

This is how to achieve the correct tightening torque - even if you are using inserts with an extension

When you tighten fasteners using inserts whose extension length S deviates from the standard length S_F , it is necessary to recalculate the setting/display value for the torque wrench in use.

Caution! If adapters are combined with inserts or special tools, use the sum of the extensions = ΣS . Where the special tool is angled to the side, W_K will have to be determined empirically.

$$W_K = \frac{M_A \cdot L_F}{L_K} \left[\frac{\text{N} \cdot \text{m} \cdot \text{mm}}{\text{mm}} \right]$$

$$W_K = \frac{M_A \cdot L_F}{L_F - S_F + S \text{ (or } \Sigma S)}$$

M_A = desired tightening torque

W = reading/setting $W = M_A$

W_K = adjusted reading or setting value $W_K \neq M_A$

L_F = functional length (see dimension table for torque wrenches)

L_K = adjusted functional length $L_K = L_F - S_F + S$ (or ΣS)

S = extension of STAHLWILLE inserts or special tools (see dimension table for inserts)

S_F = standard extension (see dimension table for torque wrenches)

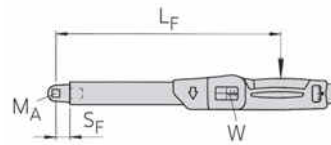
ΣS = total of all extensions of the attached inserts $S_{\text{adapter}} + S_{\text{insert}} + \dots$

Normal situation

Torque wrench No 730N/10 combined with square drive insert tool No 734/5 and socket size 13 mm.

Required tightening torque for the screw $M_A = 40 \text{ N-m}$

Dimension table for torque wrenches: $L_F = 336 \text{ mm}$, $S_F = 17.5 \text{ mm}$
 Dimension table for square drive insert tools: $S = 17.5 \text{ mm}$



No adjustment to setting value required on torque wrench.

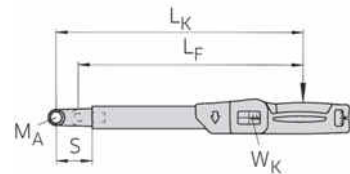
$\rightarrow S = S_F$
 $\rightarrow W = M_A$

Example 1: adjusted setting value (1 insert tool)

Torque wrench No 730N/20 combined with ring insert tool No 732/40 size 36 mm

Required tightening torque for the screw $M_A = 190 \text{ N-m}$

Dimension table for torque wrenches: $L_F = 424.5 \text{ mm}$, $S_F = 25 \text{ mm}$
 Dimension table for ring insert tools: $S = 28 \text{ mm}$



And this is what it looks like in the catalogue:

730N		Basic wrenches with tool carrier for insert tools										
Code	size	Function	Function	L ₁ [mm]	L ₂ [mm]	Fine scale	b	h	L	L _F	S _F	ø _{7A}
		N·m	ft·lb	mm	mm	mm	mm	mm	mm	mm	mm	mm
50181002	2	2-20	1.5-15	20-180	10	0.2	28	23	275	226	17.5	737
50181005	5	10-50	7.5-37	5	1	0.25	28	23	330	280.5	17.5	831
50181010	10	20-100	15-75	10	2.5	0.5	28	23	386	336	17.5	988
50181012	12	25-130	20-95	10	2.5	0.5	28	23	421	379	25	1128
50181020	20	40-200	30-150	10	5	1	28	23	467	424.5	25	1264
50181040	40	80-400	60-300	20	10	2	28	23	607	564.5	25	1655
50181065	65	130-650	100-480	50	20	2.5	30.6	25.6	890	848	25	3231
50181365	165	130-650	100-480	50	20	2.5	30.6	25.6	911	900	55	3504
50181080	80	160-800	120-600	100	25	5	30.6	25.6	1178	1167	55	4882
50181100	100	200-1000	150-750	100	25	5	30.6	25.6	1363	1297	55	5300
50581002	a/2	20-180	15-15	10	0.5	2	28	23	275	226	17.5	737
50581005	a/5	90-450	7-37	50	1	2.5	28	23	330	280.5	17.5	831
50581010	a/10	180-900	15-75	100	2.5	5	28	23	386	336	17.5	988
50581020	a/20	350-1800	30-150	100	5	10	28	23	467	424.5	25	1264
50581040	a/40	60-300	800-3600	100	10	20	28	23	607	564.5	25	1655

* recommended ratchet insert tool No 735/40HD

$$W_K = \frac{M_A \cdot L_F}{L_F - S_F + S} = \frac{190 \text{ N-m} \cdot 424.5 \text{ mm}}{424.5 \text{ mm} - 25 \text{ mm} + 28 \text{ mm}} = \frac{190 \text{ N-m} \cdot 424.5 \text{ mm}}{427.5 \text{ mm}} = 188.7 \text{ N-m}$$

Adjusted setting value $W_K = 188.7 \text{ N-m}$
 \rightarrow value to set 189 N-m

$\rightarrow S \neq S_F$
 $\rightarrow W \neq M_A$

732/40		Ring insert tools						
Code	ø	mm	b	h	S	ø _{7A}	g	
58224013	13	14x10	22.5	11	25	130		
58224014	14	14x10	23	11	25	123		
58224015	15	14x10	24	11	25	128		
58224016	16	14x10	25.5	12	25	133		
58224017	17	14x10	27	12	25	135		
58224018	18	14x10	29	13	25	134		
58224019	19	14x10	30.5	13	25	138		
58224021	21	14x10	33	15	25	144		
58224022	22	14x10	34.5	15	25	145		
58224024	24	14x10	37.5	15	25	153		
58224027	27	14x10	42.5	17	25	162		
58224028	28	14x10	45.5	19	25	175		
58224030	30	14x10	46	19	25	182		
58224032	32	14x10	47.5	19	25	181		
58224034	34	14x10	52	19	28*	210		
58224036	36	14x10	54	19	28*	203		
58224041	41	14x10	60	20	30*	240		

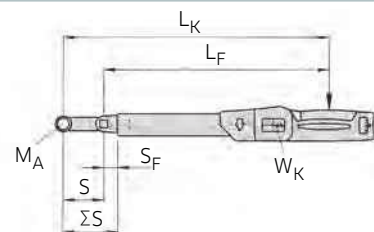
* Caution! Modified settings on torque wrench (refer to note on page 189).

Example 2: adjusted reading (insert tool and adapter)

Torque wrench No 730N/10 combined with square drive insert tool No 734/5 and adapter No 447 size 10 mm

Required tightening torque for the screw $M_A = 25 \text{ N-m}$

Dimension table for torque wrenches: $L_F = 336 \text{ mm}$, $S_F = 17.5 \text{ mm}$
 Dimension table for square drive insert tools: $S_F = 17.5 \text{ mm}$
 Dimension table for adapters: $\Sigma S = 50.8 \text{ mm}$



$$W_K = \frac{M_A \cdot L_F}{L_F - S_F + \Sigma S} = \frac{25 \text{ N-m} \cdot 336 \text{ mm}}{336 \text{ mm} - 17.5 \text{ mm} + 17.5 \text{ mm} + 50.8 \text{ mm}} = \frac{25 \text{ N-m} \cdot 336 \text{ mm}}{386.8 \text{ mm}}$$

Adjusted setting value $W_K = 21.7 \text{ N-m}$

$\rightarrow \Sigma S \neq S_F$
 $\rightarrow W \neq M_A$