TECHNICAL DATA SHEET:

CONCRETE SCREW ANCHOR

ZINC, GALVANIZED & STAINLESS STEEL

Concrete Screw-Anchors are a totally removable, medium duty, rotation setting, thread forming anchor, ideal for either temporary or permanent anchoring into substrates such as concrete, brick, hollow brick or block. The Concrete Screw-Anchor is particularly well suited to close-to-edge or close-to-anchor fixing as it does not expand and burst the surrounding substrate.

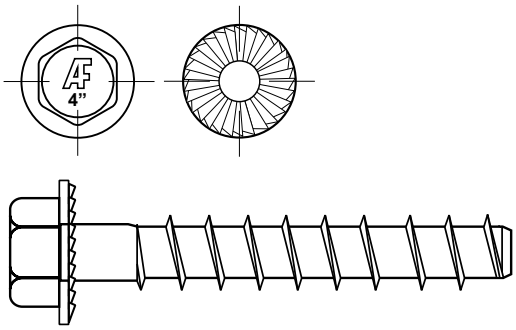
AVAILABILITY

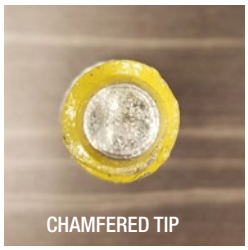
- Zinc Clear Carbon Steel
- Hot Dip Galvanized Carbon Steel
- Bi-Metal 316 Stainless with Case Hardened Tip

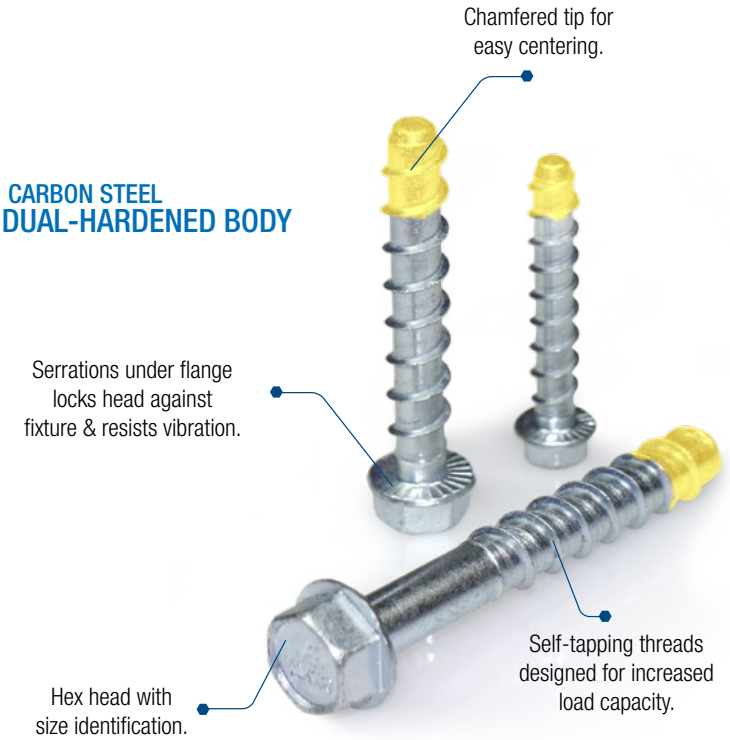
KEY BENEFITS

- Quick installation with a drill and drive method using a hex socket, ratchet or a torque controlled impact wrench.
- Unlike chemical anchoring or sleeved anchors, Concrete Screw-Anchors can be removed with ease leaving the hole clear of debris
- An increase in durability and reliability on installation of the Concrete Screw-Anchors, is a result of the dual-hardened body.
- The large self-tapping thread feature of this bolt is designed for fast advancing and high performance capacity as threads are formed in substrate material on installation.

PHYSICAL PROPERTIES







MATERIAL SPECIFICATIONS

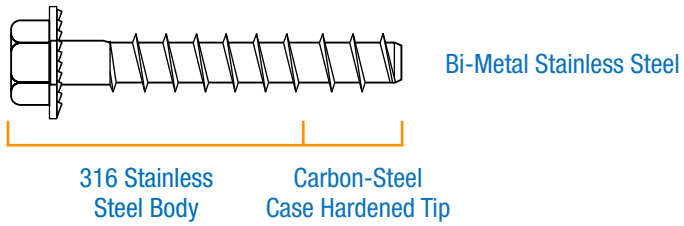
Concrete Screw-Anchors are a fast installation and immediate loading, completely removable anchor. The dual-hardened body and the large diameter self tapping screw by nature makes this anchor ideal for high load applications.

CARBON STEEL

The Carbon Steel Concrete Screw-Anchors material composition consists of 10B21 carbon steel. The anchor's tip is dual hardened for the purpose of threading into concrete.

BI-METAL

The Bi-Metal Concrete Screw-Anchors material composition provides superior corrosion resistance and lifespan when used in outdoor environments compared to other materials. The Bi-Metal anchor uses 316 stainless steel in the loading area combined with a case hardened carbon-steel tip for the purpose of threading into concrete.



INSTALLATION SPECIFICATIONS

- A. Anchor/Drill Ø, inch.
- B. Clearance hole Ø in fixture, inch (major diameter).
- C. Flanged head height, inch.
- D. Washer Ø, inch.
- E. Wrench size, inch.

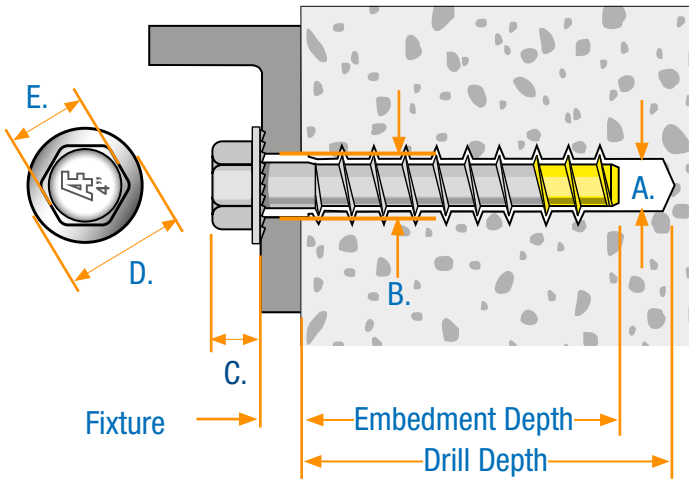
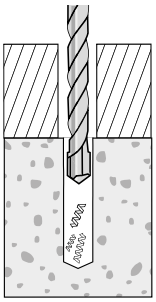


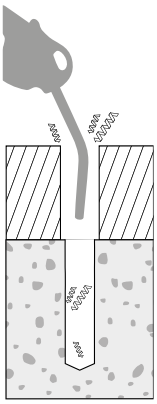
Table A1:

A.	B.	C.	D.	E.
1/4	3/8	9/32	9/16	7/16
3/8	1/2	3/8	3/4	9/16
1/2	5/8	1/2	1	3/4
5/8	3/4	9/16	1-1/8	15/16

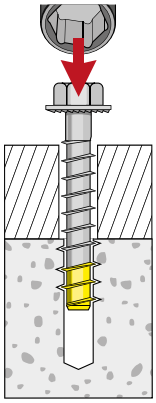
INSTALLATION GUIDE



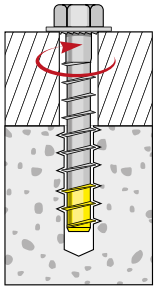
1. Drill or core a hole to the recommended diameter and depth using the fixture as a template. Clean the hole to thoroughly remove debris with a hand pump, compressed air, or vacuum.



2. Insert the Concrete Screw-Anchor through the fixture and screw it into the hole with either a socket wrench or an impact wrench using slight pressure until the self-tapping action begins.



3. Tighten the Concrete Screw Anchor until the fixture is held firm.



4. If resistance is experienced when tightening, unscrew the anchor one turn and re-tighten. Ensure that you do not over tighten.

SETTING

BASE MATERIAL THICKNESS

When setting an anchor, there is a recommended minimum thickness of the solid base material. The minimum is based on 1.5 times of the calculated embedment to be used. Eg. an anchor to be installed to a depth of 4", the base material should be 6" deep.

Embedment - a pre-determined depth to obtain the required load capacity. Equal to or greater than the minimum embedment allowance.

Drill Depth - is the required embedment depth into the substrate plus a cavity allowance approximately 1.5 times the anchor diameter.

SPACING

Anchor spacing should be determined by 10 times the selected anchor diameter to obtain the maximum load in tension or shear. This spacing can be reduced but the load value should also be reduced. The recommended minimum spacing is 5 times the selected anchor diameter, which will have a load rating reduced to 50%.

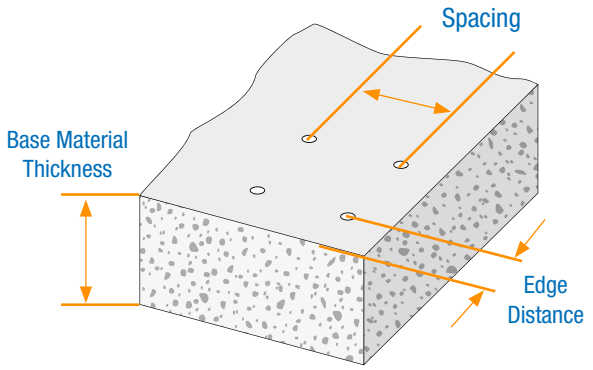
SETTING (CONT'D)

EDGE DISTANCE

Shall be determined by 10 times the selected anchor diameter to obtain the maximum load in tension or shear. The recommended minimum edge distance is 3 times the selected anchor diameter.

In tension – reducing the edge distance to the minimum, the load value will reduce by 30%.

In shear – reducing the edge distance to the minimum, the load value will reduce by 85%.



PERFORMANCE DATA

CARBON STEEL

Table B1:

Static Mean Ultimate Pull-Out Capacities					
Anchor Diameter in (mm)	Minimum Embedment in (mm)	MINIMUM CONCRETE COMPRESSIVE STRENGTH (f'c)			
		2,000 psi (13.8 Mpa)	3,000 psi (20.7 Mpa)	4,000 psi (27.6 Mpa)	6,000 psi (41.4 Mpa)
		TENSION lbs (kN)	TENSION lbs (kN)	TENSION lbs (kN)	TENSION lbs (kN)
1/4 (6.4)	1 (25.4)	839 (3.7)	948 (4.2)	1082 (4.8)	1341 (6.0)
	1-1/2 (38.1)	1740 (7.7)	1967 (8.8)	2247 (10.0)	2783 (12.4)
	2 (50.8)	3008 (13.4)	3400 (15.1)	3882 (17.3)	4809 (21.4)
3/8 (9.5)	1-1/2 (38.1)	2096 (9.3)	2369 (10.5)	2705 (12.0)	3351 (14.9)
	2 (50.8)	3096 (13.8)	3500 (15.6)	3997 (17.8)	4951 (22.0)
	2-1/2 (63.5)	4526 (20.1)	5116 (22.8)	5842 (26.0)	7237 (32.2)
	3 (76.2)	6244 (27.8)	7059 (31.4)	8060 (35.9)	9985 (44.4)
	3-1/2 (88.9)	7225 (32.1)	8167 (36.3)	9326 (41.5)	11552 (51.4)
1/2 (12.7)	2 (50.8)	3117 (13.9)	3523 (15.7)	4023 (17.9)	4984 (22.2)
	2-1/2 (63.5)	4581 (20.4)	5178 (23.0)	5913 (26.3)	7325 (32.6)
	3 (76.2)	6439 (28.6)	7279 (32.4)	8311 (37.0)	10296 (45.8)
	3-1/2 (88.9)	8241 (36.7)	9315 (41.4)	10637 (47.3)	13177 (58.6)
	4 (101.6)	9481 (42.2)	10717 (47.7)	12238 (54.4)	15160 (67.4)
5/8 (16)	3-3/4 (95)	8766 (39)		10614 (47.2)	13824 (61.5)

PERFORMANCE DATA (CONT'D)

CARBON STEEL

Table B2:

Ultimate Shear Values in Normal-Weight Concrete					
Anchor Diameter in (mm)	Minimum Embedment in (mm)	MINIMUM CONCRETE COMPRESSIVE STRENGTH (f'c)			
		2,000 psi (13.8 Mpa)	3,000 psi (20.7 Mpa)	4,000 psi (27.6 Mpa)	6,000 psi (41.4 Mpa)
		SHEAR lbs (kN)	SHEAR lbs (kN)	SHEAR lbs (kN)	SHEAR lbs (kN)
3/8 (9.5)	1-1/2 (38.1)	1670 (7.4)	1888 (8.4)	2156 (9.6)	2671 (11.9)
	2 (50.8)	2362 (10.5)	2670 (11.9)	3049 (13.6)	3777 (16.8)
	2-1/2 (63.5)	3149 (14.0)	3560 (15.8)	4065 (18.1)	4036 (22.4)
	3 (76.2)	4031 (17.9)	4556 (20.3)	5203 (23.1)	6445 (28.7)
	3-1/2 (76.2)	5484 (24.4)	6199 (27.6)	7079 (31.5)	8769 (39.0)
1/2 (12.7)	2 (50.8)	3517 (15.6)	3975 (17.7)	4539 (20.2)	5623 (25.0)
	2-1/2 (63.5)	5966 (26.5)	6744 (30.0)	7701 (34.3)	9540 (42.4)
	3 (76.2)	6922 (30.8)	7825 (34.8)	8935 (39.7)	11069 (49.2)
	3-1/2 (88.9)	7937 (35.3)	8972 (39.9)	10245 (45.6)	12691 (56.5)
	4 (101.6)	8745 (38.9)	9885 (44.0)	11288 (50.2)	13983 (62.2)
5/8 (16)	3-3/4 (95)			12185 (54.2)	

BI-METAL

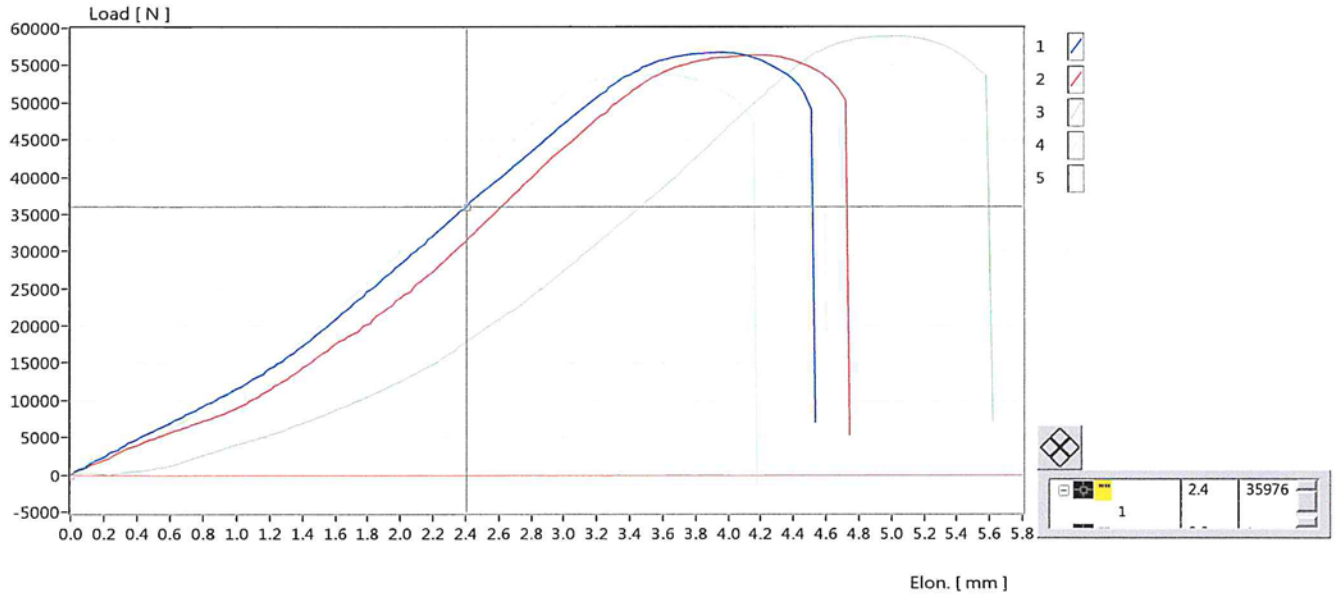
Table B3:

Recommended Loads According to ETA 15/0815					
Anchor Diameter in (mm)	Minimum Embedment in (mm)	MINIMUM CONCRETE COMPRESSIVE STRENGTH (f'c)			
		5,000 psi	5,000 psi	7,250 psi	7,250 psi
		TENSION lbs (kN)	SHEAR lbs (kN)	TENSION lbs (kN)	SHEAR lbs (kN)
6* (1/4)	55 (2-1/8)	697 (3.1)	1214 (5.4)	2156 (9.6)	2671 (11.9)
8 (5/16)	85 (3-3/8)	989 (4.4)	2158 (9.6)	1124 (5.0)	2158 (9.6)
10 (3/8)	100 (4)	2450 (10.9)	3372 (15.0)	2810 (12.5)	3372 (15.0)
12 (1/2)	120 (4-3/4)	3192 (14.2)	6070 (27.0)	3664 (16.3)	6070 (27.0)

NOTE: refer to ETA 15/0815 for characteristic resistance. Overall partial safety factor for action = 1.4
*Data not available within ETA. Performance data according to Allfasteners technical assessment.

TENSILE TEST REPORT

1. Date: 01/21/2020
2. Time: 10:41:47
3. Temperature: 25°F
4. Speed: Single Speed V1 = 15.00mm/min
5. Test Style: Tension
6. Standard: CNS
7. Specimen: 3/8 x 5"
8. Spec. Length: 50.00mm
9. Spec. Area: 63.9003mm²
10. Spec. Diameter: 9.02mm
11. Total Energy: 111.621J
12. Young's Modu.: 15151.159N/mm²
13. Jaw-Jaw: 610.00mm



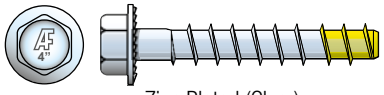
	Peak Load	Peak Elon.	Peak Stress	Peak Strain	Break Load	Break Elon.	Break Stress	Break Strain	Yield Ys Load	Yield Ys Elon.	Yield Ys Stress	Yield Ys Strain
File Name	N	mm	N/mm²	%	N	mm	N/mm²	%	N	mm	N/mm²	%
1.21.tst	56,784	3.96	888.605	7.915	51,313	4.46	802.983	8.930	52,473	3.30	821.142	6.604
2.22.tst	56,405	4.17	882.667	8.340	51,906	4.67	812.267	9.350	53,526	3.55	837.626	7.091
3.23.tst	58,982	5.02	922.997	10.045	53,722	5.58	840.686	11.155	57,460	4.61	899.185	9.211
4.24.tst	53,856	3.55	842.784	7.105	48,995	4.11	766.718	8.215	51,235	3.01	801.763	6.013
5.25.tst	56,748	4.08	888.035	8.160	51,824	4.54	810.978	9.070	55,607	3.69	870.179	7.380
Average	56,555	4.16	885.018	8.313	51,552	4.67	806.726	9.344	54,060	3.63	845.979	7.260
Standard Devi.	1630.097	0.482	25.509	0.963	1516.731	0.490	23.735	0.980	2224.362	0.540	34.809	1.080
PMK (Ca)	113107.845	6.313	1768.035	14.626	103101.821	7.344	1611.453	16.688	108118.485	5.260	1689.958	12.520
DPK (Cp)	0	0.346	0.007	0.173	0	0.340	0.007	0.170	0	0.309	0.005	0.154
CV%	2.882	11.590	2.882	11.590	2.942	10.487	2.942	10.487	4.115	14.876	4.115	14.876

CONCRETE SCREW ANCHOR

ZINC, GALVANIZED & STAINLESS STEEL

ORDERING INFORMATION

ZINC PLATED



Zinc Plated (Clear)

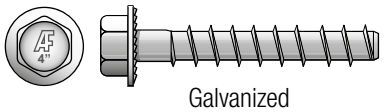
CONCRETE SCREW-ANCHOR - HEX FLANGE HEAD

PART #	ANCHOR* x LENGTH (in)	MIN. EMBEDMENT(in)	MAX. FIXTURE THICKNESS (in)	CLEARANCE HOLE Ø (in)	WRENCH SIZE (in)
1SAHZ14134	**1/4 x 1-3/4**	1	3/4	3/8	7/16
1SAHZ14214	**1/4 x 2-1/4**	1	1-1/4	3/8	7/16
1SAHZ38212	**3/8 x 2-1/2**	1-1/2	1	1/2	9/16
1SAHZ38300	**3/8 x 3**	1-1/2	1-3/8	1/2	9/16
1SAHZ38400	**3/8 x 4**	1-1/2	2-3/8	1/2	9/16
1SAHZ12300	**1/2 x 3**	2	1	5/8	3/4
1SAHZ12400	**1/2 x 4**	2	2	5/8	3/4
1SAHZ12500	**1/2 x 5**	2	3	5/8	3/4
1SAHZ12600	**1/2 x 6**	2	4	5/8	3/4
1SAHZ58400	**5/8 x 4**	2-1/2	1-1/2	3/4	15/16
1SAHZ58600	**5/8 x 6**	2-1/2	3-1/2	3/4	15/16

*Drill Diameter

ORDERING INFORMATION

GALVANIZED



Galvanized

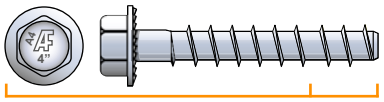
CONCRETE SCREW-ANCHOR - HEX FLANGE HEAD

PART #	ANCHOR* x LENGTH (in)	MIN. EMBEDMENT(in)	MAX. FIXTURE THICKNESS (in)	CLEARANCE HOLE Ø (in)	WRENCH SIZE (in)
1SAHG14134	**1/4 x 1-3/4**	1	3/4	3/8	7/16
1SAHG14214	**1/4 x 2-1/4**	1	1-1/4	3/8	7/16
1SAHG38212	**3/8 x 2-1/2**	1-1/2	1	1/2	9/16
1SAHG38300	**3/8 x 3**	1-1/2	1-3/8	1/2	9/16
1SAHG38400	**3/8 x 4**	1-1/2	2-3/8	1/2	9/16
1SAHG12300	**1/2 x 3**	2	1	5/8	3/4
1SAHG12400	**1/2 x 4**	2	2	5/8	3/4
1SAHG12500	**1/2 x 5**	2	3	5/8	3/4
1SAHG12600	**1/2 x 6**	2	4	5/8	3/4
1SAHG58400	**5/8 x 4**	2-1/2	1-1/2	3/4	15/16
1SAHG58600	**5/8 x 6**	2-1/2	3-1/2	3/4	15/16

*Drill Diameter

ORDERING INFORMATION

STAINLESS STEEL - 316



316 Stainless Steel + Case Hardened Tip

HEX FLANGE HEAD, BUTTON TORX HEAD AND FLAT TORX HEAD

STAINLESS PART #	SIZE MM (IN)	HEAD TYPE	ANSI DRILL SIZE	MAX. FIXTURE THICKNESS (in)	CLEARANCE HOLE Ø (mm)	WRENCH SIZE (mm)
1SAHS06060	M6 x 60mm (1/4 x 2-1/4)	Hex Head	6mm	5/8	8.5	10
1SAHS06080	M6 x 80mm (1/4 x 3)	Hex Head	6mm	1-3/8	8.5	10
1SAHS08075	M8 x 75mm (5/16 x 3)	Hex Head	8mm	7/8	10	13
1SAHS08100	M8 x 100mm (5/16 x 4)	Hex Head	8mm	1-3/4	10	13
1SAHS10085	M10 x 85mm (3/8 x 3-1/4)	Hex Head	10mm	5/8	13	17
1SAHS10120	M10 x 120mm (3/8 x 4-3/4)	Hex Head	10mm	2	13	17
1SAHS12150	M12 x 150mm (1/2 x 6)	Hex Head	12mm	2-3/4	15	19
1SABS06060	M6 x 60mm (1/4 x 2-1/4)	Button Torx Head	6mm	5/8	8.5	10
1SABS06080	M6 x 80mm (1/4 x 3)	Button Torx Head	6mm	1-3/8	8.5	10
1SABS08075	M8 x 75mm (5/16 x 3)	Button Torx Head	8mm	7/8	10	13
1SABS08100	M8 x 100mm (5/16 x 4)	Button Torx Head	8mm	1-3/4	10	13
1SACS06060	M6 x 60mm (1/4 x 2-1/4)	Flat Torx Head	6mm	5/8	8.5	10
1SACS06080	M6 x 80mm (1/4 x 3)	Flat Torx Head	6mm	1-3/8	8.5	10
1SACS08075	M8 x 75mm (5/16 x 3)	Flat Torx Head	8mm	7/8	10	13
1SACS08100	M8 x 100mm (5/16 x 4)	Flat Torx Head	8mm	1-3/4	10	13

*Drill Diameter

RECOMMENDED INSTALL TOOLS

Bosch® 18V High Torque Impact Wrench with Pin Detent with (2) FatPack Batteries (4.0Ah)

Bosch Power Tools deliver stronger performance and lasting reliability. The Bosch HTH181-01 high torque impact wrench offers a heavy duty all-metal motor, impact hammer and anvil system, made to hold up in tough environments. It comes with (2) FatPack Lithium-Ion advanced technology batteries that combines Electronic Cell Protection, a unique battery pack design and customized electronics to deliver optimal battery life and performance. Bosch 18V Batteries equipped with Coolpack Technology. This will provide better performance from your tools in extreme heats and frigid temperatures.

Part #	Type
9HTH181-01	Pin Detent

RECOMMENDED SOCKETS

Bosch® 1/2-Square Drive Socket - Impact Ready

Impact tough deep well socket engineered for high torque. Forged steel reduces breakage. Absorbs torque peaks to reduce stress. Hardened core increases socket strength, reduces fractures. Engineered to meet ISO standards.

Part #	Socket Size
5BS27273	3/8
5BS27274	7/16
5BS27275	1/2
5BS27276	9/16
5BS27279	5/8
5BS27280	11/16
5BS27281	3/4
5BS27282	13/16
5BS27283	7/8
5BS27284	15/16

TRADE APPLICATION

	CARPENTER	CONSTRUCTION	RACKING INSTALLER	CONCRETE FORMWORKER
Bottom plates	✓			
Awnings		✓		
Pallet racking			✓	
Formwork support				✓
Flooring	✓			
Shelving			✓	
Bracing	✓		✓	
Railings / Balustrade / Safety Barriers		✓		✓
Machinery			✓	
Curtain Wall		✓		

TRADE APPLICATION (CONT'D)