



R & D DEPARTMENT

DATE

04/10/2012

Air gun engineer

Technical manager

Spagnolo

Costoli

**Comparison test of DP 2000S, DP 4000 and DP4000 MG**

**Test Purpose**

To give a quantification of the power at tighteng and loosening of the DP4000 MG we tested with the same procedure the previous models DP4000 , DP 2000S.

**Test Conditions**

The rig is equipped with right handed and left handed Bolt , in order to be able to measure the power of all the guns in both directions.

**1 st Test**

**Free Speed Test with 1/2 Gas pressure lane: minimum inner dia. 10**

Working Pressure

20 BAR DINAMIC



DP 2000 S

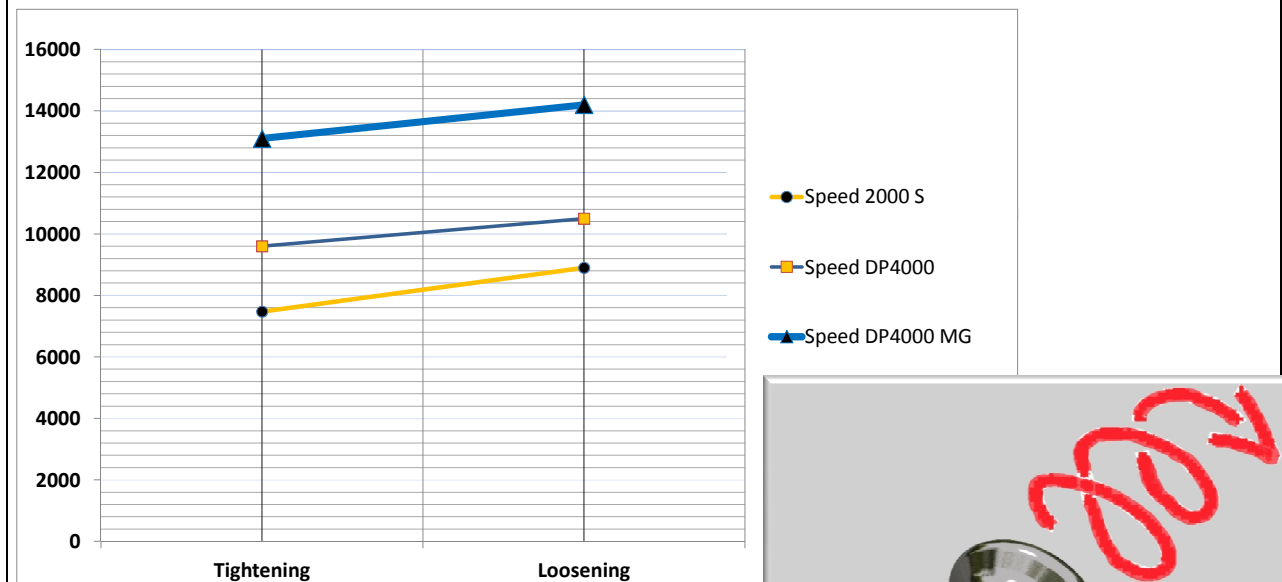


DP 4000



DP 4000 MG


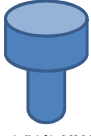
	Tightening	Loosening	Tightening	Loosening	Tightening	Loosening
rpm	7475	8900	9600	10500	13100	14200



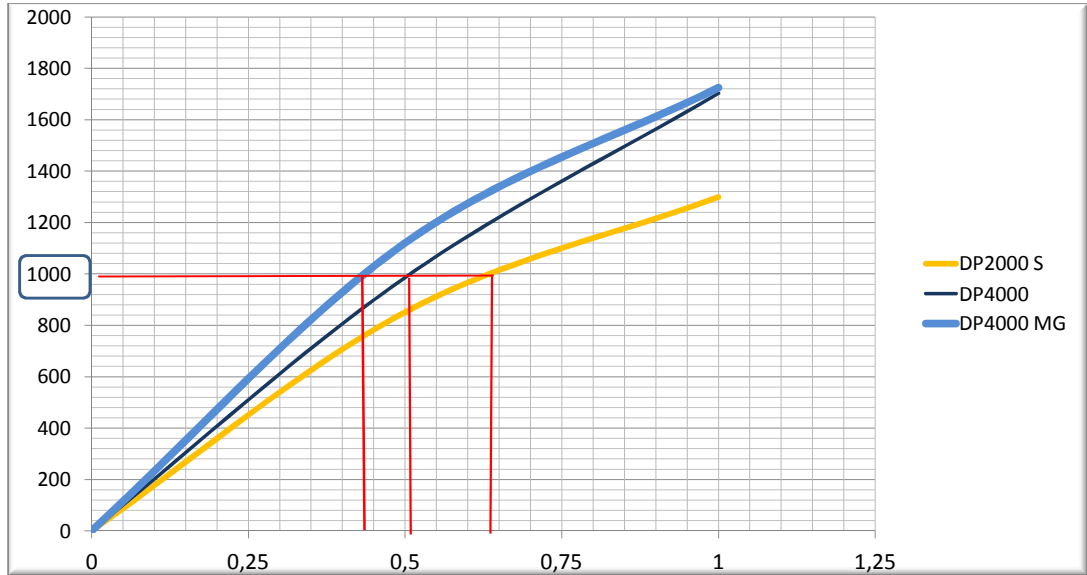
**NOTES :** We would like to underline that a faster air gun gives you advantages even during the free rotation as it is able to save time also during this phase of the tightening process. by example we consider just 2 free revolutions , these are the comparative results:

1	Dp 4000 MG	: 0.009 s / 2 rev
2	Dp 4000	: 0.0126 s / 2 rev
3	Dp 2000S	: 0.0163 s / 2 rev



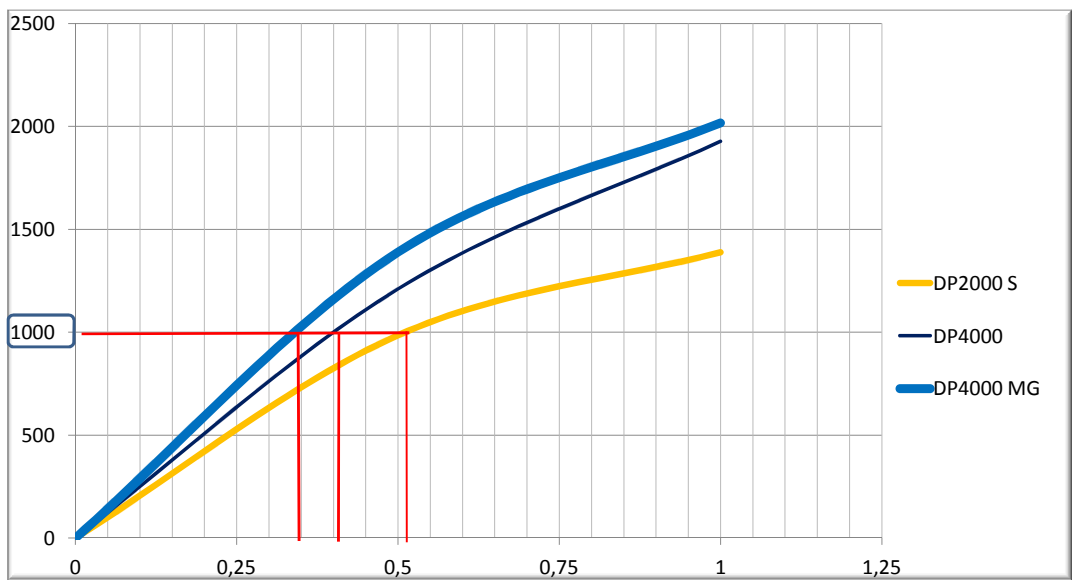
	<b>R &amp; D DEPARTMENT</b>		DATE				
			04/10/2012				
			Air gun engineer	Technical manager			
			Spagnolo	Costoli			
<b>Comparison test of DP 2000S, DP 4000 and DP4000 MG</b>							
<b>2 nd Test Torque Test with 1/2 Gas Pressure Lane ( minimum Inner dia. 10)</b>							
Test Conditions	1"1/2 UNC Screw L.120 Exagon SW 60,3 On SKIDMORE Load Cell 70000 Kg						
Bolt size	2"3/8 (60,325)						
 1 "1/2 UNC (38,1)		DP2000S		DP 4000		DP 4000 MG	
	<b>Time (sec )</b>	<b>Tightening</b>	<b>Loosening</b>	<b>Tightening</b>	<b>Loosening</b>	<b>Tightening</b>	<b>Loosening</b>
	<b>0</b>	0,00	0,00	<b>0,00</b>	<b>0,00</b>	<b>0,00</b>	<b>0,00</b>
	<b>0,5</b>	851,31	985,72	<b>985,72</b>	<b>1209,75</b>	<b>1120,14</b>	<b>1388,97</b>
	<b>1</b>	1299,36	1388,97	<b>1702,61</b>	<b>1926,64</b>	<b>1725,02</b>	<b>2016,25</b>

**tightening Torque**



**NOTES :** The graphic above shows the three torque curves correspondant respectively at the three air-guns DP4000 MG , DP4000, DP2000 S on tightening mode. Assuming a tightening torque at 1000 Nm, you can see that the DP 4000 MG reaches the torque at **0.44 s** while the DP4000 at **0.51 s** Finally the DP 2000 S at **0.65 s**.

**Loosening Torque**



**Notes** The graphic above shows three torque curves corresponding respectively to the three air-guns DP4000 MG , DP4000, DP2000 S in loosening direction. Assuming a nut tightened at 1000 Nm, you can see that the DP 4000 MG loosens this torque in **0.34s**, while the DP4000 in **0.45 s** Finally the DP 2000 S in **0.5 s**.