VOLVO

VOLVO TOOTH SYSTEM

TECHNICAL HANDBOOK 2026

Edition

3.0

Publishing Date

August 2026

Editor

Håkan Karlsson

Product Manager Wear Parts

Phone: +46735585764

Mail: hakan.g.karlsson@volvo.com

Table of Contents

Introduction

Modern design built on proven experience

- The new generation Volvo Tooth System has been developed by Volvo, specifically for Volvo machines.
- Each adapter and tooth is carefully matched to the size and model of the machine to maximize performance, breakout force, and uptime.
- From tooth size and specification to the optimal balance between wear protection and weight, every component has been engineered to help unlock the full potential of your Volvo machine.
- The innovative Volvo locking system provides a truly hammerless solution, allowing teeth to be installed or replaced in just minutes, helping to reduce downtime.
- The retainer is pre-assembled and supplied together with the tooth, eliminating the need for spring retainer replacement throughout the tooth's service life.
- The system features a reusable locking pin that can be installed from either side for increased flexibility and ease of maintenance.
- The hammerless design also improves safety by reducing the risk of injury. Only a ½" and/or 3/8" square-drive tool is required.

Designed for Volvo's larger Excavators and Wheel Loaders

- Volvo Wheel Loaders from L60 to L350.
- Volvo Excavators ranging from 14 tons up to the largest 95-ton model.

Safety Instructions

The practices described in this manual can be taken as guidelines for operating safely in many conditions and in addition to the safety standards that are current and enforceable in your region.

Your safety and the safety of third parties is the result of putting your knowledge of the correct operational procedures into practice.

When performing the work described in these instructions, always work safely, and use the personal protection elements required to minimize or avoid injury.

Always wear:

- Hard hat
- Protection gloves
- Steel toe boots
- Ear protection
- Safety glasses

To avoid eye injury, always wear safety goggles or a protective mask when using any equipment, hammer, or similar tool. When equipment is under pressure or when objects are struck, chips or other debris can be thrown out. Make sure no one gets hurt by the debris that is fired before applying pressure or hitting an object. Wear eye protection that complies with ANSI Z87.1 and OSHA standards. Also, wear hearing protection and gloves.

Lifting a heavy object can cause serious or fatal injury. Do not exceed the maximum rated capacity of lifting and positioning devices. Stay away from the area under a suspended load. Make sure that the chain is not damaged and that the load is always balanced. Do not lift an object by connecting only one end to the load chain. One should connect both ends to lifting points, if possible.

When handling heavy loads (over 25kg), use appropriate lifting equipment in accordance with ISO 7531:1987.

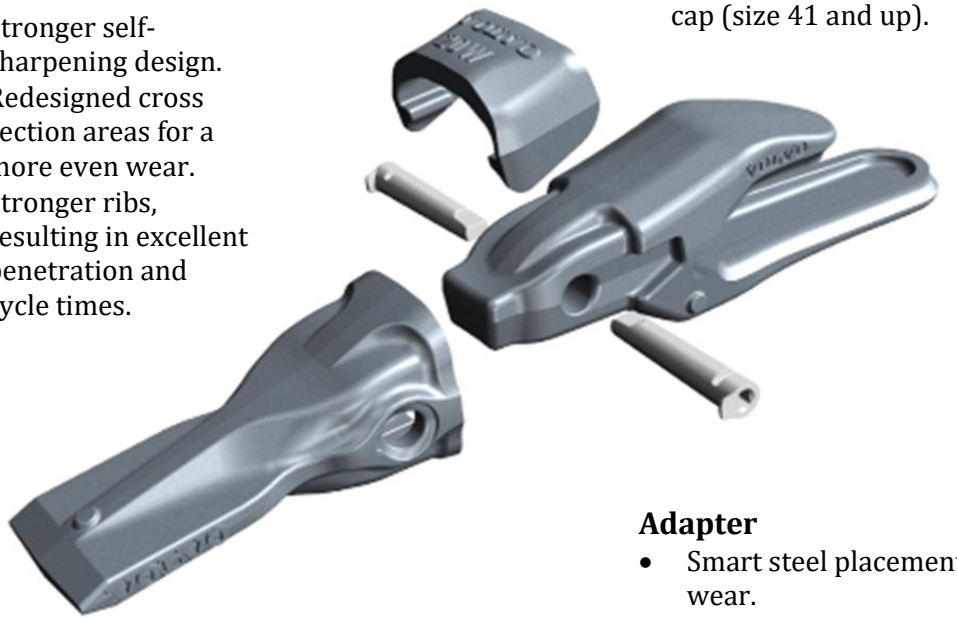
Tooth System in Detail

Tooth

- Low profile for good penetration.
- Stronger self-sharpening design.
- Redesigned cross section areas for a more even wear.
- Stronger ribs, resulting in excellent penetration and cycle times.

Wear Cap

- Optional wear placement cap, fitted on the same adapter.
- Can be used with or without wear cap (size 41 and up).



Adapter

- Smart steel placement prevents early wear.
- Slimmer adapter leg protects the welding.
- Enhanced resistance to overload conditions.
- Reusable pin, lockable from both sides (size 21 up to 126).

Locking System

- The steel retainer is supplied pre-installed with the tooth.
- No spring replacement is required throughout the service life of the tooth.
- Reusable pin, lockable from both sides (size 21 up to 126).
- The locking pin is manufactured from steel.
- No separate pin or retainer is required for hot slag applications.
- A single locking system is used for both standard and hot slag applications.

Excavator Teeth – Features & Benefits

General Purpose Tooth

For general purpose applications with a moderate level of abrasion. Good penetration. Long service life.

Designation: GPE

Abrasive Material and Rock Tooth

Provides good penetration and longer service life in rock and abrasive material handling. For rock material handling where extra wear life is needed.

Designation: ARXE

Top Leg Adapter

Adapter with long top leg for welding to both sides of the cutting edge.

Designation: TL

Pick Point Tooth

The perfect choice for extremely compact material such as hard clay and frozen ground. Provides maximum penetration capability. Can be used in combination with Twin Pick tooth. Long service life.

Designation: PPC / PPE

Twin Pick Point Tooth

Ideal for extremely compact materials such as hard clay and frozen ground. Provides maximum penetration capability. Can be used in combination with Pick Point tooth. Long service life.

Designation: TPC / TPE

Spade Nose Tooth

Works best for light-duty, low impact applications, such as levelling, cleaning, grading, and backfilling.

Designation: SNC / SNE

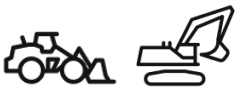
Wear Cap

Provides additional protection for the adapter, helping to extend service life in demanding applications.

Designation: W

Locking Pin

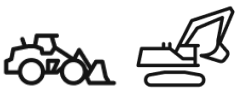
Designation: P



Retainer

Pre-installed in the tooth.
Available separately as a spare part.

Designation: R



Wheel Loader Teeth – Features & Benefits

General Purpose Tooth

An all-rounder suitable for material with a moderate level of abrasion, such as sand and gravel. Small undercut makes it suitable for cleaning work.

Designation: GPL

Abrasive Material Tooth

Designed to handle abrasive material where extra penetration is required, such as crushed or blasted rock.

Designation: AML

Abrasive Material and Rock Tooth

For heavy duty applications with a high level of abrasion, such as blasted rock or hot slag.

Designation: AMRL

Flush Adapter

Flush-mounting weld-on adapter.
For use where a smooth profile to the bucket is required (e.g. planning, levelling).

Designation: FC

Top Leg Adapter

Adapter with long top leg for welding to both sides of the cutting edge.

Designation: TL

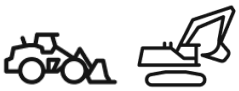
Bolt-On Adapter

Two-leg adapter for bolting to the cutting edge.

Designation: BN

Locking Pin

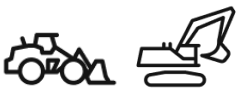
Designation: P



Retainer

Pre-installed in the tooth.
Available separately as a spare part.

Designation: R



Designations

The designation system is designed to provide information about the component type, size, application, and machine category.

Teeth Examples

Example: 16GPL

Element	Meaning
16	Tooth size
GP	Tooth design (General Purpose)
L	Machine type (Loader)

Example: 16ARXE

Element	Meaning
16	Tooth size
ARX	Tooth design (Abrasive Material and Rock)
E	Machine type (Excavator)

Adapters Examples

Example: LA21FC40

Element	Meaning
LA	Loader Adapter
21	Adapter size
FC	Adapter design (Flush Adapter)
40	Bucket cutting-edge thickness (mm)

Example: EA21TL40

Element	Meaning
EA	Excavator Adapter
21	Adapter size
TL	Adapter design (Top Leg Adapter)
40	Bucket cutting-edge thickness (mm)

When is it time to change teeth?

Inspection Procedure

- Length taken from the beginning of the box to the end of the tooth, supporting the measuring tape on the top of the tooth (see A in figure 1 and figure 2 below).
- Length taken from the beginning of the box to the end of the tooth, with the measuring tape parallel to the side of the tooth (see B in figure 1 and figure 2 below).
- Thickness of the tooth box: Use thickness gauge (see C in figure 1 and figure 2 below).

Visual Inspection

- Visually inspect the entire tooth for holes and signs of uneven wear.

Cracks Inspection

- If cracks are detected, contact your dealer for evaluation.

Excavator Teeth

Size	A(mm)	B (mm)	C (mm)
11	85	80	5
16	125	105	5
21	130	110	5
31	140	120	5
41	155	140	5
56	160	145	5
66	185	160	5
81	195	180	5
126	210	185	5

Table A – Dimensions of maximum wearing on Excavator teeth

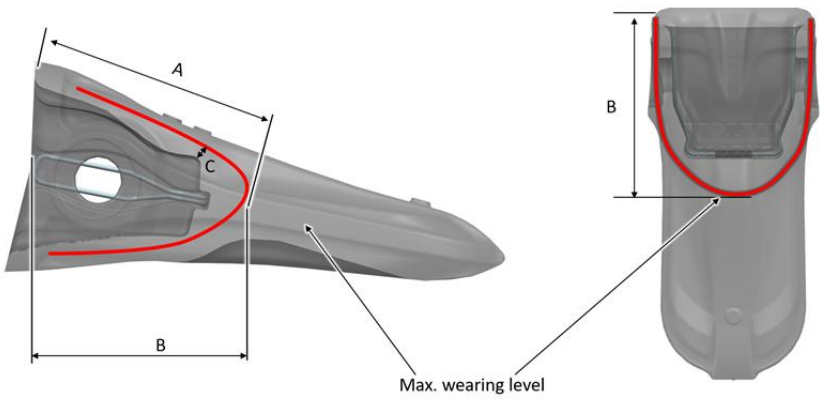


Figure 1 – Maximum wearing indicators on Excavator teeth

Wheel Loader Teeth

Size	A (mm)	B (mm)	C (mm)
11	115	110	5
16	130	125	5
21	145	135	5
31	155	145	5
41	145	160	5
56	160	180	5
66	230	220	5

Table B – Dimensions of maximum wearing on Wheel Loader teeth

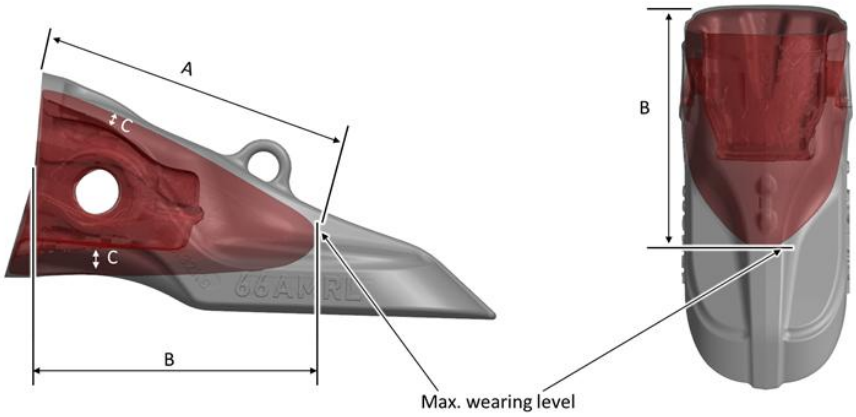


Figure 2 – Maximum wearing indicators on Wheel Loader teeth

Locking Pin Inspection

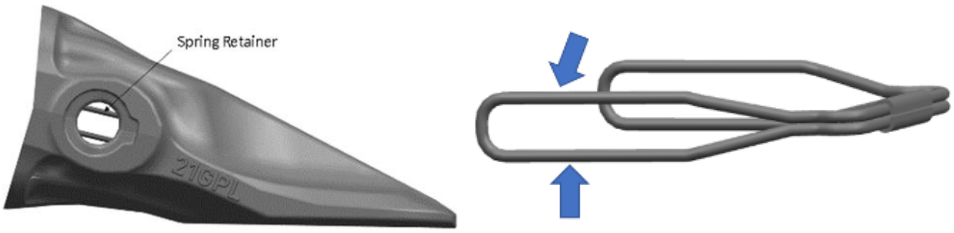
The replacement of the pin should occur when one or more of these requirements are met:

1. Deformation or wear at the ends of the pin.
2. Breakages, cracks or wearing on the pin ramp.
3. Longitudinal deformation.

(1) (2) (3)

Retainer Inspection

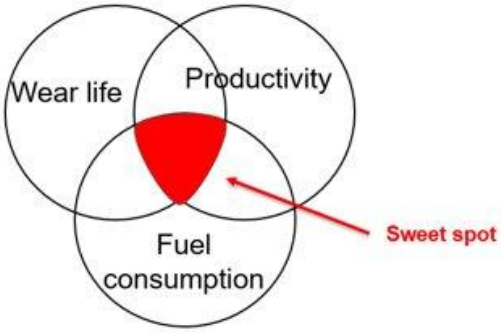
- The retainer is available as a spare part, but normally there is no need to change it.
- Check for plastic deformation at the retainer. If any have occurred, replace it with a new.



Wear life – How to Measure and Compare?

When comparing tooth systems, wear life alone should not be used as the only performance indicator. The correct tooth system should provide the best balance between wear life, fuel efficiency, and productivity. The following parameters should always be measured and evaluated together:

- Wear life
- Productivity (tons/hour)
- Fuel consumption (liters/hour)

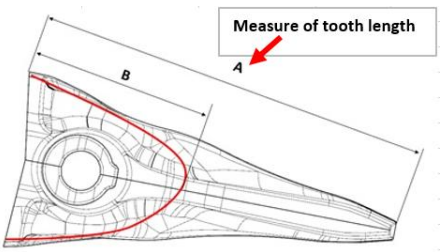


Evaluating only one of these parameters can lead to misleading conclusions. A valid comparison must consider all three factors together to determine which tooth system delivers the best overall performance.

Reliable comparisons require testing under consistent operating conditions:

- At the same work site.
- Using the same machine.
- With identical bucket specifications and configurations.
- With the same operator, whenever possible.
- Using a minimum of five sets of teeth.

	Length of Tooth (m.m)						Production hours	Loading efficiency	Fuel consumption
	Tooth 1	Tooth 2	Tooth 3	Tooth 4	Tooth 5	Hours (machine)	Hours (only Volvo)	Ton / hour	Litre / hour
Start parameters									
First check									
Second check									
Third check									
Fourth check									
Fifth check									
Sixt check									
Seventh check									
Eight test									



Tooth Wear Life

The figures in the table below may be used as a general guideline when no site-specific data is available. Actual service life depends on several factors, including application type, material characteristics, silica content, operating conditions, and machine setup. As a result, wear life may vary significantly between sites. Whenever possible, use site-specific customer data, as material abrasiveness can vary considerably even within the same quarry or work site.

Handled material	Tooth service life (hours)	Edge service life (hours)
Sand and gravel, high silica content	40-60	300-400
Shot rock, high silica content	40-60	300-400
Shot rock, granite	80-160	500-1100
Shot rock, diabase or limestone	170-500	1200-3500
Moraine Bank	170-500	1200-3500
Sand and gravel rehandling	350-1000	2400-7000

Extreme Heat and Low-Temperature Performance of Teeth

Hot Slag Applications

Volvo tooth steel is designed for demanding hot slag applications, where material temperatures can reach approximately 1300°C (2372°F). However, this does not mean that the teeth can continuously withstand direct exposure to these temperatures. No steel can maintain its mechanical properties under constant exposure to such extreme heat.

In normal hot slag applications, the teeth come into intermittent contact with molten slag while handling material. Exposure to the highest temperatures is therefore brief, allowing the teeth to cool between loading cycles. Under these operating conditions, the teeth perform as intended.

During operation, tooth temperatures may briefly reach 500–700°C (932–1292°F) before cooling again. Many slag-handling sites also use designated cooling areas to help control temperatures and reduce heat exposure for the teeth, bucket, and machine.

Steel properties gradually decrease as temperature increases:

- Up to approximately 500°C (932°F), standard steel retains most of its mechanical properties.
- Volvo tooth steel can withstand temperatures up to approximately 550°C (1022°F) with limited loss of performance.
- Above this temperature, strength and wear resistance gradually decrease.

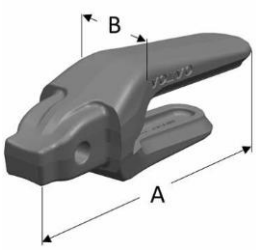
- Temperatures above 800°C (1472°F) significantly soften the steel and may cause deformation, particularly at the tooth tip.

Some bending or deformation of the tooth tip can therefore be expected in severe hot slag applications and is considered normal wear under these conditions.

Low-Temperature Applications

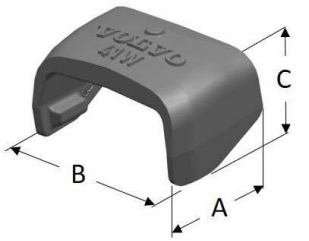
Volvo tooth steel maintains its specified mechanical properties down to −40°C (−40°F). Below this temperature, mechanical properties cannot be guaranteed. However, the teeth may still function depending on the application and operating conditions. During operation, contact with the ground and handled material will normally increase the temperature of the teeth above ambient temperature.

Excavator Teeth – Dimensions & Weight



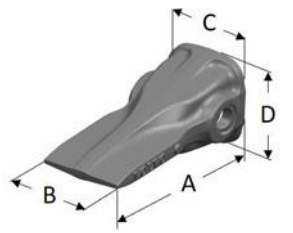
Top Leg Adapter

Designation	Part No.	Edge thickness (mm)	Edge angle (degree)	A (mm)	B (mm)	Weight (kg)
UA11TL25	VOE17491921	25	30	267	91	4,5
EA11TL30	VOE14744545	30	30	256	91	4,4
EA16TL30	VOE14727403	30	30	299	104,2	6,5
EA21TL40	VOE14727405	40	30	344	112	9,8
EA31TL40	VOE14727406	40	30	377	123	12,1
Designation	**Part No.**	**Edge thickness (mm)**	**Edge angle (degree)**	**A (mm)**	**B (mm)**	**Weight (kg)**
EA41TLW40	VOE14727409	40	30	436	115	18,9
EA41TLW50	VOE14732187	50	30	436	115	18,8
EA56TLW50	VOE14732190	50	30	479	132	25,4
EA66TLW50	VOE14732191	50	30	536	157	36,5
EA66TLW60	VOE14732192	60	30	536	157	36,5
EA81TLW80	VOE14732193	80	30	578	163	46,7
EA126TLW90	VOE14732194	90	30	670	193	76
EA126TLW100	VOE14732375	100	30	670	193	75



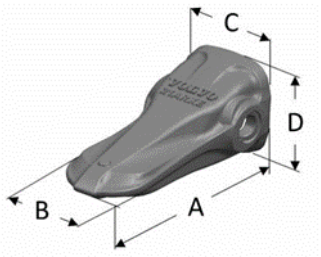
Wear Cap

Designation	Part No.	A (mm)	B (mm)	C (mm)	Weight (kg)
41W	VOE14736109	88	136	86	2
56W	VOE14736110	93	152	94	2,2
66W	VOE14736111	103	177	100	3,5
81W	VOE14736112	109	192	107	4
126W	VOE14736113	127	222	134	6,4



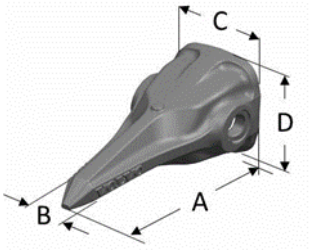
General Purpose Tooth

Designation	Part No.	A (mm)	B (mm)	C (mm)	D (mm)	Weight (kg)
11GPE	VOE14744546	200	70	93	86	2,5
11GPE	*VOE54467382*	*200*	*70*	*99*	*86*	*2,7*
16GPE	VOE14732376	224	80	109	102	4,1
21GPE	VOE14732381	255	105	116	111	5,6
31GPE	VOE14732386	268	113	134	123	7,5
41GPE	VOE14732391	292	126	135	133	9,6
56GPE	VOE14732396	320	137	164	147	13
66GPE	VOE14732401	348	144	177	167	16,5
81GPE	VOE14732404	381	165	197	175	22,7



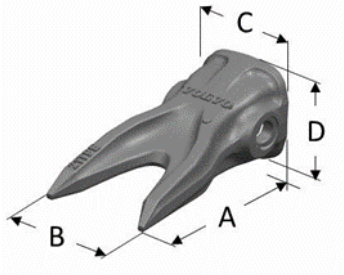
Abrasive Material and Rock Tooth

Designation	Part No.	A (mm)	B (mm)	C (mm)	D (mm)	Weight (kg)
11ARXE	VOE14744547	212	73	93	86	3,1
11ARXE	*VOE54467383*	*212*	*73*	*98*	*86*	*3,3*
16ARXE	VOE14732377	236	84	109	102	4,5
21ARXE	VOE14732382	269	95	116	111	6,8
31ARXE	VOE14732387	285	107	134	123	8,6
41ARXE	VOE14732392	312	120	141	133	12,2
56ARXE	VOE14732397	339	131	164	147	16,6
66ARXE	VOE14732402	382	147	178	167	22,5
81ARXE	VOE14731779	405	159	197	175	28,6
126ARXE	VOE14732425	464	179	216	205	42



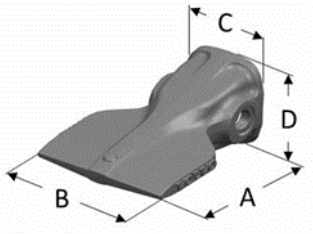
Pick Point Tooth

Designation	Part No.	A (mm)	B (mm)	C (mm)	D (mm)	Weight (kg)
16PPE	VOE14732378	241	-	109	102	3,3
21PPE	VOE14732383	273	-	116	111	4,8
41PPE	VOE14732393	330	-	140	132	8,4
56PPE	VOE14732398	359	-	164	147	11,5
66PPE	VOE14732403	391	-	178	167	15
81PPE	VOE14732424	427	-	197	175	19,4
126PPE	VOE14753794	486	-	217	205	35



Twin Pick Point Tooth

Designation	Part No.	A (mm)	B (mm)	C (mm)	D (mm)	Weight (kg)
16TPE	VOE14732379	239	119	109	102	3,8
21TPE	VOE14732384	273	125	116	111	5,9
41TPE	VOE14732394	330	162	141	133	10,5
56TPE	VOE14732399	358	182	164	147	15



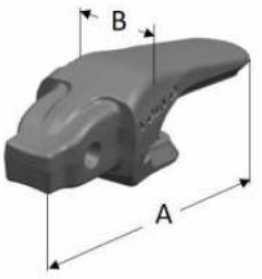
Spade Nose Tooth

Designation	Part No.	A (mm)	B (mm)	C (mm)	D (mm)	Weight (kg)
16SNE	VOE14732380	215	127	108	100	4,4
21SNE	VOE14732385	262	177	116	111	7,6
31SNE	VOE54099788	278	180	134	123	9,8
41SNE	VOE14732395	306	206	141	133	12,8
56SNE	VOE14732400	342	231	164	147	18,2
66SNE	VOE54099789	382	256	178	167	24,7

Wheel Loader Teeth – Dimensions & Weight

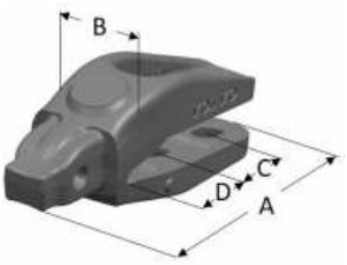
Flush Adapter

Designation	Part No.	Edge thickness (mm)	Edge angle (degree)	A (mm)	B (mm)	Weight (kg)
LA11FC25	VOE17491920	25	25	264	91	4,1
LA16FC30-35	VOE17491922	30-35	25	301	104	6,1
LA21FC40	VOE17491926	40	25	363	112	9,5
LA31FC40	VOE17491928	40	25	387	123	13



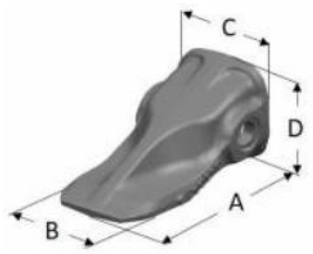
Top Leg Adapter

Designation	Part No.	Edge thickness (mm)	Edge angle (degree)	A (mm)	B (mm)	Weight (kg)
UA11TL25	VOE17491921	25	25	267	91	4,5
LA16TL30	VOE17491923	30	25	298	104	6,3
LA16TL35	VOE17491924	35	25	300	104	6,6
LA21TL35	VOE17491925	35	25	323	112	8,1
LA21TL40	VOE17491927	40	25	323	112	8,2
LA31TL40	VOE17491929	40	25	350	123	11,2
LA41TL40	VOE17491930	40	25	388	113	15,6
LA41TL50	VOE17491933	50	25	395	113	16,2
LA56TL65	VOE17491931	65	30	422	131	21,7
LA66TL65	VOE17491932	65	30	504	140	31,2



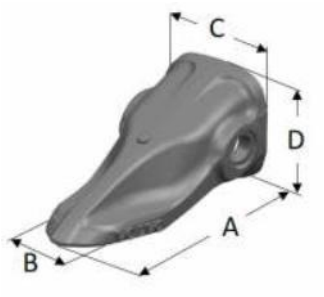
Bolt-On Adapter

Designation	Part No.	Edge thickness (mm)	Edge angle (degree)	A (mm)	B (mm)	C (mm)	D (mm)	Weight (kg)
LA11BN25	VOE17491915	25	25	290	91	87	85	5,4
LA16BN30	VOE17491916	30	25	307	103	87	85	6,9
LA16BN35	VOE17491917	35	25	357	104	111	106	7,9
LA21BN40	VOE17491918	40	25	390	112	100	117	14,4
LA31BN40	VOE17491919	40	25	401	123	100	118	18,5



General Purpose Tooth

Designation	Part No.	A (mm)	B (mm)	C (mm)	D (mm)	Weight (kg)
11GPL	VOE17491940	186	76	93	86	2,5
11GPL	*VOE55094750*	*184*	*76*	*96*	*85*	*2,8*
16GPL	VOE17491941	190	80	109	102	4,1
21GPL	VOE17491944	194	104	116	111	5,5
31GPL	VOE17491947	213	112	125	123	7,6
41GPL	VOE17491950	226	130	141	133	10,8



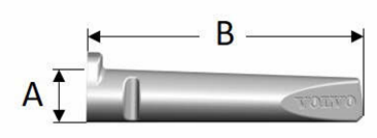
Abrasive Material Tooth

Designation	Part No.	A (mm)	B (mm)	C (mm)	D (mm)	Weight (kg)
16AML	VOE17491942	188	62	109	109	4,7
21AML	VOE17491945	201	65	116	111	5,9
31AML	VOE17491948	218	90	134	123	8,5

Abrasive Material and Rock Tooth

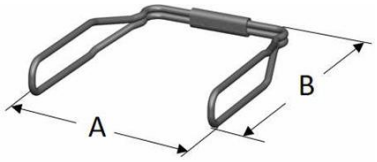
Designation	Part No.	A (mm)	B (mm)	C (mm)	D (mm)	Weight (kg)
16AMRL	VOE17491943	192	93	109	101	5,3
21AMRL	VOE17491946	213	96	116	111	8,1
31AMRL	VOE17491949	237	110	134	123	11,1
41AMRL	VOE17491951	257	140	141	133	16,6
56AMRL	VOE17491952	286	150	164	174	22,1
66AMRL	VOE17491953	322	167	178	167	27,3

Universal Locking Devices – Dimensions & Weight



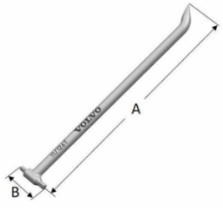
Locking Pin

Designation	Part No.	A (mm)	B (mm)	Weight (kg)
11P	VOE17473100	20	87	0,17
11P	*VOE54467517*	*20*	*91*	*0,17*
16P	VOE17473101	21	100	0,2
21P	VOE17473102	21	107	0,2
31P	VOE17473103	23,5	120	0,3
41P	VOE17473104	25	128	0,4
56P	VOE17473105	28,5	149	0,5
66P	VOE17473106	32	162	0,8
81P	VOE14740815	33,5	174	0,9
126P	VOE14740817	39	192	1,4



Retainer

Designation	Part No.	A (mm)	B (mm)
11R	VOE17493100	69,5	72,4
16R	VOE17493101	80,2	86,2
21R	VOE17493102	84,4	96
31R	VOE17493103	97,2	101,9
41R	VOE17493104	105,5	111,4
56R	VOE17493105	114,3	123,4
66R	VOE17493106	130	136,1
81R	VOE14740816	134,9	145,1
126R	VOE14740818	155,1	166,8



Locking Pin Tool

Designation	Part No.	Weight (kg)	Sizes
11\126T	VOE17473120	3	11\126

Instructions for Choosing the Right Teeth

Size Selection

1. Determine the **breakout force (BOF)** of your machine.
2. Select the machine type from the table (Wheel Loader or Excavator).
3. Choose either a **Standard (STD)** or **Heavy Duty (HD)** application based on the operating conditions, type of work, level of impact, degree of abrasion, and material resistance. Then locate the **breakout force (BOF)** applicable to your machine.
4. Read the corresponding Volvo tooth size shown on the left side of the table.

	Wheel Loaders				Excavators			
Size	BOF[1] STD[4]	BOF[1] HD[5]	CET[2]	CEA[3]	BOF[1] STD[4]	BOF[1] HD[5]	CET[2]	CEA[3]
11	165	132	25	25	100	80	25/30	30
16	211	169	30/35	25	128	102	30	30
21	296	237	35/40	25	160	128	40	30
31	361	289	40	25	195	156	40	30
41	426	340	40/50	25	230	186	40/50	30
56	546	436	65	30	295	238	50	30
66	664	532	65	30	359	292	50/60	30
81	-	-	-	-	410	328	65	30
126	-	-	-	-	600	600	80/90	30

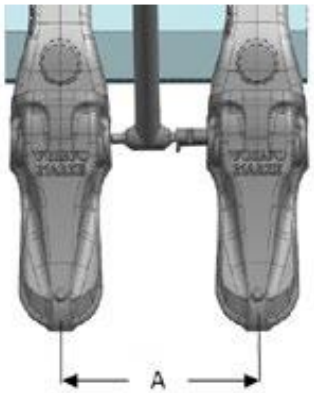
[1]BOF = Maximum Breakout Force (kN), [2]CET = Cutting Edge Thickness (mm),
[3]CEA = Cutting Edge Angle (degrees), [4]STD = Standard application, [5]HD = Heavy Duty application

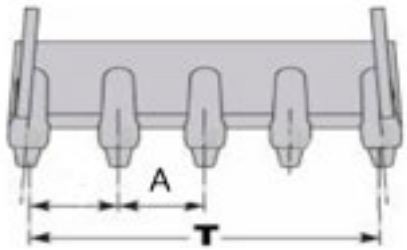
Number of teeth per bucket

Use the following method to calculate the recommended number of teeth per bucket and the minimum spacing between tooth positions. This applies to both Wheel Loaders and Excavators.

A = Minimum distance between tooth positions.
T = Blade length of the bucket.
Max number of adapters = (**T/A**) + 1

Size	A (mm)
11	180
16	209
21	224
31	255
41	267
56	313
66	338
81	371
126	408





General Welding Instructions

Cleaning and preparation

Clean the parts to be welded. Remove paint, grease, oxides, and any other contaminants from the surface that may affect the welding process. Use a wire brush or light grinding.

Preheating

Preheat and maintain the area to be welded at 200°C (392°F) to prevent cracking. Use a gas torch and monitor the temperature with temperature-indicating sticks or radiation pyrometers.

Maximum temperature and final check

During the welding process, do not exceed 250°C (482°F), except in the directly affected area. Space each row to keep the temperature within these limits. Check the quality of the surface of the weld. The surface must be flat and regular. Grind any unevenness and avoid grinding lines parallel to the weld beads.

Covered electrode procedure

If using covered electrodes, low-hydrogen basic covered electrodes are recommended.
Diameter: Use the largest diameter possible, 6 mm is suitable.
Types: UNE-EN 499 E 42 B or UNE-EN 499 E 46 B; AWS A5.1 E-7016 or AWS A5.1 E-7018.
Amperage and Polarity: Follow manufacturer's instructions.
The weld should be performed with short beads and a maximum oscillation of three times the electrode diameter. Remove the slag and lightly hammer the bead after each run to reduce tensions. Basic covered electrodes absorb moisture. To avoid this, store electrodes hermetically sealed in their original packaging. Once opened, keep them heated at 65-150°C (149-302°F).

GMAW procedure (Gas Metal Arc Welding)

When welding with gas protection, for moderate thickness and requirement welding, we recommend using welding wire with solid thread. For high thickness and high requirement welding, use welding wire of tubular thread (Flux-core) minute.

Welding wire of solid thread

Diameter: 1,6 mm (maximum recommended)
Types: UNE-EN 440 type G 46 M or G 50 M; ASME/AWS ER 70 S-6; DIN 8559 SG2; or equivalent.
Gas protection flow: 12-18 liters per minute.

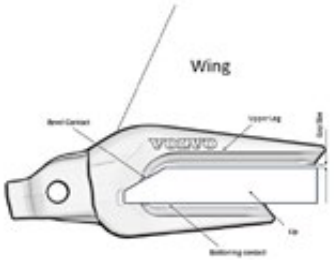
Welding wire of tubular thread (Flux-core)

Types: ASME/AWS ER 70 T1 (rutile type); ASME/AWS E 70 T5 (basic type); DIN 8559.
With both types of welding wire, welding should be carried out with a maximum oscillation of 10 mm. Lightly hammer the bead after each run to reduce residual stresses. It is very important to avoid draughts to protect the gas. For the highest thickness and requirement welding, use welding wire of tubular thread (Flux-core) with low-hydrogen content, type DIN SG B1 C5254.

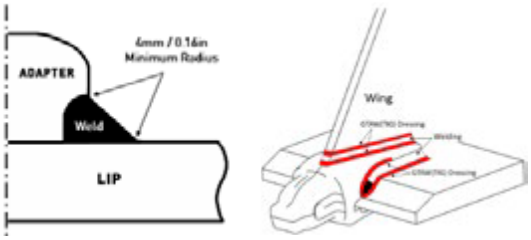
WARNING: Do not weld the adapter with the tooth mounted, as this will damage the locking system. Mount the tooth only after welding has been completed.

Welding Instructions for Bucket Side Adapter

Instruction Steps



1. Place the adapter on the lip plate at the desired position, from side to side. The bottom leg and bevel angle must be in full contact, as shown in the figure.
2. Draw on the cheek the profile of the upper leg of the central adapter.
3. Preheat to 200°C (392°F) and cut the cheek plate following the shape of the adapter's upper leg.
4. Chamfer the cut edge to allow welding between the adapter upper leg and the cheek.
5. It is recommended to perform TIG dressing on both the upper and lower adapter straps when the plate thickness is less than 70 mm. This process uses a GTAW torch to make an autogenous weld pass along the toe of the weld fillet.
   The welding power supply shall have high-frequency start capability. "Scratch-starting" is not allowed. It is preferable to use a remote foot-pedal current control to ensure proper filling of craters at the ends of the weld beads.
   Any defects along the weld toes must be corrected by grinding or repair welding before performing the GTAW process. The torch shall be positioned over the weld toe and oriented to produce a smooth weld bead without undercut. The welder shall control the travel speed to obtain a bead width of 4.8-8 mm (0.19-0.31 in).
   GTAW dressing is recommended along the weld toes on both the top and bottom legs.



Inspection Procedure

It is recommended to carry out inspections every 500 operating hours, or whenever possible.

Figure 1

Dimensional Inspection

Measurements can be taken using ultrasonic equipment or a measuring tape according to the following procedure:

1. Clean the areas where measurements will be taken.
2. Apply contact liquid to the measuring area (for ultrasonic measurements).
3. Take measurements at each point as shown in the figure below.
4. The adapter must be replaced when any of dimensions of **A**, **B**, or **C** fall below the values specified in the table.

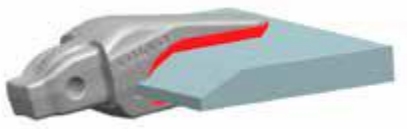
	Ultrasonic Equipment			Measuring Tape		
Designation	**A (mm)**	**B (mm)**	**C (mm)**	**A (mm)**	**B (mm)**	**C (mm)**
EA21TL40	10	10	10	20	15	15
EA31TL40	10	10	10	20	15	15
EA41TLW40	15	10	15	22	20	20
EA41TLW50	15	10	10	20	20	20
EA66TLW50	15	15	15	30	25	25
EA66TLW60	15	15	15	25	25	25
EA81TLW80	20	15	15	30	25	25

Visual Inspection

Inspect the adapter noses for signs of plastic deformation.

Cracks Inspection

Perform a visual inspection and liquid penetrant inspection of the adapter welds against the blade. If cracks are found in the welds, they must be cleaned and repaired as soon as possible to prevent them from propagating into the adapter and causing failure. If cracks are detected in any other area of the adapter, contact your dealer for evaluation.



NOTE

The dimensions provided represent maximum wear limits and do not mean the component must reach these limits before replacement. Replacing a component before any of these dimensions are reached does not indicate poor performance or abnormal wear.

Welding Instructions for Adapters for Wheel Loaders

Welding Types

The following is a quick reference to consumables that can be used to weld Volvo products. For complete welding procedures, see the section *General Welding Instructions*.

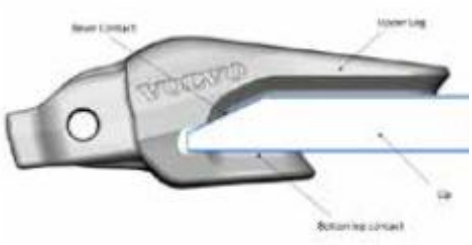
Welding Unalloyed & Low Alloyed Filler Consumables		
Process	**EN Class**	**AWS Class**
SMAW	EN ISO 2560-A E42X	E70X according to A5.1 or equivalent under A5.5
GMAW	EN ISO 14341-A G42X EN ISO 14341-A G46X	E70C-X according to A5.18 or equivalent under A5.28 ER70S-X according to A5.18 or equivalent under A5.28
FCAM	EN ISO 16834-A T42X	E7XT-X according to A5.20 or equivalent under A5.29
Welding Austenitic Stainless Filler Consumables		
Process	**AWS Class**	
SMAW	E307-X according to A5.4	
GMAW	E307T-X according to A5.22 ER307 according to A5.9	
FCAM	307X according to A5.22	

Note: *"X" may stand for one or several characters.*

Considerations regarding the gap

The gap between the adapter's upper strap and the lip must not exceed the values shown below.

Blade Thickness	Maximum Admissible Gap
25 mm	3.5 mm
30 mm	3.5 mm
35 mm	4.2 mm
40 mm	4.7 mm
50 mm	5.3 mm
65 mm	6 mm



Check the existing gap using a feeler gauge, as shown in the figure below.

Blade Thickness	Feeler Gauge Thickness
25 mm	3.5 mm
30 mm	3.5 mm
35 mm	4.2 mm
40 mm	4.7 mm
50 mm	5.3 mm
65 mm	6 mm

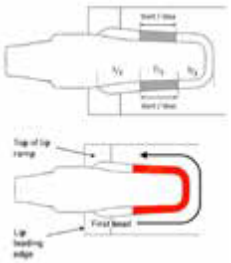
If the feeler gauge goes through the entire upper leg clearance gap, a low carbon sheet metal must be assembled to cover the gap.

Installation procedure

If the lower corner wear cap is to be installed, first refer to the installation instructions for the lower corner wear cap.

1. Remove all mill scale, rust, paint, oil, grease, arc-air slag, and moisture from surfaces within 12.5 mm (0.5 in) of the weld area. The surfaces must be sufficiently clean and free from contaminants that may introduce hydrogen into the weld and cause cracking. Cleaning may be carried out by shot blasting, sand blasting, grinding, or machining. Any porosity, embedded sand, or other defects visible on the weld preparation surfaces must be removed by grinding or arc air gouging.
2. Place the adapter on the lip plate in the desired position from side to side. The bottom leg and bevel angle must be in full contact, as shown in the figure.

3. Preheat the adapter and lip to 150-180°C (302-356°F) within an offset of 100 mm (4 in) all around the weld area. Do not exceed 250°C (482°F).
4. Apply one 25 mm (1.0 in) long tack weld at the root of the weld groove on each side of the top leg, midway between the end of the leg and the trailing edge of the lip bevel.
5. Begin welding the top leg on the start/stop area and weld one pass around the back of the leg.

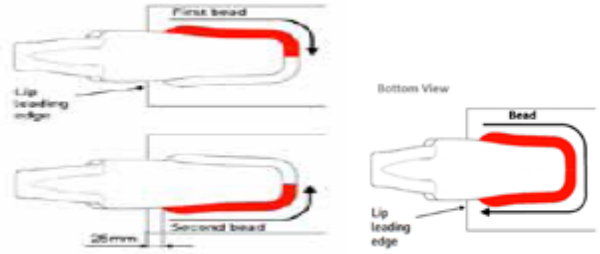


6. On the initially welded side, begin welding at the front of the weld groove and proceed to the starting point of the first bead.

7. Place a similar bead on the opposite side of the top leg. Do not weld within 19-25 mm (0.75-1.00 in) of the lip leading edge.

8. Repeat this sequence (steps 5, 6 and 7) three times. Vary the bead lengths slightly so that the start/stop positions are not located in the same place.
9. Turn the lip over.
10. Bottom leg welding. Begin welding at the front of the weld groove on the bottom leg and weld to the back of the leg. Do not weld within 19-25 mm (0.75 - 1.00 in) of the lip leading edge. After that, begin welding at the front of the groove on the opposite side of the leg, joining the initial bead at the back of the leg Alternatively, welding can be also done by depositing a bead along all the adapter bottom leg as shown in the next figure. Vary the bead

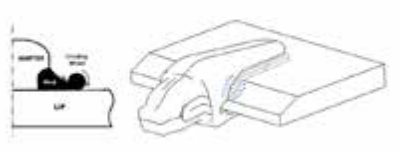
lengths slightly so that the start/stop positions are not in the same place.



11. The leg sizes of the fillet must be flush and less than 3.2 mm (0.13 in) above the edge of the cast weld groove. In some adapter patterns, the weld groove height decreases near the leading edge of the lip. With these adapters, the size of the fillet shall decrease correspondingly in the region.
12. The surfaces of adapter/lip fabrication welds shall be ground smooth 65-75mm (2.50-3.00 in) from the front ends as indicated in the figures below. All welds on both the top and bottom of the lip shall be ground.

13. Grinding shall produce a smooth surface free of roughness and unevenness associated with the weld beads. The toes of the welds shall merge smoothly with the lip and the adapter with a minimum radius of 4 mm (0.16 in). Grinding shall be done using high-speed electric or pneumatic grinders with grinding wheels no larger than 50 mm (2.00 in) in diameter. ANGLE HEAD OR DISC GRINDERS ARE NOT ALLOWED FOR THIS WORK. Grinding shall be done with the perimeter of the wheel and not the face. The grinding direction must be perpendicular to the toes of the welds.
Proper Grinding Directions: Grinding the weld toe radius is facilitated using cone-shaped grinding wheels. For final grinding, the abrasive may be no coarser than 24 grit.

14. For VTS2 adapters from size 56 onwards, it is recommended to perform TIG dressing on both the upper and lower adapter straps. This process uses a GTAW torch to make an autogenous weld pass along the toe of the weld fillet. The welding power supply shall have high-frequency start capability. "Scratch-starting" is not allowed. It is preferable to use a remote foot-pedal current control to ensure proper filling of craters at the ends of the weld beads. Any defects along the weld toes must be corrected by grinding or repair welding before performing the GTAW process. The torch shall be positioned over the weld toe and oriented to produce a smooth weld bead without undercut. The welder shall control the travel speed to obtain a bead width of 4.8-8 mm (0.19-0.31 in). GTAW dressing is recommended along the weld toes on both the top and bottom legs.



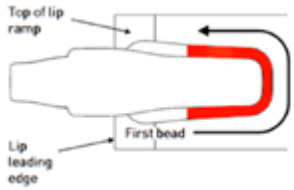
Process	GTAW	
Electrode Type	AWS EWTh-2 (2% Thoriated)	
Electrode Dia	2.4 to 4 mm / 3/32 to 5/32 in.	
Shielding Gas	100% Argon	
Gas Cup Size	13 mm / 0.50 in.	
Gas Flow Rate	9.4 to 14.2 l/minute / 20 to 30 ft^3/hour	
Current Type	Direct	
Polarity	Straight (Electrode Negative)	
Current Range	2.4 mm / 3/32 in.	175 to 250 Amperes
	3.2 mm / 1/8 in.	250 to 300 Amperes
	4.0 mm / 5/32 in.	400 to 500 Amperes
Electrode to	1.6 to 3.2 mm / 1/16 to 1/8 in.	

15. Upon completion of welding, all welds shall be subjected to visual inspection and magnetic particle inspection. Any cracks detected must be cleaned and repaired.

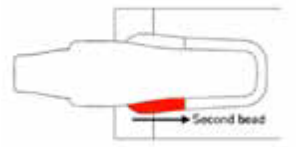
Welding Instructions for Flush Adapter

1. Remove all mill scale, rust, paint, oil, grease, arc-air slag, and moisture from surfaces within 12.5 mm (0.5 in) of the weld area. The surfaces must be sufficiently clean and free from contaminants that may introduce hydrogen into the weld and cause cracking. Cleaning may be carried out by shot blasting, sand blasting, grinding, or machining. Any porosity, embedded sand, or other defects visible on the weld preparation surfaces must be removed by grinding or arc air gouging.
2. Place adapter on lip plate per the desired location from side to side. The leg and bevel angle should be in full contact as shown in the figure:

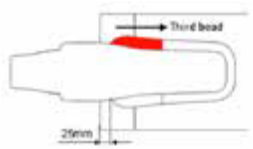
3. Preheat the adapter and lip to 150-180°C (302-356°F) within an offset of 100 mm (4 in) all around the weld area. Do not exceed 250°C (482°F).
4. Apply one 25 mm (1.0 in) long tack weld at the root of the weld groove on each side of the leg, midway between the end of the leg and the trailing edge of the lip bevel.
5. Begin welding at the center of the leg and weld one pass around the back of the leg to the center of the opposite side.



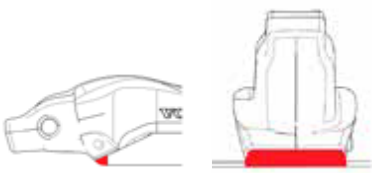
6. Begin at the front of the weld groove and proceed to the starting point of the first bead. Do not weld within 19-25 mm (0.75-1.00 in) of the lip leading edge.



7. Place a similar bead on the opposite side of the top leg.

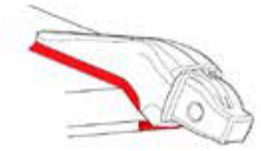


8. Repeat this sequence (steps 5, 6 and 7) three times. Vary the bead lengths slightly so that the start/stop positions are not located in the same place.
9. Turn the lip over.
10. Weld the gap between blunt against the adapter.

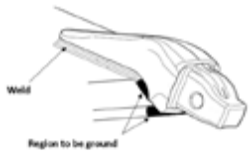


11. Vary the lengths of the beads slightly so that the start/stop positions are not at the same location.

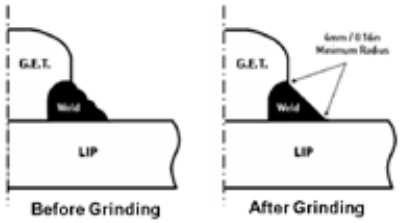
12. If the adapter size requires additional weld layers, turn the lip over and weld three layers according to the sequence for the top leg (steps 5, 6 and 7).
13. The leg sizes of the fillet must be flush and less than 3.2 mm (0.13 in) above the edge of the cast weld groove. In some adapter patterns, the weld groove height decreases near the leading edge of the lip. With these adapters, the size of the fillet shall decrease correspondingly in the region.
14. When welding large adapters, grinding effort can be reduced by carefully positioning the bead starting points near the leading edge. Start each bead slightly behind the bead of the previous layer to produce a rounded weld end.



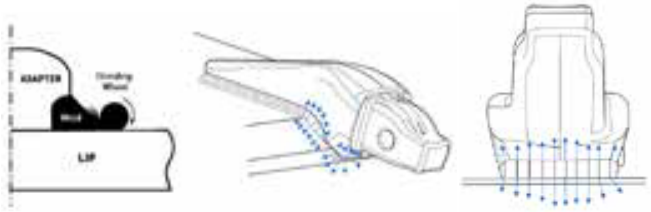
15. The surfaces of adapter/lip fabrication welds shall be ground smooth 65-75 mm (2.50-3.00 in) from the front ends as indicated in the figures below. All welds on both the top and bottom of the lip shall be ground.



16. Grinding shall produce a smooth surface free of roughness and unevenness associated with the weld beads. The toes of the welds shall merge smoothly with the lip and the adapter with a minimum radius of 4 mm (0.16 in). Grinding shall be done using high-speed electric or pneumatic grinders with grinding wheels no larger than 50 mm (2.00 in) in diameter. ANGLE HEAD OR DISC GRINDERS ARE NOT ALLOWED FOR THIS WORK. Grinding shall be done with the perimeter of the wheel and not the face. The grinding direction must be perpendicular to the toes of the welds.

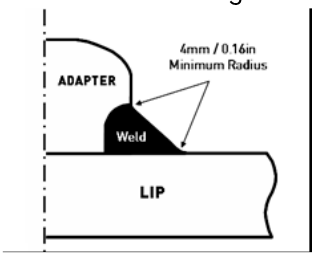


Proper Grinding Directions: Grinding the weld toe radius is facilitated using cone-shaped grinding wheels. For final grinding, the abrasive may be no coarser than 24 grit.



17. On adapters size 41 and above, it is recommended to perform TIG dressing on both the upper and lower adapter straps. This process involves using a GTAW torch to make an autogenous weld pass along the toe of the weld fillet. The welding power supply shall have high-frequency start capability. "Scratch-starting" is not allowed. It is preferable to use a remote foot-pedal current control to ensure proper filling of craters at the ends of the weld beads. Any defects along the weld toes must be corrected by grinding or repair welding

before performing the GTAW process. The torch shall be positioned over the weld toe and oriented to produce a smooth weld bead without undercut. The welder shall control the travel speed to obtain a bead width of 4.8-8 mm (0.19-0.31 in). GTAW dressing is recommended along the weld toes on the leg.

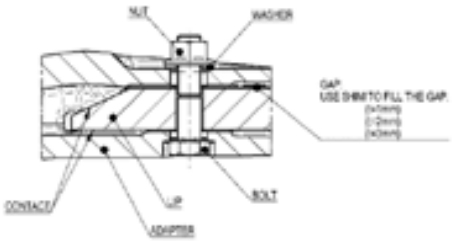


18. Upon completion of welding, all welds shall be subjected to visual inspection and magnetic particle inspection. Any cracks detected must be cleaned and repaired.

Bolt-On Instructions for Bolt-On Adapter for Wheel Loaders

Installation procedure

1. Place the Bolt-On Adapter in its designated position on the lip, aligned with the bolt holes. The adapter must be in contact with both the blade edge and the lip bevel. Use shims to fill any gap if necessary. If the gap between the adapter and the blade exceeds 1 mm, a low-carbon steel shim must be installed to cover the gap.



2. Secure the Bolt-On Adapter using the specified bolts. Ensure that the correct tightening torque is applied according to the manufacturer's specifications. Tighten the rear bolt first and the front bolt last. The correct tightening sequence is important, as the front bolt may loosen if the rear bolt is not tightened to its final torque first.

3. **Important:** Retorque the bolts after approximately 4 hours of service.
4. Periodically check the bolt torque. Insufficient bolt torque can result in adapter failure, particularly in heavy-duty applications.

Tightening Torque for Screws in Property Class 8.8	
Screw Dimension	**Tightening Torque (N·m)**
M16	220 ± 35
M20	430 ± 70
M24	740 ± 120
1"	772 ± 125
Tightening Torque for Screws in Property Class 10.9	
Screw Dimension	**Tightening Torque (N·m)**
M16	275 ± 45
M20	540 ± 90
M24	900 ± 140
1"	1090 ± 130

Welding Instructions for Adapters for Excavators

Welding type

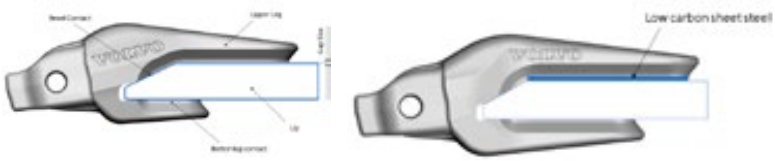
The following is a quick reference to consumables that can be used to weld Volvo products. For complete welding procedures, see the section *General Welding Instructions*.

Welding Unalloyed & Low Alloyed Filler Consumables		
Process	**EN Class**	**AWS Class**
SMAW	EN ISO 2560-A E42X	E70X according to A5.1 or equivalent under A5.5
GMAW	EN ISO 14341-A G42X EN ISO 14341-A G46X	E70C-X according to A5.18 or equivalent under A5.28 ER70S-X according to A5.18 or equivalent under A5.28
FCAM	EN ISO 16834-A T42X	E7XT-X according to A5.20 or equivalent under A5.29
Welding Austenitic Stainless Filler Consumables		
Process	**AWS Class**	
SMAW	E307-X according to A5.4	
GMAW	E307T-X according to A5.22 ER307 according to A5.9	
FCAM	307X according to A5.22	

Note: *"X" may stand for one or several characters.*

Considerations regarding the gap

The gap between the adapter's upper strap and the lip must not exceed 2 mm (0.08 in). If the upper clearance gap between the adapter and the blade exceeds this value, a low-carbon steel shim must be installed to cover the gap.



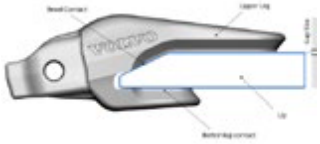
Alternatively, the upper leg adapter may be built up by welding to achieve acceptable dimensions as follows:

1. Clean all surfaces of any contaminants.
2. Preheat the adapter leg to 150°C (300°F).
3. Deposit stringer bead(s) on the adapter landing to reduce the gap.
4. Grind the weld to provide a smooth transition in the weld groove area.
5. Check the adapter fit on the lip. Grind or weld as required to eliminate the gap. If the spacing between the legs is too narrow to fit the lip, grinding of the interfering upper leg lands is permitted.

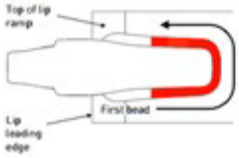
If more than 3.2 mm (0.13 in) is removed from the weld preparations of the upper leg adapter, the weld preparation must be widened to restore the original "J" groove weld size.

Installation procedure

1. Remove all mill scale, rust, paint, oil, grease, arc-air slag, and moisture from surfaces within 12.5 mm (0.5 in) of the weld area. The surfaces must be sufficiently clean and free from contaminants that may introduce hydrogen into the weld and cause cracking. Cleaning may be carried out by shot blasting, sand blasting, grinding, or machining. Any porosity, embedded sand, or other defects visible on the weld preparation surfaces must be removed by grinding or arc air gouging.
2. Place the adapter on the lip plate in the desired position from side to side. The bottom leg and bevel angle must be in full contact, as shown in the figure.



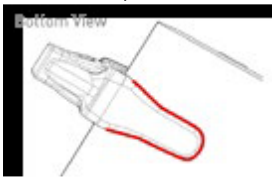
3. Preheat the adapter and lip to 150-180°C (302-356°F) within an offset of 100 mm (4 in) all around the weld area. Do not exceed 250°C (482°F).
4. Apply one 25 mm (1.0 in) long tack weld at the root of the weld groove on each side of the top leg, midway between the end of the leg and the trailing edge of the lip bevel.
5. Begin welding at the center of top leg and weld one pass around the back of the leg to the center of the opposite side.



6. On the initially welded side, begin welding at the front of the weld groove and proceed to the starting point of the first bead. Do not weld within 19-25 mm (0.75-1.00 in) of the lip leading edge.

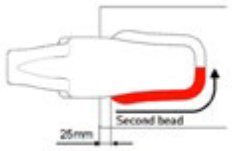
7. Place a similar bead on the opposite side of the top leg.

8. Repeat this sequence (steps 5, 6 and 7) three times. Vary the bead lengths slightly so that the start/stop positions are not located in the same place.
9. Turn the lip over.

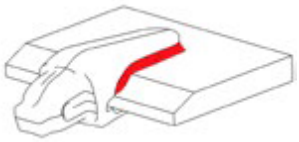


10. Begin welding at the front of the weld groove on the bottom leg and weld to the back of the leg. Do not weld within 19-25 mm (0.75-1.00 in) to the lip leading edge.

11. Begin welding at the front of the groove on the opposite side of the leg, joining the initial bead at the back of the leg.

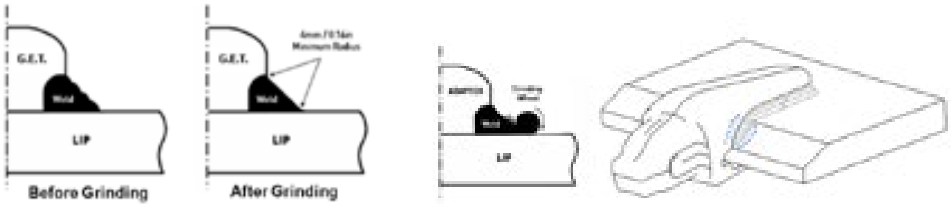


12. Repeat this sequence (steps 10 and 11) three times. Vary the lengths of the beads slightly so that the start/stop positions are not at the same location.
13. If the adapter size requires additional weld layers, turn the lip over and weld three layers according to the sequence for the top leg (steps 5, 6 and 7).
14. Turn the lip over again and apply three layers according to the sequence for the bottom leg (steps 10 and 11).
15. The leg sizes of the fillet must be flush and less than 3.2 mm (0.13 in) above the edge of the cast weld groove. In some adapter patterns, the weld groove height decreases near the leading edge of the lip. With these adapters, the size of the fillet shall decrease correspondingly in the region.
16. When welding large adapters, grinding effort can be reduced by carefully positioning the bead starting points near the leading edge. Start each bead slightly behind the bead of the previous layer to produce a rounded weld end.



17. The surfaces of adapter/lip fabrication welds shall be ground smooth 65-75mm (2.50-3.00 in) from the front ends as indicated in the figure below. All welds on both the top and bottom of the lip shall be ground.

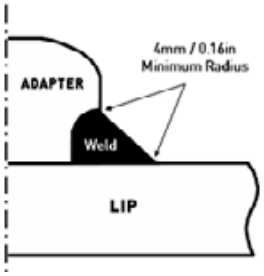
18. Grinding shall produce a smooth surface free of roughness and unevenness associated with the weld beads. The toes of the welds shall merge smoothly with the lip and the adapter with a minimum radius of 4 mm (0.16 in). Grinding shall be done using high-speed electric or pneumatic grinders with grinding wheels no larger than 50 mm (2.00 in) in diameter. ANGLE HEAD OR DISC GRINDERS ARE NOT ALLOWED FOR THIS WORK. Grinding shall be done with the perimeter of the wheel and not the face. The grinding direction must be perpendicular to the toes of the welds.
Proper Grinding Directions: Grinding the weld toe radius is facilitated using cone-shaped grinding wheels. For final grinding, the abrasive may be no coarser than 24 grit.



19. On VTS2 adapters sizes 56 and 66 only, it is recommended to perform TIG dressing on both the upper and lower adapter straps. This process uses a GTAW torch to make an autogenous weld pass along the toe of the weld fillet. The welding power supply shall have high-frequency start capability. "Scratch-starting" is not allowed. It is preferable to use a remote

foot-pedal current control to ensure proper filling of craters at the ends of the weld beads. Any defects along the weld toes must be corrected by grinding or repair welding before performing the GTAW process. The torch shall be positioned over the weld toe and oriented to produce a smooth weld bead without undercut. The welder shall control the travel speed to obtain a bead width of 4.8-8 mm (0.19-0.31 in). GTAW dressing is recommended along the weld toes on both the top and bottom legs.

Process	**GTAW**	
Electrode Type	AWS EWTh-2 (2% Thoriated)	
Electrode Dia	2.4 to 4 mm / 3/32 to 5/32 in.	
Shielding Gas	100% Argon	
Gas Cup Size	13 mm / 0.50 in.	
Gas Flow Rate	9.4 to 14.2 l/minute / 20 to 30 ft³/hour	
Current Type	Direct	
Polarity	Straight (Electrode Negative)	
Current Range	2.4 mm / 3/32 in.	175 to 250 Amperes
	3.2 mm / 1/8 in.	250 to 300 Amperes
	4.0 mm / 5/32 in.	400 to 500 Amperes
Electrode to	1.6 to 3.2 mm / 1/16 to 1/8 in.	



20. Upon completion of welding, all welds shall be subjected to visual inspection and magnetic particle inspection. Any cracks detected must be cleaned and repaired.

Welding Instructions for Segments

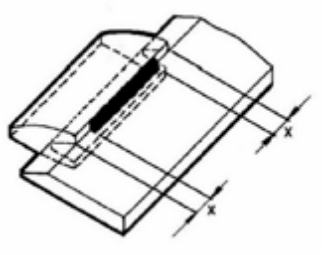
Lip Shrouds

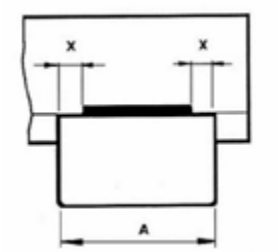
Welding must be carried out strictly according to the following instructions to avoid lip failure. Use basic electrodes such as AWS E 7016 E 7018, NF E 434/3B, DIN 1913 E 5143 B10 or E 5154B 102G.

1. Position the shrouds on the lip so that the shroud bevel edge rests on the lip bevel edge.
2. Tack the shrouds to the lip.
3. Preheat the shrouds and lip to 95°C. In cold conditions where the ambient temperature is below 5°C, preheat to 150-175°C.
4. Start welding at a minimum distance from the edge of the shroud. The minimum distance **X** depends on the shroud width **A**:

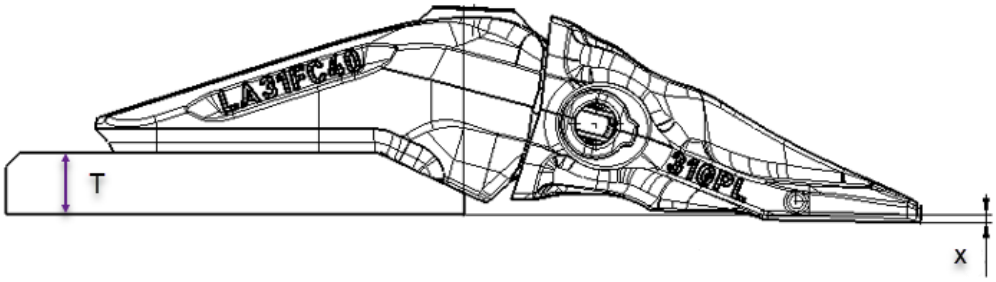
Shroud width (A)	Minimum distance (X)
120 to 195 mm	20 mm
195 to 290 mm	30 mm

   The weld strip must maintain the same thickness throughout its entire length. Weld strips must be applied on both the upper and lower sides of the shroud.
5. Grind the ends of the weld strips to avoid stress concentrations.



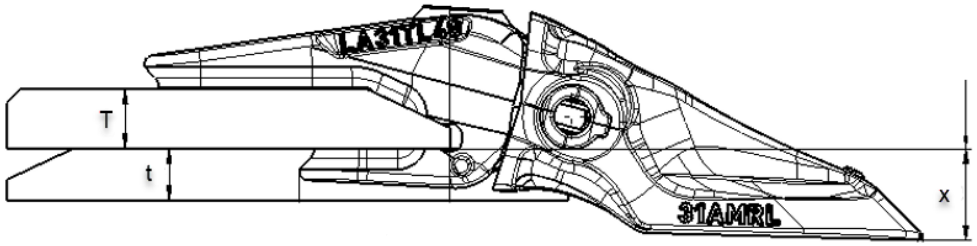


Wheel Loader Theoretical Teeth Undercut



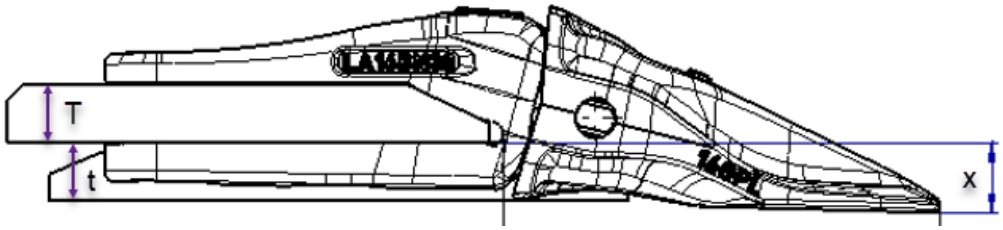
Flush Adapters

Adapter size	Adapter type	Tooth type	Bucket lip thickness (T)	Undercut (X)
Size 11	LA11FC25	11GPL	25 mm	2 mm
Size 16	LA16FC30-35	16GPL	30 mm	7 mm
Size 16	LA16FC30-35	16GPL	35 mm	2 mm
Size 16	LA16FC30-35	16AML	30 mm	17 mm
Size 16	LA16FC30-35	16AML	35 mm	12 mm
Size 16	LA16FC30-35	16AMRL	30 mm	20 mm
Size 16	LA16FC30-35	16AMRL	35 mm	15 mm
Size 21	LA21FC40	21GPL	40 mm	5 mm
Size 21	LA21FC40	21AML	40 mm	15 mm
Size 21	LA21FC40	21AMRL	40 mm	21 mm
Size 31	LA31FC40	31GPL	40 mm	4 mm
Size 31	LA31FC40	31AML	40 mm	19 mm
Size 31	LA31FC40	31AMRL	40 mm	23 mm



Top Leg Adapters

Adapter size	Adapter type	Tooth type	Bucket lip thickness (T)	Segment thickness (t)	Undercut (X)	Undercut vs. segment
Size 11	UA11TL25	11GPL	25 mm	25 mm	29 mm	4 mm
Size 16	LA16TL30	16GPL	30 mm	30 mm	30 mm	0 mm
Size 16	LA16TL30	16AML	30 mm	30 mm	40 mm	10 mm
Size 16	LA16TL30	16AMRL	30 mm	30 mm	43 mm	13 mm
Size 16	LA16TL35	16GPL	35 mm	30 mm	30 mm	0 mm
Size 16	LA16TL35	16AML	35 mm	30 mm	40 mm	10 mm
Size 16	LA16TL35	16AMRL	35 mm	30 mm	43 mm	13 mm
Size 21	LA21TL40	21GPL	40 mm	35 mm	35 mm	0 mm
Size 21	LA21TL40	21AML	40 mm	35 mm	46 mm	11 mm
Size 21	LA21TL40	21AMRL	40 mm	35 mm	49 mm	14 mm
Size 31	LA31TL40	31GPL	40 mm	35 mm	42 mm	7 mm
Size 31	LA31TL40	31AML	40 mm	35 mm	56 mm	21 mm
Size 31	LA31TL40	31AMRL	40 mm	35 mm	61 mm	26 mm
Size 41	LA41TL40	41GPL	40 mm	35 mm	53 mm	18 mm
Size 41	LA41TL40	41GPL	40 mm	45 mm	53 mm	8 mm
Size 41	LA41TL40	41AMRL	40 mm	35 mm	76 mm	41 mm
Size 41	LA41TL40	41AMRL	40 mm	45 mm	76 mm	31 mm
Size 41	LA41TL50	41GPL	50 mm	48 mm	53 mm	5 mm
Size 41	LA41TL50	41AMRL	50 mm	48 mm	76 mm	28 mm
Size 41	LA41TL50	41GPL	50 mm	45 mm	53 mm	8 mm
Size 41	LA41TL50	41AMRL	50 mm	45 mm	76 mm	31 mm
Size 41	LA41TL50	41GPL	50 mm	40 mm	53 mm	13 mm
Size 41	LA41TL50	41AMRL	50 mm	40 mm	76 mm	36 mm
Size 56	LA56TL65	56AMRL	65 mm	50 mm	73 mm	23 mm
Size 56	LA56TL65	56AMRL	65 mm	48 mm	69 mm	21 mm
Size 65	LA65TL65	66AMRL	65 mm	50 mm	76 mm	26 mm
Size 65	LA65TL65	66AMRL	65 mm	48 mm	66 mm	18 mm



Bolt-On Adapters

Adapter size	Adapter type	Tooth type	Bucket lip thickness (T)	Segment thickness (t)	Undercut (X)	Undercut vs. segment
Size 11	LA11BN25	11GPL	25 mm	20 mm	34 mm	9 mm
Size 16	LA16BN30	16GPL	30 mm	25 mm	37 mm	12 mm
Size 16	LA16BN30	16AML	30 mm	25 mm	45 mm	20 mm
Size 16	LA16BN30	16AMRL	30 mm	25 mm	48 mm	23 mm
Size 16	LA16BN35	16GPL	35 mm	25 mm	37 mm	12 mm
Size 16	LA16BN35	16AML	35 mm	25 mm	47 mm	22 mm
Size 16	LA16BN35	16AMRL	35 mm	25 mm	50 mm	25 mm
Size 21	LA21BN40	21GPL	40 mm	30 mm	34 mm	4 mm
Size 21	LA21BN40	21AML	40 mm	30 mm	45 mm	15 mm
Size 21	LA21BN40	21AMRL	40 mm	30 mm	49 mm	19 mm
Size 31	LA31BN40	31GPL	40 mm	30 mm	39 mm	9 mm
Size 31	LA31BN40	31AML	40 mm	30 mm	53 mm	23 mm
Size 31	LA31BN40	31AMRL	40 mm	30 mm	62 mm	32 mm

Step by Step Instructions on Changing Teeth

Step 1

If the flange on the pin is located on the right-hand side of the tooth, start removing the tooth from the right. This will give more space for the tool.

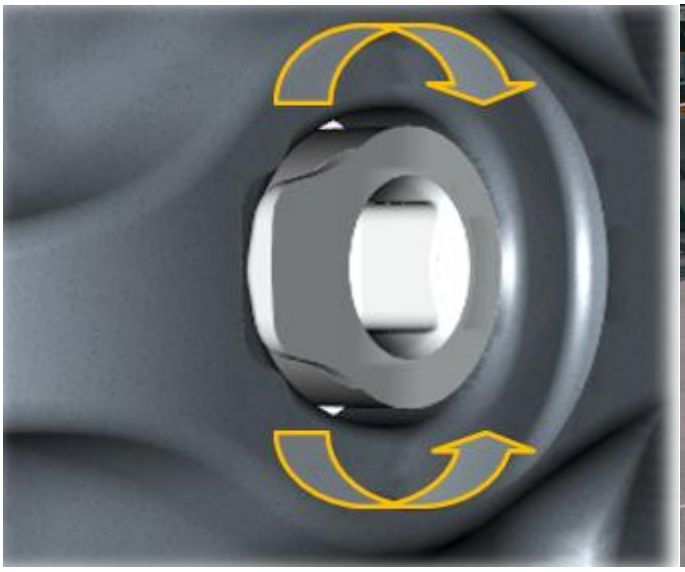
Step 2

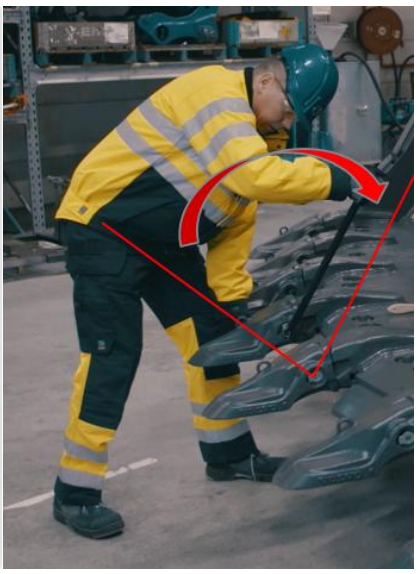
Clean the pin socket.

Step 3

Take the tool and put it into the pin socket.

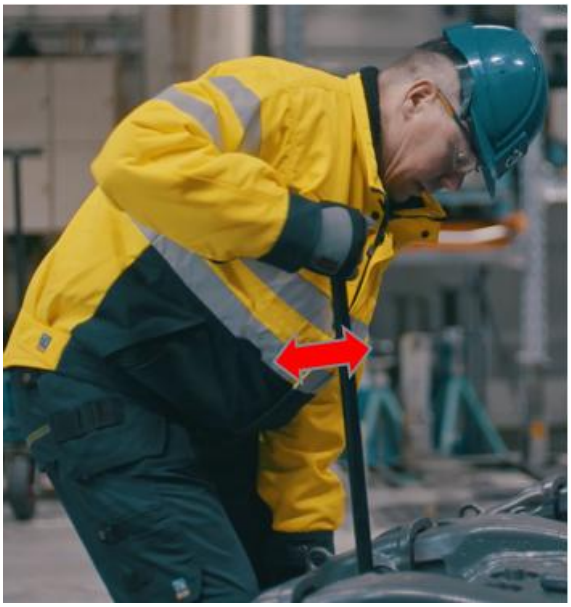
Step 4





Turn the tool approx. 90 degrees.

Step 5



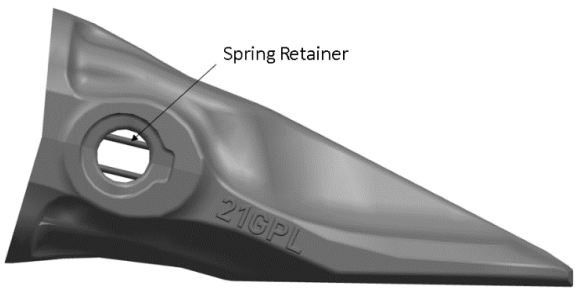
Start to twist the tool back and forth, with an outward motion, until the pin is fully extracted.

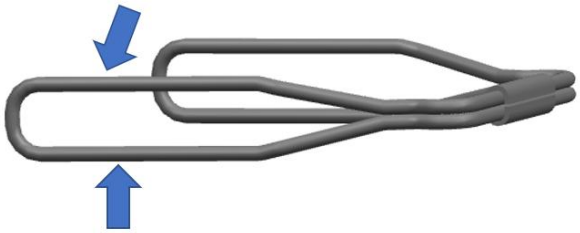
Step 6

Remove the tooth.

Visual Inspection Step for Retainer

If you remove a tooth (e.g. for inspection or changing position) always check the retainer so it's not bent or damaged.
This is not necessary if you are planning to replace the tooth since new teeth always include a new retainer mounted.





Normally there is no need to change the retainer. However, one should check for plastic deformation of the retainer. If there are deformations, replace the retainer.

Step 8

Clean adapter from dirt.

Step 9

Place the tooth on the adapter.

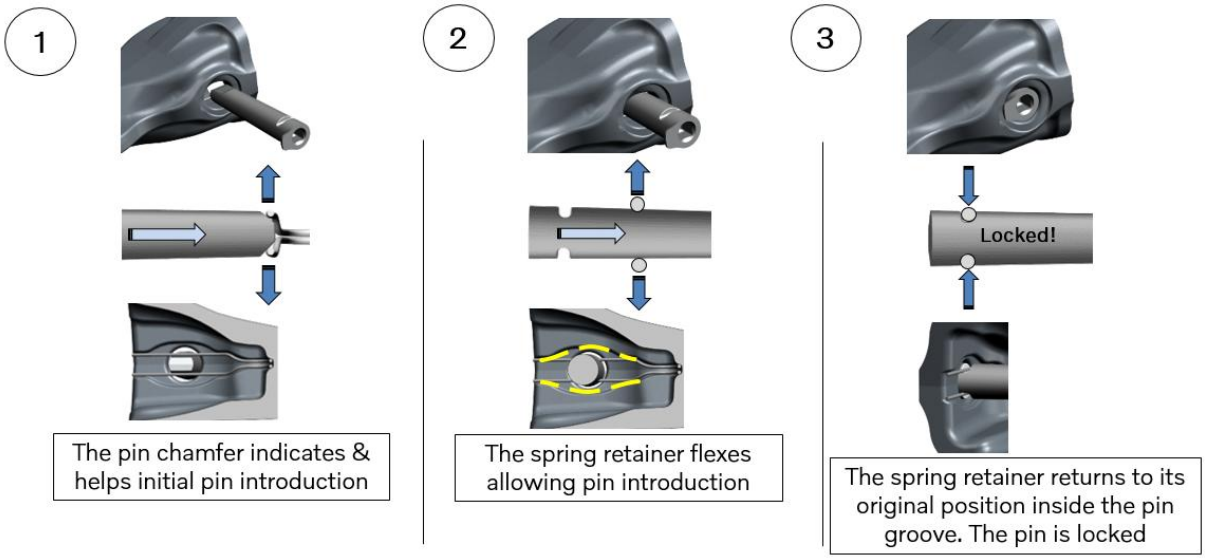
Step 10

Place the locking pin in position and attach the tool. Check so the pin flange is aligned with the adapter. You can attach the pin from both left and the right side.

Step 11

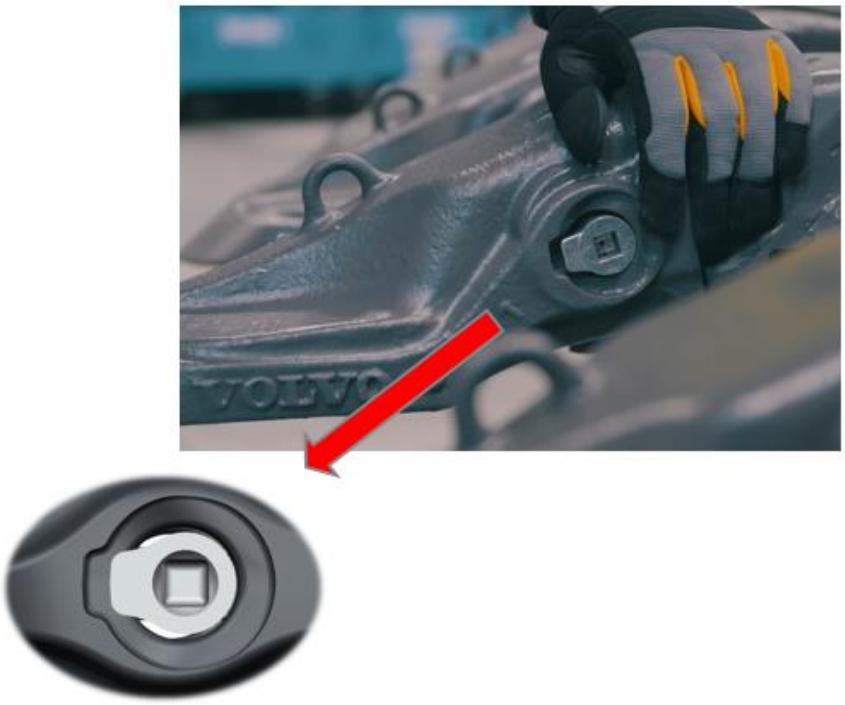
Attach the tool in the pin socket and start to twist and push the pin into position.

Step 12



When you hear a CLICK sound, the pin is mounted correctly.

Step 13



Check so the pin flange is aligned with the adapter.

Step 14

Always double check so the tooth is secured to the adapter.

Now you are done!

VTS1 to VTS2 Conversion Table for Excavators

Model	BOF (kN)	VTS1 Part No. (GPE)	VTS1 Size	Edge Thickness	VTS2 Part No. (GPE)	VTS2 Size	BOF (kN)
EC140 STD/HD	96.6	VOE14523551	15	30	VOE14732376	16	128
ECR145 STD	96.6	VOE14523551	15	30	VOE14732376	16	128
EC160 STD	121.9	VOE14523551	15	30	VOE14732376	16	128
EC160 HD	121.9	VOE14523551	15	40	VOE14732381	21	128
EC180 STD	121.9	VOE14523551	15	30	VOE14732376	16	128
EC180 HD	121.9	VOE14523551	15	40	VOE14732381	21	128
EC220 STD	153	VOE12523655	20	40	VOE14732381	21	160
EC220 HD	174 (ME)	VOE12523655	20	40	VOE14732381	21	160
ECR235 HD	149,4	VOE12523655	20	40	VOE14732381	21	160
EC250 STD	186	VOE14523552	30	40	VOE14732386	31	195
EC250 HD	186	VOE14523552	30	40	VOE14732391	41	195
EC300 STD	205	VOE14523553	40	50	VOE14732391	41	230
EC300 HD	205	VOE14524191	55	50	VOE14732396	56	230
ECR305 STD	205	VOE14524191	55	50	VOE14732396	56	230
EC340 STD	243,4 (ME)	VOE14524191	55	50	VOE14732396	56	279
EC340 HD	243,4 (ME)	VOE14524191	55	50	VOE14732395	66	279
EC350 STD	265,4 (ME)	VOE14524191	55	50	VOE14732396	56	279
EC350 HD	265,4 (ME)	VOE14526510	65	50	VOE14732401	66	279
EC380 STD	265,4 (ME)	VOE14524191	55	50	VOE14732396	56	279
EC380 HD	265,4 (ME)	VOE14526510	65	50	VOE14732401/ VOE14732402 (ARXE)	66	279
EC480 STD	311 (ME)	VOE14526510	65	60	VOE14732401	66	327
EC480 HD	311 (ME)	VOE14526511	80	70	VOE1473404	81	327
EC750 STD	389 (ME)	VOE14624281 (ARXE)	80	70	VOE14732404/ VOE14731779 (ARXE)	81	410
EC750 HD	389 (ME)	VOE14624281 (ARXE)	80	70	VOE14732425 (ARXE)	126	410
EC950 STD/HD	478 (ME)	VOE14624421	125	80	VOE14732425 (ARXE)	126	550

VTS1 to VTS2 Conversion Table for Wheel Loaders

Model	BOF (kN)	VTS1 Part No. (GPL)	Adapter Part No. (TL)	VTS1 Size	Edge thickness	VTS2 Part No. (GPL)	Adapter Part No. (TL)	VTS2 Size	BOF (kN)
L60	95	VOE11417118	VOE11417190	10	25	VOE17491940	VOE17491921	11	144
L70	110	VOE11417118	VOE11417190	10	25	VOE17491940	VOE17491921	11	144
L90	141	VOE11417125	VOE11417095	15	30	VOE17491941	VOE17491923	16	211
L110-120	194	VOE11417125	VOE11417098	15	35	VOE17491941	VOE17491924	16	211
L110-120 HD	194	VOE11417128	VOE15052849	20	35	VOE17491944	VOE17491925	21	296
L150	208	VOE11417128	VOE11417106	20	40	VOE17491944	VOE17491927	21	296
L180	247	VOE11417128	VOE11417106	20	40	VOE17491944	VOE17491927	21	296
L150 HD	208	VOE11417134	VOE11417109	30	40	VOE17491947	VOE17491929	31	361
L180 HD	247	VOE11417134	VOE11417109	30	40	VOE17491947	VOE17491929	31	361
L220	264	VOE11417134	VOE11417109	30	40	VOE17491947	VOE17491929	31	361
L220 HD	264	VOE15174417	VOE11438928	40	40	VOE17491950	VOE17491930	41	426
L250-L260	343	VOE15174417	VOE11438928	40	40	VOE17491950	VOE17491930	41	426
L250-L260 HD	343	VOE15174417	VOE11438929	40	50	VOE17491952 (AMRL)		56	516
L350	503	VOE11417137	VOE11417116	55	65	VOE17491953 (AMRL)	VOE17491931	66	605
L350 HD	503	VOE17214480 (AMRL)	VOE17214479	65	65			81	759

VTS2 Special Applications Locking Retainer

The VTS2 Special Applications Locking Retainer is an aftermarket solution developed for applications where the standard VTS2 locking system may be exposed to a combination of low material compaction around the tooth fitting area and high impact loads. Under these conditions, the special retainer helps maintain locking performance and reduce the risk of tooth loss.
NOTE! Always consult with the Product Management Department at VOLVO CE before starting to use this type of retainer.

When Should It Be Used?

The standard VTS2 locking system remains the recommended solution for most applications. The Special Applications Locking Retainer should only be used in specific operating conditions where low compaction and high impacts occur simultaneously, such as:

- Muddy applications
- Wet or rainy conditions
- Low-abrasion materials
- Applications with limited packaging around the adapter and tooth
- High-impact operating environments

Important: The Special Applications Locking Retainer is intended for specific applications only and is not required for normal operating conditions. The standard VTS2 locking system remains the preferred solution for most customers and applications.

Benefits

- Optimized for demanding, low-compaction applications
- Helps improve retainer performance in challenging conditions
- Reduces the risk of unplanned tooth loss
- Fully compatible with the current VTS2 locking system
- Easy replacement using standard service procedures
- Available for teeth sizes 41, 56, 66, 81 and 126.

Part Numbers for Special Retainer and corresponding Special Pin

Size	Component	Reference	Standard Part No.	Special Part No.
41	Retainer	41R	17493104	54836776
41	Pin	41P	17473104	54836782
56	Retainer	56R	17493105	54836786
56	Pin	56P	17473105	54836787
66	Retainer	66R	17493106	54837118
66	Pin	66P	17473106	54837124
81	Retainer	81R	14740816	54831349
81	Pin	81P	14740815	54831348
126	Retainer	126R	14740818	54831346
126	Pin	126P	14740817	54831345