

## 1940 Panzer Divisions vs 1941 Panzer Divisions

In the large majority of current works on Operation Barbarossa, it is repeated, ad nauseam and without any substantive analysis, that the 1940 panzer division was stronger than the 1941 panzer division. This is always based on a single premise: namely the 1940 panzer division had two panzer regiments (vs one in the 1941 division) and hence must have had more tanks and hence must have been 'stronger'. The claim is that when the 10 panzer divisions in 1940 'lost' their 2nd panzer regiments to form new panzer divisions, there was little overall increase in armoured division strength across the German Army.<sup>1</sup> Some commentators then use this assertion to go as far as saying, or implying, that the Wehrmacht's overall armoured strength in Operation Barbarossa was therefore comparable to that used in the 1940 French campaign.<sup>2</sup>

However, as we shall see, **this is a fundamentally incorrect and oversimplified assertion.** Firstly, it ignores the overall quality and the actual numbers of the tanks involved (see below). Secondly, it is based on the idea that an armoured division's overall combat and staying power is only proportional to the number of tanks in its TOE. It takes no account of the increased infantry, artillery and logistical support available to the tanks in the 1941 division; or how this can dramatically impact the division's performance when it is attempting to breakthrough an entrenched enemy defence, exploiting a breach in the enemy line, or protecting its extended flanks during the exploitation phase. From 1939 onwards, excessively 'tank-heavy' armoured divisions proved to be extremely vulnerable to enemy counterattack as their unsupported tank units moved forward. In addition they proved more vulnerable to enemy infantry and AT guns, and their tank regiments proved far less able to sustain periods of prolonged combat.

As a first step let us briefly examine the 10 panzer divisions involved in the French 1940 campaign, and then compare their overall tank strength and organization against the June 1941 panzer divisions. The 10 1940 panzer divisions varied widely in their organization and equipment. These divisions were authorised two panzer regiments, but in actuality the 6th, 7th, 8th and 9th Panzer Divisions had only one panzer regiment each. In addition the 1st, 2nd, 3rd, 6th and 8th Panzer Divisions had only one motorised infantry regiment (vs two in every 1941 panzer division), and only the 1st, 2nd and 10th had a heavy artillery battalion (vs one in every 1941 panzer division). Furthermore, the 1940 motorised infantry regiments (*Schuetzen*) had very few armoured infantry battalions or companies (in APCs), and most had no infantry gun companies (vs one per regiment in 1941), only 1 LMG per *Schuetzen* squad (vs two in 1941), and fewer embedded *pionier* platoons. Also, despite having more tanks, the 1940 panzer division had fewer logistical support units: it had two less transport columns (30 ton), two less heavy transport columns (60 ton), one less fuel transport (POL) column, and one less motor maintenance company.

A full analysis shows there were 2582 tanks of all types in the 16 panzer regiments in panzer divisions on 10th May 1940, which equates to an average of 258 tanks per 1940 panzer division.<sup>3</sup> Similarly, there were 3266 tanks of all types in the 17 panzer regiments in panzer divisions supporting Operation Barbarossa on 22nd June 1941. This equates to 192 tanks per 1941 panzer division (excluding 237 additional tanks in the 1941 division's armoured pionier battalion and armoured signal battalion).<sup>4</sup> The obvious thing from these numbers is that the 1940 divisions **did not** have twice the number of tanks as the 1941 divisions, as implied by having two panzer regiments instead of one. In fact we see that the average 1940 panzer division had only 26% more tanks than the average 1941 panzer division. If the actual tanks in the 1941 panzer division's armoured pionier battalion and armoured signal battalion are included, this **figure drops to only 20%**.<sup>5</sup>

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<sup>1</sup> E.g., H. Boog, et al, Germany and the Second World War, Volume IV: The Attack on the Soviet Union, Oxford University Press, New York, 1996, p. 202.

<sup>2</sup> E.g., B. Taylor, Barbarossa to Berlin, Volume One, Spellmount Ltd, Staplehurst, UK, 2003, p. 28. "In early 1941 the strength of the German panzer division had been reduced from its 1940 level due to Hitler's call for an increase in the number of divisions. The end result was roughly the same number of tanks as operated in France, but twice the number of divisions, a waste of support resources." Presumably the author believes Operation Barbarossa should have been launched with only 9 panzer divisions (with one in Africa) instead of the 17 historically used, as there was, apparently, no actual increase in armoured division strength?

<sup>3</sup> Data from: T. Jentz, Panzer Truppen: The Complete Guide to the Creation and Combat Deployment of Germany's Tank Force 1933-1942, Schiffer Military History, Atglen PA, 1996, pp. 120 and 121.

<sup>4</sup> There were 3503 tanks of all types in the 17 Panzer Divisions in the east on 22nd June 1941. Data from: Ibid, pp. 190- 193 and 206.

<sup>5</sup> In May 1940 the panzer division's *pionier* battalions and signal battalions were motorised with almost no tanks or APCs. By June 1941, many of the panzer divisions had at least one armoured company in their armoured *pionier* and armoured signal battalions. 20 additional tanks were authorised in these units although most 1941 panzer divisions actually had around 14 tanks: it was mainly the command tanks, authorised for the armoured signal battalion that were missing (they were replaced by radio armoured cars or/and radio vans).

Combining all the above information, and comparing the two division types, we get the comparison below.

<b>Table 1940-41 Pz Divisions</b>		
<b>Comparison of Tank Numbers and Tank Supporting Units in 1940 and 1941 Panzer Divisions*</b>		
	<b>10th May 1940</b>	<b>22nd June 1941</b>
Number of Panzer Divisions Fielded	10	17
Number of Panzer Regiments Fielded	16	17
Total No of Tanks in Panzer Regiments	2582	3266
Ave No of Tanks per Panzer Division <sup>^</sup>	258	192
Ave No of Tanks/Infantry-Squad in Each Pz Division	3.2	1.8
Ave No of Tanks/Gun-Howitzer in Each Pz Division**	10.8	5.3
Ave No of Tanks/Transport Column in Each Pz Division	37	17
Ave No of Tanks/POL Fuel Column in Each Pz Division	86	64
Ave No of Tanks/Div Motor Maintenance Company in Each Pz Division	129	64

\* Only Panzer Divisions involved in Fall Gelb in May 1940, and Operation Barbarossa in June 1941.  
<sup>^</sup> Excludes additional tanks in the 1941 Panzer Division's Armoured *Pionier* Battalion and Armoured Signal Battalion.  
\*\* Excludes Infantry Guns, and the 1941 Panzer Division had significantly more light, and especially, heavy infantry guns.

As most 1941 panzer divisions were close their TOE on 22nd June 1941 (see the following sections on actual equipment in each division), then, to put it succinctly, **the average tank in the 1941 panzer division could call on twice as much infantry, artillery, logistical and maintenance support as the average tank in the 1940 panzer division.** In addition the average 1941 panzer division had only around a quarter fewer tanks, and considerably more APCs. The Germans Army didn't just reduce the number of tanks per panzer division on Hitler's whim: they had also discovered that their panzer divisions in France in 1940 were too 'tank heavy'; while having too little artillery, infantry and logistical support. Consequently they readily agreed to reduce the two panzer regiments to one larger regiment by 1941, while at the same time doubling the number of supporting infantry regiments, adding an additional heavy artillery battalion, increasing the logistical support units, and adding armoured infantry units (in APCs) as they became available.<sup>6</sup> Records show that 1941 panzer divisions with roughly 30 percent of their establishment (combat) strength, and approximately 50 operational tanks, still had enough striking power to successfully conduct major offensive operations.<sup>7</sup> These figures are unmatched by any other division type fielded anywhere from 1939 to 1942, and remain a remarkable indication of how tough and resilient 1941 panzer divisions could be.

The problem of excessively tank-heavy divisions was not unique to the Wehrmacht in 1940; they were simply the first to recognise the symptoms, despite the *Panzerwaffe* victories in 1939 and 1940. Mechanised warfare was still a new 'art form' at this time and everyone was still learning. In 1940 the French and British armoured formations were even tank heavier than the panzer divisions, and suffered accordingly. The French so called light mechanised divisions (DLMs) actually had more tanks than their fledgling armoured divisions, around 220 and 158 respectively.<sup>8</sup> Yet the former had only the equivalent of one infantry regiment and the latter had only one infantry battalion. Obviously these divisions were designed to support the French infantry divisions, and being parcelled out piecemeal to the infantry divisions is exactly what happened in May 1940. Meanwhile the British 1940 armoured divisions had no less than two armoured brigades, each with three armoured regiments; a total of around 342 tanks.<sup>9</sup> This was OK, except that the entire division had only one 'support group' with two infantry battalions. Again, this was light years behind both the Germans and Soviets in terms of a balanced armoured formation ready for penetrating armoured offensives and 'deep battle'. The British Army was also slow to learn: they continued operating tank heavy divisions and brigades in North Africa in 1941 and 1942, and consistently suffered far heavier tank losses than the *Afrika Corps*. They were very fortunate they had the tanks to lose. It wasn't until 1943 that both the British and American armies started creating armoured divisions with an equal balance of infantry and tanks, and with more artillery. The abundance of

<sup>6</sup> Refer Volume V - 'Relative Overall Combat Proficiency (ROCP): the ROCP of Soviet and Axis Forces on the East Front during WWII' for reasons why infantry heavy tank divisions, and later war Soviet mechanised divisions, exhibited considerably more 'staying power' and resilience in combat compared to tank heavy formations.

<sup>7</sup> R.H.S. Stolfi, German Panzers on the Offensive, Russian Front: North Africa 1941-1942, Schiffer Military History, Atglen, PA, 2003, p. 79. The 30% excludes the logistical and non-combat elements of the division.

<sup>8</sup> J. Ellis, WWII A Statistical Survey, Facts on File Inc, New York, 1993, p. 202.

<sup>9</sup> J. Ellis, WWII A Statistical Survey, Facts on File Inc, New York, 1993, p. 218.

available tanks meant these divisions still retained large numbers of tanks, but the supporting infantry and artillery was hugely improved, and by 1944 was also mostly armoured.

Having analysed the actual number of available tank in the respective division types, and the improved organization and resilience of the 1941 panzer divisions, we lastly come to the important issue of the quality of the tanks involved. A review of the available tanks in the *Heeres* (Army) inventory on relevant dates, and an analysis of the actual tanks assigned to the panzer divisions on 10th May 1940 and 22nd June 1941, is shown in the following table.<sup>10</sup>

<b>Table 1940-41 Pz Inventory</b>				
	<b>Total Tank Inventory of the Heeres (Army)</b>		<b>Total Tanks in Panzer Regiments*</b>	
	<b>1st May 1940</b>	<b>1st June 1941</b>	<b>10-May-40</b>	<b>22-Jun-41</b>
Pz.kpfw. I (MGs only)	1077	877	554	152
Pz.kpfw. II (2cm gun)	1092	1074	920	743
Pz.kpfw. 35(t) (3.7cm gun)	143	170	118	155
Pz.kpfw. 38(t) (3.7cm gun)	238	754	207	625
Pz.kpfw. III (3.7cm gun)	381	350	349	259
Pz.kpfw. III (5cm gun)		1090		707
Pz.kpfw. IV (7.5cm gun)	290	517	280	439
Pz.Bef.Wg	244	330	154	186
<b>Total</b>	<b>3465</b>	<b>5162</b>	<b>2582</b>	<b>3266</b>

\* Only Panzer Regiments involved in Fall Gelb in May 1940, and Operation Barbarossa in June 1941.

Most German tanks from 1939 to 1942 can be placed into three broad categories, representing their overall combat power, as follows:

- Pz.kpfw. I and II Light Tanks. These were very light tanks equipped with only MGs or/and 2cm cannon armament (similar to that found on combat aircraft). They had light armour, a small 2-3 man crew and were really only suitable as training tanks or for aggressive reconnaissance. The only reason the Wehrmacht had so many in the field (especially in 1939-1940) was because Germany still had nothing better to fill out its panzer regiments.
- Pz.kpfw. 35(t) and 38(t) Light Tanks. These were light tanks originating from Czechoslovakia. They were well designed and reliable tanks with a reasonably good gun and moderate armour, and were considerably better than anything produced by the Germans in this class. Their main deficiencies stemmed from their small size. This meant they could not be easily up-armoured or up-gunned, and only allowed a below optimum crew of four with a critical two man turret (instead of the much better three man turret).
- Pz.kpfw. III and IV Medium Tanks. These were the German Army's main battle tanks and were custom designed for the job. These were excellent tanks for their day with moderate armour, good all-round tank guns, and five man crews with three man turrets. Possibly most critical, was that the Pz III and IV were optimised for tank vs tank, and tank vs anti-tank gun, combat: they incorporated many features and subtleties of design not present in contemporary tanks until 1943 onwards.<sup>11</sup> By June 1941 the Pz III (5cm) and Pz IV were probably the best all-round battle tanks in the world in general service, with the exception of the Soviet T-34 and KV tanks. For our purposes here, it is sufficient to note that the Pz III and IV possessed an OCPC (Overall Combat Power Coefficient) value 2.8-5 times greater than that for the Pz I and II tanks.<sup>12</sup>

From table 1940-41 Pz Inventory we can see that in the summer of 1940 no less than 63% of the tanks in the German inventory were Pz I and II light tanks, and they made up 57% of the tanks in the 1940 panzer divisions! Apart from being a shocking indictment of the French and British Armies of 1940, we can see that the

<sup>10</sup> Data collated from: T. Jentz, *Panzer Truppen: The Complete Guide to the Creation and Combat Deployment of Germany's Tank Force 1933-1942*, Schiffer Military History, Atglen PA, 1996, pp. 117, 120, 121, 186 and 190 – 193.

<sup>11</sup> Refer Volume I Part II 2. 3) – 'Methodology for Calculating a Weapon System's or Database Unit's Overall Combat Power Coefficient (OCPC) - Calculating a Land Based, Motorised Mobile Fighting Machine's (MFM's) Overall Combat Power Coefficient (OCPC)'.

<sup>12</sup> Ibid, also, refer Volume IIA 2. 6), tables Ger Res Database 2 and Ger Res Database 2A.

corresponding numbers in June 1941 had shrunk to 38% and only 27% respectively. In other words, in May 1940 well over half the German panzers fielded were very light tanks and this number had dropped to around a quarter the following year. At the same time the proportion of Czech light tanks had increased from only 13% to almost a quarter, while most importantly, the proportion of main-battle medium tanks had increased from 24% to 43%. Almost equally important is that in May 1940 all 349 Pz IIIs had 3.7cm guns, while in June 1941 there were 707 Pz IIIs with the much better 5cm gun and only 259 had 3.7cm guns.

Considering that the average 1941 panzer divisions had only around a quarter fewer tanks and considerably more APCs than the average 1940 panzer division, and considering that the average tank in the former had 2-3 times more combat power than the average tank in the latter, then based on tanks alone (without considering other factors) the average 1941 panzer division was significantly more powerful than the average 1940 panzer division.

Despite common perception, it is apparent that, in fact, individual German panzer divisions in 1941 exhibited considerably more combat power and resilience than the panzer divisions in France in 1940. For similar reasons, many Soviet June 1941 mechanised divisions (with fewer tanks) exhibited considerably more combat and staying power than their companion tank divisions did in June and July 1941. In the next section we will examine in some detail a classic example of why the numbers of tanks present should not be the dominating factor when determining any division's overall combat power or its ability to endure periods of prolonged combat.

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Extract from Volume IIA 3.3) a. i.