SUBJECT: **NUMBER 3 HEAD PLOW BOLTS (INCH)**

1.0 SCOPE AND PURPOSE. This Material & Process Specification provides dimensional data, material specifications, and performance requirements for Number 3 Head Plow Bolts (Inch).

2.0 USE OF THIS STANDARD. Unless otherwise specified, all Number 3 Head (Round Countersunk Head Square Neck) Plow Bolts (Inch) will conform to this Material & Process Specification.

3.0 SOURCE REFERENCE. AGCO's Hesston Operations standards engineer is responsible for the content of this specification.

The following documents were used as reference:

IFI – Inch Fastener Standards, 8th Edition

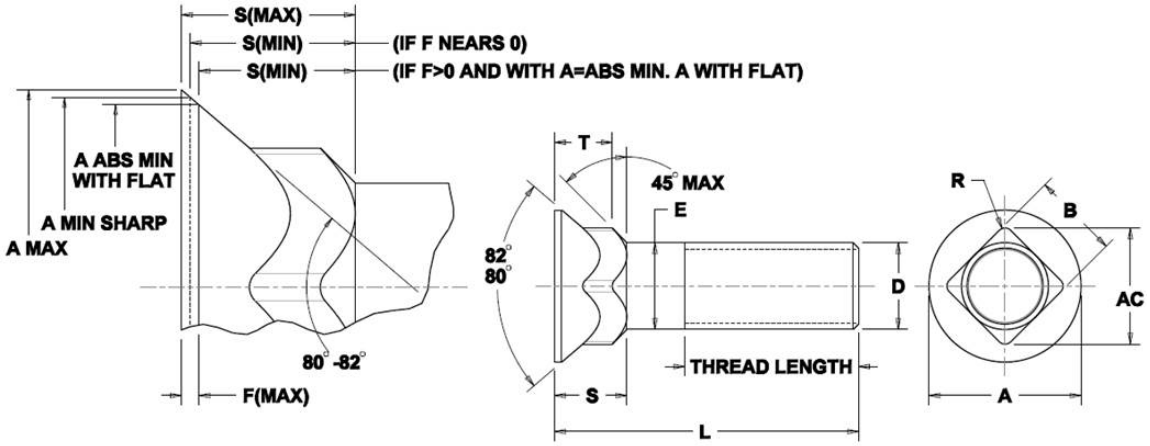
ANSI / ASME B1.1 Unified Inch Screw Threads.

ASME B18.9–2012 Plow Bolts.

SAE J429-2011 Mechanical & Material Requirements for Externally Threaded Fasteners.

M&PS 705100300 Fasteners – Dip Spin Zinc Rich Inorganic Coating.

4.0 DIMENSIONS OF NUMBER 3 HEAD PLOW BOLTS (ROUND COUNTERSUNK SQUARE NECK) Regular Head Per ASME B18.9 – 2012. All Dimensions are in inches.



D	E		A			F	S		T	B		AC	R
Nominal or Basic Bolt Diameter	Diameter of Full-Size Body		Diameter of Head			Maximum Feed Thickness	Depth of Square & Head		Min. Square Corner Length	Width of Square		Minimum Across Corners	Max. Radius On Corners Of Square
	Max.	Min.	Max.	Min Sharp	Abs. Min With Flat		Max.	Min.		Max.	Min. (Basic)		
Regular Head													
5/16 (0.3125)	0.312	0.299	0.605	0.578	0.538	0.040	0.269	0.228	0.176	0.325	0.313	0.417	0.031
3/8 (0.3750)	0.375	0.360	0.708	0.671	0.624	0.050	0.312	0.262	0.206	0.387	0.375	0.491	0.047
7/16 (0.4375)	0.438	0.421	0.826	0.781	0.729	0.058	0.364	0.306	0.235	0.450	0.438	0.580	0.047
1/2 (0.5000)	0.500	0.483	0.945	0.890	0.831	0.068	0.417	0.349	0.265	0.515	0.500	0.668	0.047
9/16 (0.5625)	0.592	0.544	1.045	1.000	0.924	0.072	0.461	0.389	0.305	0.578	0.563	0.732	0.078
5/8 (0.6250)	0.657	0.606	1.147	1.094	1.013	0.080	0.506	0.426	0.330	0.640	0.625	0.819	0.078
3/4 (0.7500)	0.782	0.729	1.303	1.250	1.169	0.080	0.541	0.461	0.338	0.765	0.750	0.996	0.078
7/8 (0.8750)	0.938	0.853	1.512	1.469	1.344	0.100	0.626	0.526	0.384	0.906	0.875	1.160	0.094
1 (1.0000)	1.062	0.976	1.700	1.656	1.532	0.100	0.690	0.590	0.422	1.031	1.000	1.336	0.094

This size is not recommended

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5.0 MATERIAL. Unless otherwise specified, chemical and mechanical properties of Number 3 Head Plow Bolts shall conform to Grade 5, or Grade 8 of SAE J429 as specified by the purchaser. AGCO Hesston shall only specify Grade 5 and Grade 8.

Grade	Material & Treatment	Chemical Analysis, % by Weight					
		C		Mn	P	S	B
		Min.	Max.	Min.	Max.	Max.	Min.
5	Medium Carbon Steel, Quenched & Tempered	0.28	0.55	—	0.025	0.025	—
8	Medium Carbon Alloy Steel, Quenched & Tempered	0.28	0.55	—	0.025	0.025	—

6.0 MECHANICAL PROPERTIES.

Grade	Nominal Size Dia., (Inch)	Proof Load (Stress) PSI	Tensile Strength (Stress) Min, PSI	Core Hardness
5	1/4 thru 1 Over 1 thru 1 1/2	85,000 74,000	120,000 105,000	25-34 HRC 19-30 HRC
8	1/4 THRU 1 1/2	120,000	150,000	33-39 HRC

7.0 BODY DIAMETER. Bolt body diameters shall not exceed the maximum specified in the dimensions table. Unless otherwise specified, bolts that are not threaded full length shall be furnished with full diameter body within the limits specified in the dimension table. Bolts that are threaded full length, the diameter of the unthreaded length under the head or neck shall not be less than the minimum pitch diameter of the thread.

8.0 LENGTH. The length of a plow bolt is the overall distance from the end of the bolt to the top of the head. Recommended lengths are given in Section 16.

9.0 THREADS. Threads shall conform to ANSI / ASME B1.1, UNC-2A or UNF-2A as specified. Threads shall be right hand unless otherwise specified. For Plated bolts, the maximum diameter of class 2A may be exceeded by the amount of the allowance.

10.0 THREAD LENGTH. The tread length dimension is measured from the end of the bolt to the last complete (full form) thread. See Section 16 for minimum thread length and tolerances on thread length.

11.0 POINTS. Plow bolts are not ordinarily pointed.

12.0 IDENTIFICATION SYMBOLS. Plow Bolts shall have both grade and source identification symbols on the heads. Grade symbols will conform to SAE-J429. Source symbols will identify the source (manufacturer or private label distributor). AGCO Hesston shall only specify Grade 5 and Grade 8.



GRADE 5 GRADE 8

13.0 FINISH. Items furnished to this specification shall be as specified on the drawing. Bolts shall be either non-plated (plain) or plated as specified. If plated is specified, plating to conform to M&PS 705100300 (Fasteners-Dip Spin Zinc Rich Inorganic Coating).

14.0 DEFECTS. Plow Bolts shall not contain any surface imperfections that might affect their serviceability. For example, burrs, seams, laps, loose scale and other surface irregularities.

15.0 AGCO HESSTON PART NUMBERS. A current listing of all number three head plow bolts (inch) can be found in the MRP program (BSCDSP) in Category 1220. An effort should be made to use existing part numbers and not create new numbers.

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16.0 MINIMUM THREAD LENGTH TABLE OF NUMBER 3 HEAD PLOW BOLTS.

Minimum Thread Lengths of Plow Bolts (2D + 0.250)

Recommended Bolt Length, L	Nominal Bolt Diameter, D							
	5/16 0.3125	3/8 0.3750	7/16 0.4375	1/2 0.5000	5/8 0.6250	3/4 0.7500	7/8 0.8750	1 1.0000
3/4 (0.75)	T to H	T to H	T to H	T to H	T to H	T to H	T to H	T to H
1 (1.00)	T to H	T to H	T to H	T to H	T to H	T to H	T to H	T to H
1-1/4 (1.25)	0.875	T to H	T to H	T to H	T to H	T to H	T to H	T to H
1-1/2 (1.50)	0.875	1.000	T to H	T to H	T to H	T to H	T to H	T to H
1-3/4 (1.75)	0.875	1.000	1.125	1.250	T to H	T to H	T to H	T to H
2 (2.00)	0.875	1.000	1.125	1.250	T to H	T to H	T to H	T to H
2-1/4 (2.25)	0.875	1.000	1.125	1.250	1.500	T to H	T to H	T to H
2-1/2 (2.50)	0.875	1.000	1.125	1.250	1.500	1.750	T to H	T to H
2-3/4 (2.75)	0.875	1.000	1.125	1.250	1.500	1.750	2.000	T to H
3 (3.00)	0.875	1.000	1.125	1.250	1.500	1.750	2.000	2.250
3-1/4 (3.25)	0.875	1.000	1.125	1.250	1.500	1.750	2.000	2.250
3-1/2 (3.50)	0.875	1.000	1.125	1.250	1.500	1.750	2.000	2.250
3-3/4 (3.75)	0.875	1.000	1.125	1.250	1.500	1.750	2.000	2.250
4 (4.00)	0.875	1.000	1.125	1.250	1.500	1.750	2.000	2.250
4-1/4 (4.25)	0.875	1.000	1.125	1.250	1.500	1.750	2.000	2.250
4-1/2 (4.50)	0.875	1.000	1.125	1.250	1.500	1.750	2.000	2.250
4-3/4 (4.75)	0.875	1.000	1.125	1.250	1.500	1.750	2.000	2.250
5 (5.00)	0.875	1.000	1.125	1.250	1.500	1.750	2.000	2.250
5-1/4 (5.25)	0.875	1.000	1.125	1.250	1.500	1.750	2.000	2.250
5-1/2 (5.50)	0.875	1.000	1.125	1.250	1.500	1.750	2.000	2.250
5-3/4 (5.75)	0.875	1.000	1.125	1.250	1.500	1.750	2.000	2.250
6 (6.00)	0.875	1.000	1.125	1.250	1.500	1.750	2.000	2.250
Plus Tolerance on Thread Length for Nominal Dia., In	0.139	0.156	0.179	0.192	0.227	0.250	0.278	0.312
Tolerance on Length for Nominal Dia., In	±0.03	±0.03	±0.06	±0.06	±0.12	±0.12	±0.12	±0.12

Note: Short lengths above the solid stepped line are not recommended.

T to H: Threaded to head or square within 2 1/2 full threads.

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17.0 PROOF LOAD AND TENSILE STRENGTH TABLE.

Nominal Dia. & Threads Per Inch	Stress Area, In²	Grade 5		Grade 8	
		Proof Load, lb.	Tensile Strength Min., lb.	Proof Load, lb.	Tensile Strength Min., lb.
Coarse Thread Series - UNC					
5/16-18	0.0524	4,450	6,300	6,300	7,850
3/8-16	0.0775	6,600	9,300	9,300	11,600
7/16-14	0.1063	9,050	12,800	12,800	15,900
1/2-13	0.1419	12,100	17,000	17,000	21,300
5/8-11	0.2260	19,200	27,100	27,100	33,900
3/4-10	0.3340	28,400	40,100	40,100	50,100
7/8-9	0.4620	39,300	55,400	55,400	69,300
1-8	0.6060	51,500	72,700	72,700	90,900

Revision History.
02 rev. – Update entire specification, including finish requirement. Redrawn to electronic format.