



Lockbolt & pull-type blind fasteners



Tooling Catalogue



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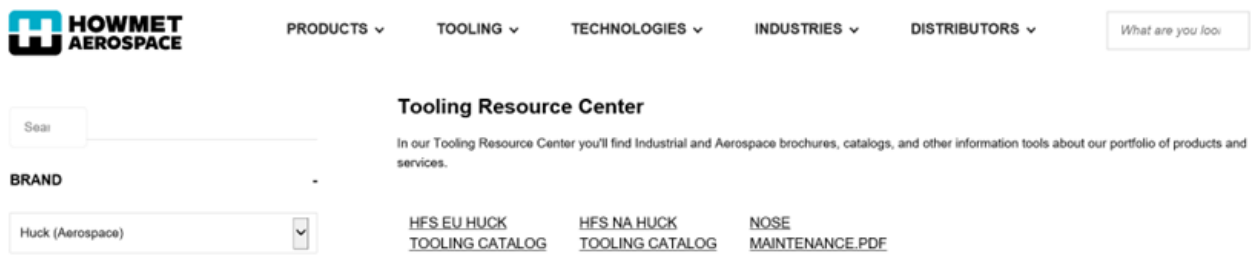
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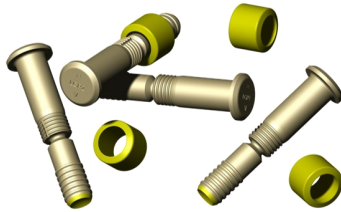
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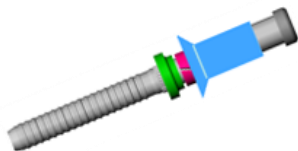
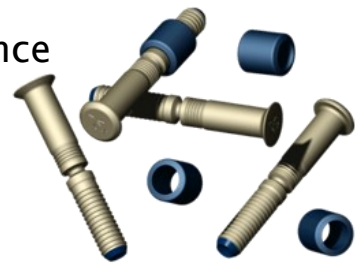


Fasteners covered by the HFS tools



LGP[®] & GP[™] : HFS offer tools for the complete LGP lockbolt[®] and GP[™] product range, inch and metric application, from 4 mm to 12,7 mm

XPL[®] : XPL[®] lockbolt are eXtended Performance Lockbolt, with double grip capability. They essentially use same tools than LGP, with an



Blind rivets / bolts : HFS tool product range covers installation of blind rivets and blind bolts, NAS1919/21, MS21140/41, MS90353/54, HuckMAX[®], UAB[™] blind bolt and others, from 4 mm up



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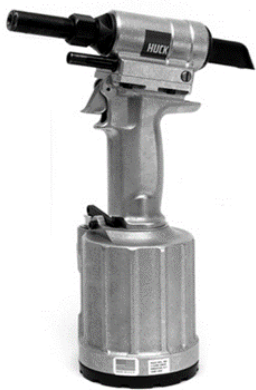




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Pull type tools

General informations



Different type of tools



▶ Pneudraulic :

They require pressurized air, 6,5 bars pressure. They can be used up to 9,5 mm diameter.

HFS tools combine a reduced weight, with an improved ergonomic, to reduce operators' fatigue.

HFS Lockbolt pneudraulic tools have a unique oil reservoir feature which allows for reduced maintenance frequency.

▶ Battery operated :

Electric installation tools can install fasteners up to ¼", Lockbolt and blinds. They use latest generation of 18 volts Li-Ion batteries offering extended lifetime and quick charge capability.

They do not require any power source and are ideal if air or electric power supply are not available. They also do not have any hose or wire attached which improves ergonomic.



▶Hydraulic :



They require an hydraulic power rig, can work up to 600 bars pressure, and are ideal for very high production rates. They are required for large diameter fasteners, 10 mm and more.

Due to higher pressure, they are usually lighter and smaller than pneudraulic tools, but have hydraulic hoses that can limit maneuverability.

They require basically no maintenance, nor inspection.



Hydraulic power rig

▶ HC315AF

HC315 AF is HFS standard power rig, fitting in most of the applications. It has a pressure preset of 450 bars, manually adjustable if needed, and a flow rate of 1,5 liters per minutes.

It is designed to install any aerospace fastener, from 4 mm to 12,7 mm included. It is compliant with the standard HFS hydraulic product range.

It shall be the preferred hydraulic power rig. More advanced power rigs are shown on next page. They are to be used for intensive pull-in applications or swaging of large diameter fasteners.

The HC315AF is available in different voltage options, single phase 110 & 220 Volts, and 3 phases 230 & 400 Volts. Voltage shall be specified in part number as follow :

HC315AF/S110 : 110 Volts single phase

HC315AF/S230 : 230 Volts single phase

HC315AF/T230 : 230 Volts three phases

HC315AF/T400 : 400 Volts three phases



All HFS power rigs are built on modular aluminum frames, are equipped with Plexiglas panels on the sides, wheels and handles.



Hydraulic power rig

Pressure recognition system

▶ HK3413PC

PC (Pressure Control) power rigs and tool product range is ideal for intensive pull-in applications. It has an improved cooling capability, combined with a Pressure Control feature, that will automatically recognize the connected tool, and adapt pressure to the application. It requires "PC" hydraulic tools for Pressure Control feature, and also accept all standard hydraulic tools. It is available in 110, 220 volts single phase version and 230 & 400 volts 3 phases.

HK3413PC/S110 : 110 Volts single phase

HK3413PC/S230 : 230 Volts single phase

HK3413PC/T230 : 230 Volts three phases

HK3413PC/T400 : 400 Volts three phases

▶ HK418CPC

CPC (Computer Pressure Control) power rigs feature a high accuracy and highly repeatable pressure regulation system. They are equipped with a PLC unit, pressure transducer and a large display on front panel, showing max pressure reached during installation cycle. High accuracy of the HK418CPC power rig allow installation of larger diameters XPL © fasteners, 14,3 and 15,9 mm, equipped with removable pintails. It will accept all other tools, standard and PC type. It is available in 400 Volts, 3 phases only.



HK3413PC



HK418CPC



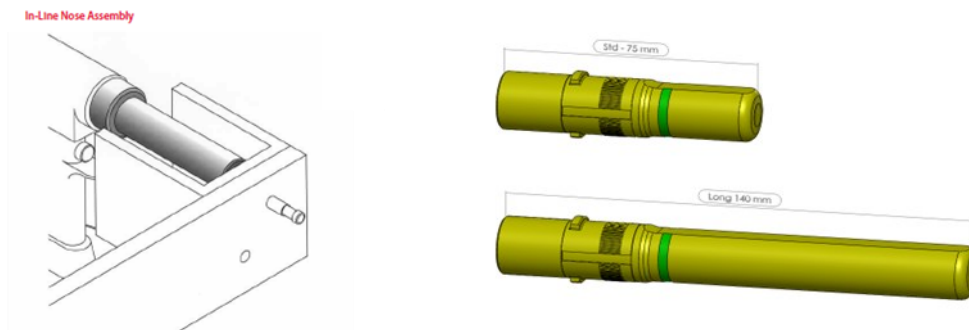
Nose assembly

Standard

▶ IN LINE

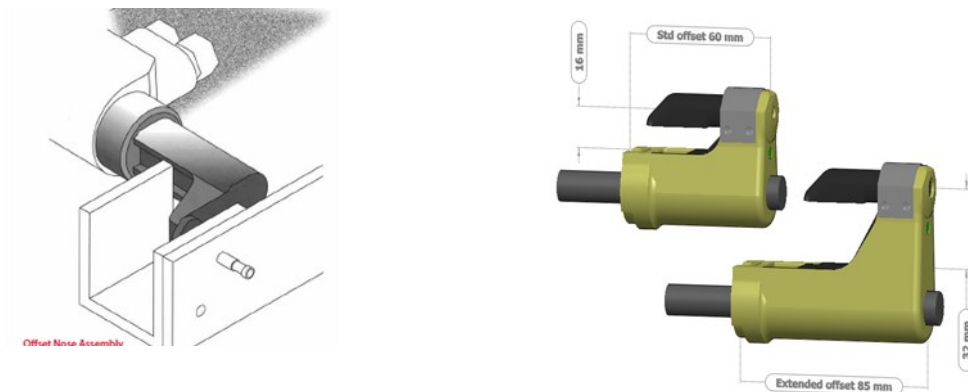
In line nose assemblies are recommended for general use. They typically have a longer life time than the equivalent offset nose, and a lower cost. Spare parts are also more common, and shall be easier to procure.

They are usually available in 2 lengths.



▶ OFFSET

Offset noses shall only be used in applications which have limited accessibility. Attachment is different from the in line noses, which will require different tools and/or adapters. Two offset distances are available. A straddle offset option is also offered.

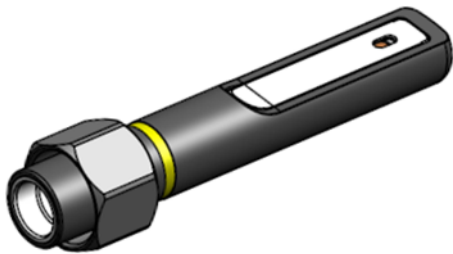


Nose assembly

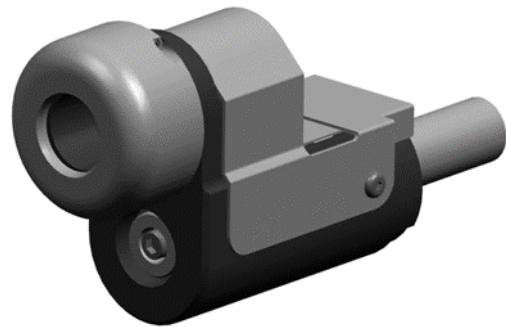
Specific

▶ SPECIFIC

Noses for specific applications, or limited accessibility, are available. They shall be used if standard noses do not fit in the application. Please contact your Howmet representative for further info & details. Few examples of Howmet tooling capabilities are shown here below.



In-line nose with reduced center to edge distance



Swivel pad offset nose assembly for pull-in



700 series hydraulic tool
combo pull & swage



90° offset adapter for lockbolt
& blind bolts/rivets



How to use this catalog ?

A chart is shown for each fastener family. It shows available noses, combined with optimum installation tool for each fastener diameter. Adapter option is shown if available, allowing to install offset nose on tools designed for in line noses.

Background colors indicate nose connection style. Larger tools, having more capacity and stroke than recommended tool, can be used as alternative if they have same connection.

Tools, noses and/or adapters can be ordered individually.

		In line			
Alcoa Diameter	Dia. Inch / mm	Noses		Tools	
		Standard	Long	Pneudraulic	Hydraulic
5	.1640" 4,16 mm	<u>99-2501</u>	<u>99-2502</u>	244X	2480
6	.1900" 4,8 mm	<u>99-2507</u>	<u>99-2508</u>		
7	.2187" 5,55 mm	<u>99-2675</u>	<u>99-2676</u>		
8	.2500" 6,35 mm	<u>99-2513</u>	<u>99-2514</u>	254	2503
10	.3125" 7,9 mm	<u>99-2519</u>	<u>99-2520</u>		
12	.3750" 9,5 mm	<u>99-2522</u>	<u>99-2523</u>	2600-16-12	
14	.4375" 11,1 mm	<u>99-2657</u>	<u>99-2657-1</u>		
16	.5000" 12,7 mm	<u>99-2669</u>	<u>99-2669-1</u>		

Tools can also be ordered assembled, ready to use. Simply combine underlined section of the tool part number you have selected with underlined section of nose assembly, adding a "A" letter in between. Howmet will assemble the tool for you, and will include adaptor if needed, plus pintail collector bag or any other component needed.

For example, you have selected a long in line nose for LGP, part number 99-2508, and a 244 pneudraulic tool, build assembly part number as follow :

Alcoa Diameter	Dia. Inch / mm	Noses		Tools	
		Standard	Long	Pneudraulic	Hydraulic
5	.1640" 4,16 mm	<u>99-2501</u>	<u>99-2502</u>	244X	2480
6	.1900" 4,8 mm	<u>99-2507</u>	<u>99-2508</u>		
7	.2187" 5,55 mm	<u>99-2675</u>	<u>99-2676</u>		

Assembly part number : **244X A 2508**

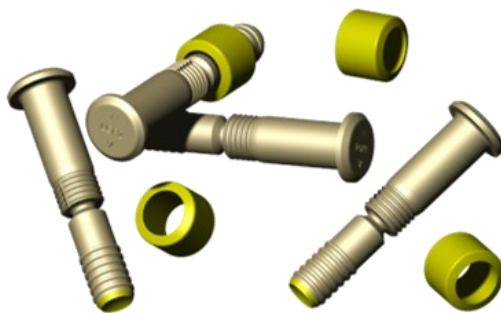




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Lockbolt fasteners

Part Numbers



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Fastener family - Lockbolt Inch

Howmet Fastening Systems (HFS) only guarantees system performances when genuine HFS GP® lockbolt, LGP® lockbolt, or XPL® lockbolt components are used in combination with other genuine HFS hardware and are installed using HFS tooling. HFS expressly does not guarantee system performance, and disclaims any and all liability, when: (a) fasteners and/or components from an unlicensed source are used in combination with HFS fasteners and/or components; and/or (b) HFS fasteners are installed without HFS tooling. Head marking must reflect GP, LGP and XPL as applicable. Customer part numbers are provided for reference only.

Cust. Pin P/N	Cust. collar P/N	HFS Pin P/N	HFS collar P/N	Tooling selection list
ABS0548 / 0549* ASNA2391 / 2392* ASNA2043 / 2048* MBBN4481*	ASNA2025*	LGPL4SC/SP LGPL2SC/SP	3SLC-C	
ASNA2041/2042* ABS0095/ABS1781*	ASNA2045*	LGPL4/7/8/9SP/SC- V()B	SLFC-MV	LGP ®
EN6050/6100/6120*	EN6051/6054*	LGPL2/4SP/SCEB	3SLC-F/G	
BACB31D / E / F	BACC30CT	ALP 7/8/12	ASF-LV	
B0206072 / B0206071 BACB31P6 / BACB31N6		ALC8SC-VC ALC12SP-VC		
ABS0998*	ABS0999*	XPL8BP	XBF-LV	XPL ®
ABS0995/1504/1506*	ABS1505*	XPL4/8MC/MP	XMC-LV	
ABS0268/0269	ABS0270/0644	GPL8TC/TP-V	2TC-C/FTC-C	GP ™
ASNA2040/2054*	ASNA2044*	GPL7TC/TP-EU	2TC-M	

* See diameter [conversion chart](#) to define Howmet diameter code



Fastener family - Lockbolt metric

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Cust. Pin P/N	Cust. collar P/N	HFS Pin P/N	HFS collar P/N	Tooling selection list
35655 35656 35657	35665	MGPL6/7/8TP/TC-TX	M2TC-C	MGP™
JN0028 JN0029	JN0024	MGPL28/29 TP/TC	M2TC-C	
35660 35661	35666	MLGPL6/9 CTX	MSLFC-MV	
JN0026 JN0027	JN0023	MLGPL2/22 SC/SP V	M3/4SLC-C	
JN0030 JN0031	JN0025	MLGPL28/29 SC/SP	MSLFC-MV	
EN4172 EN4173 EN4401 EN4402	EN4175 ECS6102	MLGPL28/29 SC/SP	MSLFC-MV	MLGP™
DIN65548 DIN65549	DIN65355	MLGPL28/29 SC/SP	MSLFC-MV	
JN0177 JN0179	JN0201	MLGPL22/22 SC/SP EB	M3/4SLC-G	



Interference fit - Pull-in

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Cust. P/N

ABS0548/0549*

ABS0995/1506*

B0206072 / B0206071

BACB31P6 / BACB31N6

HFS P/N

LGPL()S()-V()L

XPL()M()-V()L

ALC()S()-VC

Tooling selection list

Pull-in

* See diameter [conversion chart](#) to define Howmet diameter code



Lockbolt Diameter

		Airbus				Boeing Bombardier	
HFS dia code	Dia inch / mm	0095					
		0548	2041				
		0549	2042				
		0995	2043				
		0998	2048			6050	206
		1504	2054	ABS 0268 0269	MBBN 4481	EN 6100 6120	B 071 206 072
		1506	2391				BAC 31P B 31N
		1745	2392				
		1778	2705				
		1781					
		5	4,16 mm 5/32"	2	5	4	40
6	4,8 mm 3/16"	3	6	5	50	6	
7	5,55 mm 7/32"	3A	7		60	7	
8	6,35 mm 1/4"	4	8	6	80	8	
10	7,9 mm 5/16"	5	10			10	
12	9,5 mm 3/8"	6	12			12	
14	11,1 mm 7/16"	7				14	
16	12,7 mm 1/2"	8					
18	14,3 mm 9/16"	9					
20	15,9 mm 5/8"	10					

All equipment listed in this catalog refers to Howmet diameter code.

Metric and blind fasteners diameter code are usable directly, no conversion is required.

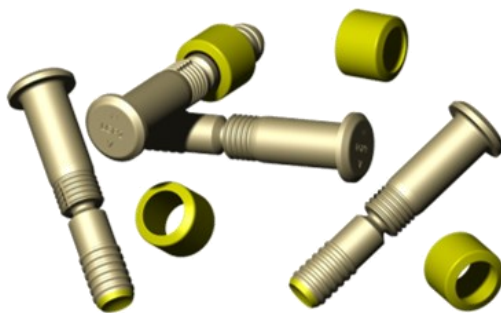




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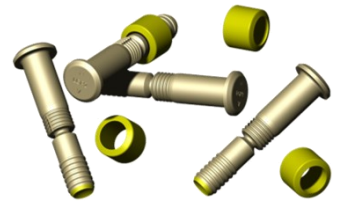
Lockbolt fasteners

Tooling selection chart








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LGP[®] tool selection



In-Line tools

		Noses		Tools		
HFS diameter code	Dia Inch / mm	Standard	Long	Electric	Pneudraulic	Hydraulic
						
5	,1640" 4,16 mm	99-2501	99-2502	(K)EBS43X	244X	2480
6	,1900" 4,8 mm	99-2507	99-2508			
7	,2187" 5,55 mm	99-2675	99-2676	(K)EBS44X	254	2583
8	,2500" 6,35 mm	99-2513	99-2514			
10	,3125" 7,9 mm	99-2519	99-2520			
12	,3750" 9,5 mm	99-2522	99-2523			
14	,4375" 11,1 mm	99-2657				
16	,5000" 12,7 mm	99-2669				2600-16-12

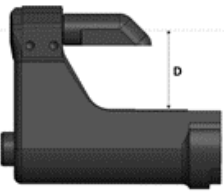
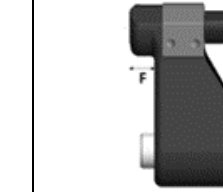
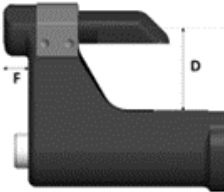




Colors in chart indicates nose connection style.

LGP[®] noses are identified by a yellow color, a stripe on anvil for in line, a dot on face of nose for offset.

Click on tool part number to go to tool detailed information page.

Italic are Make To Order items, price is depending on quantity, prefer standard ones if possible.

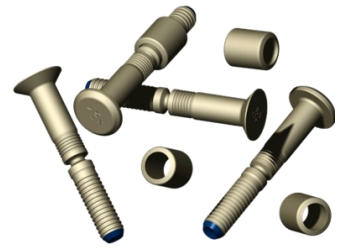
Offset tools

		Noses				Tools		
HFS diameter code	Dia Inch / mm	Std		Straddle		Electric	Pneudraulic	Hydraulic
		Off-Set (OR)* 16 mm Offset D	Off-Set + (OL)* 32 mm Offset D	Off-Set (ZR)* 16 mm Offset D	Off-Set + (ZL)* 32 mm Offset D			
								
5	,1640" 4,16 mm	99LGP-05-ORAD	99LGP-05-OLAD	99LGP-05-ZRAD	99LGP-05-ZLAD	(K)EBS43OSX or (K)EBS44OSX	244OSX	206-500
6	,1900" 4,8 mm	99LGP-06-ORAD	99LGP-06-OLAD	99LGP-06-ZRAD	99LGP-06-ZLAD			
7	,2187" 5,55 mm	99LGP-07-ORAD	99LGP-07-OLAD	99LGP-07-ZRAD	99LGP-07-ZLAD	(K)EBS44OSX	254OS	208-625
8	,2500" 6,35 mm	99LGP-08-ORAD	99LGP-08-OLAD	99LGP-08-ZRAD	99LGP-08-ZLAD			
10	,3125" 7,9 mm	99-3719	99-3719-1	99-1736DG				
12	,3750" 9,5 mm	99-3754	99-3754-1					
14	,4375" 11,1 mm	99-3790						






* Clearance noses with reduced center to edge distance are available for restricted accessibility area. For such noses, OR/ZR becomes OC/ZC. OL/ZL becomes OB/ZB.



XPL[®] tool selection



In-Line tools

		Noses		Tools		
HFS diameter code	Dia Inch / mm	Standard	Long	Electric	Pneudraulic	Hydraulic
						
5	.1640" 4,16 mm	<i>LGP[®] tools usable, see LGP[®] selection page</i>				
6	.1900" 4,8 mm					
7	.2187" 5,55 mm					
8	.2500" 6,35 mm	<i>LGP[®] tools usable, see LGP[®] selection page</i>				
10	.3125" 7,9 mm					
12	.3750" 9,5 mm					
14	.4375" 11,1 mm	<i>LGP[®] tools usable, see LGP[®] selection page</i>				
16	.5000" 12,7 mm					
18	.5625" 14,3 mm					
20	.6250" 15,9 mm	<i>99-2634LGP</i>			<i>2600-16-12CPC540</i>	




Colors in chart indicates nose connection style.

XPL[®] lockbolt noses are the same than LGP[®] lockbolt. Some tools will require longer stroke. All XPL[®] lockbolt tools will also work with LGP[®] lockbolt.

Click on tool part number to go to tool detailed information page.

Italic are Make To Order items, price is depending on quantity, prefer standard ones if possible.

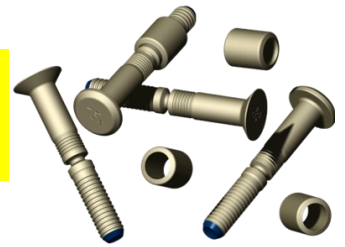
Offset tools

		Noses				Tools			
HFS diameter code	Dia Inch / mm	Std		Straddle		Electric	Pneudraulic	Hydraulic	
		Off-Set (OR)* 16 mm Offset D	Off-Set + (OL)* 32 mm Offset D	Off-Set (ZR)* 16 mm Offset D	Off-Set + (ZL)* 32 mm Offset D				
5	.1640" 4,16 mm	<i>LGP[®] tools usable, see LGP[®] selection page</i>							
6	.1900" 4,8 mm								
7	.2187" 5,55 mm								
8	.2500" 6,35 mm	99LGP-08-ORAD	99LGP-08-OLAD	99LGP-08-ZRAD	99LGP-08-ZLAD	(K)EBS44OSX	244OSX	206-XPL-08	
10	.3125" 7,9 mm	<i>LGP[®] tools usable, see LGP[®] selection page</i>							
12	.3750" 9,5 mm								

* Clearance noses with reduced center to edge distance are available for restricted accessibility area. For such noses, OR/ZR becomes OC/ZC.
OL/ZL becomes OB/ZB.



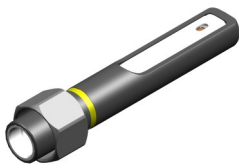

Specific noses, LGP[®] & XPL[®]



Howmet also offers nose assembly for restricted accessibility. Chart here below shows a selection of such noses, with reduced center to edge distance.

Noses in first column are optimized noses on which collet remains cylindrical, which limits the number of components. Center to edge distance reach 6,4 mm.

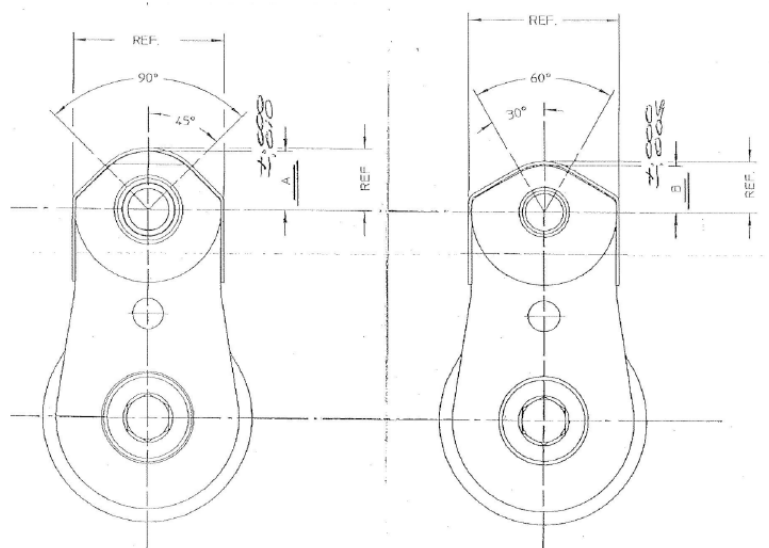
Noses in second column comes with a cut on collet. Center to edge distance is even more reduces (5,5 mm for diameter 5 and 6, 6,7 mm for diameter 7 & 8), but noses have more components and a bigger external diameter.

HFS diameter code	Dia Inch / mm	Noses		Tools		
		Reduced	Extra reduced	Electric	Pneudraulic	Hydraulic
						
5	,1640" 4,16 mm	99-3485	99-3473	(K)EBS43X	244X	2480
6	,1900" 4,8 mm	99-3486	99-3474			
7	,2187" 5,55 mm		99-2638	(K)EBS44X54	254	2580
8	,2500" 6,35 mm		99-3476			

Offset noses with reduced center to edge distance are also available. Center to edge distance is reduced from 9,5 mm to 8 mm, for most common diameters (5 thru 8).

For such configurations, refer to LGP[®] lockbolt or XPL[®] lockbolt tooling selection chart, and substitute letter of nose part number as follow :

- OR becomes OC
- ZR becomes ZC
- OL becomes OB
- ZL becomes ZB








Standard Offset
90° angle

Clearance cut
60° angle



GP™ installation tool selection chart

In-Line tools




		Noses		Tools		
HFS diameter code	Dia Inch / mm	Standard	Long	Electric	Pneudraulic	Hydraulic
						
5	,1640" 4,16 mm	99-2549T	99-2550T	(K) EBS43X	244X	2480
6	,1900" 4,8 mm	99-2555	99-2556			
7	,2187" 5,55 mm	99-2681	99-2682	(K) EBS44X		
8	,2500" 6,35 mm	99-2564	99-2565		254	2583
10	,3125" 7,9 mm	99-2567	99-2568		256	
12	,3750" 9,5 mm	99-2570			256	

Colors in chart indicates nose connection style.

Click on tool part number to go to tool detailed information page.

Italic are Make To Order items, price is depending on quantity.

Offset tools

		Noses		Tools		
HFS diameter code	Dia Inch / mm	<i>Std</i>		Electric	Pneudraulic	Hydraulic
		Off-Set (OR)* 16 mm Offset D	Off-Set + (OL)* 32 mm Offset D			
		5	,1640" 4,16 mm	99GP-05-ORAD	99GP-05-OLAD	(K) EBS43OSX or (K) EBS44OSX
6	,1900" 4,8 mm	99GP-06-ORAD	99LP-06-OLAD	(K) EBS44OSX		
7	,2187" 5,55 mm	99GP-07-ORAD	99GP-07-OLAD	(K) EBS44OSX		
8	,2500" 6,35 mm	99GP-08-ORAD	99GP-08-OLAD			206-XPL-08
10	,3125" 7,9 mm	99-1720DG			254OS	208-625
12	,3750" 9,5 mm	99-1756DG				








MGP™ installation tool selection chart

Metric MGP™ Installation Tool

In-Line tools

Colors in chart indicates nose connection style.

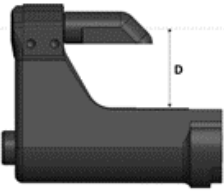
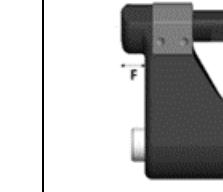
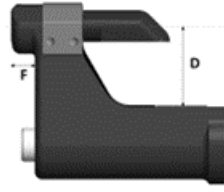




Diameter	Noses		Tools		
	Standard	Long	Electric	Pneudraulic	Hydraulic
4 mm					
5 mm	99-2573	99-2574	(K)EBS43X	244X	2480
6 mm	99-2579	99-2580			
8 mm	99-2585	99-2586	(K)EBS44X	254	2583
10 mm	99-2591				
	99-2594			256	

MGP™ noses are identified by a blue color, a stripe on anvil for in line, a dot on face of nose for offset.

Click on tool part number to go to tool detailed information page.

Italic are Make To Order items, price is depending on quantity.

Offset tools






Diameter	Noses				Tools		
	Std		Straddle		Electric	Pneudraulic	Hydraulic
	Off-Set (OR)* 16 mm Offset D	Off-Set + (OL)* 32 mm Offset D	Off-Set (ZR)* 16 mm Offset D	Off-Set + (ZL)* 32 mm Offset D			
4 mm							
5 mm	99-3706	99-3706-1	99-3748		(K)EBS43OSX or (K)EBS44OSX	244OSX	206-500
6 mm	99-3707	99-3707-1	99-3749				
8 mm	99-3708	99-3708-1	99-3750		(K)EBS44OSX	254OS	208-625
	99-1722DG						



MLGP™ installation tool selection chart

Metric MLGP™ Installation

In-Line tools

Diameter	Noses		Tools		
	Standard	Long	Electric	Pneudraulic	Hydraulic
4 mm					
5 mm	99-2525	99-2526	(K) EBS43X	<u>244X</u>	<u>2480</u>
6 mm	99-2531	99-2532			
8 mm	99-2537	99-2538		<u>254</u>	<u>2583</u>
10 mm	99-2543				
	99-2546				

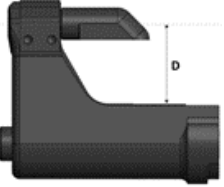
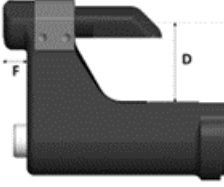



Colors in chart indicates nose connection style.

MLGP™ noses are identified by a red color, a stripe on anvil for in line, a dot on face of nose for offset.

Click on tool part number to go to tool detailed information page.

Italic are Make To Order items, price is depending on quantity.

Offset tools






Diameter	Noses				Tools			
	Std		Straddle		Electric	Pneudraulic	Hydraulic	
	Off-Set (OR)* 16 mm Offset D	Off-Set + (OL)* 32 mm Offset D	Off-Set (ZR)* 16 mm Offset D	Off-Set + (ZL)* 32 mm Offset D				
4 mm						(K) EBS43OSX or (K) EBS44OSX	<u>244OSX</u>	<u>206-500</u>
5 mm	99-3709	99-3709-1	99-3743			(K) EBS44OSX		
6 mm	99-3710	99-3710-1	99-3744					
8 mm	99-3711	99-3711-1	99-3745				<u>254OS</u>	<u>208-625</u>
	99-1721DG							



Pull-in (M)LGP™/(M)GP™/XPL® / ALC™ Lockbolts

Pull-in tools

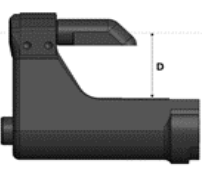
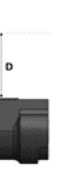



In-Line tools

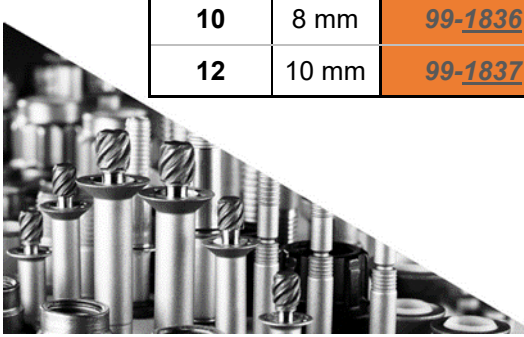
		Noses		Tools			
Inch Fasteners HFS diameter code	Metric Fasteners	Standard	Long	Electric	Pneudraulic		Hydraulic
					Tool 	Regulator 	
5	4 mm	<u>99LGP-05-PRAC-2</u>	<u>99LGP-05-PLAC-2</u>	(K)EBSPX5	2012	127308-6	<u>2480PC120</u>
6	5 mm	<u>99LGP-06-PRAC-2</u>	<u>99LGP-06-PLAC-2</u>	(K)EBSPX6		127308-9	<u>2480PC160</u>
7	N/A	<u>99LGP-07-PRAC-2</u>	<u>99LGP-07-PLAC-2</u>	(K)EBSPX7		127308-9	<u>2480PC170</u>
8	6 mm	<u>99LGP-08-PRAC-2</u>	<u>99LGP-08-PLAC-2</u>	(K)EBSPX8		2025	127308-8
10	8 mm	<u>99-1831</u>	<u>99-1831-1</u>		2057	127308-11	<u>2583PC210</u>
12	10 mm	<u>99-1832</u>	<u>99-1832-2</u>			127308-15	<u>2583PC320</u>

Colors in chart indicates nose connection style. Pull-in noses will be identified by a white color, a stripe on anvil for in line, a dot on face of nose for offset. Chart is for Titanium fasteners only, consult Howmet for aluminum pins.

Pull-in tools are for interference fit applications, and require appropriate pintail length on fasteners. Battery & hydraulic tools are pre-adjusted to appropriate pressures. Pneudraulic tools require the air pressure regulator suggested in chart to operate. It needs to be installed in line with installation tool, on air intake.

Offset tools

		Noses		Tools			
Inch Fasteners HFS diameter code	Metric Fasteners	Standard	Extended	Electric	Pneudraulic		Hydraulic
					Tool 	Regulator 	
5	4 mm	<u>99-1833</u>	<u>99-1833-1</u>	(K)EBSPX5	244OSX	127308-3	<u>206-500PC70</u>
6	5 mm	<u>99-1834</u>	<u>99-1834-1</u>	(K)EBSPX6		127308-5	<u>206-500PC100</u>
7	N/A	<u>99-1853</u>	<u>99-1853-1</u>	(K)EBSPX7		127308-5	<u>206-500PC110</u>
8	6 mm	<u>99-1835</u>	<u>99-1835-1</u>	(K)EBSPX8		127308-9	<u>206-500PC170</u>
10	8 mm	<u>99-1836</u>			254OS	127308-7	<u>208-750PC140</u>
12	10 mm	<u>99-1837</u>				127308-10	<u>208-750PC220</u>

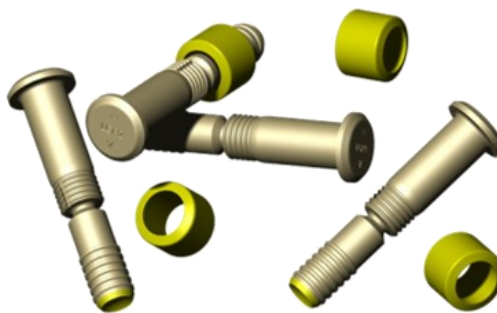




**HOWMET
AEROSPACE**

Lockbolt fasteners

Grip selection & Inspection



**HOWMET
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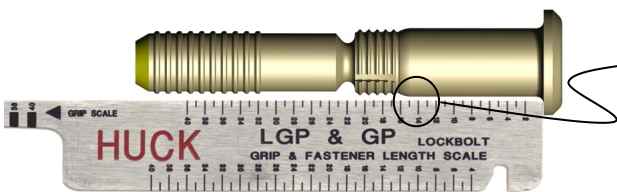
Fastener selection &

Inspec-

▶ GRIP GAGES

Grip gage are used for fastener grip selection. The chart below shows appropriate grip gage according to fastener part number.

Fastener type	Gage P/N
<i>GP / LGP / ALP Lockbolt & EN6114/6115</i>	122666
<i>MGP / MLGP Lockbolt, 2 mm grip range (Eurofighter)</i>	122667
<i>XPL Lockbolt</i>	126983
<i>RXL & RXB Sleeved Fasteners</i>	129885



They also allow verification of grip length of fasteners. Alling fastener on gage, and read value corresponding to end of full cylindrical portion of shank.



▶ SWAGE GAGES

Swage gages allow inspection of installed fasteners. See chart on following pages for part number selection.

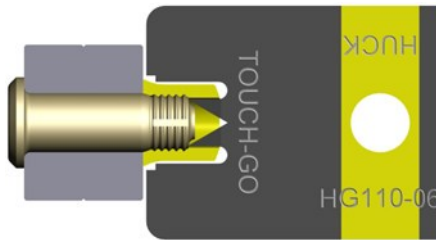
▶ NOSE ASSEMBLY VERIFICATION

Noses are subject to wearing, and it is recommended to occasionally inspect swage cavity dimensions. HFS Swage Cavity Inspection sheets, containing a guide and dimensions to use are shown in following pages.



Swage gages usage

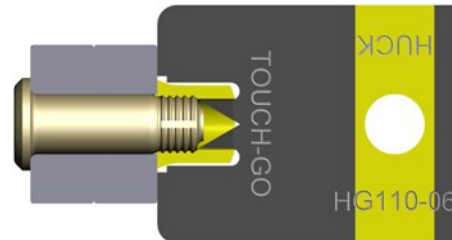
▶ TOUCH GO SIDE



Accept

Contact between swage gage and end of the pin.

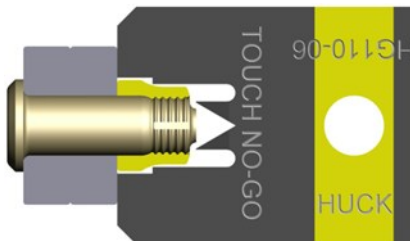
No contact between collar and swage gage, no contact between structure and swage gage.



Reject

Contact between collar & gage or contact between structure & gage.

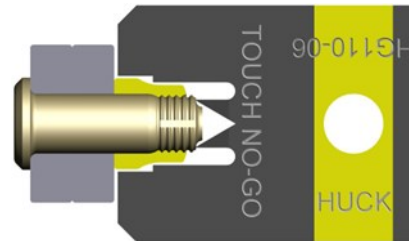
▶ TOUCH NO GO SIDE



Accept

Contact between assembly and gage.

No contact between collar and swage gage, no contact between pin and gage.



Reject

Contact between pin & gage or contact between collar & gage.

Swage gages verify the correct length pin is used and inspect the swage collar to determine if it is completely and sufficiently swaged. This gage does not verify tooling, equipment, and part conformance.

Howmet Fastening Systems (HFS) only guarantees compatibility when genuine HFS GP® lockbolt, LGP® lockbolt, or XPL® lockbolt components are used in combination with other genuine HFS hardware and are installed using HFS tooling. HFS expressly does not guarantee system performance, and disclaims any and all liability, when: (a) fasteners and/or components from an unlicensed source are used in combination with HFS fasteners and/or components; and/or (b) HFS fasteners are installed without HFS tooling. Head marking must reflect GP, LGP and XPL as applicable.



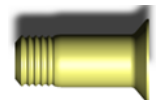
Swage gages selection

▶ GP™ / LGP® lockbolt Inch series pull type



<i>Collar P/N</i>	<i>Pin P/N</i>	<i>Swage gage P/N</i>
2TC-C / 2TCC-C	GPL8TP-V / GPL8TC-V	HG100-()
FTC-C		HG140-()
2TCC-M	GPL7TP-EU / GPL7TC-EU	HG134-()
3SLC-C	LGPL2SP/LGPL2SC LGPL4SP/LGPL4SC	HG110-()
	LGPL7/8/9S()-V()B	HG131-()
SLFC-MV	LGPL7/8/9S()-V()B	HG118-()
	LGPL4S()-V()B	HG166-()
3SLC-F / 3SLC-G	HLGPL2/4S()EB	HG171-()

▶ GP™ / LGP® lockbolt inch series stump type



<i>Collar P/N</i>	<i>Pin P/N</i>	<i>Swage gage P/N</i>
2TC-C / 2TCC-C	GPS8TP-V / GPS8TC-V	HG107-()
3SLC-C	LGPS4SP/LGPS4SC	HG113-()
	LGPS7/8/9S()-V()B	HG138-()
SLFC-MV	LGPS7/8/9S()-V()B	HG119-()



Swage gages selection

▶ XPL® lockbolt



<i>Collar P/N</i>	<i>Pin P/N</i>	<i>Swage gage P/N</i>
XMC-LV	XPL4MP/MC-V / XPL8MC-V	HG164-()
	XPL8BP / XPL4BC-V	HG176-()
XBF-LV	XPL8BP / XPL4BC-V	HG162-()

▶ MGP™ / MLGP™ Metric series pull type

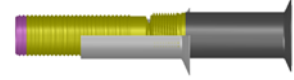


<i>Collar P/N</i>	<i>Pin P/N</i>	<i>Swage gage P/N</i>
M2TC-C	MGPL6/7/8TP/TC-TX	HG115-()
	MGPL28/29 TP/TC	HG142-()
MSLFC-MV	MLGPL6/9 CTX	HG129-()
	MLGPL28/29 SC/SP	HG143-()
	MLGPL2/22 SC/SP-V	HG146-()
M3/4SLC-C	MLGPL2/22 SC/SP-V	HG141-()
	MLGPL28/29 SC/SP	HG144-()
M3/4SLC-G	MLGPL2/22 SC/SP-EB	HG175-()



Swage gages selection

▶ ALC™ / RXL™ – Sleeved fasteners – Lockbolt types



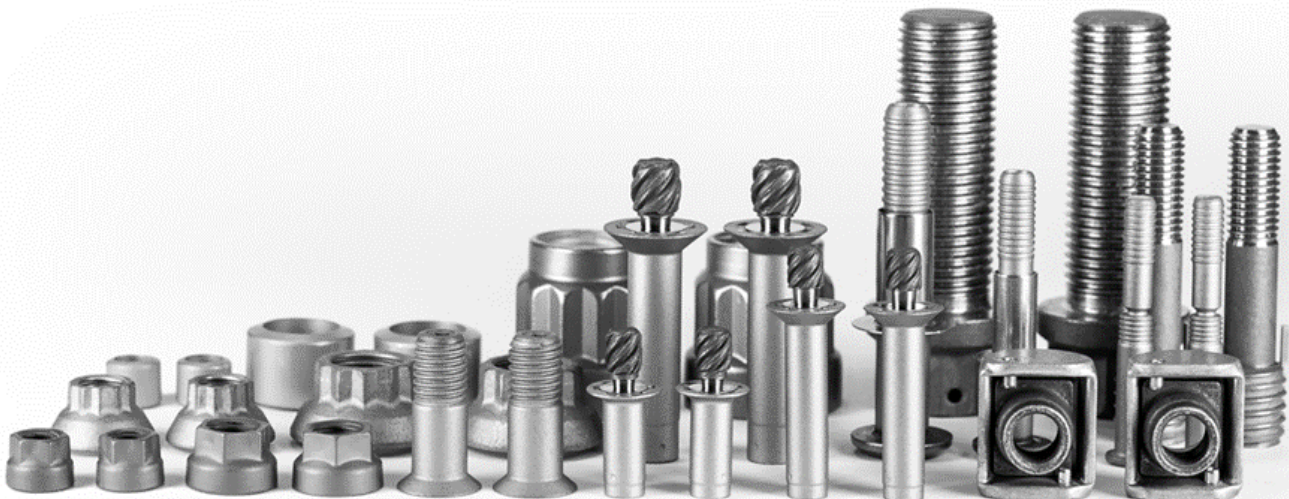
<i>Collar P/N</i>	<i>Pin P/N</i>	<i>Swage gage P/N</i>
ASFC-LV <i>BACB30CY / B0206075</i>	AL8SC / AL12SP-VC() <i>BACB31N6 / BACB31P6</i> <i>B0206071 / B0206072</i>	HG169-()
RXLC-LV <i>ABS1746</i>	RXL12BP-VC <i>ABS1745</i>	HG172-()
RXC-LV <i>ABS1780</i>	RXL4BC-VL <i>ABS1778</i>	HG173-()





**HOWMET
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Swage Cavity Inspection Sheets



Swage Cavity Inspection – LGP® /XPL®



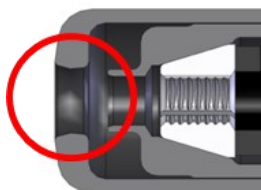
LGP® & XPL® lockbolt installation noses have a yellow identification strip

For proper and smooth lockbolt installations, a periodic inspection and cleaning of swage cavities is recommended. The following instructions are related to LGP® & XPL® lockbolt systems

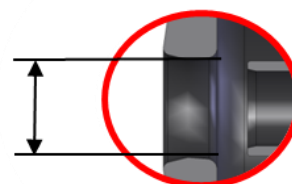
The inspection consists in a visual validation that the swage cavity is smooth and free of contamination, followed by verification with a plug gage of the swage cavity internal. Diameter has to always be in the dimensional limits of the following table. **Max. in service** dimensions column lists the maximum acceptable diameter of the swage cavities for LGP® and XPL® lockbolt installation noses and for the anvils installed on Automatic Collar Feeding Devices (ACFD).

Swage cavity Dimensions		
Diameter Code	<i>Dia mm</i>	max in service mm
-05	4,16	5,687
-06	4,8	6,274
-07	5,55	7,353
-08	6,35	8,283
-10	7,9	10,368
-12	9,5	12,261
-14	11,1	14,486
-16	12,7	16,703
-18	14,3	18,834
-20	15,9	20,688

Nose assembly



Diameter to be inspected



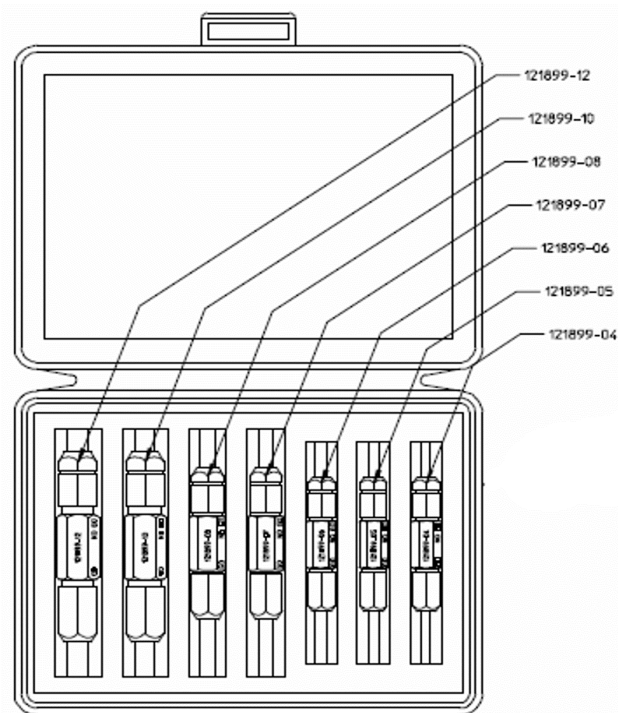
ACFD anvil



Diameter to be inspected



Installation noses exceeding Max. in service dimensions require immediate replacement



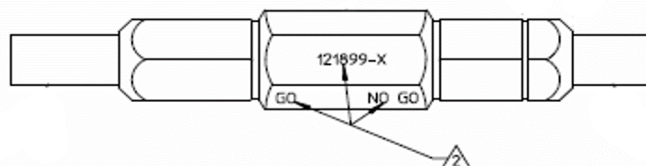
Kits are available for easier operation. HFS gages are made to indicated max in service dimension $\pm 3\mu\text{m}$.

Part numbers are :

512LGPKIT for diameter between $5/32''$ (4,16mm) to $3/8''$ (9,5 mm).

1420LGPKIT for diameter between $7/16''$ (11,1 mm) to $5/8''$ (15,9 mm).

Any gage that produces equivalent results to the HFS gauge can be used.



NO GO cylindrical gauge should not enter in swage cavity.

GO cylindrical gauge is maximum manufacturing dimension, to be used for incoming inspection only.

For further information, please contact Howmet Fastening Systems at the following address:

Howmet Fastening Systems
15 rue du petit Albi
95800 Cergy-Pontoise
France
Tel : +33-1-34-33-98-00

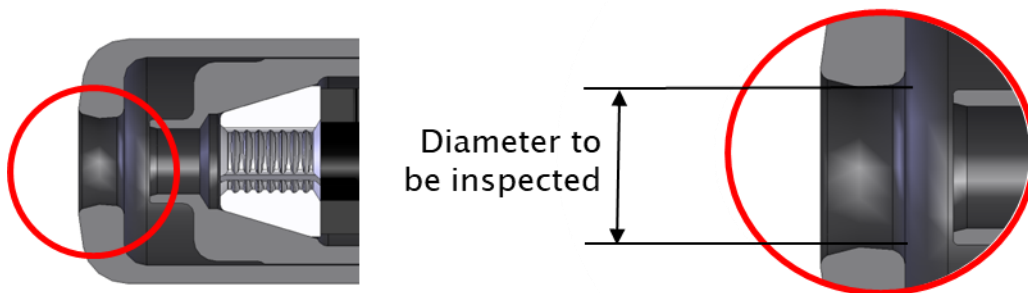
Swage Cavity Inspection – GP™

GP™ installation noses do not have a identification colour

For proper and smooth lockbolt installations, a periodic inspection and cleaning of swage cavities is recommended. The following instructions are related to GP™ lockbolt systems.

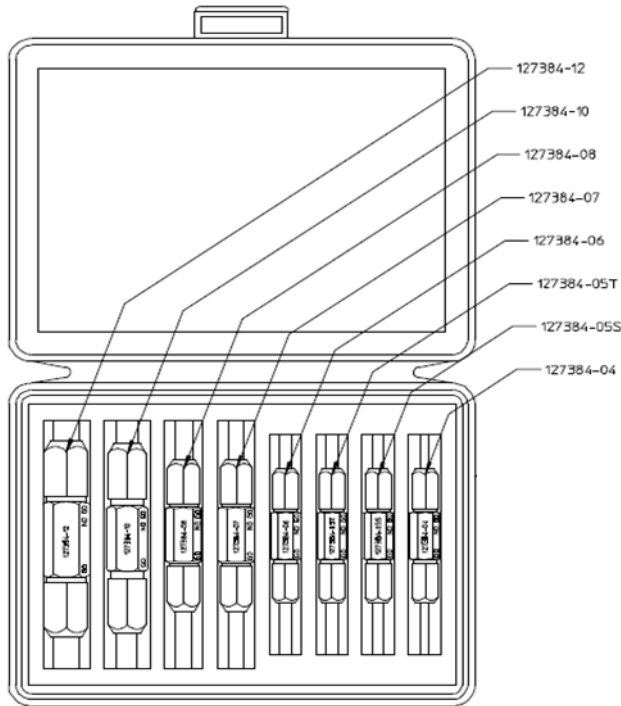
The inspection consists in a visual validation that the swage cavity is smooth and free of contamination, followed by verification with a plug gage of the swage cavity internal diameter. Diameter has to always be in the dimensional limits of the following table. **Max. in service** dimensions column lists the maximum acceptable diameter of the swage cavities for GP™ installation noses:

<i>Swage cavity Dimensions</i>		
Diameter Code	<i>Dia mm</i>	max in service mm
-05	4,16	6,007
-06	4,8	6,972
-07	5,55	8,456
-08	6,35	9,195
-10	7,9	11,481
-12	9,5	13,995



Installation noses exceeding Max. in service dimensions require immediate replacement

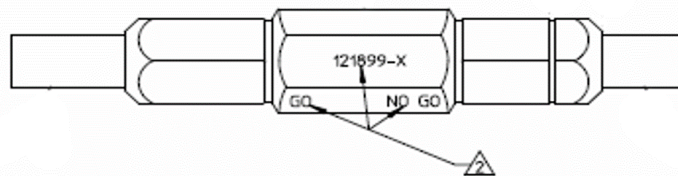




Kits are available for easier operation. HFS gages are made to indicated max in service dimension $\pm 3\mu\text{m}$.

Part number is 512GPKIT for diameter between 5/32" (4,16mm) to 3/8" (9,5 mm).

Any gage that produces equivalent results to the HFS gauge can be used.



NO GO cylindrical gauge should not enter in swage cavity.

GO cylindrical gauge is maximum manufacturing dimension, to be used for incoming inspection only.

For further information, please contact Howmet Fastening Systems at the following address:

Howmet Fastening Systems
15 rue du petit Albi
95800 Cergy-Pontoise
France
Tel : +33-1-34-33-98-00

Swage Cavity Inspection – MLGP™

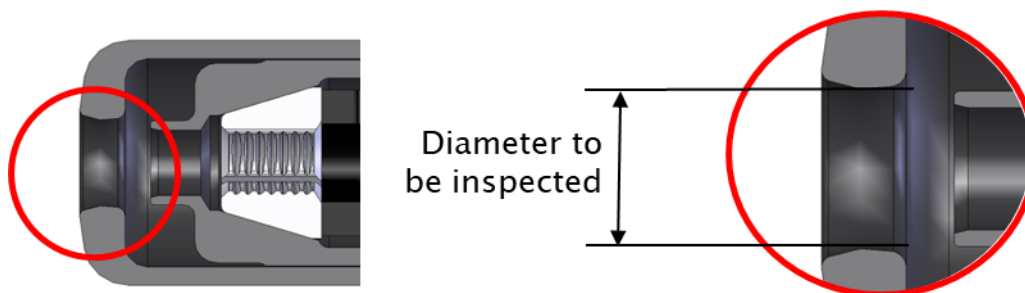


MLGP™ installation noses have a red identification strip

For proper and smooth lockbolt installations, a periodic inspection and cleaning of swage cavities is recommended. The following instructions are related to MLGP™ lockbolt systems

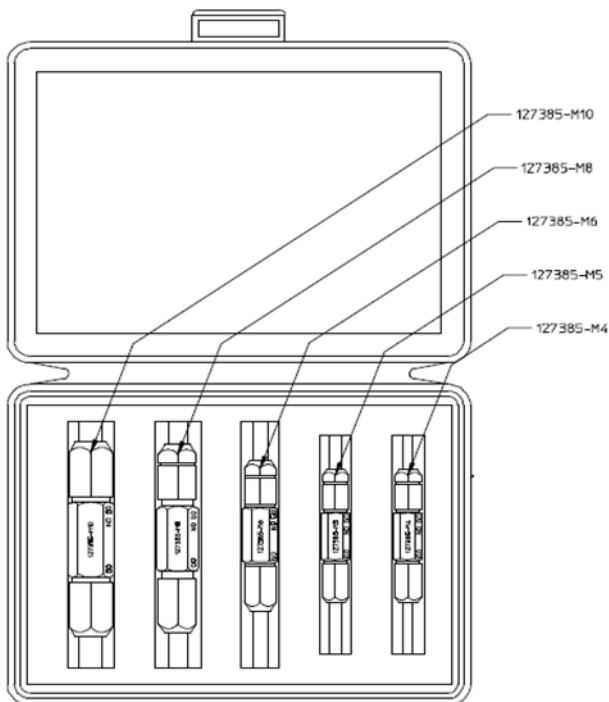
The inspection consists in a visual validation that the swage cavity is smooth and free of contamination, followed by verification with a plug gage of the swage cavity internal diameter. Diameter has to always be in the dimensional limits of the following table. **Max. in service** dimensions column lists the maximum acceptable diameter of the swage cavities for MLGP™ installation noses:

Swage cavity Dimensions		
Diameter Code	<i>Dia mm</i>	max in service mm
-04	4	5,474
-05	5	6,510
-06	6	7,838
-08	8	10,472
-10	10	12,878



Installation noses exceeding Max. in service dimensions require immediate replacement

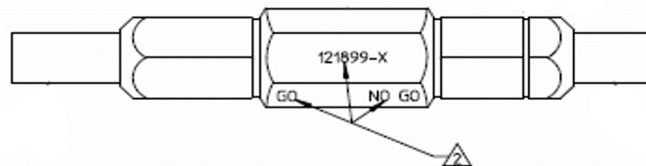




A kit is available for easier operations. It is calibrated to indicated max in service dimension $\pm 3\mu\text{m}$.

Part number is 512MLGPKIT for diameter from 4 to 12 mm.

Any gage that produces equivalent results to the HFS gauge can be used.



NO GO cylindrical gauge should not enter in swage cavity.

GO cylindrical gauge is maximum manufacturing dimension, to be used for incoming inspection only.

For further information, please contact Howmet Fastening Systems at the following address:

Howmet Fastening Systems
15 rue du petit Albi
95800 Cergy-Pontoise
France
Tel : +33-1-34-33-98-00

Swage Cavity Inspection – MGP™

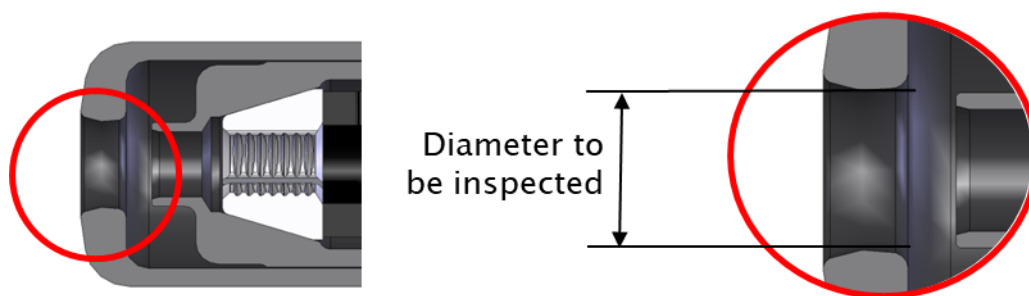


MGP™ installation noses have a blue identification strip

For proper and smooth lockbolt installations, a periodic inspection and cleaning of swage cavities is recommended. The following instructions are related to MGP™ lockbolt systems

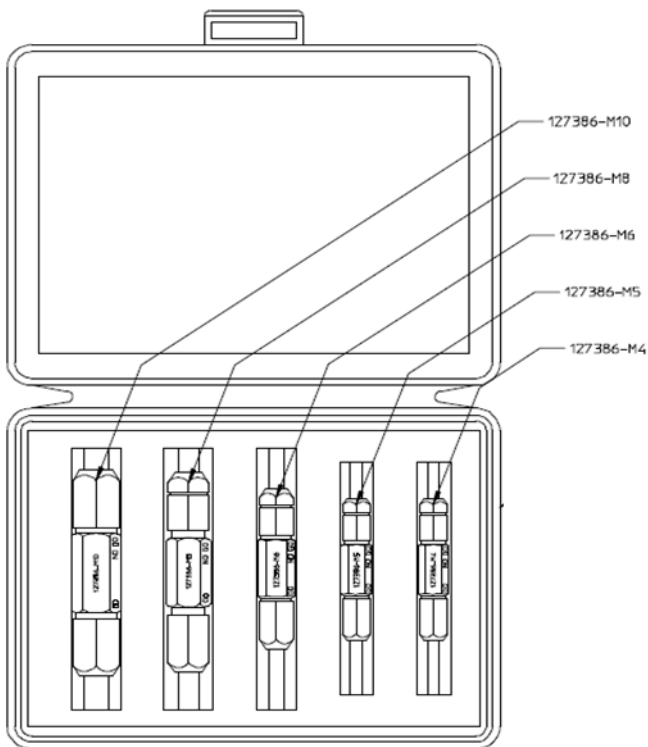
The inspection consists in a visual validation that the swage cavity is smooth and free of contamination, followed by verification with a plug gage of the swage cavity internal diameter. Diameter has to always be in the dimensional limits of the following table. **Max. in service** dimensions column lists the maximum acceptable diameter of the swage cavities for MGP™ installation noses:

Swage cavity Dimensions		
Diameter Code	<i>Dia mm</i>	max in service mm
-04	4	5,829
-05	5	7,310
-06	6	8,890
-08	8	11,532
-10	10	14,072



Installation noses exceeding Max. in service dimensions require immediate replacement

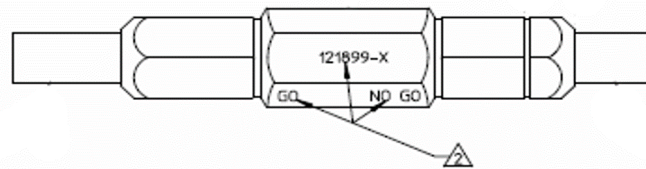




A kit is available for easier operations. HFS gages are made to indicated max in service dimension $\pm 3\mu\text{m}$.

Part number is **512MGPKIT** for diameter from 4 to 10 mm.

Any gage that produces equivalent results to the HFS gage can be used.



NO GO cylindrical gauge should not enter in swage cavity.

GO cylindrical gauge is maximum manufacturing dimension, to be used for incoming inspection only.

For further information, please contact Howmet Fastening Systems at the following address:

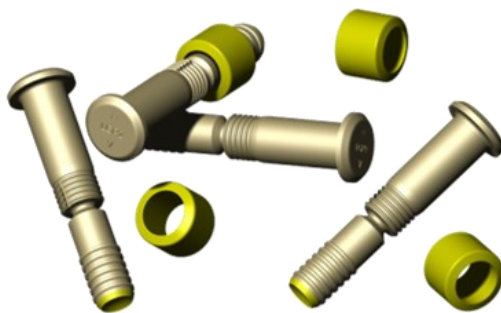
Howmet Fastening Systems
15 rue du petit Albi
95800 Cergy-Pontoise
France
Tel : +33-1-34-33-98-00



**HOWMET
AEROSPACE**

Lockbolt fasteners

Removal



**HOWMET
AEROSPACE**

Collar removal



Manual collar cutters: Knipex® collar cutters are based on standard pliers. Same plier can remove aluminum double-end collars (3CLC-C) from 5/32'' up to 5/16''.

In addition to the standard version, a 45° angle offset plier is available if required for accessibility.

546/548 tool mounted collar cutter : Tool mounted collar cutters are designed to fit on 244X pneudraulic tools, and are fastest and more efficient solution to cut double cylindrical collars (3SLC-C). They are designed to offer a 45° angle positioning, and can cut collars in most of the accessibility conditions. They allow removal of collars up to 5/16''.



Hydraulic collar cutter: Hydraulic collar cutters are required for flanged titanium collars, or any XPL® lockbolt collars. There are 2 subfamilies :

- **Double Blades :** Double blades cutters allow to cut all XPL © collars, and cylindrical aluminum collars.

- **FCMV cutters :** They are only option to remove SLFC-MV collars, made of Cp Titanium.

They require hydraulic pumps to be operated.



SLFC-MV collars cut with FCMV hydraulic cutter






XBF-LV collars cut with Double Blades hydraulic cutter



Lockbolt collar cutters type & selection

Collar cutter compatibility per collar part number

		Manual	Pneudraulic	Hydraulic	
					
		Std: 86 05 250 S5 45° off : 86 05 250 S4	546/548	VA2-CC()-FCMV	VA2-CC()-DB Double Blade
LGP	3SLC-C <i>ASNA 2025</i>	Alum double end			
	SLFC-MV <i>ASNA 2045</i>	Titan flanged			
XPL	XMC-LV <i>ABS1505</i>	Ta3V2,5 double end			
	XBF-LV <i>ABS0998</i>	Ta3V2,5 flanged			
RXL	RXC/RXLC-LV <i>ABS1748/1776</i>	Ta3V2,5 flanged			

Blue cell indicates cutter compatibility for each collar part number. For non listed collars, contact HFS

Lockbolt collar cutters type & selection

Part number per diameter

	-5	-6	-7	-8	-10
	4,16 mm / 5/32"	4,8 mm / 3/16"	5,5 mm / 7/32"	6,35 mm / 1/4"	7,9 mm / 5/16"
Manual (Knipex ®)	Standard : 86 05 250 S5 45° offset : 86 05 250 S4				
Pneudraulic 546/548	548G-05	546G	547G	548G	548G-10
Hydraulic for SLFC- MV : FCMV	VA2-CC05- FCMV	VA2-CC06- FCMV	VA2-CC07- FCMV	VA2-CC08- FCMV	VA2-CC10- FCMV
Hydraulic Double Blade : DB	VA2-CC05-DB	VA2-CC06-DB	VA2-CC07-DB	VA2-CC08-DB	VA2-CC10-DB

	-12	-14	-16	-18	-20
	9,5 mm / 3/8"	11,1 mm / 7/16"	12,7 mm / 1/2"	14,3 mm / 9/16"	15,9 mm / 5/8"
Manual (Knipex ®)					
Pneudraulic 546/548					
Hydraulic for SLFC- MV : FCMV	VA2-CC12-FCMV				
Hydraulic Double Blade : DB	VA2-CC12-DB	VA2-CC14-DB	VA2-CC16-DB	VA2-CC18-DB	VA2-CC20-DB



Collar removal - Power source

Tool mounted collar cutters

Tooling compatibility



546/548 collar cutters are designed to work with 244X pneudraulic tools or EBS44X battery tool.

Hydraulic collar cutter

Hydraulic pump option



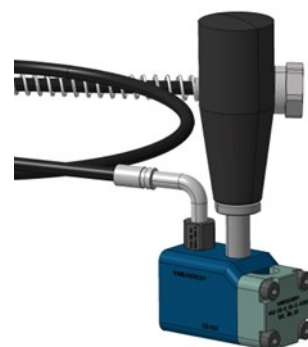
Hydro pneumatic pump - All VA2 collar cutters

VA2-SP-PH-VA



Manual pump - VA2 collar cutters up to 12 dia (9,5 mm / 3/8")

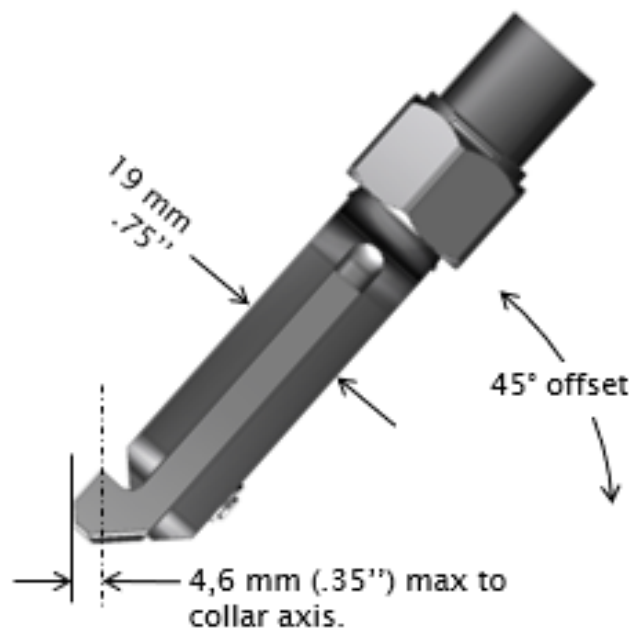
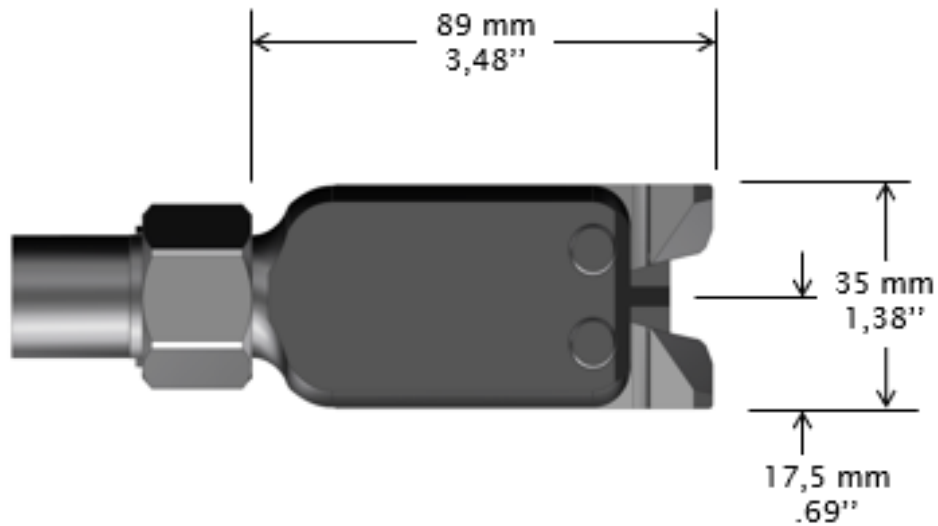
VA2-MP700



VA2-CC()-()

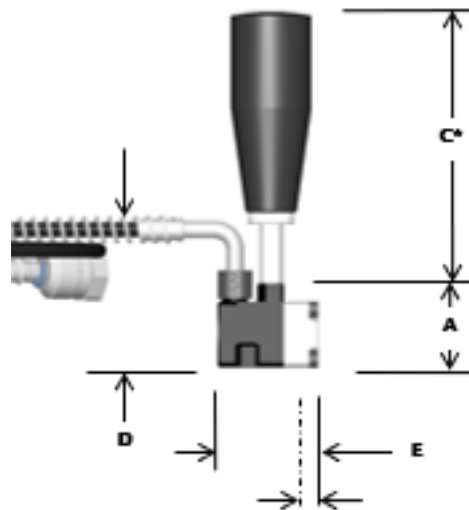
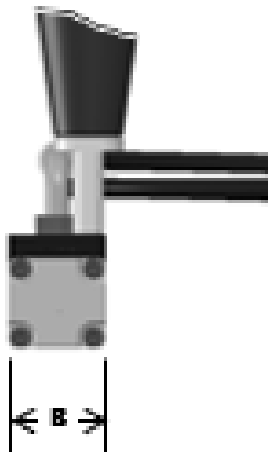


546/548 Collar cutters

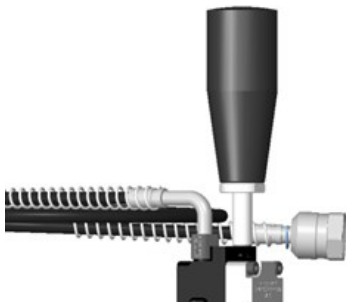


Hydraulic Collar cutters

		-5	-6	-7	-8	-10	-12	-14	-16	-18	-20	
FCMV collar cutters	A	31				34	38					
	B	27				33	40					
	C*	91										
	D	53	60			55,5	60					
	E	52		53,5	55	62	77,5					
	F	8,5	12	12,7	13,7	16	22					
Double Blade DB collar cutters	A	29	29,2	31		34	38	45		56		
	B	25		27		33	40	49,5	50	70		
	C*	95						91				
	D	52	52,1	60		62	67	85	85,5	96,5		
	E	34,4	34,9	54		58	68,2	80	82	108		
	F	9,5	9,8	13,8	14	21,7	22,1	27,6	28,7	40	39	



F Fastener axis to
face of cutter





Pull Type blind rivets & blind bolts

Part Numbers



Fastener family - Blinds

Cust. P/N

HFS P/N

Tooling
selection list

NAS1919/1921S U

SMLS100/SMLSP U

Blind Rivets U

NAS1919/1921S

SMLS100/SMLSP

Blind Rivets

ASNA0077/0078

HC3212/3213

HuckMax

NAS9301 thru NAS9312

HCXXXX / HRXXXX

MS21140/21141 (W)

S/UPB/UB100 EU (W)

MS90353/90354 (W)
ASNA0026/0027(S)

S/UBP/UB100 T (W)

Blind Bolts (W)

ASNA0341/0342/0363
A297/298/299
JN0003/JN0004

S/UPB/100/130 MV (W)

EN6122/6127/6128/6129

UABP/100/130/6127

UAB





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Pull Type blind rivets & blind bolts

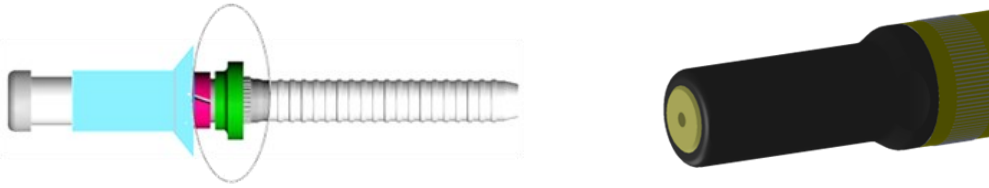
Tooling selection charts



**HOWMET
AEROSPACE**






Blind Rivet U with drive anvil washer

Blind rivets **NAS1919/1921 U** (with drive anvil washer)



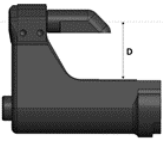
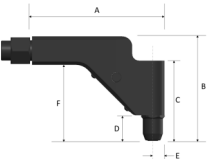



Blind rivet with drive anvil washer have their part numbers ending by a "U". Drive anvil washer is shown in green on sketch here below. It pushes on fastener lock ring, and allow the use of blunt installation noses, less sensitive to wear. It also allows the use of same nose on several fastener diameters.

In-Line tools

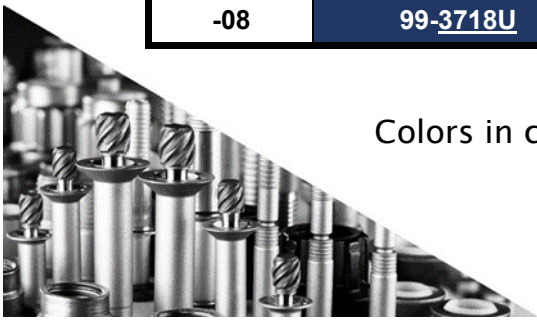
Diameter Code	Noses		Tools		
	Standard	Long	Electric	Pneudraulic	Hydraulic
-04					
-05	99-3458-202	99-3459-202	(K)EBS43X	2012 or 2025	2480
-06					
-08	99-2743U	99-2744U		2025	

Colors in chart indicates nose connection style.

Offset/90° tools

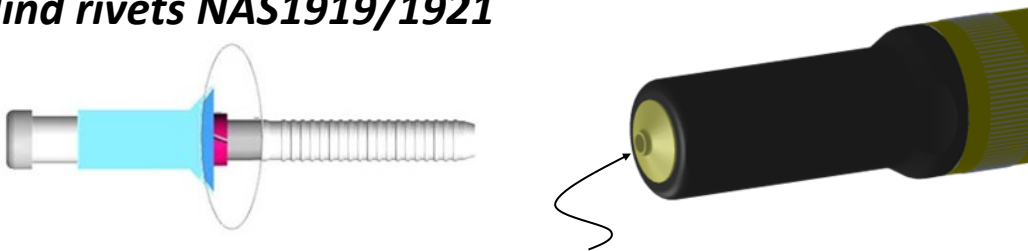
Diameter Code	Noses		Tools		
	Offset	90 degrees	Electric	Pneudraulic	Hydraulic
-04					
-05	99H_{HCM}-MD-ORAC-46	99H_{HCM}-MD-RRAC-46	(K)EBS43X	2012 or 2025	2480
-06	99-3717U		(K)EBS43OSX	244OSX	206-500
-08	99-3718U				

Colors in chart indicates nose connection style.



Blind Rivet without drive anvil washer






Blind rivets NAS1919/1921



Blind rivet without drive anvil washer require a **conical end** that will apply load on locking during installations. They are sensitive to wearing, damages to nose end will cause improper fastener installations.

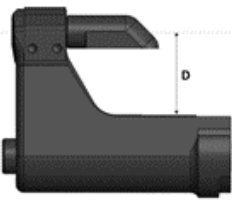



Noses suggested here are also usable on fasteners with drive anvil washers even if blunt noses shall be preferred.

In-Line tools

Diameter Code	Noses		Tools		
	Standard	Long	Electric	Pneudraulic	Hydraulic
-04					
-05	<u>99-2725</u>	<u>99-2726</u>	<u>(K)EBS43X</u>	<u>2012</u> or <u>2025</u>	<u>2480</u>
-06	<u>99-2731</u>	<u>99-2732</u>			
-08	<u>99-2737</u>	<u>99-2738</u>			
-08	<u>99-2743</u>	<u>99-2744</u>			

Colors in chart indicates nose connection style.

Offset/90° tools

Diameter Code	Noses		Tools		
	Standard D = 16 mm	Extended D = 32mm	Electric	Pneudraulic	Hydraulic
-04					
-05	<u>99-3715</u>	<u>99-3715-1</u>	<u>(K)EBS43OSX</u>	<u>244OSX</u>	<u>206-500</u>
-06	<u>99-3716</u>	<u>99-3716-1</u>			
-08	<u>99-3717</u>	<u>99-3717U</u>			
-08	<u>99-3718</u>	<u>99-3718-1</u>			






Colors in chart indicates nose connection style.



HuckMAX® blind rivet

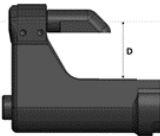
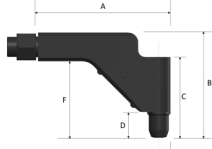



Tools listed here will install Howmet Huck-Clinch® blind rivet and HuckMAX® blind rivet. They are also compliant with CherryMAX® fasteners. CherryMAX® is a trademark of Cherry® Aerospace.

In-Line tools

Diameter Code	Noses		Tools		
	Standard	Long	Electric	Pneudraulic	Hydraulic
					
-04				2012	
-05	99-3458-202	99-3459-202	(K)EBS43X	or	2480
-06				2025	

Colors in chart indicates nose connection style.

Offset/90° tools

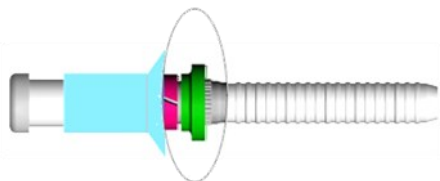
Diameter Code	Noses		Tools		
	Offset	90 degrees	Electric	Pneudraulic	Hydraulic
					
-04				2012	
-05	99HCM-MD-ORAC-46	99HCM-MD-RRAC-46	(K)EBS43X	or	2480
-06				2025	

Colors in chart indicates nose connection style.



Blind Bolts

All blind bolts except UAB



Blind bolts can be supplied with or without drive anvil washer, shown in green on sketch on the left. Parts supplied with the optional drive anvil washer can be recognized by their part number, ending by "W".

To get corresponding blunt installation noses, add "W" to nose part numbers.

Whenever possible, blunt noses (ending by « W ») shall be preferred. Standard noses will install all blind bolts, but will be more sensitive to wearing, which may affect fastener installations. See next page for different blind bolts configurations.

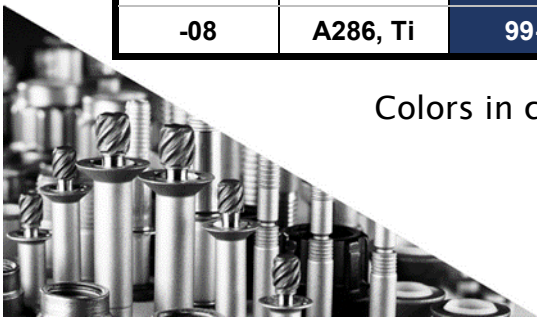
In-Line tools

In-Line tools		Noses		Tools		
		Standard	Long	Electric	Pneudraulic	Hydraulic
Diameter Code	Material					
-04	All	99-2725(U)	99-2726(U)	(K)EBS43X	2012	2480
-05	All	99-2701(W)	99-2702(W)		or	
-06	Ti	99-2707(W)	99-2708(W)		2025	
	+A286, Steel				2025	
-08	A286, Ti	99-2713(W)	99-2714(W)			2583
	+ Steel	99-2716(W)	99-2717(W)		254	
-10	All	99-2719(W)	99-2720(W)		256	
-12	Ti	99-2722(W)	99-2723(W)		256	
	+ A286					
	+ Steel					

Offset tools

Offset tools		Noses		Tools		
		Standard D = 16 mm	Extended D = 32mm	Electric	Pneudraulic	Hydraulic
Diameter Code	Material					
-04	All	99-3715(U)	99-3715-1(U)	(K)EBS43OSX	244OSX	206-500
-05		99-3712(W)	99-3712-1(W)			
-06		99-3713(W)	99-3713-1(W)			
-08	A286, Ti	99-3714(W)	99-3714-1(W)			

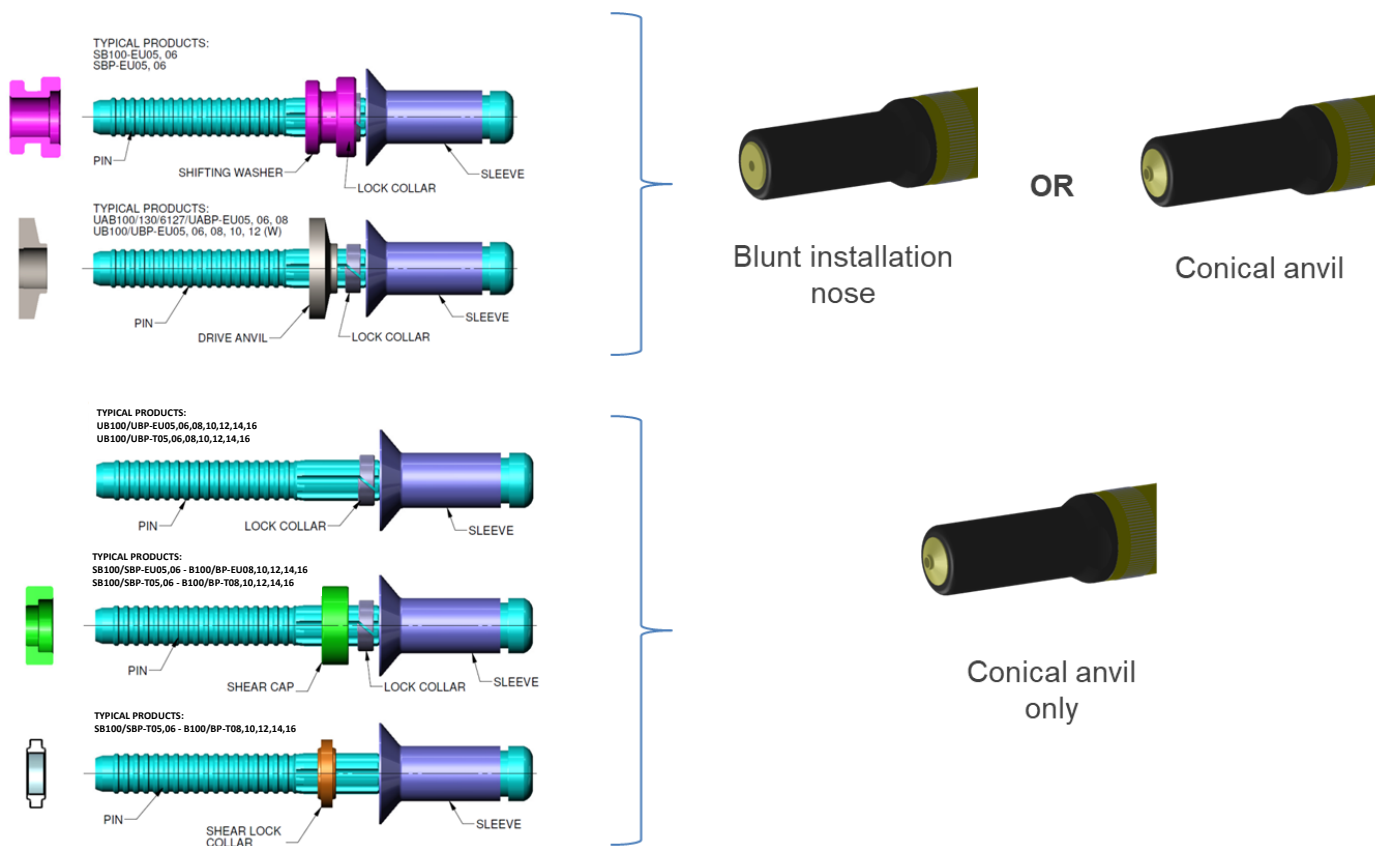
Colors in chart indicates nose connection style.



Blind Bolts driving variants

In case of doubt, sketch here below provides information on different driving systems used on blind-bolts fasteners, and nose compatibility.

Blunt installation noses are usable with fasteners equipped with either a shifting washer, or a drive anvil washer. Whenever possible, blunt installation noses shall be preferred anyway.







Any other configuration will require the use of a nose with a conical end.



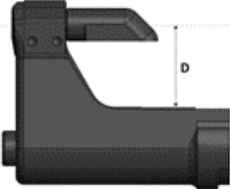



UAB installation tools EN6122/6127/6128/6129

UAB™ blind bolt are enhanced version of blind bolts. Thru other advantages, they come with an overgrip capability and a pintail design allowing the use of a single nose on several diameters. Noses are specific to UAB™ blind bolt,

In-Line tools

Diameter Code	Noses	Tools		
	Standard	Electric	Pneudraulic	Hydraulic
				
-05	99-2782	(K)EBS43X	2025	2480
-06				
-07	99UAB-MD-IRAC-78	(K)EBS44X		
-08				
-09	99UAB-MD-IRAC-90		254	2583
-10				

Offset tools

Diameter Code	Noses		Tools		
	Standard D = 16 mm	Extended D = 32mm	Electric	Pneudraulic	Hydraulic
					
-05	99-3764	99-3764-1	(K)EBS43OSX	244OSX	206-500
-06	99-3765	99-3765-1			
-07			(K)EBS44OSX		
-08	99-3766	99-3766-1			

Colors in chart indicates nose connection style.





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Pull Type blind rivets & blind bolts

Grip selection & inspection



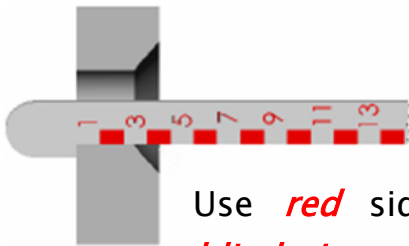
**HOWMET
AEROSPACE**

Fastener selection & Inspection

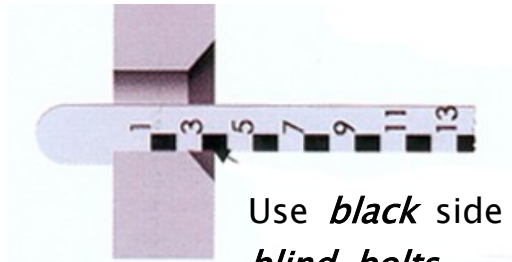
▶ GRIP GAGES

Grip gage are used for fastener grip selection. The chart below shows appropriate grip gage according to fastener part number.

<i>Fastener type</i>	<i>Gage P/N</i>
<i>Blind bolts & Blind rivets</i>	<i>105093</i>



Use *red* side for *blind-rivets*



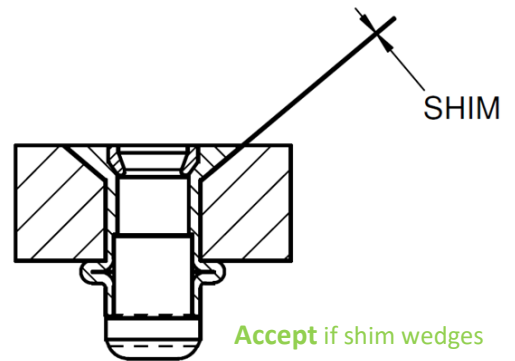
Use *black* side for *blind-bolts*



Fastener selection & Inspection

▶ INSPECTION HEAD AND BULB SEATING

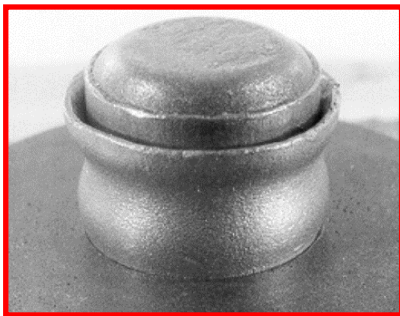
Bearing surface of head and bulb shall seat on structure on at least 50% of area. Head seating can be inspected using a 50 μm (.002'') feeler gage. When a minimum bulb diameter is specified, value to be considered shall be average of min and max measurements on fastener periphery.



Accept if shim wedges over less than 50%.

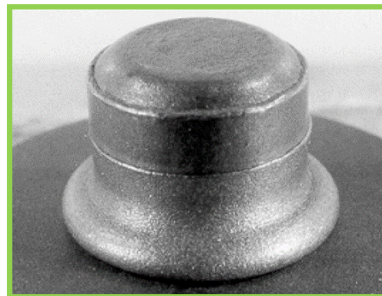
Reject if over 50%

Reject if less than 50%



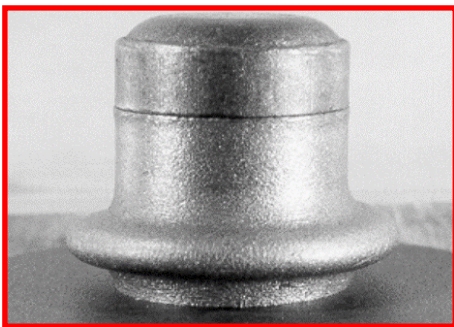
No bulb, full tulip

Accept if contact with 50% or more

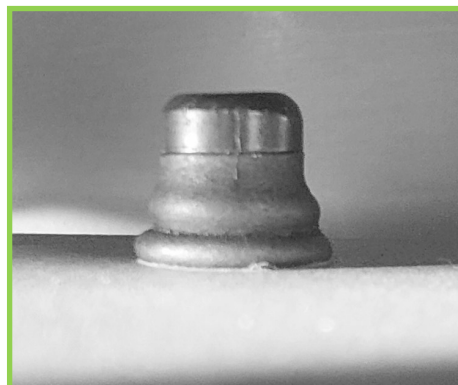
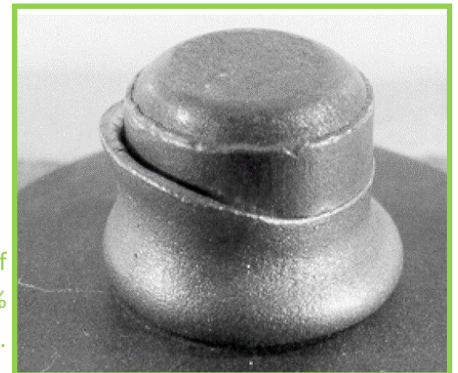


Perfect bulb

Bulb offsheet



Partial tulip, accept if bulb is formed on 50% or more of periphery.



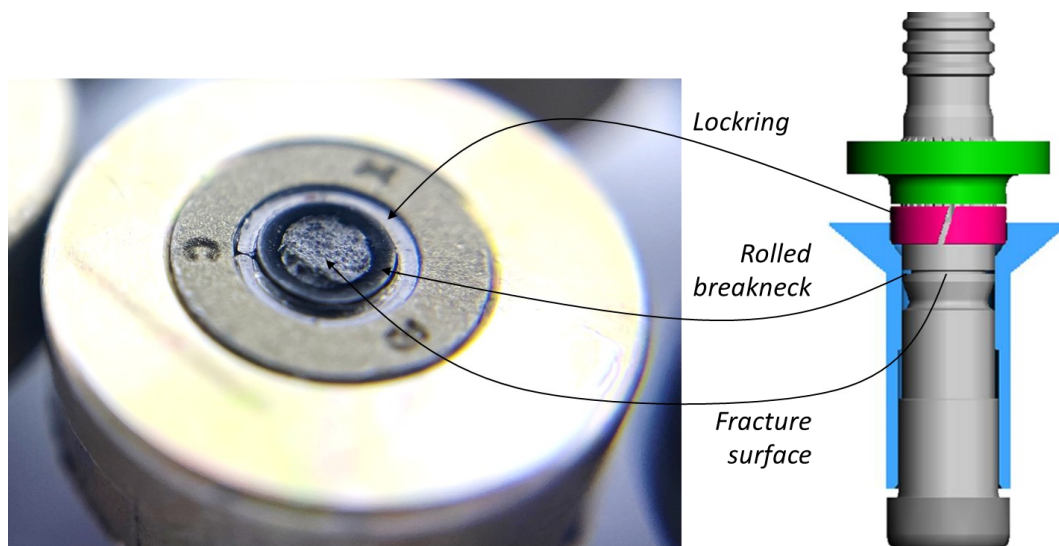
Sleeve buckling. Accept if bulb in contact with structure, and bulb

Fastener selection & Inspection

▶ INSPECTION HEAD SIDE, PIN AND LOCK RING POSITION

Pin and lock ring positions need to be verified. This allow to ensure that locking is properly locked and that fastener will meet expected level of performances. Fasteners not meeting these criteria shall be removed.

Typical anatomy of installed fastener is shown here below. Lockring and pin position need to be verified. Pin is composed of the fracture area, and a smooth surface where breakneck is rolled. Both are part of pin position requirements.



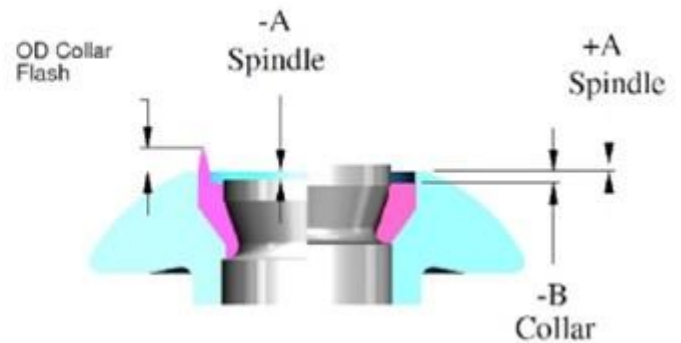
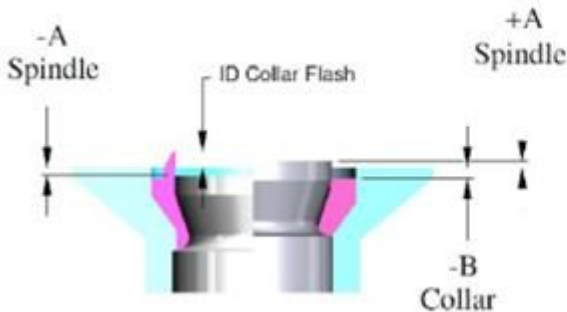
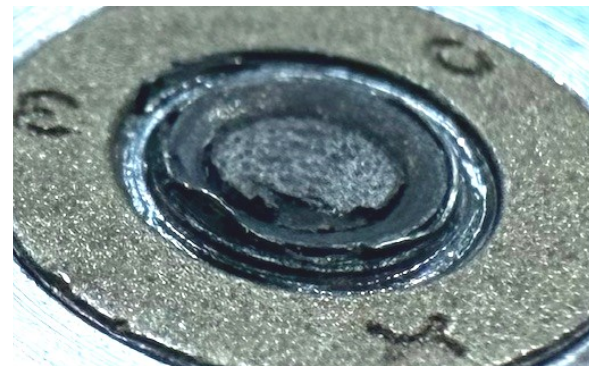
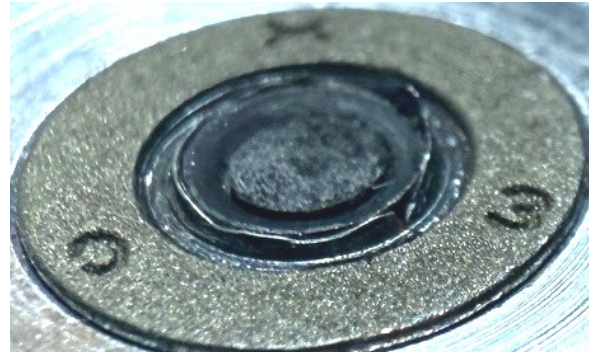
Position of components is typically inspected using dial indicator, equipped with a sharp stylus and a tripod or similar. Other means are also usable.



Fastener selection & Inspection

▶ FLASH & COLLAR COSMETIC IMPERFECTIONS

Previous recommendations are to be used to guarantee fastener performances and assess proper installations. Collars may anyway show flashes after installations, on internal or external diameters resulting from insertion in their pocket. Such behavior shall not be cause for rejections, and followings are acceptance recommendations for both internal and external collar flashes :

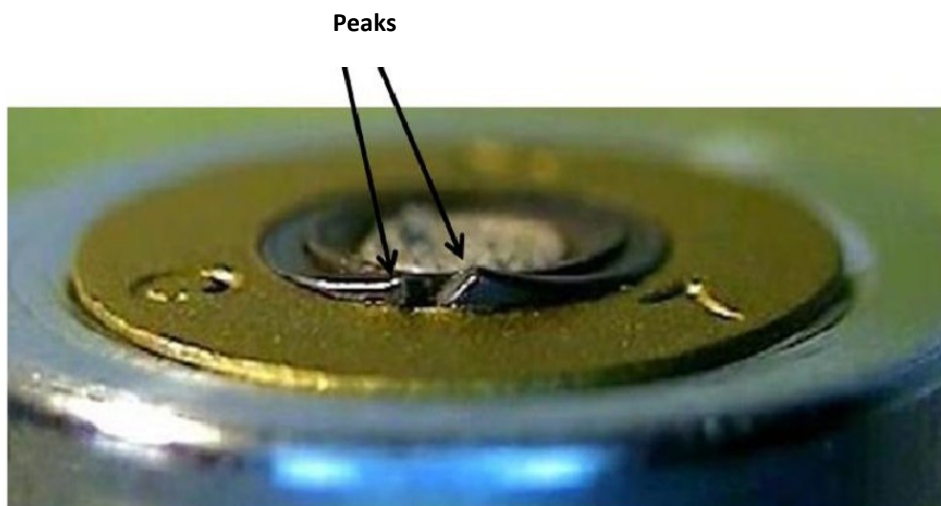


Dia code	NAS1919/NAS1921 Blind rivets				Blind bolts							
	C, EU & M flush head		Protruding head & B material		EU blind bolts MS21140/21141		T blind bolts MS90353/90354		MV Ti-Matic Blind bolts		UAB Blind Bolts	
	ID collar flash	OD collar flash	ID collar flash	OD collar flash	ID collar flash	OD collar flash	ID collar flash	OD collar flash	ID collar flash	OD collar flash	ID collar flash	OD collar flash
04	0,25 mm above splindle land	0,25 mm above sleeve head 0,38 mm	0,25 mm above splindle land	0,5 mm above splindle land	0,25 mm above splindle land	0,25 mm above sleeve head	0,25 mm above splindle land	0,5 mm above sleeve head	0,25 mm above sleeve head		Below « A » max of splindle position.	
05												
06												
08												
10												
12												

Fastener selection & Inspection

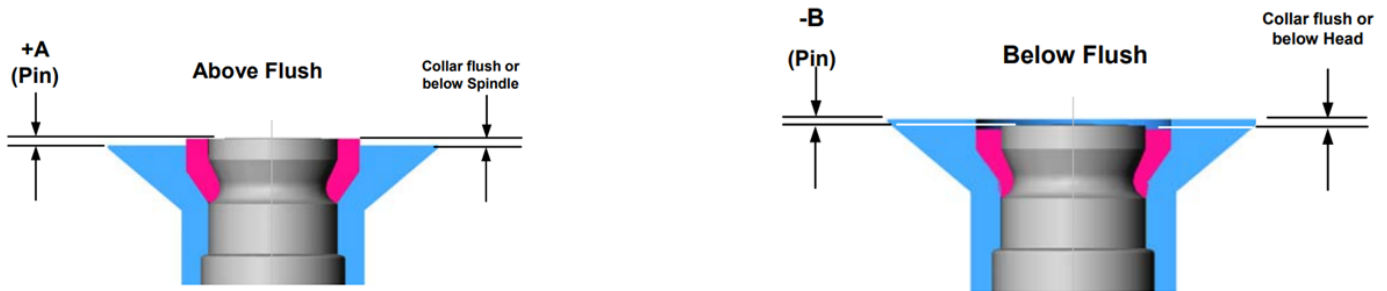
▶ PEAKS ADJACENT TO SPLITS

Previous recommendations are to be used to guarantee fastener performances and assess proper installations. Collars may anyway show flashes after installations, on internal or external diameters resulting from insertion in their pocket. Such behavior shall not be cause for rejections, and followings are acceptance recommendations for both internal and external collar flashes :



Fastener selection & Inspection

▶ BLIND RIVETS NAS1919 & 1921, PIN & LOCK RING POSITION

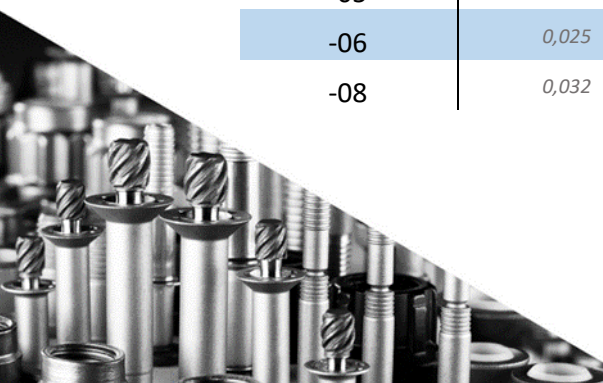


Single actionc Monel (M) and CRES (C) flush head rivets NAS1921M()S / NAS1921C()S NAS1900

Dia	Pin position "A" above		Pin position "B" below	
	<i>Inch</i>	mm	<i>Inch</i>	mm
-04	0,010	0,25	-0,005	-0,13
-05	0,010	0,25	-0,005	-0,13
-06	0,010	0,25	-0,005	-0,13
-08	0,015	0,38	-0,005	-0,13

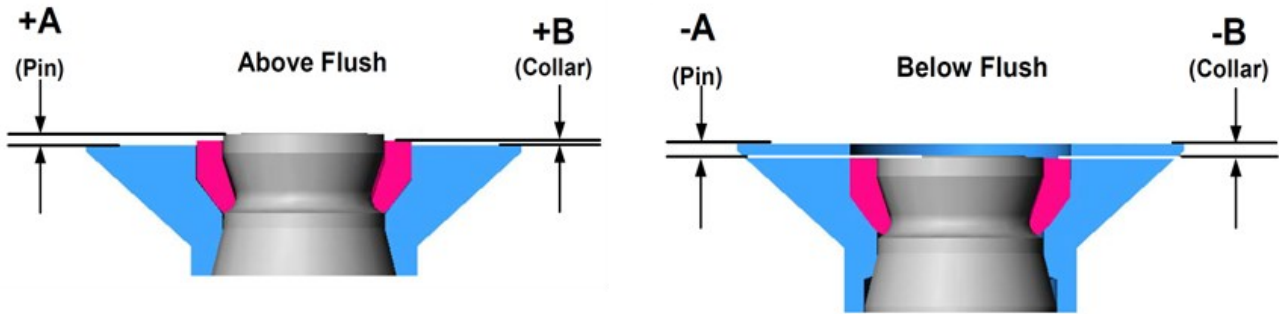
All other blind rivets NAS1919() ()S / NAS1921B()S NAS1900

Dia	Pin position "A" above		Pin position "B" below	
	<i>Inch</i>	mm	<i>Inch</i>	mm
-04	0,018	0,46	-0,008	-0,2
-05	0,022	0,56	-0,01	-0,25
-06	0,025	0,64	-0,012	-0,3
-08	0,032	0,81	-0,016	-0,41



Fastener selection & Inspection

▶ BLIND BOLTS EXCEPT UAB, PIN & LOCK RING POSITION

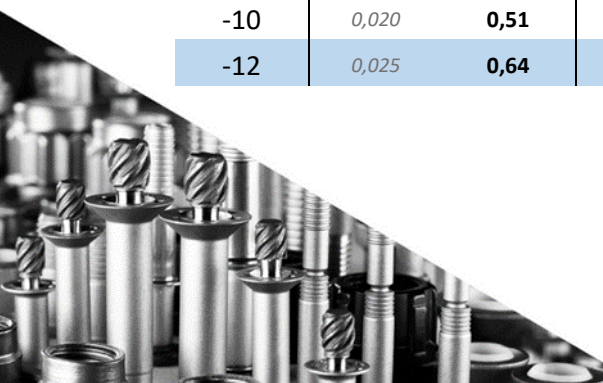


**STEEL MS90353/90354
NASM81177**

Dia	+ A		- A		+ B		- B	
	Inch	mm	Inch	mm	Inch	mm	Inch	mm
-05	0,020	0,51	0	0	0,017	0,43	0,017	0,43
-06	0,024	0,61	0	0	0,022	0,56	0,022	0,56
-08	0,030	0,76	0	0	0,029	0,74	0,029	0,74
-10	0,038	0,97	0	0	0,037	0,94	0,037	0,94
-12	0,046	1,17	0	0	0,045	1,14	0,045	1,14
-14	0,054	1,37	0	0	0,050	1,27	0,050	1,27
-16	0,062	1,57	0	0	0,056	1,42	0,056	1,42

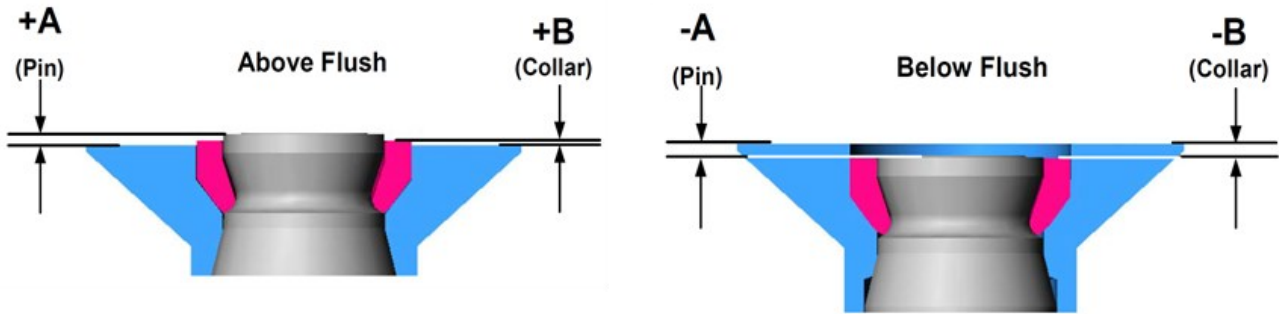
**MS21140/21141 & Ti-Matic UB()-MV
NASM8975 & T0102**

Dia	+ A		- A		+ B		- B	
	Inch	mm	Inch	mm	Inch	mm	Inch	mm
-04	0,010	0,25	0,010	0,25	0	0	0,015	0,38
-05	0,010	0,25	0,010	0,25	0	0	0,017	0,43
-06	0,010	0,25	0,010	0,25	0	0	0,022	0,56
-08	0,015	0,38	0,015	0,38	0	0	0,029	0,74
-10	0,020	0,51	0,015	0,38	0	0	0,037	0,94
-12	0,025	0,64	0,020	0,51	0	0	0,045	1,14



Fastener selection & Inspection

▶ UAB™ blind bolt



UAB()-EU / EN6122/27/28/29
T0106

Dia	Flush heads				Protruding heads			
	+ A		- A		+ A		- A	
	<i>Inch</i>	mm	<i>Inch</i>	mm	<i>Inch</i>	mm	<i>Inch</i>	mm
-05	0,008	0,2	0,008	0,2	0,010	0,25	0,010	0,25
-06	0,008	0,2	0,008	0,2	0,010	0,25	0,010	0,25
-07	0,010	0,25	0,010	0,25	0,010	0,25	0,010	0,25
-08	0,012	0,3	0,012	0,3	0,015	0,38	0,015	0,38
-09	0,014	0,36	0,014	0,36	0,020	0,51	0,015	0,38
-10	0,020	0,51	0,015	0,38	0,020	0,51	0,015	0,38

UAB()-EU / EN6122/27/28/29
T0106

Dia	+ B		- B	
	<i>Inch</i>	mm	<i>Inch</i>	mm
-05	0	0	0,017	0,43
-06	0	0	0,022	0,56
-07	0	0	0,025	0,64
-08	0	0	0,029	0,74
-09	0	0	0,034	0,86
-10	0	0	0,037	0,94





**HOWMET
AEROSPACE**

Pull Type blind rivets & blind bolts

Removal



**HOWMET
AEROSPACE**

Fastener selection & Inspection

▶ DRILLING KITS

Drilling kits are available to ease removal of pull type blind rivets & blind bolts. They are composed of bushing, drill bits and punches adjusted to each diameter to be removed. Refer to user manual for further information about use.



Blind removal tool kits

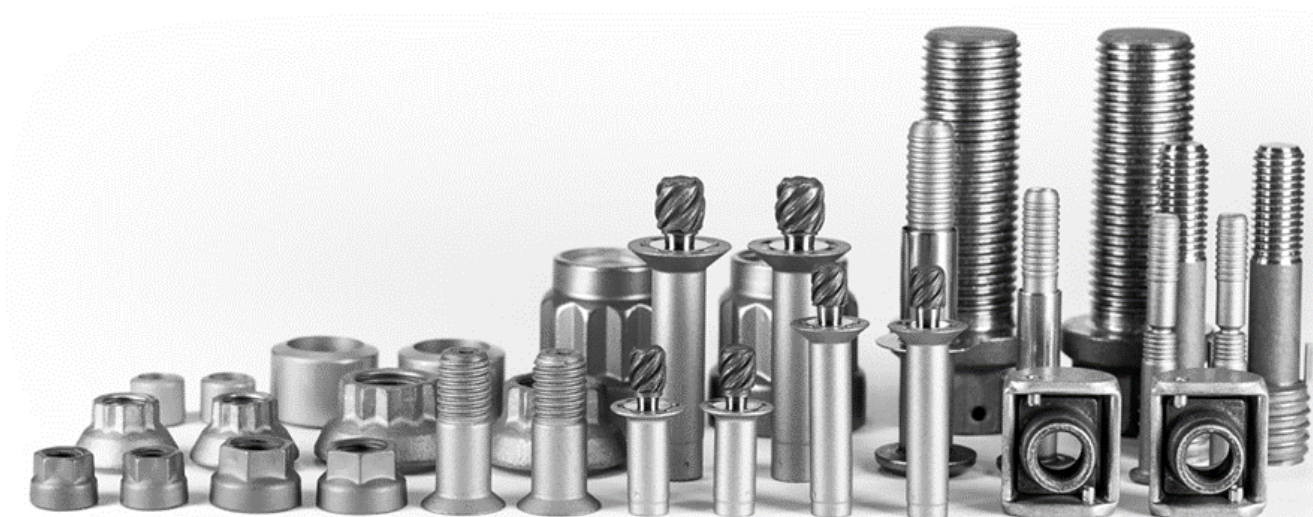
Dia	Blind rivets NAS1919/1921	Blind Bolts
-04	105-24	
-05	105-25	105-50
-06	105-26	105-60
-08	105-28	105-80
-10		105-100
-12		105-120
-14		105-140
-16		105-160



**HOWMET
AEROSPACE**

Pull-Type tools

General recommendations



Tool maintenance recommendations

► Maintenance guide lines

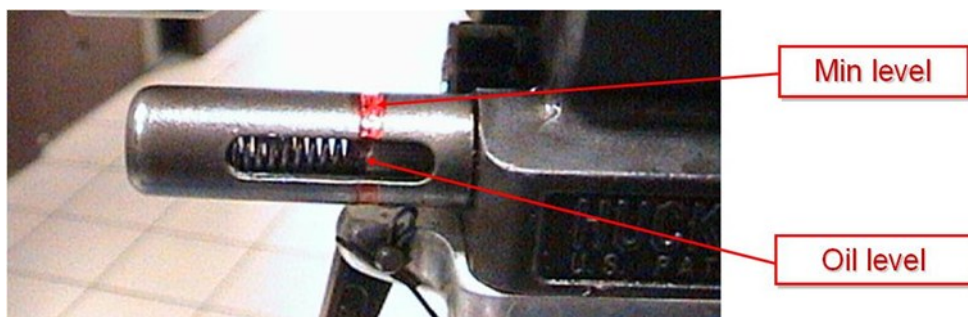
- Swage cavities of Lockbolt noses are subject to wearing. It is recommended, during each maintenance operation, to verify swage cavity is smooth, and below max in-use diameter of swage cavity. Swage Cavity Inspection sheets are shown in Lockbolt section for each family of fastener.



- Noses, and especially jaws are sensitive to sealant. Proper cleaning practices shall be used to optimize life time of nose assemblies.



- Pneudraulic Lockbolt tools are equipped with an oil reservoir feature. It is recommended, for optimum maintenance operation, to fill reservoir before reaching minimum level. If oil level goes below min, tool will need to go thru a full fill and bleed process.



Tool maintenance Spare parts & kits

► Maintenance Kits

- For each tool, a maintenance kit is available. Kit contains all o’rings, back-up rings, spring, plugs and specific tool require for maintenance operation.

- Kit part numbers are as follow :

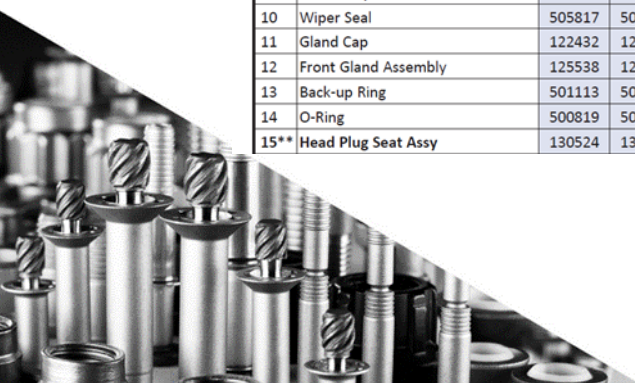
- **2012KIT** for 2012
- **202KIT** for 202
- **2025KIT** for 2025
- **2047KIT** for 2047
- **2057KIT** for 2057
- **2044KIT** for 204, 244OS, 244X and 244OSX
- **254KIT** for 254
- **2480KIT** for 2480
- **2503KIT** for 2502, 2053, 2582 and 2583
- **2600KIT** for 2600-16-12
- **206-375KIT** for 206-375, 206-500, 206XPL-08 & 206-625
- **208-625KIT** for 208-625 and 208-750
- **OS5500KIT** for OS5500-56-()



- Kit content is shown on part lists of tool manual. Any component with a * symbol next to qty is part of maintenance kit.

Item	Description	244X	244OSX	Qty
1	Handle	130351	130351	1
2	Cable Assy	116404-1	116404-1	1
3	Trigger Cable Pin	505496	505496	1
4	Roll Pin	500621	500621	1
5	Trigger	124333-2	124333-2	1
6	Polyseal	505818	505818	1*
7	Retaining Nut	111795	n/a	1
8	Stop	120588	125951	1
9	Nose Adapter	125537	130377	1
10	Wiper Seal	505817	505817	1*
11	Gland Cap	122432	122432	1
12	Front Gland Assembly	125538	125538	1
13	Back-up Ring	501113	501113	1*
14	O-Ring	500819	500819	1*
15**	Head Plug Seat Assy	130524	130524	1

Item	Description	244X	244OSX	Qty
56	Bottom Plate	128790	128790	1
57	Muffler	115554-1	115554-1	1
58	Locknut	505420	505420	1
59	Washer	506493	506493	1
60	Cylinder Head	123778	111959-1	1
61	Air Piston	123776	123753	1
62	Retaining Ring	506490	506490	1
63	Piston Rod	125561	125561	1
64	Pivot Screw	125118	125118	1
65	Spring	116272-244	116272-244	1*
66	O-Ring	507396	507396	3*
67	Throttle Valve	125562	125562	1
68	Throttle Arm	123754	123754	1
69	Screw	500062	500062	4
70	Housing Spacer Assy	112403	112403-1	1

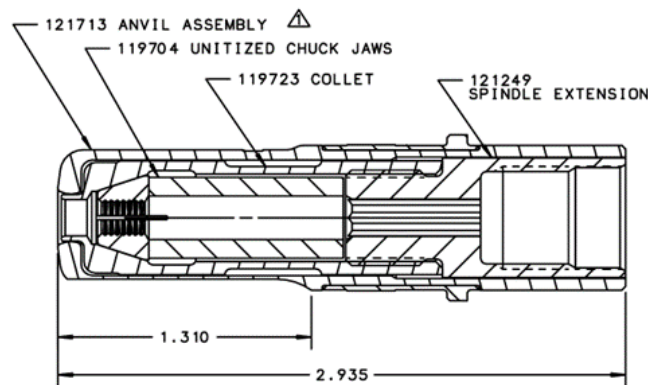


Tool maintenance

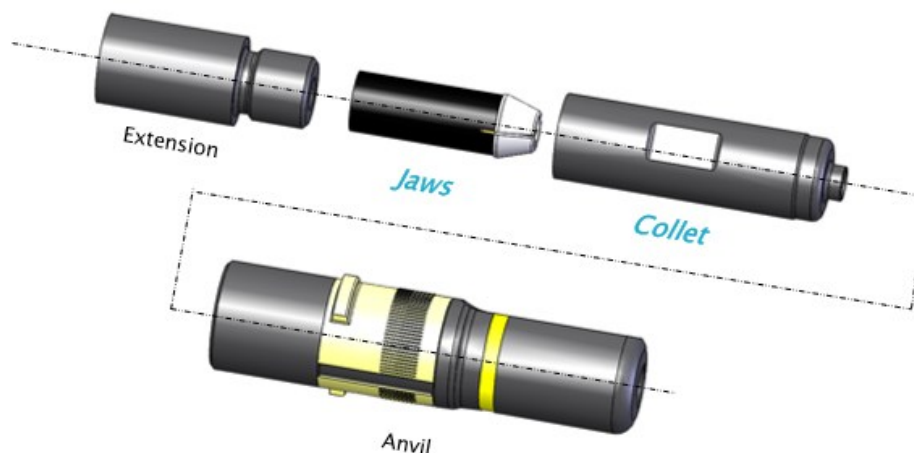
Noses spare parts

► Noses components

- Each component of nose assembly can be ordered individually. Part number is shown on nose drawing, shipped with each nose assembly.



- Last nose drawings can also be downloaded on <https://www.hfsindustrial.com/us/tooling-resource-center/index/view/brand/huck-aerospace>
- Jaws are subject to wearing, and it is recommended to have them available on site. Collets of Lockbolt noses shall also be held on site.
- Spring, screws and small components that can be lost easily shall also be kept on stock.

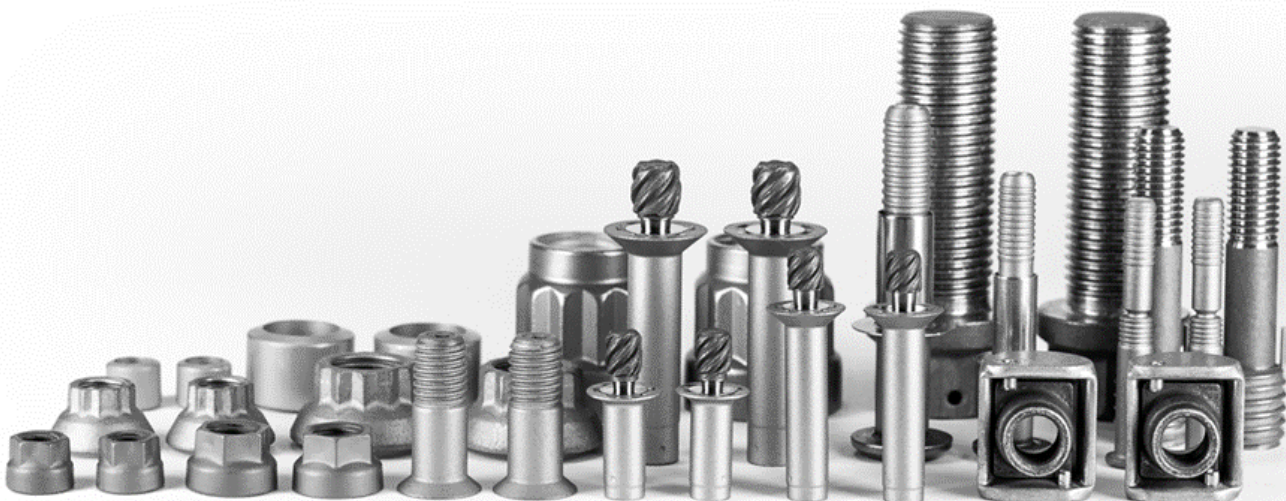




**HOWMET
AEROSPACE**

Pull-Type tools

Accessories & options



Accessories / Options



Pintail collector bags: In line tools and nose assembly can be equipped with optional pintail collection bag to eliminate FOD.

If tools are ordered assembled, bag will be included wherever it is needed.

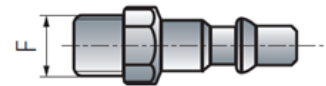


Part number :

125652 for 2012, 2013, 202, 2025, 244X & 2480.

125655 for 2581, 2582, 2583, 254 & 256.

111247 for 2600



Air connectors: Pneudraulic tools are delivered without air connector. They are equipped with a ¼” 18 female pipe thread to accept air hose fitting. Quick connectors are available as shown here.

Staubli : 253-7532

Walther : 1038001

CEJN 410 : 667-2024

Assembled tool will include the Staubli air quick connectors. Add a “G” prefix before assembly part number for Walther quick connector or a “U” for CEJN 410 quick connector.

244XA2508



Staubli air connector

G244XA2508



Walther air connector

U244XA2508



CEJN410 air connector



Accessories / Options

Pintail collection system for EBS4()X electric installation tool: EBS4()X tool is equipped with a pintail bag system P/N EB44-PBBL.

Pintail collection system can store up to 500 pintails, depending on fastener diameter installed.



Plastic pintail collection bottles: Optional plastic bottles are also available, in either black (PN EB44-B5B) or transparent (PN EB44-B5T).



Accessories / Options



Batteries: 18 Volts Li-Ion technology batteries. Batteries are available in HFS as follow :

- 2,5 Ah : HST-PR-1825
- 5Ah : HST-PR-1850



Tool is also compliant with standard Makita batteries 18 Volts Li-Ion product range, BL18 serie (2,5 Ah min).

Rubber boot for batteries are available as well :

- On battery HST-PR-1825, use cover-1825
- On battery HST-PR-1850, use cover-1850



Battery charger: charging time of about 45 minutes. Compliant with all 18 Volts Li-Ion batteries sold by HFS.

3 chargers are available, depending on country in which they are to be used:

- EU : HST-PR-2830 - 230 Volt
- UK : HST-PR-2830-UK - 230 Volt, UK plug. EU adaptor compliant as well thru adaptor.
- US : HST-PR2830-USA - 110 Volt



Accessories / Options

Power rigs

Cable holder: Power rigs can be equipped with a cable holder, allowing to hold tool during transportation. It can be installed per user preference, on the modular frame of power rig.



CH-AF : Cable Holder for Aluminum Frame



Extra handles: All power rigs can be equipped with additional handles, to ease manipulation. In such configuration, power rigs will be equipped with 2 lateral handles on each side, one vertical, and one horizontal, 4 handles total.

H at end of power rig part number indicated optional handles.

HC315AF/T400-H

Optional Handles



Accessories / Options

Electric plugs:



Single phase 230 Volts power rigs are delivered equipped with plugs.

Three phases and single phase 110 Volts hydraulic power rigs are delivered without electric plug, due to variety.

They can be equipped with standard industrial 16 amps plugs. In such case, simply specify number of pins of plug you wish at end of selected power rig part number as follow :



3 x 400 Volts 4 pins plug, 3 phases and earth connection
16 Amps



3 x 400 Volts 5 pins plug, 3 phases, neutral and earth connection
16 Amps

Example for 3 x 400 Volts, red plugs. Similar option available for 3 x 230 Volts, blue plugs.

HC315AF/T400-4

Number of pins in the plug, **4** (3phases + earth), or **5** (3phases, neutral and earth).

For 3 x 400 Volts 32 Amps power supply, 5 pins version, a Power Adapter is available. It is equipped with a built in fuse, and allow safe use of 3 x 400 Volts 16 amps, 5 pins power rigs on 32 amps plug.



PA32/T400-5

3 x 400 Volts, 5 pins

Power Adpater for 32 Amps plug

To be used with any power rig T400-5 on 32 amps plug.



Accessories / Options

Pressure verification kits: PC and CPC power rigs require occasional pressure verification. Trouble shooting of power rig also require pressure verifications and checking, and it is recommended, if hydraulic tools are used, to have available a pressure verification kit.

HFS offer 3 kits for each kind of power rigs. They come in a plastic suitcase, and are directly usable on HFS power rigs, to verify both pull and return pressures.

PV-X : Pressure Verification kit for HC315AF and all standard power rigs

PV-PC : PV-X pressure verification kit plus switch box for HK3413PC power rig.

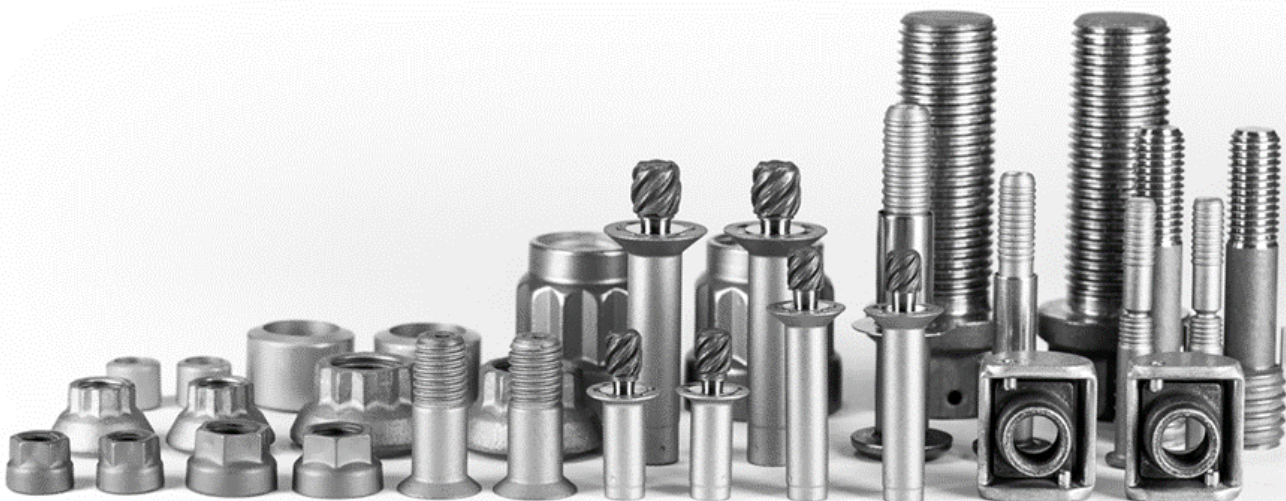
PV-PC-CPC : PV-PC pressure verification kit plus switch box for HK418CPC power rig





**HOWMET
AEROSPACE**

Pull type tools draw- ings & main character- istics



(K)EBS43X & (K)EBS44X

Configurations :

EBS43X: EBS43X tool, no battery, no charger

KEBS43X: EBS43X tool, 1 x 2,5Ah battery HST-PR-1825 & battery cover cover-1825

EBS44X: EBS44X tool, no battery, no charger

KEBS44X: EBS44X tool, 1 x 2,5Ah battery HST-PR-1825 & battery cover cover-1825

Underlined characters are to be used for kit part numbers construction and will define configuration of tool shipped in tool.

Battery chargers are shown in accessories section as well as optional pintail collection systems.

HFS EBS43() and EBS44() tools are also usable with 18 Volts Makita batteries (BL18 serie, 2,5 Ah min).



Kit additional components



Electric installation tools can install LGP® lockbolt and XPL® lockbolt fasteners up to ¼" (6,35 mm) diameter, see selection chart for tool compatibility.

They can also install blind fasteners up to ¼".

• **Stroke**: EBS43X : 12,7 mm
EBS44X : 14,3 mm

• **Capacity** : EBS43X 3400 lbs (1500 daN)
EBS44X 4500 lbs (2000 daN)

• **Weight** : 1,7 Kgs without battery, 2,1 Kgs with 2.5 Ah battery.

• **Rated Voltage** : DC 18 Volts

Light blue attachment

(K)EBS43OSX & (K)EBS44OSX

Configurations :

EBS43OSX: EBS43X tool, no battery, no charger

KEBS43OSX: EBS43X tool, 1 x 2,5Ah battery HST-PR-1825 & battery cover cover-1825.

EBS44OSX: EBS44X tool, no battery, no charger

KEBS44OSX: EBS44X tool, 1 x 2,5Ah battery HST-PR-1825, battery cover cover-1825.

Underlined characters are to be used for kit part numbers construction and will define configuration of tool shipped in tool.

Battery chargers are shown in accessories section as well as optional pintail collection systems.

HFS EB43S() and EB44S() tools are also usable with 18 Volts Makita batteries (BL18 serie, 2,5 Ah min).



Kit additional components



Electric installation tools can install LGP® lockbolt and XPL® lockbolt fasteners up to ¼" (6,35 mm) diameter, see selection chart for tool compatibility.

They can also install blind fasteners up to ¼".

• **Stroke** : EBS43X : 12,7 mm
EBS44X : 14,3 mm

• **Weight** : 1,7 Kgs without battery, 2,1 Kgs with 2.5 Ah battery.

• **Capacity** : EBS43OSX 3400 lbs (1500 daN)
EBS44OSX 4500

• **Rated Voltage** : DC 18 Volts

Dark blue attachment, offset noses only.

(K)EBSPX & (K)EBSPXS

Configurations :

EBSPX(): Tool, load adjusted for pull-in of fastener diameter between parenthesis, no battery, no charger for in line pull-in noses.

KEBSPX(): EBSPX tool, 1 x 2,5Ah battery HST-PR-1825 & battery cover cover-1825

EBSPXS(): Tool, load adjusted for pull-in of fastener diameter between parenthesis, no battery, no charger for offset pull-in noses.

KEBSPXS(): EBSPXS tool, 1 x 2,5Ah battery HST-PR-1825 & battery cover cover-1825

Underlined characters are to be used for kit part numbers construction and will define configuration of tool shipped in tool.

Battery chargers are shown in accessories section as well as optional pintail collection systems.

HFS EBSPX() and EBSPXS() tools are also usable with 18 Volts Makita batteries (BL18 serie, 2,5 Ah min).



Kit additional components



Electric installation tools can pull-in & install LGP® lockbolt and XPL® lockbolt fasteners up to ¼" (6,35 mm) diameter, see selection chart for tool compatibility.

Load is adjusted to optimum pull-in load for diameter specified between parenthesis. Load and stroke can also be adjusted by user if required using HFS tool manager software.

•**Stroke** : EBSPX() : 25 mm
EBSPXS : 14,3 mm

•**Weight** : 1,7 Kgs without battery, 2,1 Kgs with 2.5 Ah battery.

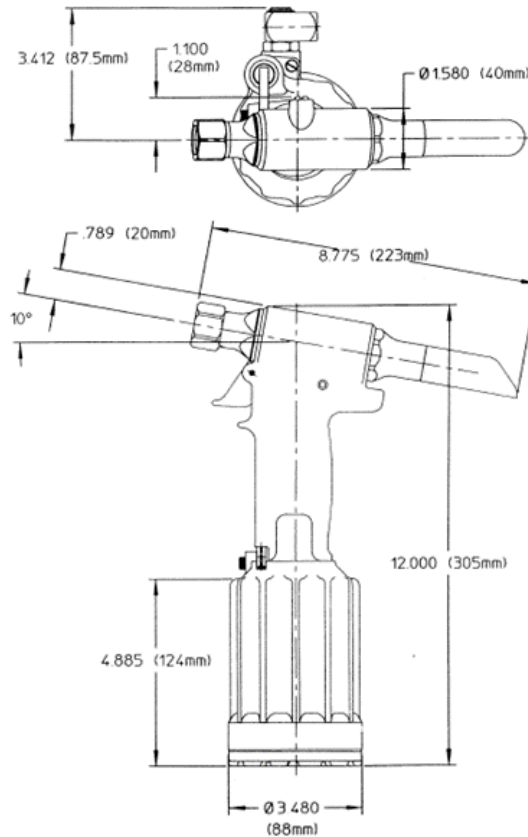
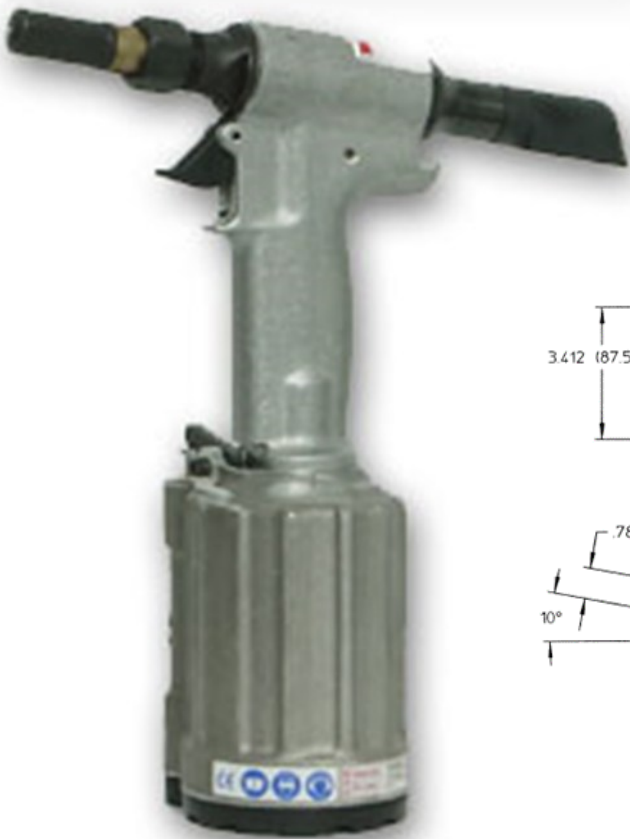
•**Capacity** : adjustable thru software,

•**Rated Voltage** : DC 18 Volts

Light blue attachment
EBSPX

Dark blue attachment
EBSPXS

2012



- Min. Stroke: .650
- Air Pressure: 90 psi
- Speed/Cycles: 20 per minute
- Air Consumption: 2.9 CFM
- Weight of 2012: 4.4 lbs
- Min. Capacity: 2670 lbs @ 90 psi

Light blue attachment

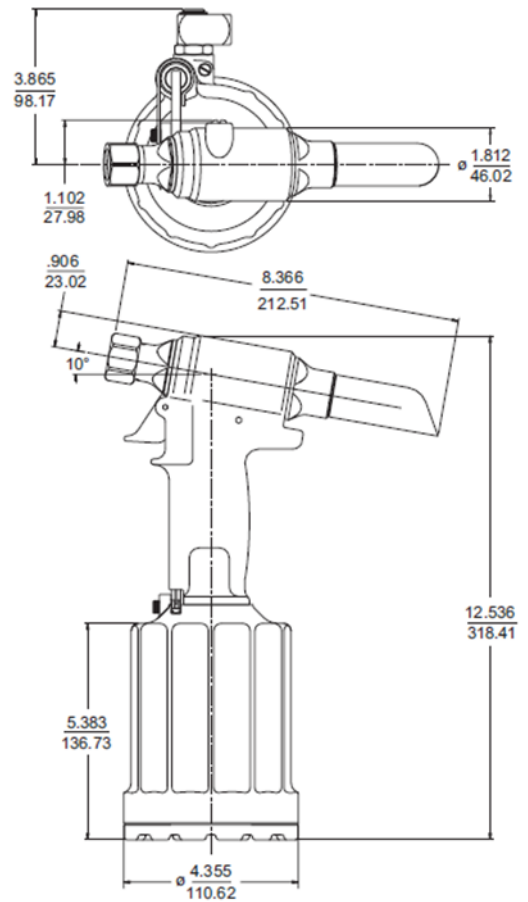


2025



Models 2025 & 2025L

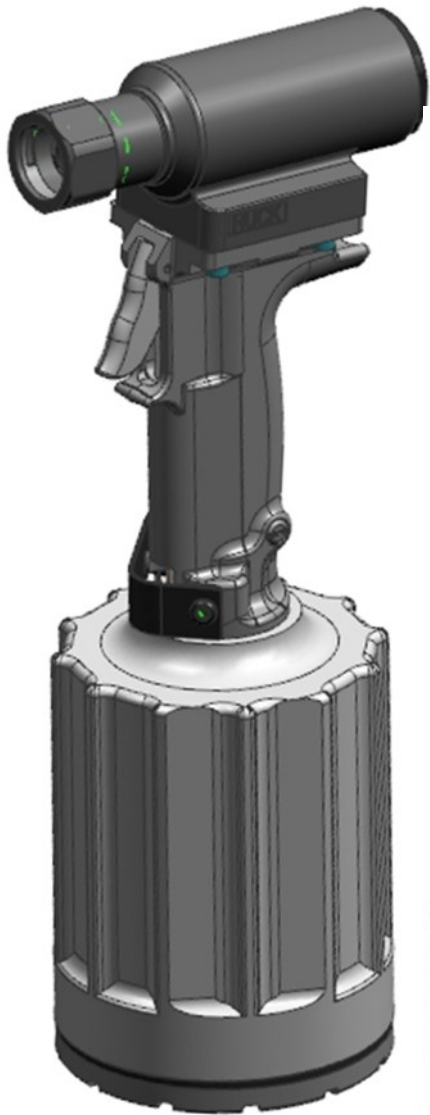
- Stroke: .675 in
- Weight: 5 lbs 12oz
- Air Pressure: 90 psi
- Capacity: 5290 lbs @ 90 psi
- Speed/Cycles: 30 per minute
- Noise Level: 75 dBA @ 90 psi



Light blue attachment
Can be used wherever 2012 and 202 are used.



2057



SPECIFICATIONS

HYDRAULIC FLUID:

ATF meeting DEXRON III, DEXRON IV, MERCON, Allison C-4 or equivalent specifications. Fire resistant hydraulic fluid may also be used, and is required to comply with OSHA regulation 1926.302 paragraph (d): "the fluid used in hydraulic power tools shall be fire resistant fluid approved under schedule 30 of the US Bureau of Mines, Department of Interior, and shall retain its operating characteristics at the most extreme temperatures to which it will be exposed."

MAX INLET PRESSURE: 7400 psi, (510 bar)

PULL CAPACITY: 5280 lbs (24 KN) @ 90 psi

STROKE: .815 in. (2.07 cm)

WEIGHT WITHOUT NOSE ASSY: 10.01 lbs (4.54 kg)

HEAD LENGTH WITHOUT NOSE ASSY: 8.4 in (21.3 cm)

HEAD WIDTH: 2.25 in (5.72 cm)

CYLINDER DIAMETER: 4.63 in (11.76 cm)

CENTERLINE TO TOP OF HEAD: .73 in (1.85 cm)

OVERALL HEIGHT: 14.62 in (37.13 cm)

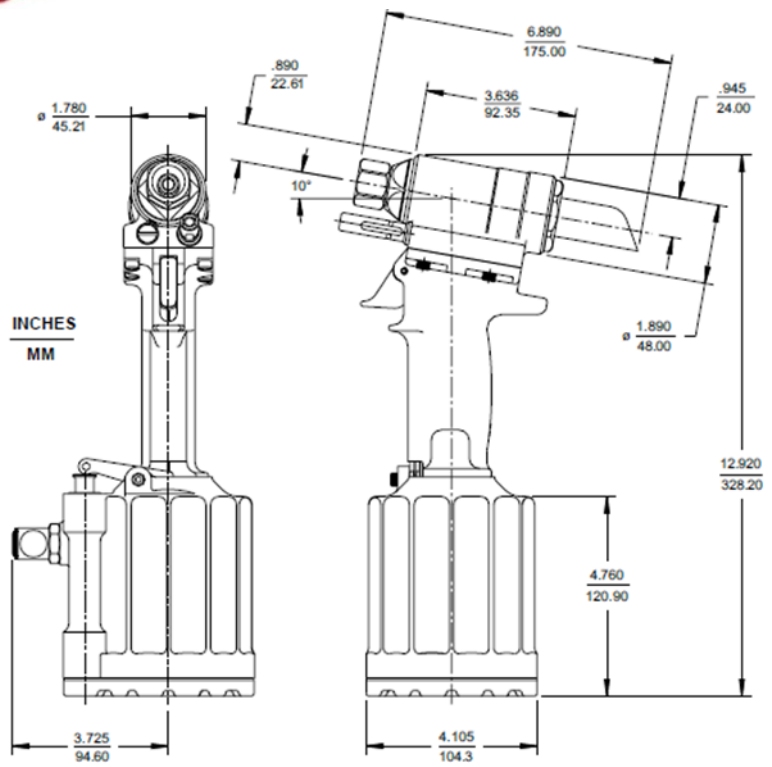
AIR PRESSURE REQD: 90-100 psi (620-690 kPa)

AIR CONSUMPTION: 11.5 CFM (.005 m³/s)
(based on 30 fastener installation per minute)

Light orange attachment
Long stroke tool, pull-in only



244X

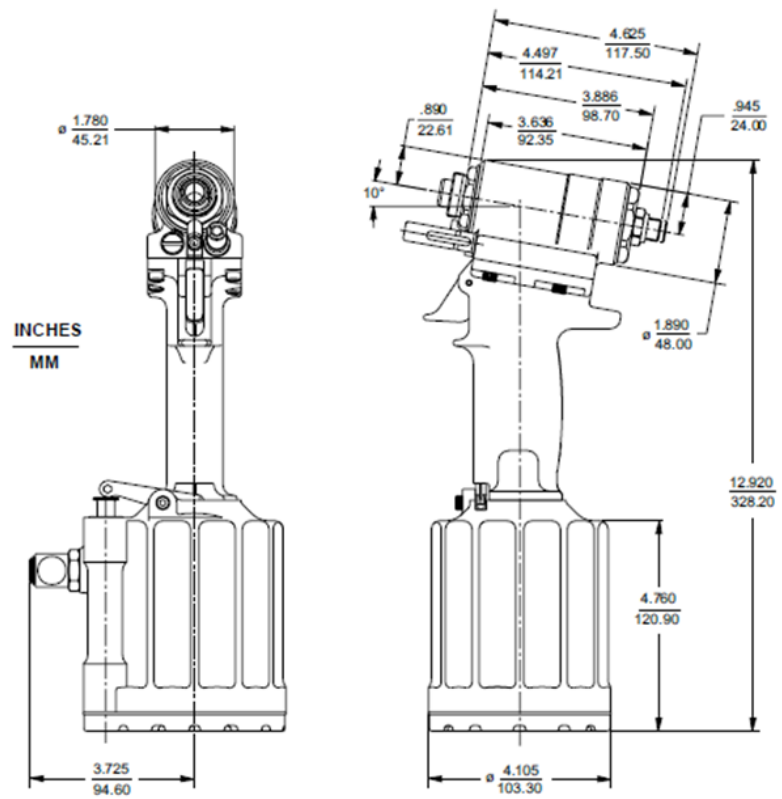


- Stroke: .562 in
- Weight: 5 lbs 11oz
- Air Pressure: 90-100 psi
- Capacity: 4606 lbs @ 90 psi
- Speed/Cycles: 30 per minute
- Noise Level: 75 dBA @ 90 psi

Light blue attachment



2440SX

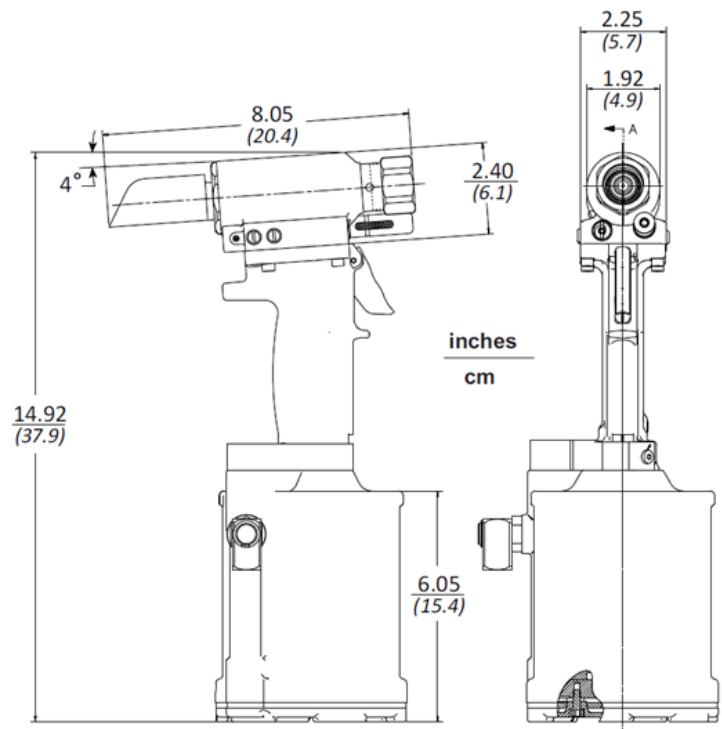


- Stroke: Adjustable 0 - .500 in
- Weight: 5 lbs 11oz
- Air Pressure: 90-100 psi
- Capacity: 4606 lbs @ 90 psi
- Speed/Cycles: 30 per minute
- Noise Level: 75 dBA @ 90 psi

Dark blue attachment, offset noses only.



254



WEIGHT:
8.67 lbs (3.9 kg)

MAX AIR PRESSURE:
100 psi (6.9 bar)

MIN PULL CAPACITY:
8,620 lbs (38.34 kN) @ 90 psi

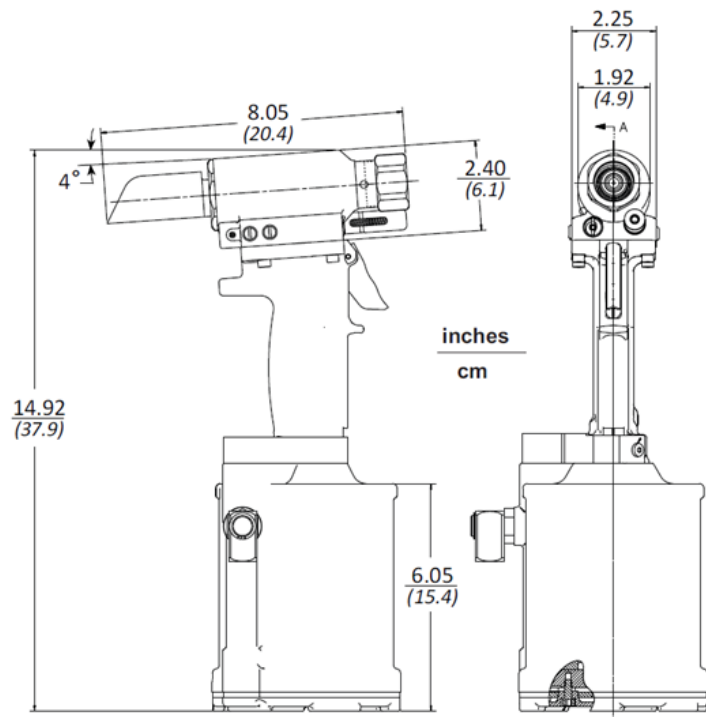
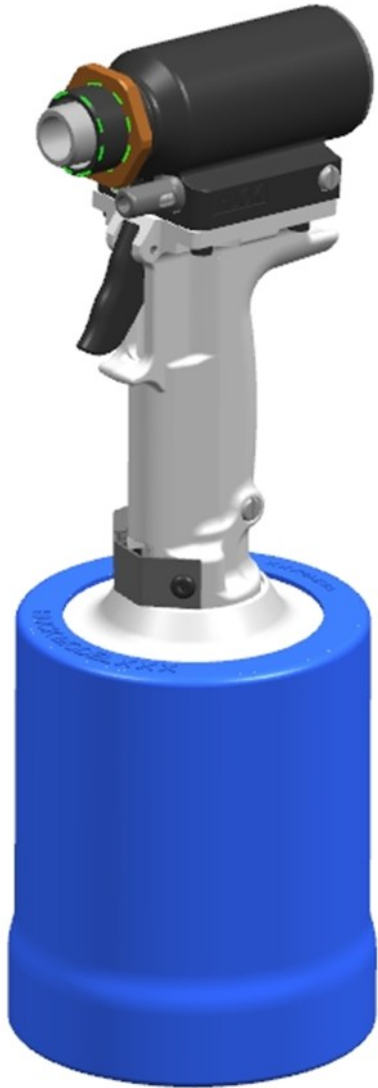
MIN PULL CAPACITY:
8,620 lbs (38.34 kN) @ 90 psi

MIN STROKE:
.565 inches (1.43 cm)

Light orange attachment



2540S



WEIGHT:
8.67 lbs (3.9 kg)

MAX AIR PRESSURE:
100 psi (6.9 bar)

MIN PULL CAPACITY:
8,620 lbs (38.34 kN) @ 90 psi

MIN PULL CAPACITY:
8,620 lbs (38.34 kN) @ 90 psi

MIN STROKE:
.565 inches (1.43 cm)

Dark orange attachment, offset noses only.

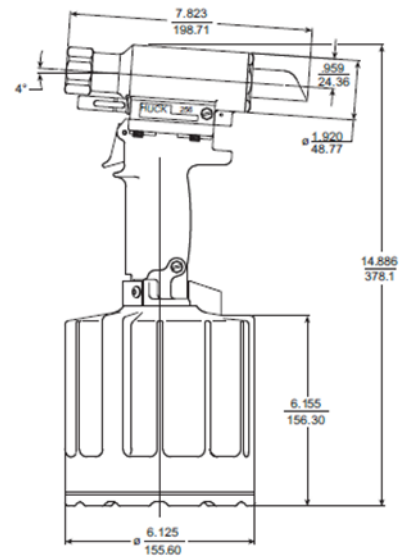
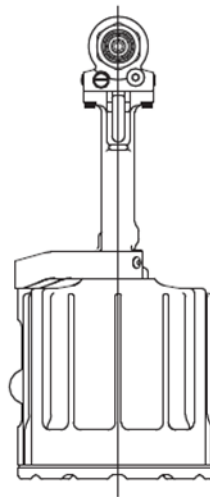


256

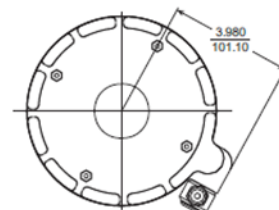


TOOL SPECIFICATIONS

INCHES
MM



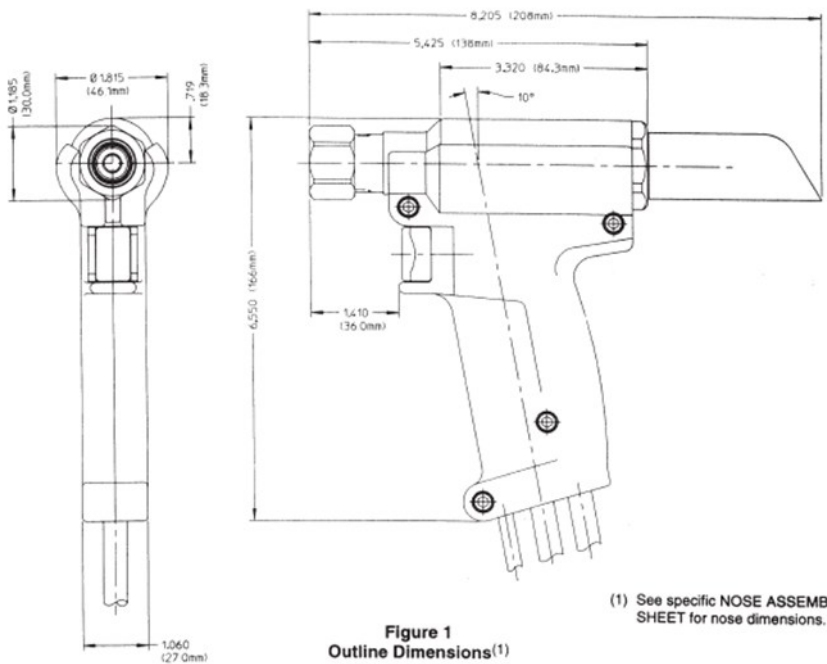
- Stroke: .875
- Weight: 11.1 lbs
- Air Pressure: 90-100 psi
- Capacity: 9986 lbs @ 90 psi
- Speed/Cycles: 30 per minute
- Noise Level: 85 dBA @ 90 psi



Light orange attachment
Can be used wherever 245 is used.



2480



Model No.	Length	Width	Height	Weight	Stroke
2480	8.63 in. 219 mm	1.88 in. 48 mm	6.50 in. 165 mm	2.2 lbs. 1.0 kg	.875 22.2 mm

Power source Huck POWERIG Hydraulic Unit
 PULL pressure 8400 psi 580 BAR
 RETURN pressure 3200 psi 220 BAR
 Maximum pinbreak 5380 lb_f 23,931 N

Light blue attachment.
 Shipped with 3,6 meters length hoses.

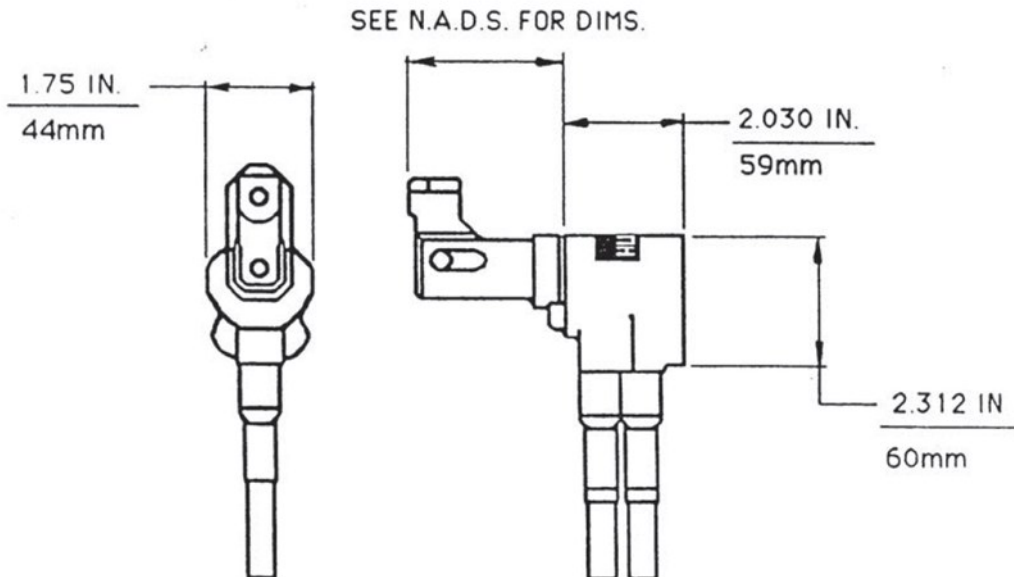


206 - 375 / 206 - 500



<u>Model No.</u>	<u>Length</u>	<u>Width</u>	<u>Height</u>	<u>Weight</u>
206-375	4.5 in. 115 mm	1.75 in. 43.5 mm	3.25 in. 83mm	3.37 lbs. 1.5 kg

Note: Length, Width, Height and Weight include overall dimensions/weight of typical assembled Offset Nose Assembly and Tool.



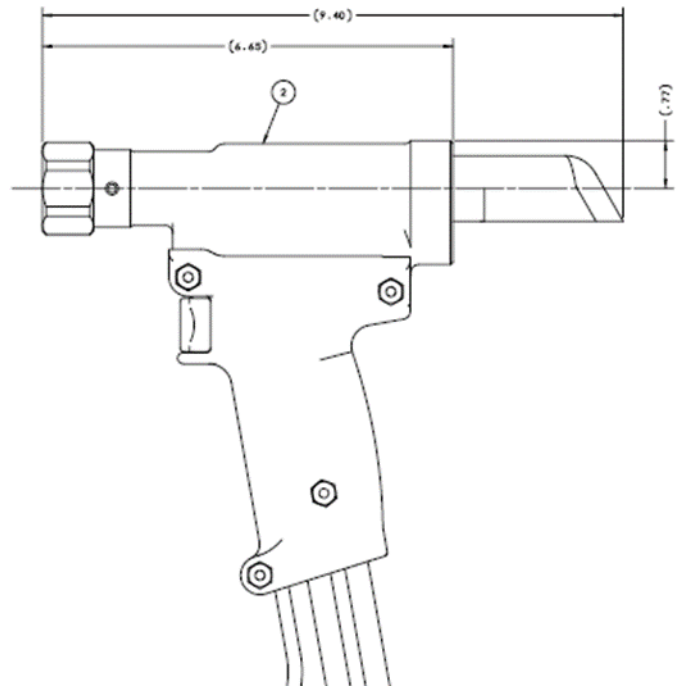
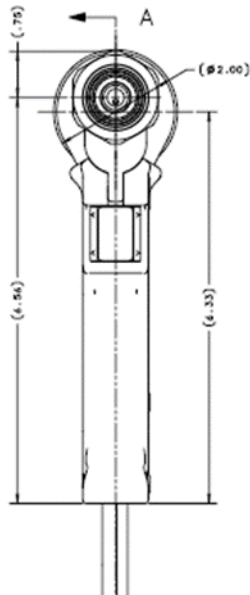
Dark blue attachment, offset noses only.

Shipped with 3,6 meters length hoses.

Switch from 206-375 to 206-500 by removing stroke limiter, and switch release valve.



2583



Length	9.40"	(23,9 mm)
Width	2.00"	(50 mm)
Height (incl. handle)	7.31"	(185 mm)
Weight	4.6 lbs	2,9 Kgs
Max Pull press.	8400 PSI	580 bars
Max Return press.	2400 PSI	165 bars

Light orange attachment.
Shipped with 3,6 meters length hoses.

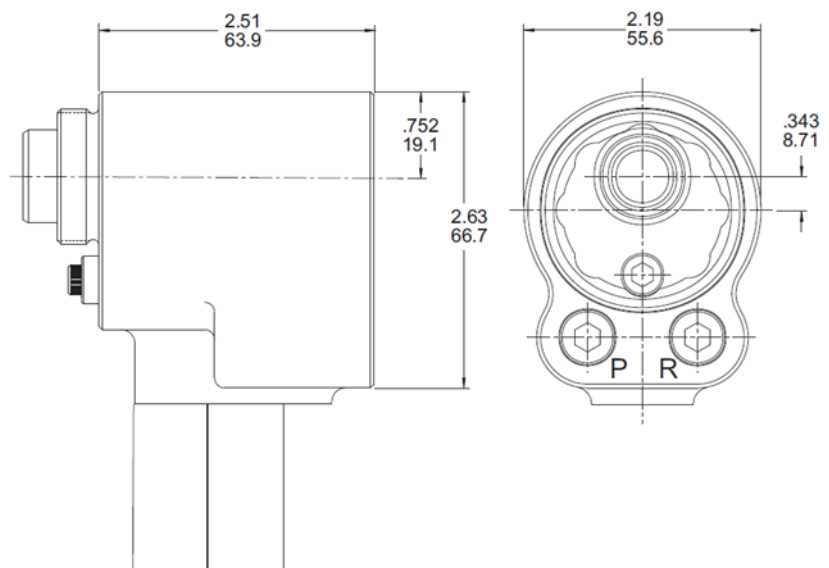


2080 - 625 / 208 - 750



<u>Model No.</u>	<u>Length</u>	<u>Width</u>	<u>Height</u>	<u>Weight</u>
208-625	6.0 in. 152 mm	2.19 in. 56 mm	3.81 in. 97mm	3.96 lbs. 1.8 kg

Note: Length, Width, Height and Weight include overall dimensions/weight of typical assembled Offset Nose Assembly and Tool.



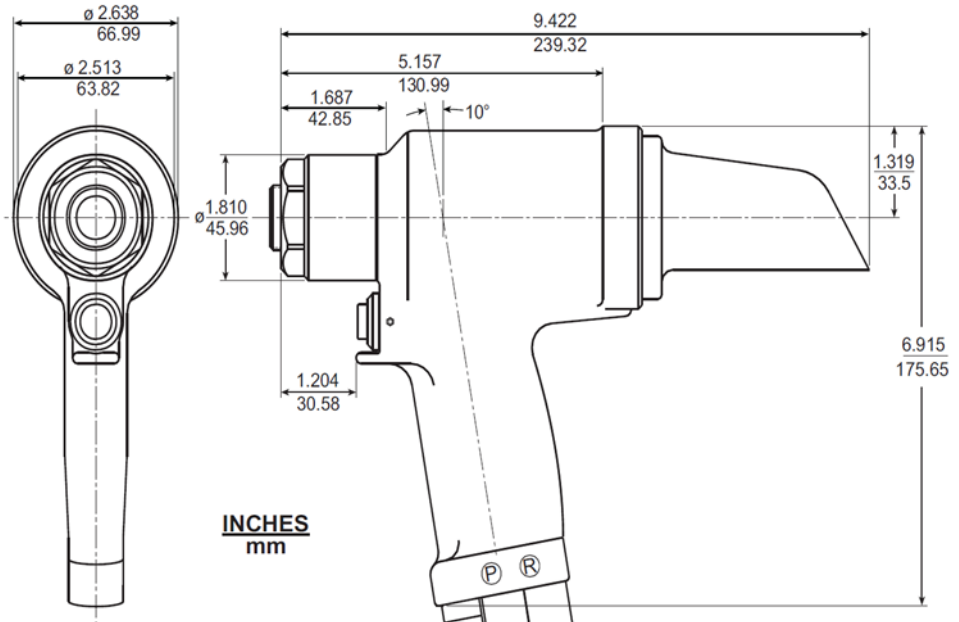
Dark orange attachment, offset noses only.

Shipped with 3,6 meters length hoses.

Switch from 208-625 to 208-750 by removing stroke limiter, and switch release valve.



2600 - 16 - 12



PULL CAPACITY:
20,020 lbs (89.05 kN) @ 7400 psi

STROKE:
1.25 inches (3.18 cm)

WEIGHT:
7.3 lbs (3.31 kg)

Light green attachment.
Shipped with 3,6 meters length hoses.

