

Easy-To-Learn Ridge Split Technique

- Reduced Chair Time ✓
- Reduced Complications ✓
- Reduced Patient Discomfort ✓



The ESSET Kit is THE solution for easy, safe and stable implant placement in Narrow Ridge Situations

ESSET (Easy Safe Stable Expanding & Tapping Kit) is the safe and effective solution for placing implants in patients with a narrow alveolar ridge. Compared to conventional ridge splitting methods (i.e. mallets and chisels), the ESSET Kit's specialized tools, safely and predictably split and expand the crestal bone, preparing the site to accept dental implants

<http://ShivTak.com>



Simple, Predictable & Safe

- Easy to follow surgical sequence
- Increased patient comfort compared to malleting and chiseling
- Controllable and predictable procedure



Reduced Recovery Time

- Split and Expanded bone provides a sufficient supply of bone forming cells for quicker integration
- Compared to just bone grafting, recovery time is shorter

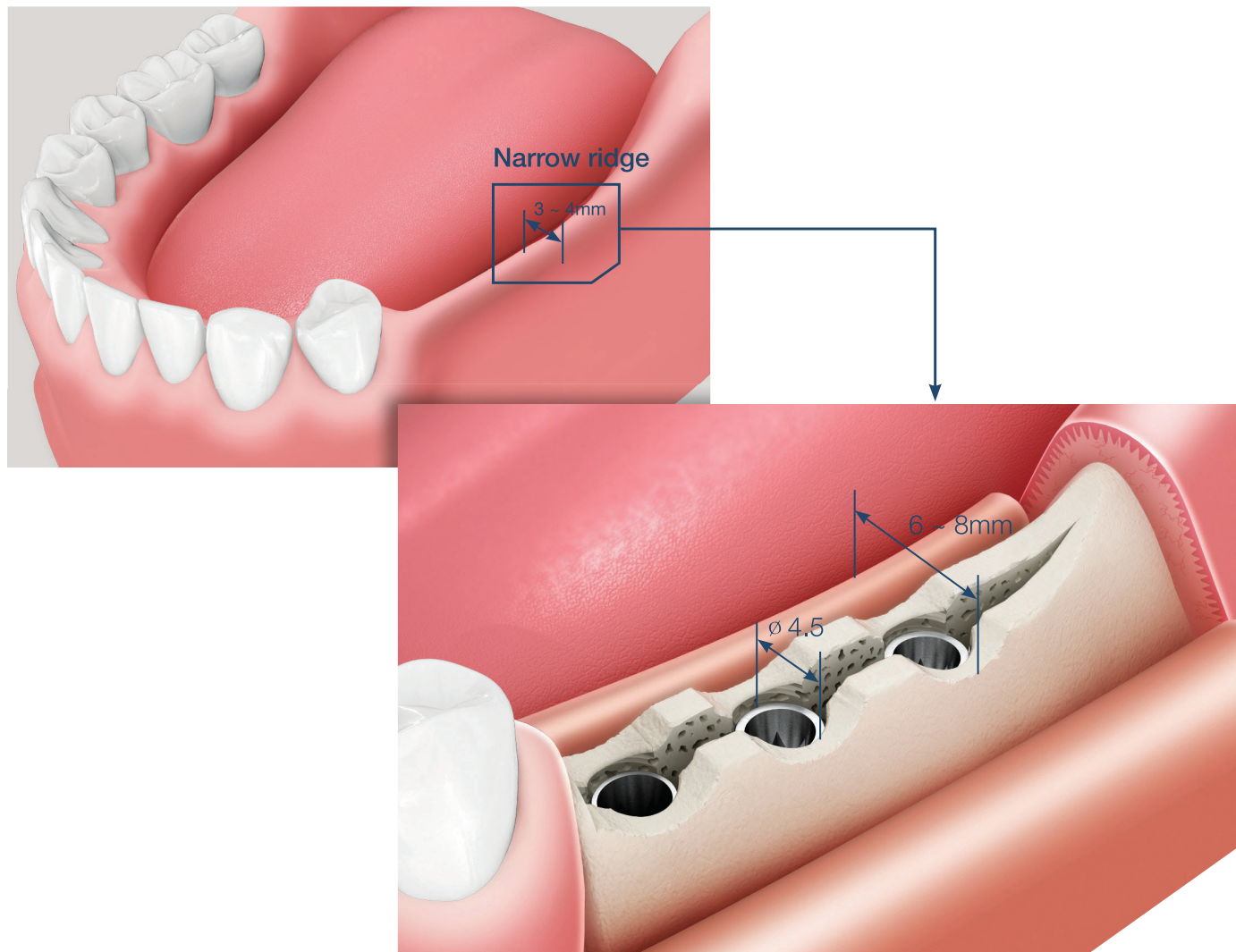


Minimal Bone Fracture & High Initial Stability

- Surgical sequence and specialized tools minimize bone fractures
- Initial implant stability is enhanced by tapping of the basal bone base



Introduction



Bone Expansion and Tapping

The ESSET Kit was developed over the course of 10 years. Initially developed in 2002 by Dr. B.H. Suh, Dr. Suh tried to resolve the issue of insufficient horizontal bone volume without using bone grafts by focusing on the visco-elastic properties of bone tissue and the elasticity coefficient of the alveolar bone.

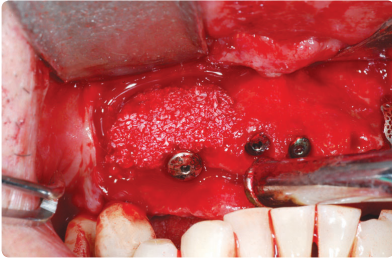
Using the ESSET (Easy Safe Stable Expanding & Tapping) Kit for narrow ridge cases can shorten the healing time by not using bone grafts but utilizing natural stem cells from the expanded bone. Dental implants are placed with high degree of stability.



Simple, Predictable & Safe



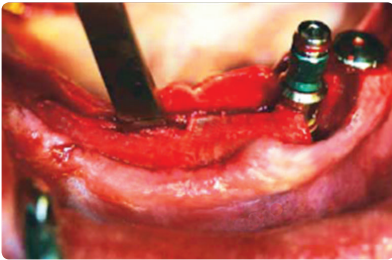
Conventional Methods



Guided Bone Regeneration

Performing full ridge augmentation requires experience and advanced surgical skills. The grafted site requires regular wound management to prevent secondary infections. Also, there are financial considerations due to the cost of bone materials and membranes.

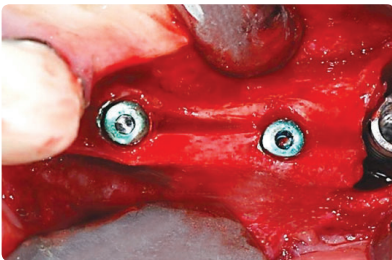
No Additional
GBR



Mallet & Chisel

Using a mallet and chisel to split the ridge does cause patient discomfort and is associated with high risk of buccal plate fracture. The procedure is unpredictable and implant initial stability is unknown.

No Mallet



Ridge Expansion

Performing a controlled expansion is unpredictable and implant stability is unknown

No Buccal
Fracture



Uneven Ridge Height Alveoplasty

Difficulties pinpointing an osteotomy placement on an uneven buccal ridge.

Easy Crest
Modification



The ESSET Kit



Minimal GBR

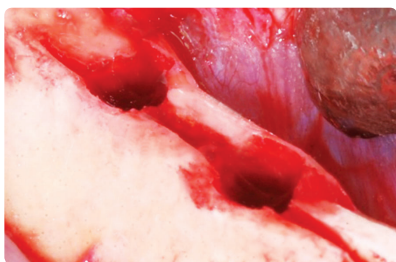
Osteotomy expansion and bone condensing using the Expansion Tap tool is easy. Controlled widening of the osteotomy reduces the need of GBR and additional drilling.

Developer's Comments

"The ESSET Kit allows the operator to perform safe and easy splitting and expansion of narrow spaces after tooth extraction based on the principles of alveolar bone elasticity, which ensures implant initial stability without compromising the alveolar bone. In addition it facilitates the manipulation of soft tissue, allowing for general clinicians to perform this procedure."

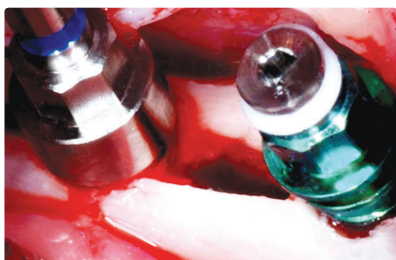
The safety and reliability of this technique is based on clinical results accumulated over the past 10 years."

Dr. Bong-Hyun Suh
The Prosth-Line Dental Institute
Seoul, South Korea



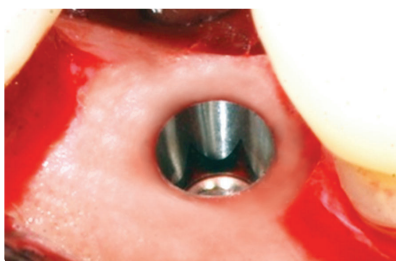
Safe and Easy Ridge Split

The ESSET Kit's Saw Blade easily splits the alveolar bone and significantly reduces the risk of buccal plate fracturing.



Safe and Controlled Ridge Expansion

The ESSET Kit's SET drill safely expands the ridge. Under a low setting, torque the SET drill to slowly and controllably widen the ridge.

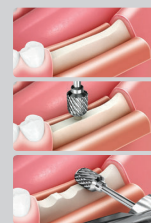


Simple Ridge Modification

Irregular, uneven alveolar bone can be modified using the Crest Removal bur to prepare the site for proper selection and placement of the osteotomy

Crest Remover

- Proper buccolingual width by ridge modification
- Prepared site allows for easy implant placement

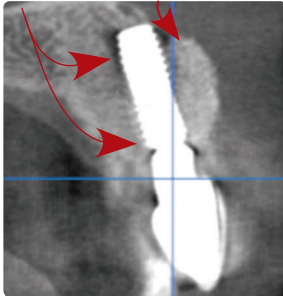




Reduced Recovery Time

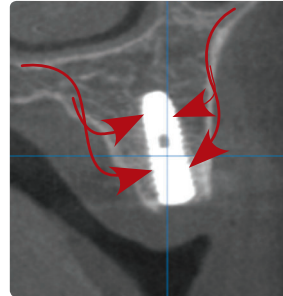


GBR Procedure

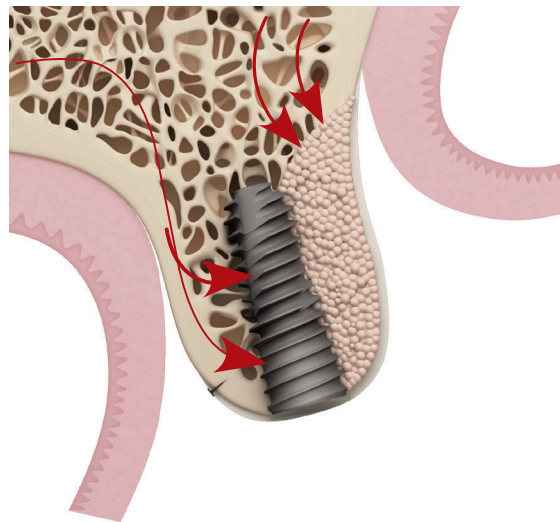


In GBR cases, bone cells are supplied from a limited direction. Bone generation requires significant time to go through the multiple stages of healing; incorporation replacement, modeling and RAP.

Ridge Splitting Procedure



In ridge split cases, the dental implant is enveloped by the patient's natural bone. Sufficient blood supply surrounding the implant allows for bone regeneration to occur quicker. This shortens the bone healing process and integration of the implant.



→
Blood Supply

Clinical Evidence

Ridge Splitting Technique

1. This technique splits and expands the buccal-lingual bone to create space that allows for new bone to form. In other words, blood supply through the periosteum of the buccal cortical bone is maintained to form the osseous tissue and the lamellar bone.

2. The treatment period is relatively shorter compared to GBR procedures (4 to 6 months).

Alternative bone expansion technique for implant placement in atrophic edentulous maxilla and mandible.

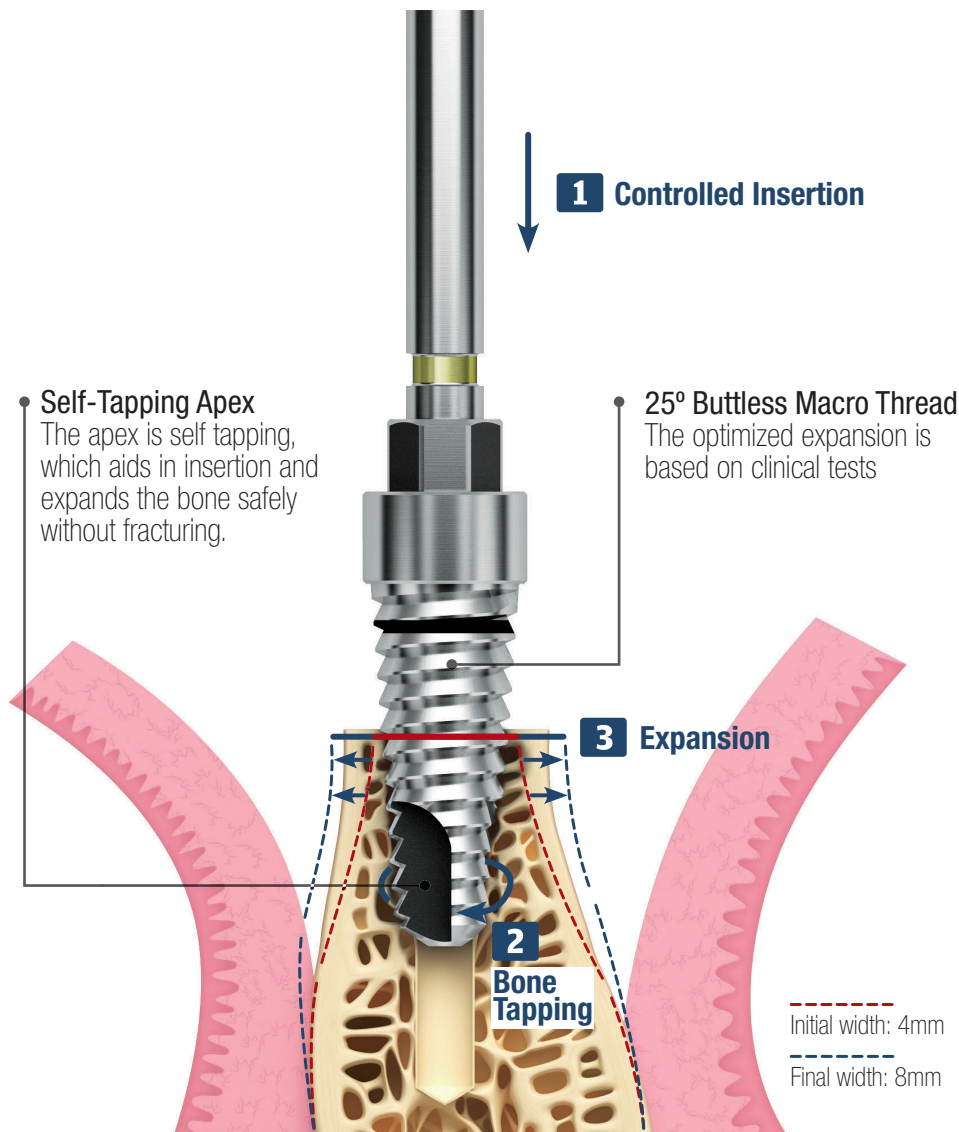
Demetriades et al.
Journal of Implantology, 2011



Minimal Bone Fracture & High Initial Stability



http://Shetak.com



ISQ Results

High initial stability is achieved even after ridge splitting due to the bone's elasticity.

Patient: Male, 50 Y.O.
Ridge split case with multiple implants:
#20-18 & #30-31



Photo Courtesy of Dr. B.H. Suh, Prosth-Line Dental Clinic

Clinical Reference

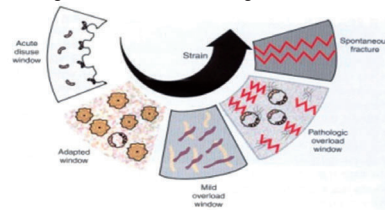
Table 1. Comparison of Elasticity

Elastic modulus of dental materials

Porcelain	$6.89 \times 10,000$
Resin	$0.27 \times 10,000$
Cortical	$0.272 - 1.5 \times 10,000\text{Pa}$
Trabecular	$0.015 - 0.137 \times 10,000\text{Pa}$

[Source] Forst HM, Vital Biomechanics, 1987

Fig. 1 Zones of Pathological Overload



Bone is a visco-elastic material

Bone fracture occurs at an instant force of $10,000$ to $20,000\mu\text{m}^2$, and the use of the viscoelastic properties of bone can allow increased expansion of bone volume-wise. Bone tapping effect is observed at the apical part of the bone in which there is strong resistance, while bone expansion occurs in the coronal part with less resistance. This increases the horizontal bone volume and prevents bone fracture.

Overview & Surgical Sequence



1 Crest Remover

Modifies crestal bone



2 Twist Drill

Initial drill



Mount Extension

Torque handle
- SET drill used for torque



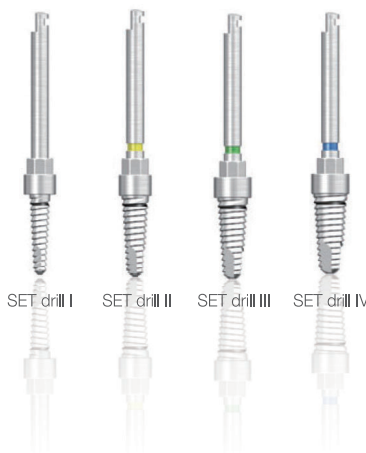
3 Saw

Ridge splitting / Cutting



4 SET Drill

Bone expansion / Self tapping



Crest Remover

Ridge marking / Removing



Lower Part Components

Torque Wrench (Bar Type)

Implant placement - SET drill changed to torque during torque application



Depth Gauge

Use during torque application on the SET drill HEX fixed to the hand-piece





ESSET KIT Sequence



1

1. Modify crest to form at least 3mm ~ 4mm of horizontal bone.

- Crest remover: \varnothing 7.0
- Recommended rpm: 1,200 ~ 1,500rpm



2

1. Create an indentation where the implant is to be placed.

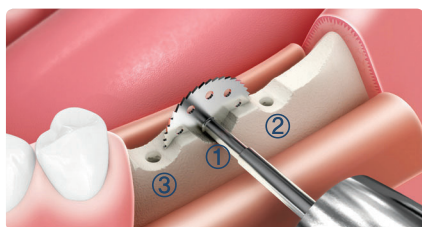
- Crest remover: \varnothing 7.0 (radius 3.5mm)
- Initial drill location: if the implant placement locations are #20 ~ #18, the first and second implants should be placed 5.0mm and 7.0mm from the proximal tooth, respectively.

2. Mark the implant placement location.

- Initial lance drill

3. Perform \varnothing 1.8 drilling on the implant placement location.

- Twist drill: 1.8mm



3

1. Perform full depth vertical cut with the \varnothing 13 Saw .

2. Perform horizontal splitting along the crestal bone from the distal to the mesial direction.

3. Perform additional splitting around the proximal tooth with \varnothing 7 Saw .

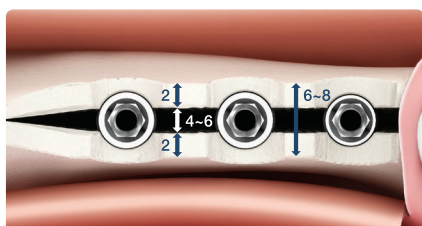
- Saw: \varnothing 7.0, \varnothing 10.0, \varnothing 13.0mm
- Recommended rpm: 1,200 ~ 1,500rpm
- The saw must be used from the distal to the mesial direction.



4

1. Use the SET drill at full depth sequentially for bone expansion.

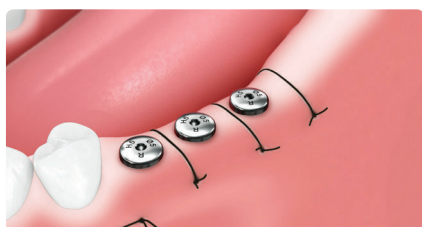
- SET drill: \varnothing 1.6 / 2.8, \varnothing 2.2 / 3.6, \varnothing 2.7 / 4.1, \varnothing 3.1 / 4.5 (sequential use)
 - Recommended rpm: 25 ~ 35rpm
 - Surgical engine recommended torque: Under 35N.cm
- [Caution]** Use the drill extension before applying high amounts of torque. Excessive torquing can pose a risk of locking the hand-piece.



5

1. Place the taper fixtures.

- Normal bone density: 4.5mm fixture
- Hard bone density: 4.0mm fixture



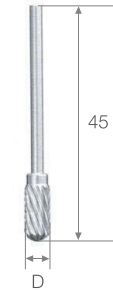
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1. Suture after placing the healing abutment.

- Healing abutment should be 2mm bigger than the height of the gingiva.



1 Crest Remover



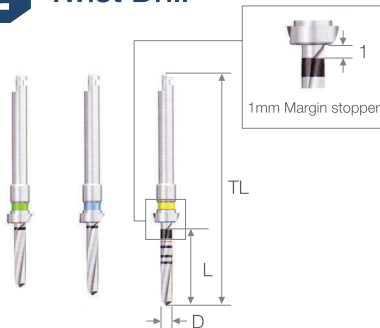
D	L	Code
ø 5.0	45	CERM50S

- For horizontal and modification of the crest bone
- Recommended rpm: 15,000 ~ 30,000rpm
- Straight type

D	L	Code
ø 7.0	29	CERM70A
ø 5.0	29	CERM50A

- For horizontal and modification of the crest bone
- Recommended rpm: 1,200 ~ 1,500rpm
- Straight type

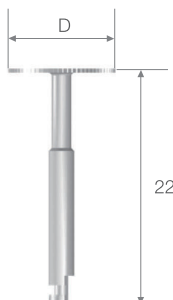
2 Twist Drill



D	L	TL	Code
ø 1.8	8.5	33	231DC204070
ø 1.8	10	34.5	231DC204100
ø 1.8	11.5	36	231DC204130

- For initial drilling for ridge splitting
- Laser marking to adjust the drilling depth according to the implant placement depth

3 Saw

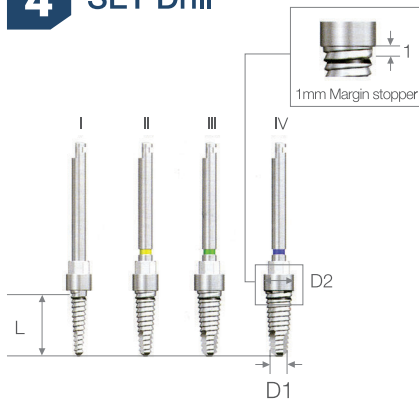


D	Blade thickness	Code
ø 7.0	0.3	RA231DC070
ø 10.0	0.3	RA231DC100
ø 13.0	0.3	58231DC204130

- For ridge modification and splitting
- Minimize bone removal with blade thickness of 0.3mm
- Recommended rpm: 1,200 ~ 1,500rpm



4 SET Drill



L	Type I	Type II	Type III	Type IV
8.5	SET162808	SET223608	SET274108	SET314508
10	SET162810	SET223610	SET274110	SET314510
11.5	SET162811	SET223611	SET274111	SET314511
D1/D2	ø 1.6 / 2.8	ø 2.2 / 3.6	ø 2.7 / 4.1	ø 3.1 / 4.5

- A tool for splitting and expansion of the crest bone
- Sequential use of type I, II, III, IV (for ø 4.5 fixture) (but for ø 4.0 fixture , use in the order of type I, II, III)
- Recommended rpm: 25 ~ 35rpm

Mount Extension

Code

ASMEL



Torque Wrench

Code

TQWCB



Depth Gauge

Code

ODG



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ESSET KIT



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