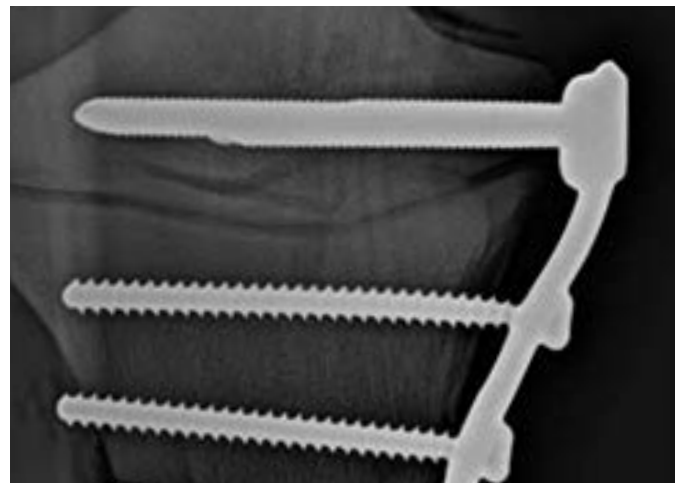


Figure 2

1c.

Place the caudal hole in the head of the plate adjacent to the collateral ligament. If needed, the plate can be clamped into position or temporarily secured using 2.0mm Kirschner wires.

1d.

Insert the Push-Pull Reduction Device into the center proximal hole and secure the plate to the bone. See Figure 3.

Note: A threaded drill guide inserted into one of the proximal holes can be used to hold the plate during placement and clamping.



Figure 3

SCREW INSERTION TECHNIQUE

2

Screw Insertion

Refer to the DePuy Synthes Veterinary Large Fragment Technique Guide J9574A for correct screw insertion techniques.

Note: All screws must be fully tightened for proper function. Avoid over-tightening cortex screws as this may result in stripping the bone. Do not perform final tightening of the screws to the plate under power. It is recommended that final tightening should be performed manually.

For 4.0 and 5.0 mm Locking Screws, 511.771 Torque Limiting Attachment, 4 Nm, can be used. Screws inserted with the Torque Limiting Adapter should be checked by hand to ensure they are fully tightened.

2a

Insert a 5.0mm locking screw into the caudal hole (A) using standard screw insertion technique. If locking fixation is not desired, a 4.5mm or 5.5mm cortex screw should be inserted.

Ensure that the screw engages the epiphysis and does not enter the joint or physis.

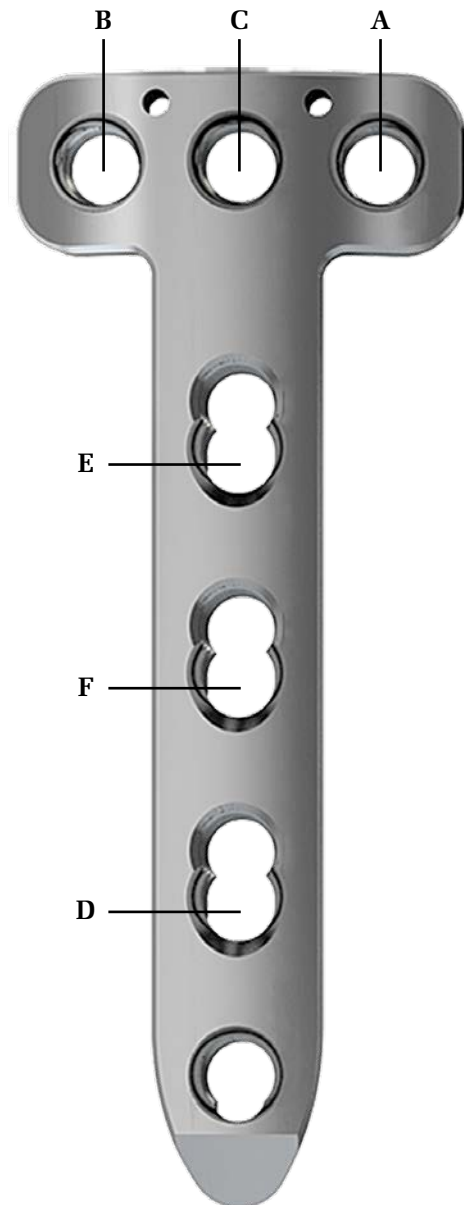
2b

Insert a locking (or cortex) screw into the cranial proximal hole (B) using the standard screw insertion technique.

If Kirschner wires were placed, they can be removed at this time.

2c

Remove the push/pull device from the center proximal hole (C) and replace with a screw.



2d

Place a 5.5 mm cortex screw into the most distal Combi-hole (D) in the load position and tighten fully to compress the fracture.

2e

Place cortex screws into holes E and F.

The screws should be parallel to the locking screw in hole A to avoid entering the physis. The screws in holes E and/or F may be used in a lag fashion to secure the lateral metaphyseal fragment.

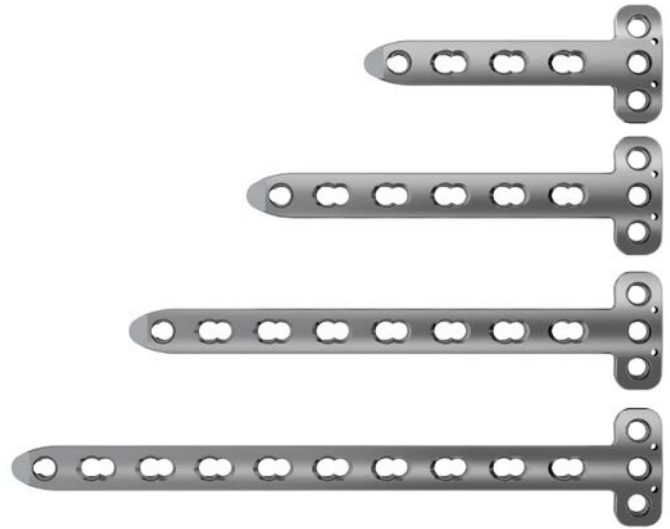
2f

Insert a 5.0mm locking screw into the remaining hole. For longer plates, insert 5.0mm locking screws into all remaining holes.



IMPLANTS

4.5mm LCP T-plate	Shaft Holes	Length (mm)
VP4353.04	4	91
VP4353.06	6	127
VP4353.08	8	163
VP4353.10	10	199



5.5 mm Cortex Screws, non self-tapping, with Hexagonal recess

VS501.024- VS501.060	24 mm – 60 mm (in 2 mm increments)
VS501.064	64 mm
VS501.070- VS501.100	70 mm – 100 mm (in 10 mm increments)



4.5 mm Cortex Screws, self-tapping, with Hexagonal recess

VS402.014- VS402.072	14 mm – 72 mm (in 2 mm increments)
VS402.076	76 mm
VS402.080- VS402.100	80 mm – 100 mm (in 5 mm increments)



5.0 mm Locking Screws, self-tapping, with Stardrive recess

VS502.014- VS502.050	14 mm – 50 mm (in 2 mm increments)
VS502.055- VS501.090	55 mm – 90 mm (in 5 mm increments)



4.0 mm Locking Screws, self-tapping, with Stardrive recess

VS406.014- VS406.062	14 mm – 62 mm (in 2 mm increments)
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Implants

Also Available

4.5mm Cortex Screws, non self-tapping, with Hexagonal recess

VS401.014- 14 mm – 72 mm (in 2 mm increments)
VS401.072

VS401.076 76 mm

VS401.080- 80 mm – 100 mm (in 5 mm increments)
VS401.100

Thread Diameter	5.5mm	4.5mm	5.0mm	4.0mm
Screw Type	Cortex	Cortex	Locking	Locking
Drill Bit for Threaded Hole	4.0mm	3.2mm	4.3mm	3.2mm
Tap	5.5mm	4.5mm	Self-Tapping	Self-Tapping
Drive Type	3.5mm Hexagonal	3.5mm Hexagonal	T25 Stardrive	T25 Stardrive

INSTRUMENTS

LARGE FRAGMENT STANDARD INSTRUMENT SET (103.531)

Graphic Case

690.542 Large Fragment Instrument Set
Graphic Case

Instruments

310.29 3.2 mm Drill Bit, quick coupling, 195 mm
310.40 4.0 mm Drill Bit, quick coupling, 197 mm
310.48 4.5 mm Drill Bit, quick coupling, 145 mm
310.55 5.5 mm Drill Bit, quick coupling, 197 mm
310.99 Countersink, for 4.5 mm Cortex Screws
311.44 T-Handle with quick coupling
311.48 Tap for 4.5 mm Cortex and 4.5 mm
Shaft Screws, 180 mm/110 mm tap depth
311.55 Tap for 5.5 mm Cortex Screws, 197 mm/
100 mm tap depth
311.66 Tap for 6.5 mm Cancellous Screws,
197 mm/150 mm calibration
312.46 4.5 mm/3.2 mm Double Drill Sleeve
312.560 5.5 mm/4.0 mm Double Drill Sleeve
314.11 Holding Sleeve
314.15 Large Hexagonal Screwdriver Shaft
314.27 Large Hexagonal Screwdriver
319.10 Depth Gauge, for large screws
321.12 Articulated Tension Device
321.20 Ratchet Wrench, 11 mm width across flats
322.535 5.5 mm Universal Drill Guide
323.46 4.5 mm Universal Drill Guide

Also Available

310.31 3.2 mm Drill Bit, quick coupling, 145 mm
310.44 4.5 mm Drill Bit, quick coupling, 145 mm

Note: Large Fragment Instrument Set (103.530) consists of Large Fragment Standard Instrument Set (103.531), with graphic case, and Large Fragment Locking Instrument Set (103.532).

For detailed cleaning and sterilization instructions, please refer to:
www.synthes.com/cleaning-sterilization
In Canada, the cleaning and sterilization instructions will be provided with the Loaner shipments.



LARGE FRAGMENT LOCKING INSTRUMENT SET (103.532)

Instruments

- 310.431 4.3 mm Drill Bit, quick coupling, 180 mm
- 311.449 Push-Pull Reduction Device, for 4.5 mm LCP Plates
- 312.449 4.3 mm Threaded Drill Guide, 3 ea.
- 314.118 Stardrive Screwdriver, T25
- 314.119 Stardrive Screwdriver Shaft, T25, quick coupling
- 397.705 Handle, quick coupling, for Compact Air Drive Connection
- 511.771 Torque Limiting Attachment, 4 Nm



310.431



311.449



312.449



314.118



314.119



397.705



511.771

Also Available

- 312.445 3.2 mm Threaded Drill Guide, for 4.0 mm Locking Screws
- 324.075 Threaded Plate Holder
- 397.705 Handle, for AO Reaming Coupler Connection
- 511.774 Torque Limiting Attachment, 4 Nm, for AO Reaming Coupler

Note: Large Fragment Instrument Set (103.530) consists of Large Fragment Standard Instrument Set (103.531), with graphic case, and Large Fragment Locking Instrument Set (103.532).

Compact Air Drive II Accessories

- 511.701 Compact Air Drive II
- 511.771 Torque Limiting Attachment, 4 Nm
- 511.791 Quick Coupling for K-wires
- 511.75 AO Quick Coupling for Drill bits

For the full range of attachments and accessories for the Compact Air Drive II, please contact your DePuy Synthes Vet representative or consult the DePuy Synthes Power Tools product catalog.

CAUTION: Federal Law restricts these devices to sale by or on the order of a veterinarian.



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