VOLVO

Volvo Tooth System Technical Handbook.

New Generation

Edition: 1.1

Editor:

Håkan Karlsson, Product Manager Wear Parts

Phone: +46735585764

Mail: hakan.g.karlsson@volvo.com

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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 area or region.

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

Attention, 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 globes
- Steel toed 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; Connect both ends to lifting points, if available.

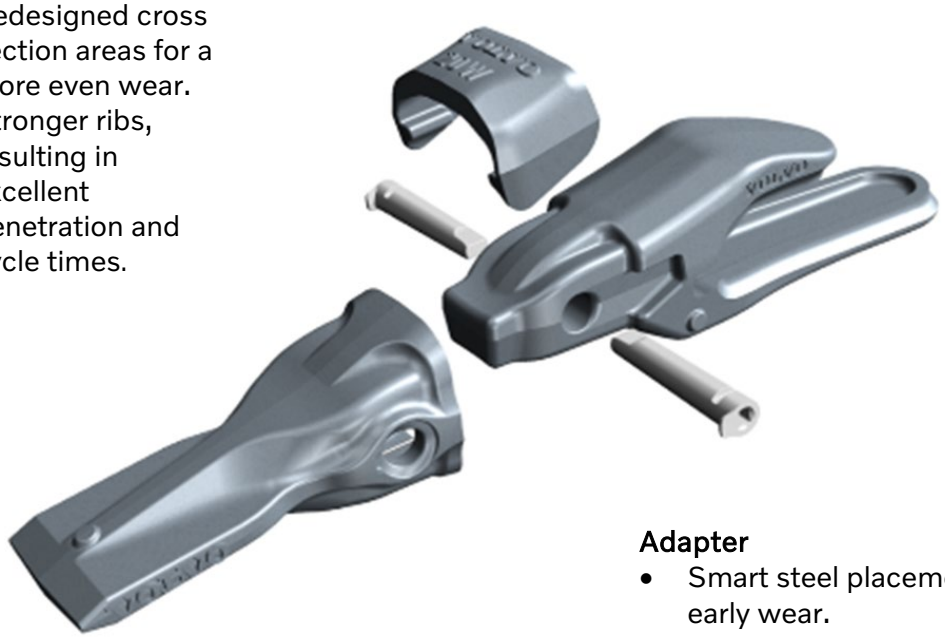
When handling heavy loads (+ 25 kg), use a sling truck according to ISO 7531: 1987.

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.
- Improved behavior against overloads.
- Reusable pin, lockable from both sides (size 21 up to 126).

Locking System

- Reusable pin, lockable from both sides (size 21 up to 126).
- Steel retainer pre-mounted into the tooth box
- The spring retainer and the tooth are assembled and supplied together
- No spring replacement is necessary during the tooth life
- The locking pin is made by steel
- No need of a separate, “Hot slag” pin or retainer.
- Only one looking system for both normal use and Hot–slag use.

Modern design based on the best available experience.

- The new generation Volvo Tooth System is developed by Volvo, for Volvo.
- The adapter and tooth are specifically matched to the size and model of your Volvo machine, helping to deliver maximum performance, breakout force and uptime.
- From the correct tooth size and specification to the optimal balance of wear protection and weight, every detail has been precision engineered to unlock the full potential of your Volvo.
- A genuinely hammerless solution with the new Volvo locking system you can install or change teeth in minutes, helping to minimize downtime.
- The retainer and the tooth are assembled and supplied together, and no spring retainer replacement is required during the tooth life.
- The smart system works with a reusable locking pin, which can be mounted from both sides.
- A genuinely hammerless solution reducing the risk of injury. Only a ½" and/or 3/8" square male tool needed.

Aimed at Volvo's larger Excavators and Wheel Loaders.

- Volvo Wheel Loaders between L60 to L350.
- Volvo Excavators from 14-ton capacity up to its largest 95-ton machine.

Excavators

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, providing maximum penetration capability.

Can be used in combination with Twin Pick tooth. Long service life.

Designation: PPC / PPE

Twin Pick Point Tooth:

The perfect choice for extremely compact material, such as hard clay and frozen ground, providing 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:

Protecting adapter.

Designation: W

Locking Pin:

Designation: P

Retainer:

Retainer as spare part.

Include in the tooth.

Designation: R

Wheel Loaders

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:

Retainer as spare part.

Include in the tooth.

Designation: R

Designations

Wheel loader example:

Tooth for a wheel loader. **16 GPL**
16 = size of tooth.
GP = type of tooth. In this case, General Purpose.
L = Loader.

Adapter for a wheel loader. **LA 21 FC 40**
LA = Loader adapter.
21 = size of adapter.
FC = type of adapter. In this case, flush mounted.
40 = thickness of bucket cutting edge.

Excavators example:

Tooth for an excavator. **16 GPE**
16 = size of tooth.
GP = type of tooth. In this case, General Purpose.
E = excavator.

Adapter for an excavator. **EA 21 BL 40**
EA = excavator adapter.
21 = size of adapter.
BL = type of adapter. In this case, bottom leg 1 1/2 (long bottom leg).
40 = thickness of bucket cutting edge.

When is it time to change teeth?

Inspection and control 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 (A).
- 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 (B).
- Thickness of the tooth box (C): Use thickness gauge.

Visual control

- Visual inspection of the whole tooth in search of holes sign of non-uniform wearing.

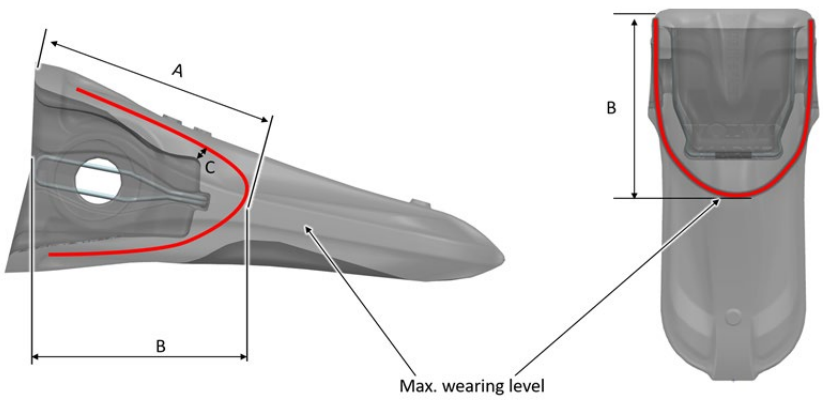
Cracks control

- In case of cracks detection, 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

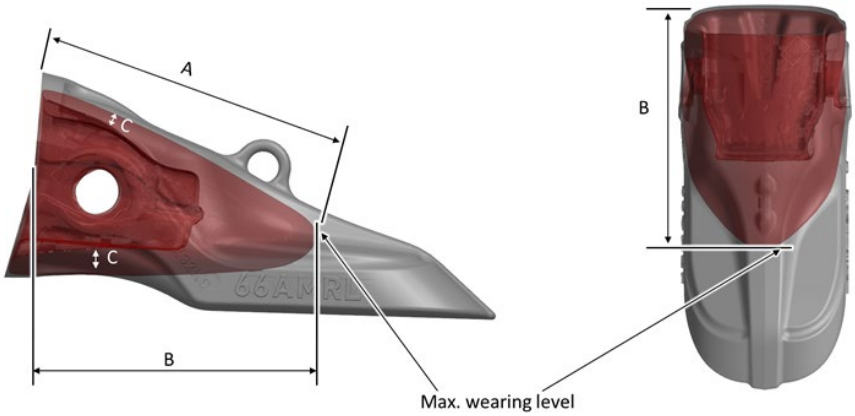
Table A. Dimensions of max. wearing on VTS-II teeth



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 max. wearing on VTS-II teeth



Locking pin:

Visual control

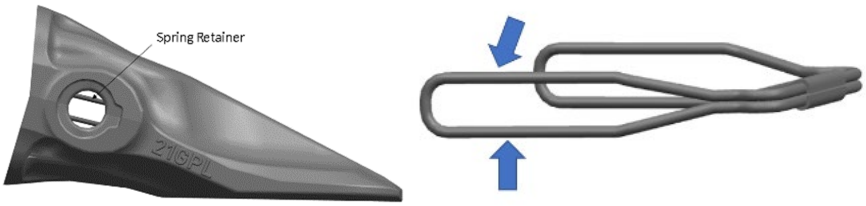
- The absence of deformation or wear at the ends of the pin.
- The absence of breakages, cracks or wearing on the pin ramp.
- The absence of longitudinal deformation.

The replacement of the pin must occur when one or more of the previous requirements are met.

Retainer:

Visual control

- Normally there are no need of changing the retainer.
- Check for plastic deformation at the retainer, if any, change it by a new one.
- The retainer is available as spare part – good to have in case of...



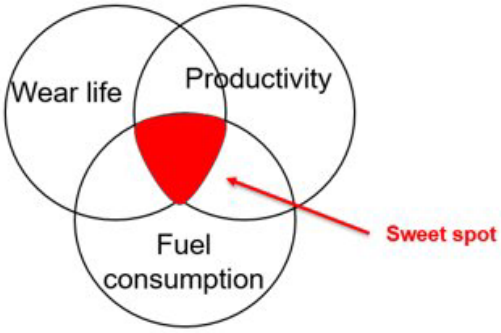
Wear life – how to measure and compare?

To compare a tooth system correctly you cannot compare only wear life.

The recording data to be controlled must be:

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

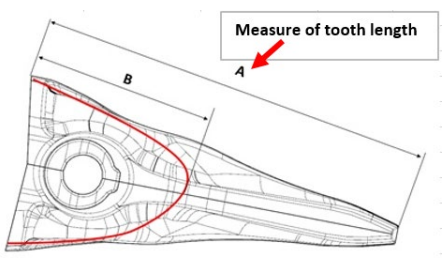
If all these variables are not included and studied together, the comparison is not real and not valid, and in any case, without all of this, we can't know which system has the best behavior.



The only way to perform a correct and trustful comparison is to work:

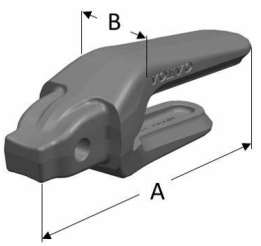
- In the same place
- With the same machine
- With equal buckets and configuration
- Same driver (if possible)
- Use a minimum of 5 sets of teeth

	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									

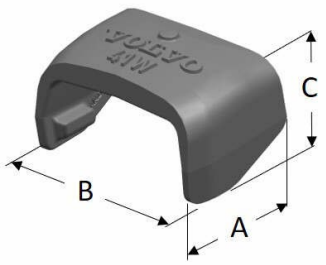


Even best wear life does not mean necessarily the best system.
Correct tooth gives the lowest fuel consumption and highest productivity.

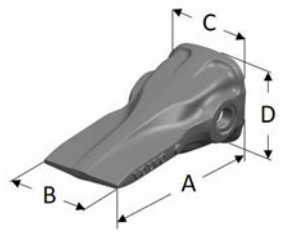
Excavators – Dimensions and Weight Teeth & Adapter



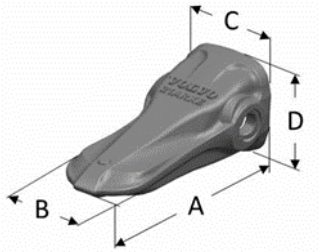
Adapters	Designation	Part No.	Edge thickness (mm)	Edge angle (mm)	A (mm)	B (mm)	Weight (kg)
	EA11TL25	VOE 17491921	25	30	267	91	4,5
	EA11TL30	VOE 14744545	30	30	256	91	4,4
	EA16TL30	VOE 14727403	30	30	299	104,2	6,5
	EA21TL40	VOE 14727405	40	30	344	112	9,8
	EA31TL40	VOE 14727406	40	30	377	123	12,1
Adapters	**Designation**	**Part No.**	**Edge thickness (mm)**	**Edge angle (mm)**	**A (mm)**	**B (mm)**	**Weight (kg)**
	EA41TLW40	VOE 14727409	40	30	436	115	18,9
	EA41TLW50	VOE 14732187	50	30	436	115	18,8
	EA56TLW50	VOE 14732190	50	30	479	132	25,4
	EA66TLW50	VOE 14732191	50	30	536	157	36,5
	EA66TLW60	VOE 14732192	60	30	536	157	36,5
	EA81TLW80	VOE 14732193	80	30	578	163	46,7
	EA126TLW90	VOE 14732194	90	30	670	193	76
	EA126TLW100	VOE 14732375	100	30	670	193	75



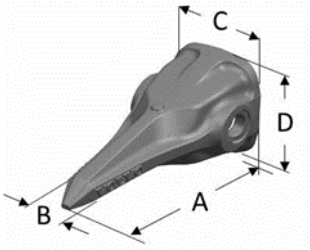
Wear cap	Designation	Part No	A (mm)	B (mm)	C (mm)		Weight (kg)
	41W	VOE 14736109	88	136	86		2
	56W	VOE 14736110	93	152	94		2,2
	66W	VOE 14736111	103	177	100		3,5
	81W	VOE 14736112	109	192	107		4
	126W	VOE 14736113	127	222	134		6,4



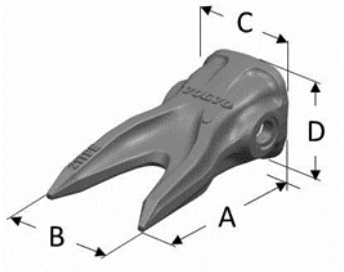
Teeth	Designation	Part No.	A (mm)	B (mm)	C (mm)	D (mm)	Weight (kg)
	11GPE	VOE 14744546	200	70	93	86	2,5
	16GPE	VOE 14732376	224	80	109	102	4,1
	21GPE	VOE 14732381	255	105	116	111	5,6
	31GPE	VOE 14732386	268	113	134	123	7,5
	41GPE	VOE 14732391	292	126	135	133	9,6
	56GPE	VOE 14732396	320	137	164	147	13
	66GPE	VOE 14732401	348	144	177	167	16,5
	81GPE	VOE 14732404	381	165	197	175	22,7



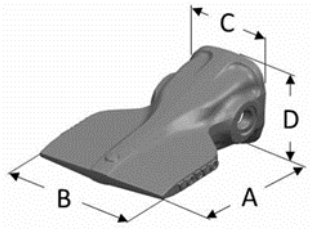
Teeth	Designation	Part No.	A (mm)	B (mm)	C (mm)	D (mm)	Weight (kg)
	11ARXE	VOE 14744547	212	73	93	86	3,1
	16ARXE	VOE 14732377	236	84	109	102	4,5
	21ARXE	VOE 14732382	269	95	116	111	6,8
	31ARXE	VOE 14732387	285	107	134	123	8,6
	41ARXE	VOE 14732392	312	120	141	133	12,2
	56ARXE	VOE 14732397	339	131	164	147	16,6
	66ARXE	VOE 14732402	382	147	178	167	22,5
	81ARXE	VOE 14731779	405	159	197	175	28,6
	126ARXE	VOE 14732425	464	179	216	205	42



Teeth	Designation	Part No.	A (mm)	B (mm)	C (mm)	D (mm)	Weight (kg)
	16PPE	VOE 14732378	241	-	109	102	3,3
	21PPE	VOE 14732383	273	-	116	111	4,8
	41PPE	VOE 14732393	330	-	140	132	8,4
	56PPE	VOE 14732398	359	-	164	147	11,5
	66PPE	VOE 14732403	391	-	178	167	15
	81PPE	VOE 14732424	427	-	197	175	19,4
	126PPE	VOE14753794	486	-	217	205	35



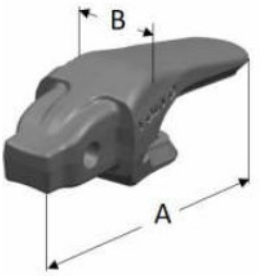
Teeth	Designation	Part No.	A (mm)	B (mm)	C (mm)	D (mm)	Weight (kg)
	16TPE	VOE 14732379	239	119	109	102	3,8
	21TPE	VOE 14732384	273	125	116	111	5,9
	41TPE	VOE 14732394	330	162	141	133	10,5
	56TPE	VOE 14732399	358	182	164	147	15



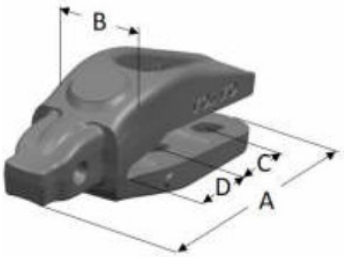
Teeth	Designation	Part No.	A (mm)	B (mm)	C (mm)	D (mm)	Weight (kg)
	16SNE	VOE 14732380	215	127	108	100	4,4
	21SNE	VOE 14732385	262	177	116	111	7,6
	31SNE	VOE 54099788	278	180	134	123	9,8
	41SNE	VOE 14732395	306	206	141	133	12,8
	56SNE	VOE 14732400	342	231	164	147	18,2
	66SNE	VOE 54099789	382	256	178	167	24,7

Wheel Loaders – Dimensions and Weight Teeth & Adapter

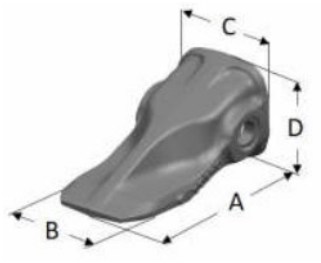
Adapter	Designation	Part No.	Edge thickness (mm)	Edge angle (degree)	A (mm)	B (mm)	Weight (kg)
	LA11FC25	VOE17491920	25	25	264	91	4.1
	LA16FC30-35	VOE17491922	30-35	25	301	104	6.1
	LA21FC40	VOE17491926	40	25	363	112	9.5
	LA31FC40	VOE17491928	40	25	387	123	13



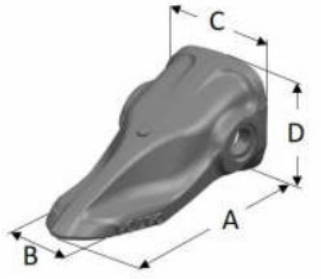
Adapter	Designation	Part No.	Edge thickness (mm)	Edge angle (degree)	A (mm)	B (mm)	Weight (kg)
	LA11TL25	VOE17491921	25	25	267	91	4.5
	LA16TL30	VOE17491923	30	25	298	104	6.3
	LA16TL35	VOE17491924	35	25	300	104	6.6
	LA21TL35	VOE17491925	35	25	323	112	8.1
	LA21TL40	VOE17491927	40	25	323	112	8.2
	LA31TL40	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



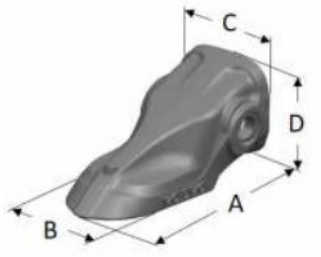
Adapter	Designation	Part No.	Edge thickness (mm)	Edge angle (degree)	A (mm)	B (mm)	C (mm)	D (mm)	Weight (kg)
	LA11BN25	VOE17491915	25	25	290	91	87	85	5.4
	LA16BN30	VOE17491916	30	25	307	103	87	85	6.9
	LA16BN35	VOE17491917	35	25	357	104	111	106	7.9
	LA21BN40	VOE17491918	40	25	390	112	100	117	14.4
	LA31BN40	VOE17491919	40	25	401	123	100	118	18.5



Teeth	Designation	Part No.	A (mm)	B (mm)	C (mm)	D (mm)	Weight (kg)
	11GPL	VOE17491940	186	76	93	86	2,5
	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

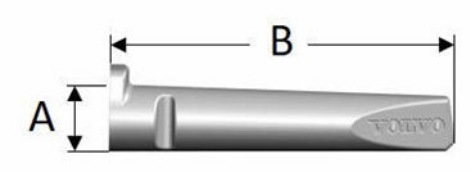


Teeth	Designation	Part No.	A (mm)	B (mm)	C (mm)	D (mm)	Weight (kg)
	16AML	VOE17491942	188	62	109	109	4,7
	21AML	VOE17491945	201	65	116	111	5,9
	31AML	VOE17491948	218	90	134	123	8,5

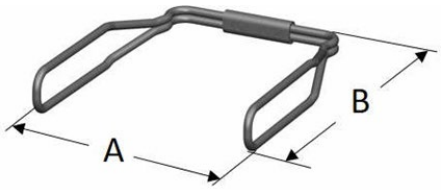


Teeth	Designation	Part No.	A (mm)	B (mm)	C (mm)	D (mm)	Weight (kg)
	16AMRL	VOE17491943	192	93	109	101	5,3
	21AMRL	VOE17491946	213	96	116	111	8,1
	31AMRL	VOE17491949	237	110	134	123	11,1
	41AMRL	VOE17491951	257	140	141	133	16,6
	56AMRL	VOE17491952	286	150	164	174	22,1
	66AMRL	VOE17491953	322	167	178	167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

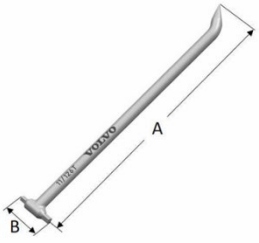
Locking devices – Excavators and Wheel Loaders – Dimensions and Weight



Pin	Designation	Part No	A (mm)	B (mm)	Weight (kg)
	11P	VOE 17473100	20	87	0,17
	16P	VOE 17473101	21	100	0,2
	21P	VOE 17473102	21	107	0,2
	31P	VOE 17473103	23,5	120	0,3
	41P	VOE 17473104	25	128	0,4
	56P	VOE 17473105	28,5	149	0,5
	66P	VOE 17473106	32	162	0,8
	81P	VOE 14740815	33,5	174	0,9
	126P	VOE14740817	39	192	1,4



Retainer	Designation	Part No	A (mm)	B (mm)
	11R	VOE 17493100	69,5	72,4
	16R	VOE 17493101	80,2	86,2
	21R	VOE 17493102	84,4	96
	31R	VOE 17493103	97,2	101,9
	41R	VOE 17493104	105,5	111,4
	56R	VOE 17493105	114,3	123,4
	66R	VOE 17493106	130	136,1
	81R	VOE14740816	134,9	145,1
	126R	VOE14740818	155,1	166,8



Tool	Designation	Part No	Weight (kg)	Sizes
	11\126T	VOE 17473120	3	11\126

Break-out forces

General instructions for choosing the right Volvo Tooth System for your machine - size selection:

1. Check first what the break-out force for your machine is.
2. Select type of machine from the table (wheel loader or Excavators).
3. Select “Standard” or “Heavy Duty” application depending on the working conditions, type of work to be carried out by the machine – degree of impact, abrasion, and resistance to set application level. Go down to the BOF applicable for your machine.
4. Read to the left in the table the size of the Volvo tooth to choose for your machine.

Volvo size	BOF [1] STD [4] STD	BOF [1] HD [5]	CET [2]	CEA [3]		BOF [1] STD [4]	BOF [1] HD [5]	CET [2]	CEA [3]
	Wheel Loaders					Excavators			
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 Break out Force (kN) [2] CET = Cutting Edge Thickness (mm) [3] CEA = Cutting Edge Angle (degrees)

[4] STD = Standard application [5] HD = Heavy Duty application

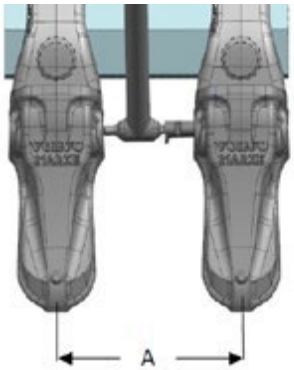
Number of teeth per bucket

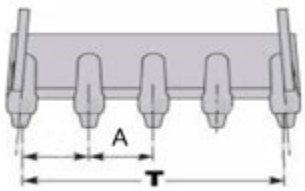
Number of teeth per bucket and distance limit between two teeth for both wheel loaders and Excavators.

Max number of adapters=T/A+1

A= Minimum distance between teeth positions.

T= Blade length of the bucket.





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

General Welding Instructions

Welding - Cleaning and preparation

Clean the parts to weld. Remove paint, grease, oxide, and others on the surface that can disturb the welding process. Use a wire brush or light grinding.

Preheating

Preheat and keep the area to be welded at 200 °C, to prevent cracks. Use a gas torch and control temperature with tempersticks or radiation pyrometers.

Maximum temperature and final check

During the welding process, do not go over 250 °C, except at the direct affected parts. 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 the unevenness, avoid parallel grinding lines to the beads.

Covered electrode procedure

If using covered electrodes, we recommend basic covered electrodes with low-hydrogen content. Diameter: use the biggest diameter as 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 must be performed with short beads and a maximum oscillation of three times the diameter of the electrode. Remove the slag and lightly hammer the bead to reduce tensions after each run. A basic covered electrode absorbs humidity. To avoid this, we recommend to stock electrodes in the original packaging hermetically sealed. Once opened, keep them heated within 65-150 °C.

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; and equivalents. Gas protection flow: 12-18 liters per minute.

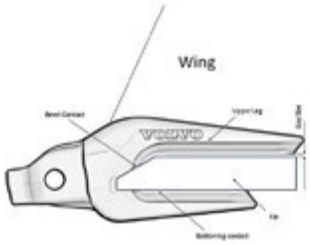
Welding wire of tubular thread (Flux-core)

Types: ASME/AWS ER 70 T1 (rutile type); ASME/AWS E 70 T5 (basic type); DIN 8559. With both types of welding wire, the welding must be done with a maximum oscillation of 10 mm. Lightly hammer the bead to avoid residual stresses after each run. 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.

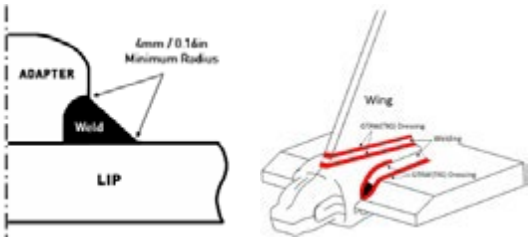
WARNING: Do not weld adapter with tooth mounted as this will cause damage to the locking system. Mount the tooth after welding is completed.

Welding Instruction for Bucket side adapter

Instruction steps



1. Place adapter on lip plate per desired location from side to side. Bottom leg and bevel angle should be in full contact as show in figure:
2. Draw on the cheek the profile of the upper leg of the central adapter.
3. Preheat at a recommended temperature (follow the procedure described at 1.6) and cut the cheek with following the shape of the upper leg of the adapter.
4. Do a chamfer around this cut edge in order to be able to weld the upper leg of the adapter and the cheek.
5. It is recommendable to perform a TIG dressing on both upper and lower adapters' straps. In case of thinner than 70mm plate thickness case. 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 capabilities. "Scratch-starting" is not allowed. It is preferable to employ a remote foot-pedal current control to permit suitable filling of craters at the ends of beads.
   Any defects along the toes of the welds must be corrected by grinding or repair welding before the GTAW process. The torch shall be positioned over the weld toe and shall be oriented to produce a smooth weld bead without undercut. The welder shall control the travel speed to obtain a bead ranging from 4.8 - 8mm (0.19 - 0.31in) wide.
   The GTAW dressed is recommendable to be performed along to the weld toes on the top and bottom legs.



Inspection and control procedure

It is recommendable to perform the inspection every 500h or whenever possible

Figure 1

Dimensional control

The measurement can be made by means of ultrasonic equipment or measuring tape according to the following procedure:

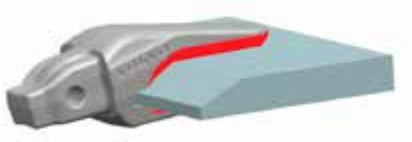
- Clean the areas where the measurement will be performed.
- Apply contact liquid in the area (in the case of ultrasonic measurement).
- Take measurement at each point as shown in figured 1:
- The replacement of the adapter must occur when one of the dimensions, A, B, or C is below what is exposed in the table.

	BY MEANS OF ULTRASONIC EQUIPMENT			BY MEANS OF MEASURING TAPE		
	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 control

Plastic deformation on the adapter noses.

Cracks control



Visual and liquid penetrating inspection of the adapter welds against the blade must be performed.

In the event of cracks in the weld, they must be cleaned and repaired as soon as possible to avoid their propagation to the adapter causing the breakage.
In case of cracks detection at any other area of the adapter, contact your dealer for evaluation.
NOTE: These measures are measures of maximum wear and do not imply the need for the element to reach them to be replaced. The fact of replacing the element before reaching any of these dimensions does not suppose a bad behavior of them.

Welding Instruction adapters for Wheel Loaders

Welding Types

Following is a quick reference to consumables that can be used to weld VOLVO products. For a complete reference on welding procedures, refer to the document entitled “General welding recommendations”.

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

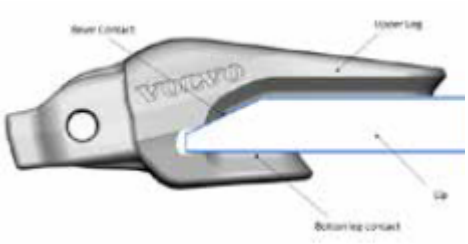
WELDING AU ST ENITIC STAINLESSFILLER CONSUMABLES	
Process	**AWS Class**
SMAW	E307-X according to A5.4
GMAW	E307T-X according to A5.22
	ER307 according to A5.9
FCAM	307X according to A5.22

Note that „X“ may stand for one or several characters.

Considerations regarding the gap

The gap between the adapter's upper strap and the lip must be not greater than the values shown in the following table:

Machine Tyre	Blade Thikness (mm)	Maximum Admissible Gap (mm)
LOADERS	25	3,5
	30	3,5
	35	4,2
	40	4,7
	50	5,3
	65	6,0



Check the existing gap by means of a feeler gauge as shown in the next figure:

Blade Thickness (mm)	Feeler Gauge Thickness (mm)
25	3,5
30	3,5
35	4,2
40	4,7
50	5,3
65	6,0

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

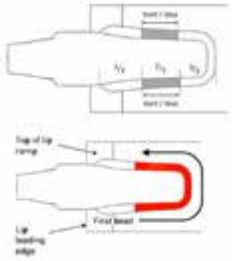
Installation procedure

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

1. All mill scale, rust, paint, oil grease, arc air slag or moisture shall be removed from the surfaces within 12.5 mm (0.5 in) of any weld location. The surfaces must be sufficiently clean so that there is nothing that might contain moisture or hydrocarbons, which break down in the heat of the arc producing hydrogen, which can be absorbed in the weld and cause cracks. Removal may be accomplished by shot blasting, sand blasting, grinding, or machining. Any porosity, burned-in sand or other defects visible on the weld prep surfaces must be removed by grinding or arc air gouging.
2. Place adapter on lip plate per the desired location from side to side. Bottom leg and bevel angle should be in full contact as shown in the figure:

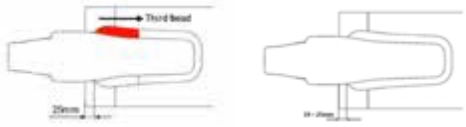
3. Preheat adapter and lip to a temperature between 150ºC and 180ºC (302ºF and 356ºF) within an offset of 100mm (4 in) all around according to what is exposed on the document entitled "General welding recommendations". Do not overpass 250ºC (482 ºF).

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.

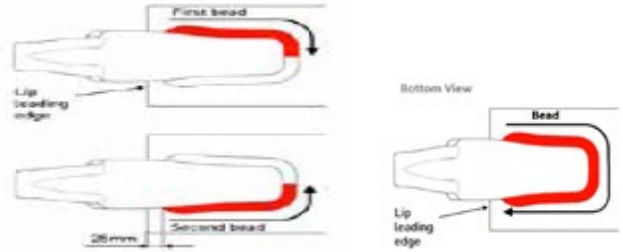


6. On the initially welded side, begin welding at the front of the weld groove and proceed to the starting point of the first bead.

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



8. Repeat this sequence (steps 5, 6 and 7) three times. Vary the lengths of the beads slightly so that the start/stop positions are not at the same location.
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 19-25mm (0.75 - 1.00 in) to 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 lengths of the beads slightly so that the start/stop positions are not at the same location.



11. The leg sizes of the fillet must be flush and less than 3.2mm (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. Ensure that the welding technique complies with what is exposed on the document entitled: “General welding recommendations”. Steps 13 to 17 are recommendable, but NOT compulsory.
13. 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.

14. 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 4mm (0.16 in).
Grinding shall be done using high speed electric or pneumatic grinders with grinding wheels no larger than 50mm (2.00 in) in diameter. ANGLE HEAD OR DISK 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 as in the illustration:
Proper Grinding Directions: Grinding the radio at the toes of the welds is facilitated using cone-shaped grinding wheels. For final grinding, the abrasive may be no coarser than 24 Grit.
15. On Volvo teeth new generation adapters from size 56 onwards, it is recommendable to perform a TIG dressing on both upper and lower adapters’ 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 capabilities. “Scratchstarting” is not allowed. It is preferable to employ a remote foot-pedal current control to permit suitable filling of craters at the ends of beads. Any defects along the toes of the welds must be corrected by grinding or repair welding before the GTAW process. The torch shall be positioned over the weld toe and shall be oriented to produce a smooth weld bead without undercut. The welder shall control the travel speed to obtain a bead ranging from 4.8 - 8mm (0.19 - 0.31in) wide. The GTAW dressed is recommendable to be performed along to the weld toes on the top and bottom legs.

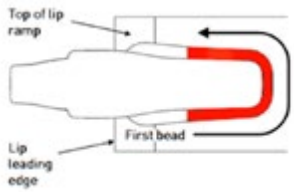
Process	GTAW	
Electrode Type	AWS EWTh-2 (2% Thoriated)	
Electrode Dia	2.4 to 4mm /3/32 to 5/32 in.	
Shielding Gas	100% Argon	
Gas Cup Size	13mm/ 0.50 in.	
Gas Flow Rate	9.4 to 14.2 l/minute/ 20 to 30 ft³/hour	
Current Type	Direct	
Polarity	Straight (Electrode Negative)	
Current Range	2.4mm/3/32 in.	175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

16. Repeat the sequence at all the rest of stations.
17. After completion of welding, all welds shall be subjected to visual and magnetic particle inspection. Any detected welding crack must be cleaned and repaired.

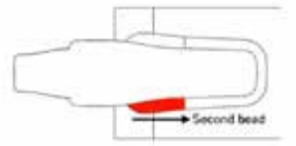
Welding instruction for flush adapter

1. All mill scale, rust, paint, oil grease, arc air slag or moisture shall be removed from the surfaces within 12.5 mm (0.5 in) of any weld location. The surfaces must be sufficiently clean so that there is nothing that might contain moisture or hydrocarbons, which break down in the heat of the arc producing hydrogen, which can be absorbed in the weld and cause cracks. Removal may be accomplished by shot blasting, sand blasting, grinding, or machining. Any porosity, burned-in sand or other defects visible on the weld prep surfaces must be removed by grinding or arc air gouging.
2. Place adapter on lip plate per the desired location from side to side. leg and bevel angle should be in full contact as shown in the figure:

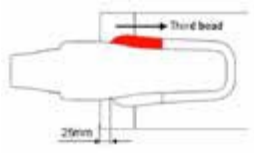
3. Preheat adapter and lip to a temperature between 150ºC and 180ºC (302ºF and 356ºF) within an offset of 100mm (4 in) all around according to what is exposed on the document entitled “General welding recommendations”. Do not overpass 250ºC (482 ºF).
4. Apply one 25 mm (1.0 in) long tack weld at the 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.



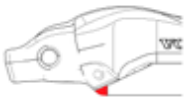
6. the front of the weld groove and proceed to the starting point of the first bead. Do not weld within 19 - 25mm (0.75 - 1.00 in) of the lip leading edge.



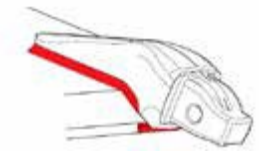
7. Place a similar bead on the opposite side of the top leg.



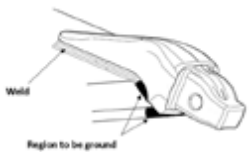
8. Repeat this sequence (steps 5, 6 and 7) three times. Vary the lengths of the beads slightly so that the start/stop positions are not at exactly the same location.
9. Turn the lip over.
10. Weld the gap between blunt against the adapter.



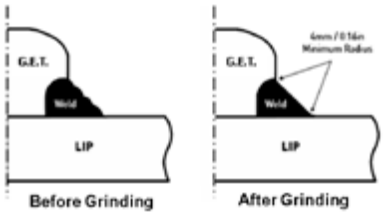

11. Vary the lengths of the beads slightly so that the start/stop positions are not at the same location.
12. If the adapter size requires additional weld layers, turn the lip over and weld three layers according to the sequence for the top leg (steps 5, 6 and 7).
13. The leg sizes of the fillet must be flush and less than 3.2mm (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. Ensure that the welding technique complies with what is exposed on the document entitled: “General welding recommendations”.
15. When welding large adapters, the considerable grinding effort can be saved by carefully positioning the starting points of the beads near the leading edge. Start each bead slightly behind those of the preceding layer so as to produce a “rounded” weld end.



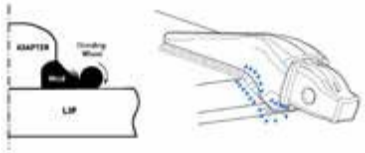
16. The surfaces of adapter/lip fabrication welds shall be ground smooth 65 - 75mm (2.50 - 3.00 in) from the front ends as indicated in the figures below. All welds on both the top and bottom of the lip shall be ground.



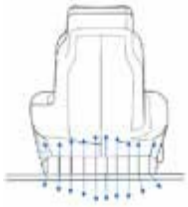
17. Grinding shall produce a smooth surface free of roughness and unevenness associated with the weld beads. The toes of the welds shall merge smoothly with the lip and the adapter with a minimum radius of 4mm (0.16 in). Grinding shall be done using high speed electric or pneumatic grinders with grinding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



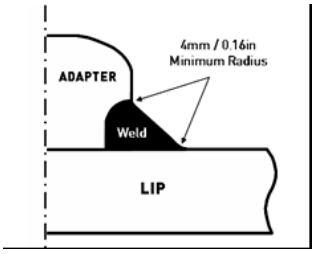
Grinding shall be done with the perimeter of the wheel and not the face. The grinding direction must be perpendicular to the toes of the welds as in the illustration: *Proper grinding directions:*



Grinding the radio at the toes of the welds is facilitated by the use of cone-shaped grinding wheels. For final grinding, the abrasive may be no coarser than 24 Grit.



18. On VT adapters from size 41 onwards, it is recommendable to perform a TIG dressing on both upper and lower adapters' straps. This process involves using a GTAW torch to make an autogenous weld pass along the toe of the weld fillet.



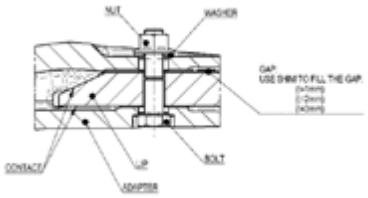
The welding power supply shall have high-frequency start capabilities. "Scratch-starting" is not allowed. It is preferable to employ a remote foot-pedal current control to permit suitable filling of craters at the ends of beads. Any defects along the toes of the welds must be corrected by grinding or repair welding before the GTAW process. The torch shall be positioned over the weld toe and shall be oriented to produce a smooth weld bead without undercut. The welder shall control the travel speed to obtain a bead ranging from 4.8 - 8mm (0.19 - 0.31in) wide. The GTAW dressed is recommendable to be performed along to the weld toes on the leg.

19. Repeat the sequence at all the rest of stations.
20. After completion of welding, all welds shall be subjected to visual and magnetic particle inspection. Any detected welding crack must be cleaned and repaired.

Bolt-on instruction for bolt adapter for Wheel loaders

Installation procedure.

1. Place Bolt-On Adapter on its determined allocation (aligned with the bolt drills) on the lip. When position on the lip the adapter must have contact on edge and the lip bevel. Use shims to fill the GAP if necessary. In the If the gap between the adapter and the blade is higher than 1 mm, a low carbon sheet metal must be assembled to cover the gap.



2. Proceed to fix the Bolt-On Adapter by means of its corresponding bolts, ensuring the proper tightening torque is applied as per manufacturer specification.

TIGHTENING TORQUE FOR SCREWS IN PROPERTY CLASS 8.8	
SCREW DIMENSION	**TIGHTENING TORQUE (Nw)**
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 (Nw)**
M16	275+-45
M20	540+-90
M24	900+-140
1"	1090+-130

3. IMPORTANT! Retorque bolt after approximately 4 hours of service. ACC. TO 4
4. Periodically check bolt torque. Insufficient bolt torque can result in adapter failure in heavy duty applications.
   Note: Rear screw first and front screw last.
   Note: The correct tightening sequence is important because the front screw may loosen if the rear screw is not brought to final Torque first.
   Important! Retorque screws after approximately 4 hours of service.

Welding instruction adapters for Excavators

Welding type

Following is a quick reference to consumables that can be used to weld VOLVO products. For a complete reference on welding procedures, refer to the document entitled “General welding recommendations”.

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 AU ST ENITIC STAINLESSFILLER 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 that „X“ may stand for one or several characters.

Considerations regarding the gap

The gap between the adapter’s upper strap and the lip must be not greater than 2mm (0.8 in) In the event that the upper clearance gap between the adapter and the blade is higher than previously specified, a low carbon sheet-metal must be assembled to cover the gap.

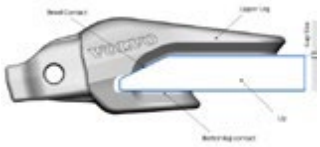
Alternatively, the upper leg adapter may be built up by welding to acceptable dimensions in the following manner:

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

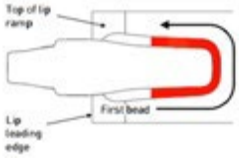
If more than 3.2mm (0.13 in) is removed from the weld preps of the upper leg adapter, the weld prep must be widened to restore the original “J” groove weld size.

Installation procedure

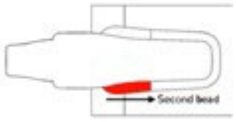
1. All mill scale, rust, paint, oil grease, arc air slag or moisture shall be removed from the surfaces within 12.5 mm (0.5 in) of any weld location. The surfaces must be sufficiently clean so that there is nothing that might contain moisture or hydrocarbons, which break down in the heat of the arc producing hydrogen, which can be absorbed in the weld and cause cracks. Removal may be accomplished by shot blasting, sand blasting, grinding, or machining. Any porosity, burned-in sand or other defects visible on the weld prep surfaces must be removed by grinding or arc air gouging.
2. Place adapter on lip plate per the desired location from side to side. Bottom leg and bevel angle should be in full contact as shown in the figure:



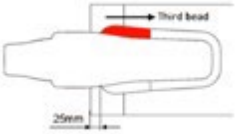
3. Preheat adapter and lip to a temperature between 150ºC and 180ºC (302ºF and 356ºF) within an offset of 100mm (4 in) all around according to what is exposed on the document entitled “General welding recommendations”. Do not overpass 250ºC (482 ºF).
4. Apply one 25 mm (1.0 in) long tack weld at the 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 - 25mm (0.75 - 1.00 in) of the lip leading edge.

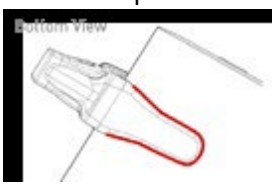


7. Place a similar bead on the opposite side of the top leg.

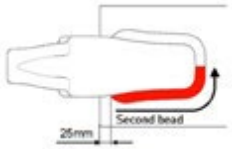


8. Repeat this sequence (steps 5, 6 and 7) three times. Vary the lengths of the beads slightly so that the start/stop positions are not at exactly the same location.

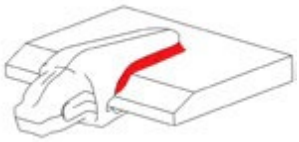
9. Turn the lip over



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 19-25mm (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.

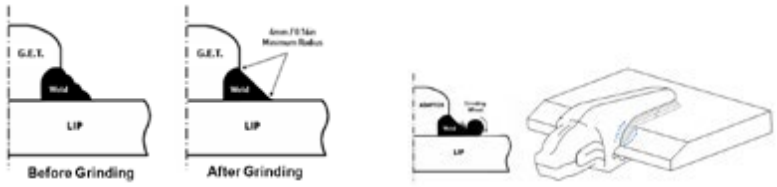


12. Repeat this sequence (steps 10 and 11) three times. Vary the lengths of the beads slightly so that the start/stop positions are not at the same location.
13. If the adapter size requires additional weld layers, turn the lip over and weld three layers according to the sequence for the top leg (steps 5, 6 and 7).
14. Turn the lip over again and apply three layers according to the sequence for the bottom leg. (Step 10 and 11).
15. The leg sizes of the fillet must be flush and less than 3.2mm (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. Ensure that the welding technique complies with what is exposed on the document entitled: “General welding recommendations”.
17. When welding large adapters, the considerable grinding effort can be saved by carefully positioning the starting points of the beads near the leading edge. Start each bead slightly behind those of the preceding layer to produce a “rounded” weld end.



18. 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.

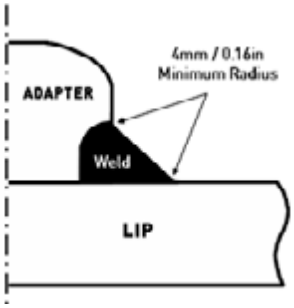
19. Grinding shall produce a smooth surface free of roughness and unevenness associated with the weld beads. The toes of the welds shall merge smoothly with the lip and the adapter with a minimum radius of 4mm (0.16 in). Grinding shall be done using high speed electric or pneumatic grinders with grinding wheels no larger than 50mm (2.00 in) in diameter.
ANGLE HEAD OR DISK 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 as in the illustration:
Proper Grinding Directions: Grinding the radio at the toes of the welds is facilitated using cone-shaped grinding wheels. For final grinding, the abrasive may be no coarser than 24 Grit.



20. Not:On VTS-II adapters from size 56, 61 only. It is recommendable to perform a TIG dressing on both upper and lower adapters' 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 capabilities. "Scratchstarting" is not allowed. It is preferable to employ a remote foot-pedal current control so as to permit suitable filling of craters at the ends of beads.

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

Any defects along the toes of the welds must be corrected by grinding or repair welding before the GTAW process. The torch shall be positioned over the weld toe and shall be oriented to produce a smooth weld bead without undercut. The welder shall control the travel speed to obtain a bead ranging from 4.8 - 8mm (0.19 - 0.31in) wide. The GTAW dressed is recommendable to be performed along to the weld toes on the top and bottom legs.



21. Repeat the sequence at all the rest of stations.

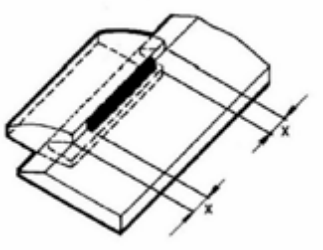
22. After completion of welding, all welds shall be subjected to visual and magnetic particle inspection. Any detected welding crack must be cleaned and repaired.

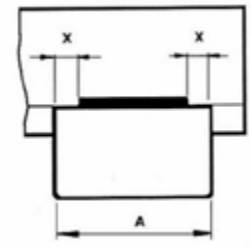
Welding instruction for segments

Lip Shrouds

Welding should be done following strictly the instructions hereafter in order to avoid any lip failure.
Welding should be done using basic electrodes: AWS E 7016 E 7018, NF E 434/3B, DIN 1913 E 5143 B10 our E 5154B 102G.

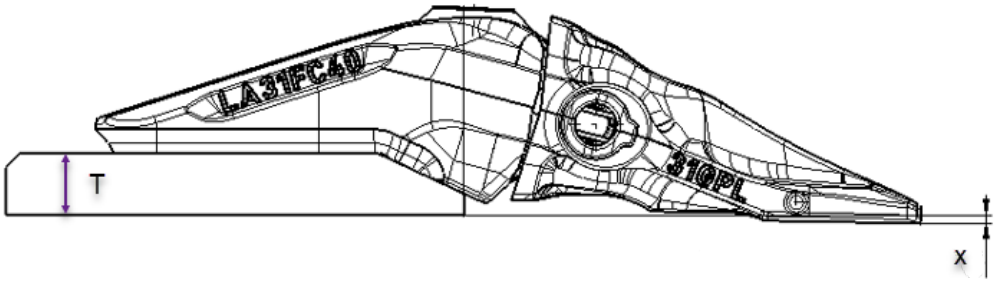
1. Locate shrouds on the lip. (Shroud bevel edge rests on lip bevel edge.)
2. Tack shrouds on the lip.
3. Preheat shrouds and lip at 95ºC. In cold conditions (ambient temperature below 5ºC) preheat between 150ºC and 175ºC.
4. Start welding “X” mm (minimum) away from shroud edge. (“X” depending on shroud width.)
   SHROUD WIDTH “A” DIMENSIONS “X” 120 up to 195 mm 20 mm 195 up to 290 mm 30 mm the weld strip must have the same thickness throughout its length. Weld strips must be done in the upper side and the lower side of the shroud.
5. Grind weld trip ends to avoid stress concentration.





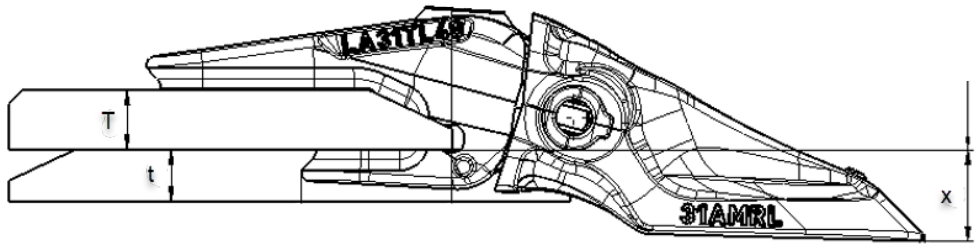
Wheel Loader Undercut teeth versus bucket edge

Volvo Tooth System Flush adapters – Theoretical Teeth Undercut



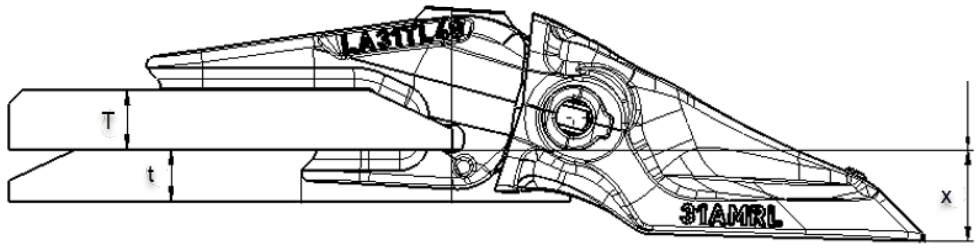
Adapter size	Adapter type	Tooth type	Bucket lip thickness (T)	Undercut (X)
Size 11	LA11FC25	11GPL	25 mm	2mm
Size 16	LA16FC30-35	16GPL	30mm	7mm
Size 16	LA16FC30-35	16GPL	35mm	2mm
Size 16	LA16FC30-35	16AML	30mm	17mm
Size 16	LA16FC30-35	16AML	35mm	12mm
Size 16	LA16FC30-35	16AMRL	30mm	20mm
Size 16	LA16FC30-35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

VTS 1 ½ Leg adapters – Theoretical Teeth Undercut



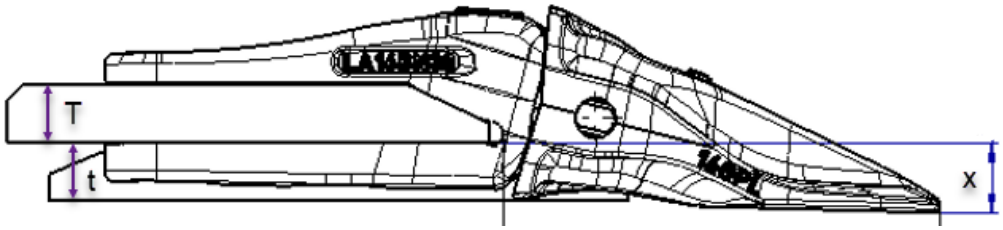
Adapter size	Adapter type	Tooth type	Bucket lip thickness (T)	Segment thickness (t)	Undercut(X)	Undercut versus segment
Size 11	UA11TL25	11GPL	25 mm	25mm	29mm	4mm
Size 16	LA16TL30	16GPL	30mm	30mm	30mm	0mm
Size 16	LA16TL30	16AML	30mm	30mm	40mm	10mm
Size 16	LA16TL30	16AMRL	30mm	30mm	43mm	13mm
Size 16	LA16TL35	16GPL	35mm	30mm	30mm	0mm
Size 16	LA16TL35	16AML	35mm	30mm	40mm	10mm
Size 16	LA16TL35	16AMRL	35mm	30mm	43mm	13mm
Size 21	LA21TL40	21GPL	40mm	35mm	35mm	0mm
Size 21	LA21TL40	21AML	40mm	35mm	46mm	11mm
Size 21	LA21TL40	21AMRL	40mm	35mm	49mm	14mm
Size 31	LA31TL40	31GPL	40mm	35mm	42mm	7mm
Size 31	LA31TL40	31AML	40mm	35mm	56mm	21mm
Size 31	LA31TL40	31AMRL	40mm	35mm	61mm	26mm

VTS 1 ½ Leg adapters – Theoretical Teeth Undercut



Adapter size	Adapter type	Tooth type	Bucket lip thickness (T)	Segment thickness (t)	Undercut (X)	Undercut versus segment
Size 41	LA41TL40	41GPL	40 mm	35mm	53mm	18mm
Size 41	LA41TL40	41GPL	40mm	45m	53mm	8mm
Size 41	LA41TL40	41AMRL	40mm	35mm	76mm	41mm
Size 41	LA41TL40	41AMRL	40mm	45mm	76mm	31mm
Size 41	LA41TL50	41GPL	50mm	48mm	53mm	5mm
Size 41	LA41TL50	41AMRL	50mm	48mm	76mm	28mm
Size 41	LA41TL50	41GPL	50mm	45mm	53mm	8mm
Size 41	LA41TL50	41AMRL	50mm	45mm	76mm	31mm
Size 41	LA41TL50	41GPL	50mm	40mm	53mm	13mm
Size 41	LA41TL50	41AMRL	50mm	40mm	76mm	36mm
Size 56	LA56TL65	56AMRL	65mm	50mm	73mm	23mm
Size 56	LA56TL65	56AMRL	65mm	48mm	mm	21mm
Size 65	LA65TL65	66AMRL	65mm	50mm	61mm	26mm
Size 65	LA65TL65	66AMRL	65mm	48mm	53mm	18mm

Volvo Tooth System Bolt-on adapters – Theoretical Teeth Undercut



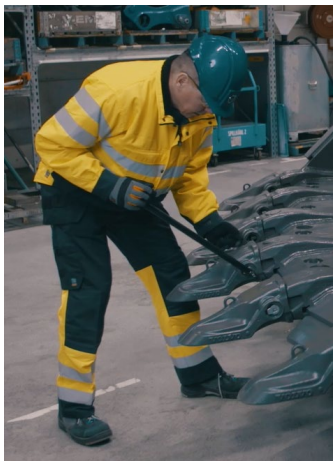
Adapter size	Adapter type	Tooth type	Bucket lip thickness (T)	Segment thickness (t)	Undercut (X)	Undercut versus segment
Size 11	LA11BN25	11GPL	25 mm	20mm	34mm	9mm
Size 16	LA16BN30	16GPL	30mm	25mm	37mm	12mm
Size 16	LA16BN30	16AML	30mm	25mm	45mm	20mm
Size 16	LA16BN30	16AMRL	30mm	25mm	48mm	23mm
Size 16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

How to remove and mount a tooth?

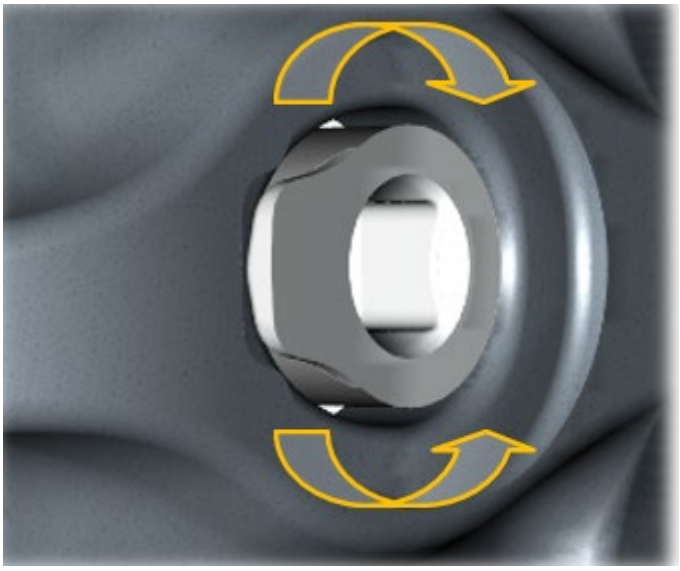
If the flange on the pin is located on the right-hand side at the tooth, start remove the teeth from the right.

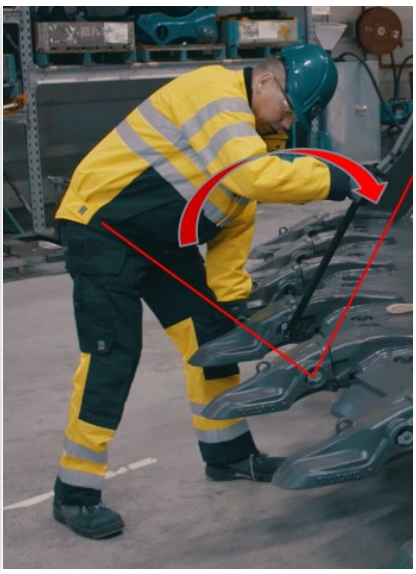
That will give more space for the tool.

Clean the pin socket

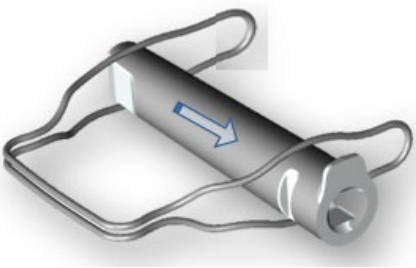


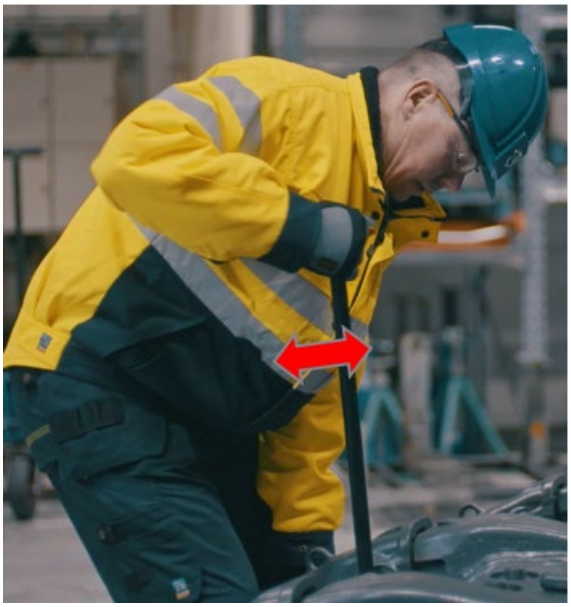
Take the tool and put it into the pin socket.





Turn the tool approx. 90 degrees

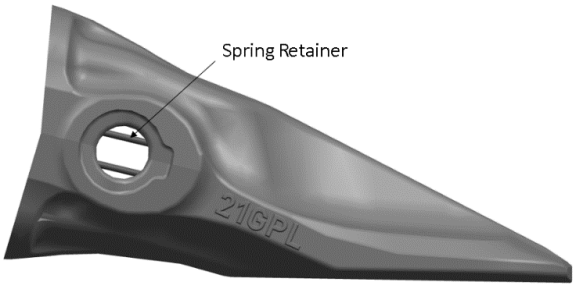


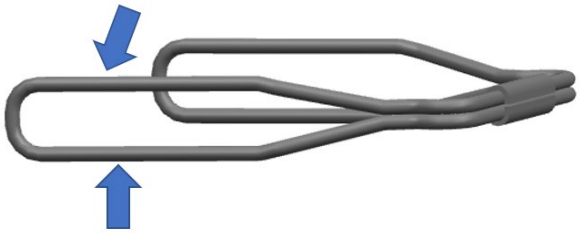


Start to twist the tool back and forth, with an outward motion, until the pin is fully extracted.

Remove the tooth.

If you remove a tooth maybe for changing position, always check the retainer so it's not bended or damaged.
Not necessary if you change teeth
New teeth always incudes a new retainer mounted





Visual control.

Normally there are no need of changing the retainer. Check for plastic deformation at the retainer, if any, change it by a new one. The retainer is available as spare part – good to have in case of...

Check the pin so it is not bended or damaged.

Visual control

- The absence of deformation or wear at the ends of the pin.
- The absence of breakages, cracks or wearing on the pin ramp.
- The absence of longitudinal deformation.

The replacement of the pin must occur when one or more of the previous requirements are met.

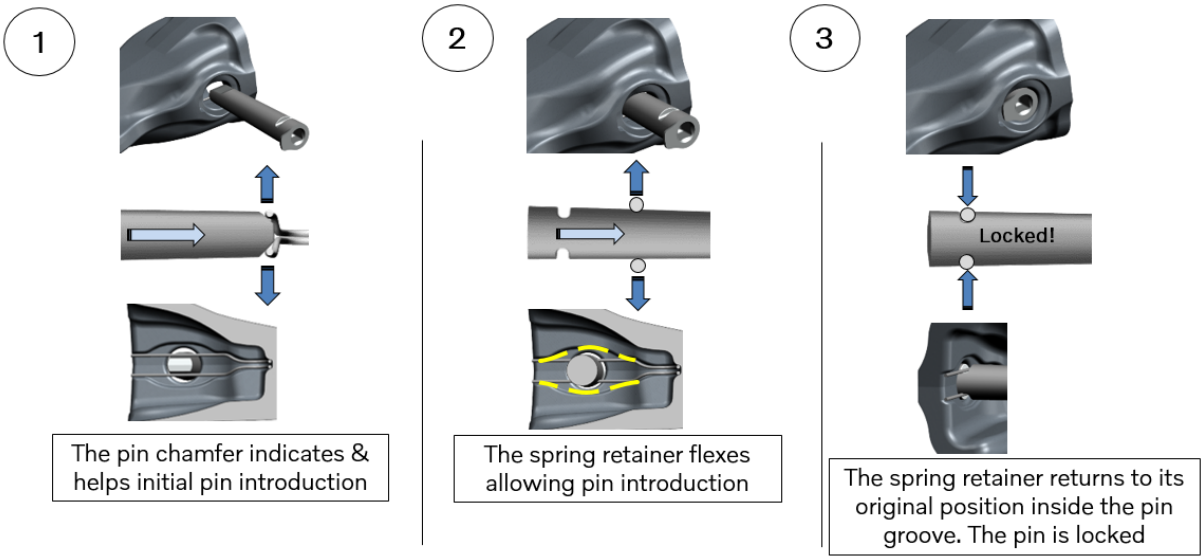
If you plan to place the flange on the pin on the right-hand side at the tooth, start install the teeth from the left. That will give more space for the tool.

Clean adapter from dirt.

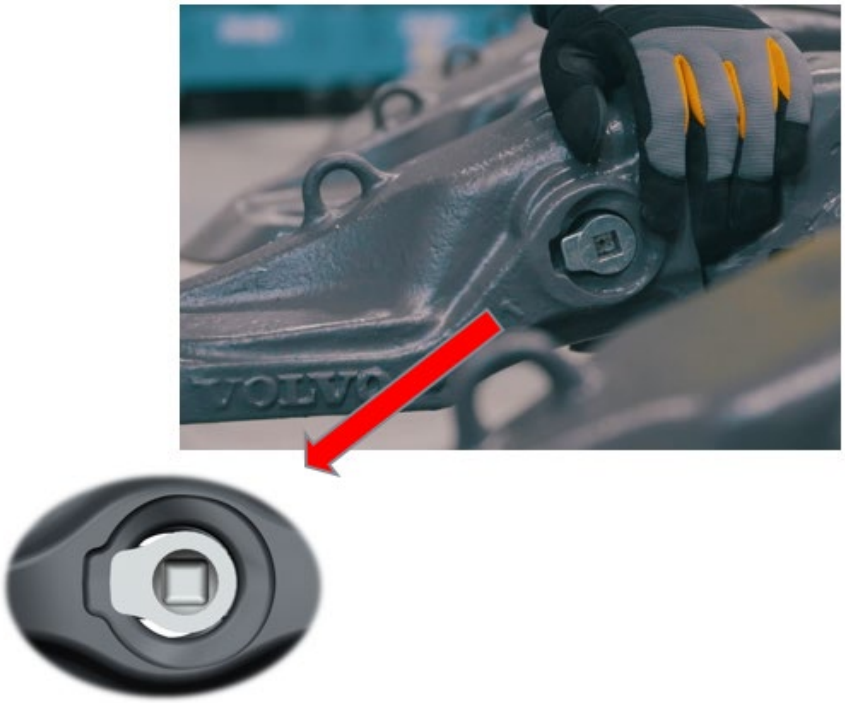
Place the tooth on the adapter.

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

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



When a CLICK sounds, the pin is mounted correctly.



Check so the pin flange is aligned with the adapter.

Check so the tooth is secured to the adapter – job done.

VTS 1 and VTS-New Generation conversions Excavators

EXCAVATORS							
MODEL	**BOF max (kN)**	**VTS1 Part Number (GPE)**	**VTSI Size**	**Edge Thickness**	**VTS II Part Number (GPE)**	**VTSII New Size**	**BOF VTSII Value**
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
EC 480 STD	311 (ME)	VOE14526510	65	60	VOE14732401	66	327
EC 480 HD	311 (ME)	VOE14526511	80	70	VOE1473404	81	327
EC 750 STD	389 (ME)	VOE14624281 (ARXE)	80	70	VOE14732404 / VOE14731779 (ARXE)	81	410
EC 750 HD	389 (ME)	VOE14624281 (ARXE)	80	70	VOE14732425 (ARXE)	126	410
EC 950 STD/HD	478 (ME)	VOE14624421	125	80	VOE14732425 (ARXE)	126	550

VTS 1 and VTS-New Generation conversions Wheel Loaders

LOADERS									
MODEL	Machine BOF max (kN)	VTS1 Part number (GPL)	Adapter Part Number (TL)	VTSI Size	Edge thickness	VTS 2 Part Number (GPL)	Adapter Part Number	VTSII New 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
110-120	194	VOE11417125	VOE11417098	15	35	VOE17491941	VOE17491924	16	211
110-120 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