

## Aerospace &amp; Defence Update

## Aftermarket tracker – Engine thrust improved across all OEMs

Industry Overview

## Engine thrust improved strongly across all OEMs WoW

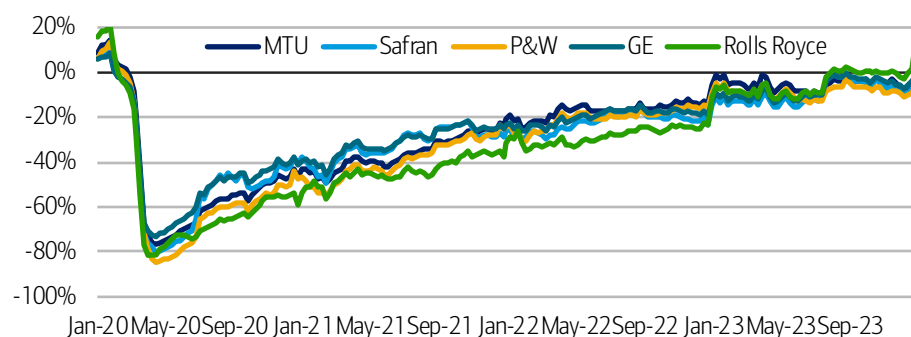
Weekly average engine thrust vs'19 improved across all OEMs over last week. Rolls Royce improved the most, followed by Safran and MTU. Similarly both Narrowbody and Widebody weekly average thrust also improved. We remind investors that some engines such as PW1100, CFM LEAP or Trent 7000 were increasing its engine installed base strongly through 2019, and therefore will be subject to base effect through the first weeks of the year as we compare 2024 performance vs 2019.

Rolls Royce weekly average thrust vs 2019 improved the most by 14.3ppts to +16% this week, vs +2% last week driven by 10,488ppts, 66.2ppts and 15.3ppts improvement in Trent 7000, Trent XWB and Trent 1000 weekly average thrust vs 2019 to 10,664%, 125% and 24% this week, vs 175%, 59% and 9% last week. To a lesser extent, Safran weekly average thrust vs 2019 improved by 5.2ppts to -3% this week, vs -8% last week. This was primarily driven by the CFM LEAP and CFM56 5B & 7B average thrust vs 2019 improving by 156ppts, 4.4ppts and 7.0 ppts to 240%, -10% and -14% this week, vs 84%, -18% and -17% last week. On the same lines, GE weekly average thrust vs 2019 improved by 3.1 ppts to -1% this week, vs -4% last week.

MTU and P&W weekly average thrust vs 2019 also improved by 4.3ppts and 2.9ppts to -1% and -6% this week, vs -5% and -9% last week respectively.

**Exhibit 1: Average weekly engine thrust vs 2019 across engine OEMs**

Engine thrust vs'19 improved strongly across all OEMs in 2023 compared to 2022



Source: BofA Global Research, Flightradar24

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NB & WB weekly average thrust vs 2019 improved by +9.8ppts, & +3.2ppts to 2% and 2% this week, vs -8% and -1% last week respectively. On the flip side, Freightier weekly average thrust vs 2019 declined by 8ppts to -24% this week, vs -16% last week.

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NB = Narrowbody

WB = Widebody

QTD = Quarter to Date

MTD = Month to Date

YTD = Year to Date

YoY = Year on Year

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# Engine Thrust across families

We provide below details around blended thrust performance since 1Q20 vs 2019 baseline across engine OEMs & engine categories.

## Engine OEMs – MTU, Safran, P&W, GE, Rolls Royce

### Exhibit 2: Engine thrust vs 2019 across engine OEMs

All OEMs are now >90% vs FY19

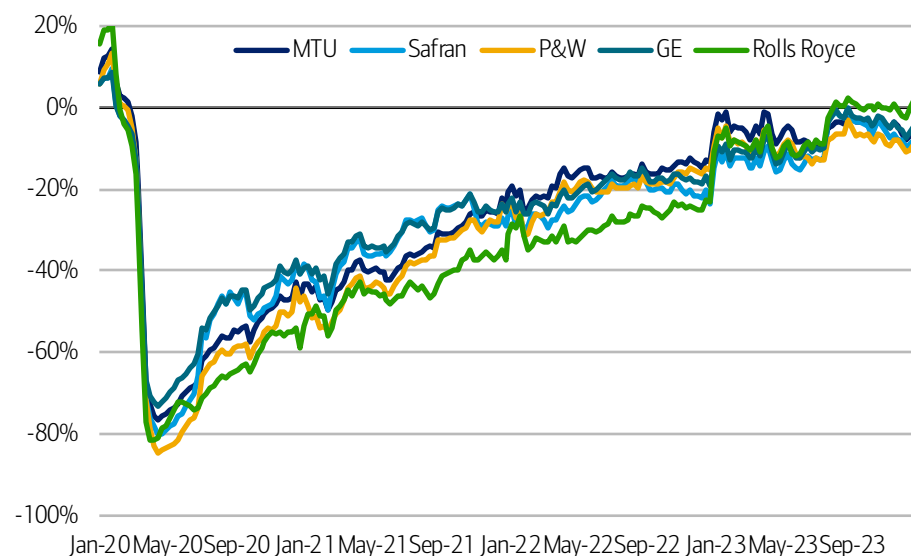
	MTU	Safran	P&W	GE	Rolls Royce
1Q20 vs 2019	-1%	-6%	-4%	-6%	-3%
2Q20 vs 2019	-72%	-76%	-80%	-68%	-76%
3Q20 vs 2019	-57%	-50%	-61%	-49%	-67%
4Q20 vs 2019	-49%	-46%	-53%	-43%	-57%
1Q21 vs 2019	-44%	-41%	-50%	-39%	-50%
2Q21 vs 2019	-40%	-35%	-43%	-33%	-46%
3Q21 vs 2019	-34%	-27%	-36%	-28%	-43%
4Q21 vs 2019	-26%	-26%	-28%	-24%	-37%
1Q22 vs 2019	-21%	-27%	-26%	-24%	-31%
2Q22 vs 2019	-16%	-23%	-19%	-20%	-31%
3Q22 vs 2019	-16%	-19%	-19%	-17%	-26%
4Q22 vs 2019	-14%	-21%	-16%	-18%	-24%
1Q23 vs 2019	-4%	-13%	-8%	-11%	-8%
2Q23 vs 2019	-6%	-13%	-10%	-11%	-9%
3Q23 vs 2019	-5%	-5%	-8%	-4%	-2%
4Q23 vs 2019	-5%	-7%	-8%	-4%	0%
YTD vs 2019	2%	-2%	-4%	1%	19%
QTD vs 2019	2%	-2%	-4%	1%	19%
MTD vs 2019	2%	-2%	-4%	1%	19%
Previous week vs 2019	-5%	-8%	-9%	-4%	2%
Latest week vs 2019	-1%	-3%	-6%	-1%	16%
Latest day vs 2019	2%	-2%	-5%	1%	19%

Source: BofA Global Research, Flightradar24

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### Exhibit 3: Average weekly engine thrust vs 2019 across engine OEMs

Engine thrust across all engine OEMs is now >90% vs 2019



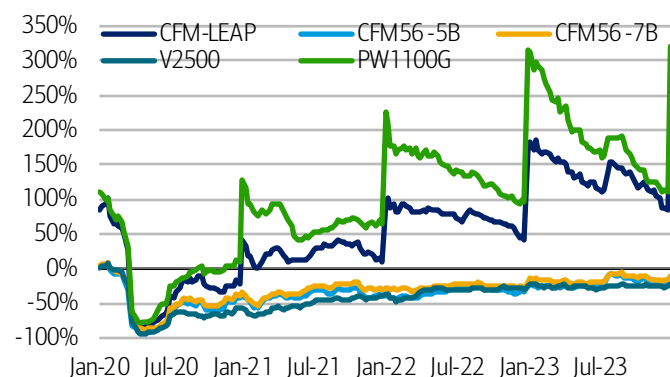
Source: BofA Global Research, Flightradar24

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## Engine Categories – N/body, W/body, Freight dominated

### Exhibit 4: Narrowbody engine thrust vs 2019

PW1100G and LEAP are largely ahead vs FY19

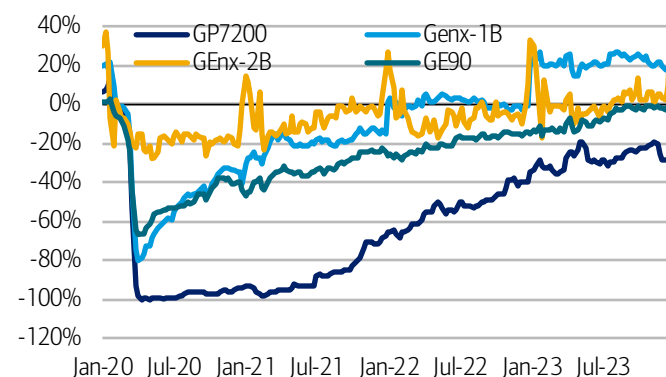


Source: BofA Global Research, Flightradar24

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### Exhibit 5: Widebody engine thrust vs 2019

Genx-1B and GEnX-2B has climbed back to above FY19 levels

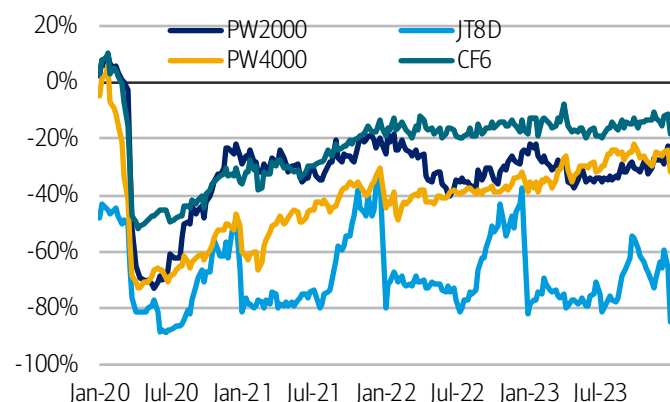


Source: BofA Global Research, Flightradar24

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### Exhibit 6: Freight dominated engine thrust vs 2019

JT8D has sharply declined YTD vs FY19

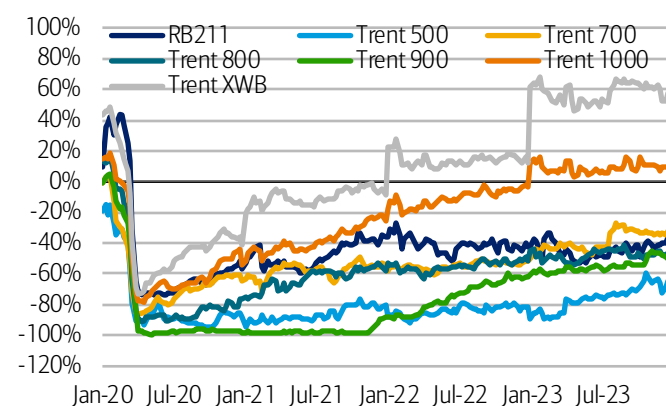


Source: BofA Global Research, Flightradar24

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### Exhibit 7: Rolls Royce engine thrust vs 2019

RR is still lagging peers, with only the Trent XWB and the Trent 1000 above FY19 levels



Source: BofA Global Research, Flightradar24

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### Exhibit 8: Engine thrust vs 2019 across engine categories

Widebody and Freight engines have increased in 4Q23 vs 3Q23

	Narrowbody	Widebody (all)	Widebody (excl. RR)	Freighter
1Q20 vs 2019	-5%	-6%	-7%	-5%
2Q20 vs 2019	-85%	-65%	-60%	-55%
3Q20 vs 2019	-51%	-56%	-51%	-51%
4Q20 vs 2019	-49%	-46%	-41%	-38%
1Q21 vs 2019	-42%	-43%	-39%	-38%
2Q21 vs 2019	-35%	-38%	-35%	-35%
3Q21 vs 2019	-25%	-35%	-32%	-30%
4Q21 vs 2019	-26%	-28%	-24%	-23%
1Q22 vs 2019	-26%	-25%	-23%	-23%
2Q22 vs 2019	-20%	-23%	-20%	-24%
3Q22 vs 2019	-16%	-20%	-18%	-25%
4Q22 vs 2019	-19%	-19%	-16%	-21%
1Q23 vs 2019	-8%	-10%	-11%	-21%
2Q23 vs 2019	-10%	-10%	-10%	-22%
3Q23 vs 2019	-2%	-5%	-6%	-21%
4Q23 vs 2019	-5%	-3%	-4%	-18%
YTD vs 2019	1%	7%	2%	-19%

**Exhibit 8: Engine thrust vs 2019 across engine categories**

Widebody and Freighter engines have increased in 4Q23 vs 3Q23

	Narrowbody	Widebody (all)	Widebody (excl. RR)	Freighter
QTD vs 2019	1%	7%	2%	-19%
MTD vs 2019	1%	7%	2%	-19%
Previous week vs 2019	-8%	-1%	-2%	-16%
Latest week vs 2019	2%	2%	-3%	-24%
Latest day vs 2019	0%	7%	1%	-20%

Source: BofA Global Research, Flightradar24

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**Exhibit 9: Engine thrust vs 2019 across engine families (Narrowbody)**

Narrowbody engines have declined in 4Q23 vs 3Q23

	CFM56 -5B	CFM56 -7B	CFM-LEAP	V2500	PW1100G	JT8D	Narrowbody
1Q20 vs 2019	-11%	-7%	59%	-8%	70%	-49%	-5%
2Q20 vs 2019	-88%	-83%	-77%	-89%	-66%	-83%	-85%
3Q20 vs 2019	-52%	-49%	-23%	-66%	-11%	-82%	-51%
4Q20 vs 2019	-53%	-48%	-26%	-65%	1%	-60%	-49%
1Q21 vs 2019	-46%	-43%	19%	-63%	93%	-78%	-42%
2Q21 vs 2019	-40%	-34%	17%	-55%	62%	-78%	-35%
3Q21 vs 2019	-31%	-25%	34%	-45%	60%	-71%	-25%
4Q21 vs 2019	-36%	-26%	25%	-42%	68%	-45%	-26%
1Q22 vs 2019	-41%	-29%	90%	-41%	182%	-71%	-26%
2Q22 vs 2019	-34%	-26%	84%	-30%	160%	-72%	-20%
3Q22 vs 2019	-27%	-22%	76%	-30%	133%	-73%	-16%
4Q22 vs 2019	-32%	-26%	60%	-28%	107%	-50%	-19%
1Q23 vs 2019	-25%	-17%	169%	-25%	277%	-75%	-8%
2Q23 vs 2019	-24%	-19%	135%	-26%	197%	-77%	-10%
3Q23 vs 2019	-13%	-11%	137%	-26%	179%	-74%	-2%
4Q23 vs 2019	-18%	-14%	110%	-25%	130%	-65%	-5%
YTD vs 2019	-15%	-11%	236%	-24%	321%	-84%	1%
QTD vs 2019	-15%	-11%	236%	-24%	321%	-84%	1%
MTD vs 2019	-15%	-11%	236%	-24%	321%	-84%	1%
Previous week vs 2019	-18%	-17%	84%	-26%	111%	-66%	-8%
Latest week vs 2019	-14%	-10%	240%	-23%	321%	-85%	2%
Latest day vs 2019	-15%	-11%	237%	-25%	316%	-84%	0%

Source: BofA Global Research, Flightradar24

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**Exhibit 10: Engine thrust vs 2019 across engine families (Widebody)**

Most Widebody engines have improved in 4Q23 vs 3Q23

	GP7200	PW2000	PW4000	CF6	GE90	Genx-1B	Genx-2B	RB211	Trent 500	Trent 700	Trent 800	Trent 900	Trent 1000	Trent 7000	Trent XWB	Widebody (all)
1Q20 vs 2019	-6%	1%	-16%	-1%	-10%	1%	0%	23%	-35%	-24%	-7%	-15%	0%	1051%	22%	-6%
2Q20 vs 2019	-100%	-69%	-69%	-48%	-59%	-68%	-21%	-72%	-88%	-81%	-88%	-98%	-71%	-23%	-63%	-65%
3Q20 vs 2019	-98%	-53%	-65%	-45%	-50%	-48%	-17%	-67%	-91%	-71%	-87%	-97%	-66%	-48%	-46%	-56%
4Q20 vs 2019	-96%	-31%	-54%	-35%	-40%	-36%	-18%	-59%	-88%	-63%	-81%	-97%	-52%	-44%	-36%	-46%
1Q21 vs 2019	-96%	-28%	-59%	-32%	-41%	-24%	-7%	-51%	-91%	-62%	-70%	-98%	-46%	527%	-13%	-43%
2Q21 vs 2019	-94%	-30%	-48%	-31%	-35%	-19%	-12%	-56%	-89%	-55%	-65%	-98%	-43%	206%	-12%	-38%
3Q21 vs 2019	-87%	-30%	-42%	-26%	-32%	-19%	-5%	-47%	-86%	-59%	-60%	-98%	-36%	73%	-9%	-35%
4Q21 vs 2019	-74%	-22%	-36%	-18%	-25%	-14%	-2%	-38%	-80%	-54%	-56%	-95%	-26%	24%	-4%	-28%
1Q22 vs 2019	-64%	-22%	-43%	-16%	-26%	-1%	-1%	-36%	-88%	-56%	-56%	-88%	-16%	1443%	16%	-25%
2Q22 vs 2019	-54%	-34%	-40%	-16%	-21%	3%	-10%	-44%	-85%	-57%	-58%	-78%	-13%	626%	12%	-23%
3Q22 vs 2019	-51%	-35%	-38%	-18%	-17%	1%	-6%	-41%	-82%	-53%	-54%	-69%	-7%	216%	14%	-20%
4Q22 vs 2019	-42%	-30%	-36%	-15%	-15%	-1%	-5%	-43%	-82%	-53%	-52%	-63%	-5%	105%	15%	-19%
1Q23 vs 2019	-33%	-26%	-35%	-14%	-13%	22%	6%	-41%	-87%	-44%	-49%	-59%	10%	2620%	59%	-10%
2Q23 vs 2019	-26%	-33%	-30%	-16%	-10%	20%	-4%	-49%	-77%	-43%	-50%	-56%	7%	949%	53%	-10%
3Q23 vs 2019	-27%	-33%	-26%	-16%	-4%	24%	2%	-45%	-73%	-33%	-45%	-55%	9%	376%	61%	-5%
4Q23 vs 2019	-24%	-29%	-26%	-14%	-1%	21%	5%	-42%	-66%	-33%	-47%	-49%	10%	197%	60%	-3%

**Exhibit 10: Engine thrust vs 2019 across engine families (Widebody)**  
Most Widebody engines have improved in 4Q23 vs 3Q23

	GP7200	PW2000	PW4000	CF6	GE90	Genx-1B	GEnx-2B	RB211	Trent 500	Trent 700	Trent 800	Trent 900	Trent 1000	Trent 7000	Trent XWB	Widebody (all)
YTD vs 2019	-21%	-24%	-29%	-13%	1%	48%	57%	-43%	-80%	-30%	-36%	-47%	29%	11716%	135%	7%
QTD vs 2019	-21%	-24%	-29%	-13%	1%	48%	57%	-43%	-80%	-30%	-36%	-48%	29%	11716%	135%	7%
MTD vs 2019	-21%	-24%	-29%	-13%	1%	48%	57%	-43%	-80%	-30%	-36%	-48%	29%	11716%	135%	7%
Previous week vs 2019	-29%	-22%	-24%	-11%	0%	19%	32%	-39%	-64%	-31%	-44%	-49%	9%	175%	59%	-1%
Latest week vs 2019	-25%	-30%	-31%	-19%	-3%	43%	42%	-43%	-80%	-31%	-36%	-49%	24%	10664%	125%	2%
Latest day vs 2019	-22%	-25%	-31%	-14%	1%	48%	56%	-42%	-77%	-30%	-37%	-47%	28%	11575%	137%	7%

Source: BofA Global Research, Flightradar24

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