

Aerospace & Defence Update

Aftermarket tracker – 2023 in review: Engine thrust improved across all OEMs

Industry Overview

Engine thrust improved strongly across all OEMs in 2023

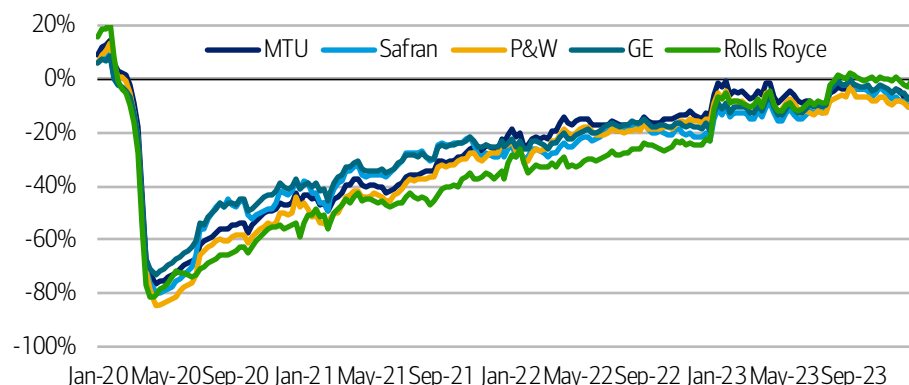
Engine thrust vs 2019 reported strong improvement across all OEMs in 2023 compared with Rolls-Royce reporting the strongest improvement followed by Safran, GE, MTU and P&W resp. Similarly, Narrowbody, Widebody and Freighters average annual thrust vs 2019 also improved in 2023.

Rolls-Royce 2023 average thrust vs 2019 improved the most by +23.3ppts to -4.7% in 2023, vs -28% in 2022 driven by improvement across the whole Rolls Royce portfolio. Safrans average annual thrust vs 2019 improved by +13ppts to -9.2% in 2023, vs -22.2% in 2022 driven by +13.4ppts, +10.3ppts and +58.9ppts improvement in CFM56-5B, CFM56-7B and CFM56-7B and CFM56-7B and CFM56-7B average annual thrust vs 2019 to -19.9%, -15.4% and +134.6% in 2023, vs -33.3%, -25.7% and +75.7% in 2022 resp.

GE average annual thrust vs 2019 improved by +12.2ppts to -7.3% in 2023, vs -19.5% in 2022 driven by +12.6ppts, +21.3ppts and +8ppts improvement in GE90, GEnX-1B and GEnX-2B average annual thrust vs 2019 to -7.2%, +21.9% and +2.2% in 2023, vs -19.7%, +0.7% and -5.8% in 2022 resp. Similarly, MTU average annual thrust vs 2019 improved by +11.7ppts to -5.1% in 2023, vs -16.8% in 2022. P&W average annual thrust vs 2019 also improved by +11.5ppts to -8.6% in 2023, vs -20.2% in 2022 driven by +45.7ppts and +10ppts improvement in PW1100G and PW4000 average annual thrust vs 2019 to +185.5% and -29.3% in 2023, vs +139.7% and -39.4% in 2022 resp.

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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Narrowbody, Widebody and Freighters average annual thrust vs 2019 also improved by +13.7ppts, +14.9ppts and +3ppts to -6.1%, -6.8% and -20.4% in 2023, vs -19.9%, -21.7% and -23.4% in 2022 resp.

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NB = Narrowbody

WB = Widebody

QTD = Quarter to Date

MTD = Month to Date

YTD = Year to Date

YoY = Year on Year

OEM = original equipment
manufacturer

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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

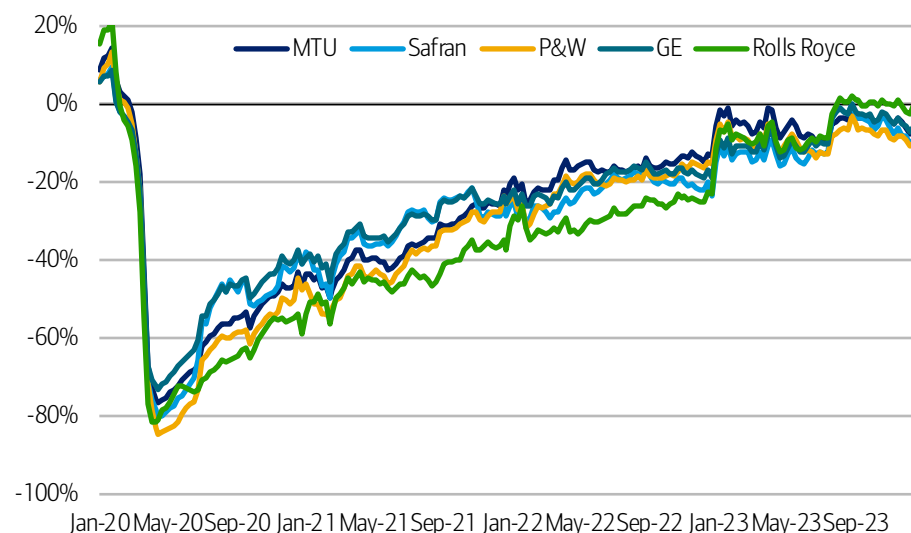
	MTU	Safran	P&W	GE	Rolls Royce
1Q20 vs 2019	-1%	-6%	-4%	-6%	-3%
2Q20 vs 2019	-72%	-76%	-80%	-68%	-76%
3Q20 vs 2019	-57%	-50%	-61%	-49%	-67%
4Q20 vs 2019	-49%	-46%	-53%	-43%	-57%
1Q21 vs 2019	-44%	-41%	-50%	-39%	-50%
2Q21 vs 2019	-40%	-35%	-43%	-33%	-46%
3Q21 vs 2019	-34%	-27%	-36%	-28%	-43%
4Q21 vs 2019	-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	3%	-2%	-4%	2%	18%
QTD vs 2019	3%	-2%	-4%	2%	18%
MTD vs 2019	3%	-2%	-4%	2%	18%
Previous week vs 2019	-7%	-9%	-10%	-6%	0%
Latest week vs 2019	-5%	-8%	-9%	-4%	2%
Latest day vs 2019	3%	-2%	-4%	2%	18%

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



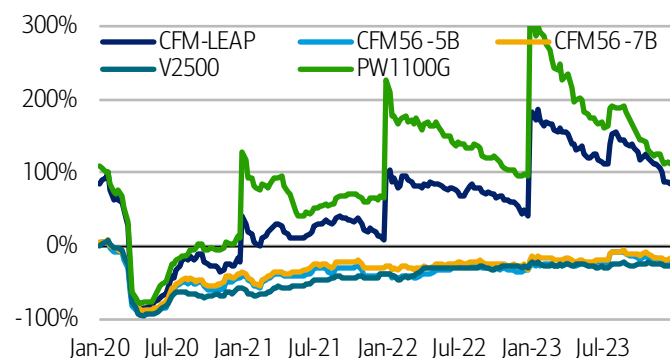
Source: BofA Global Research, Flightradar24

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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

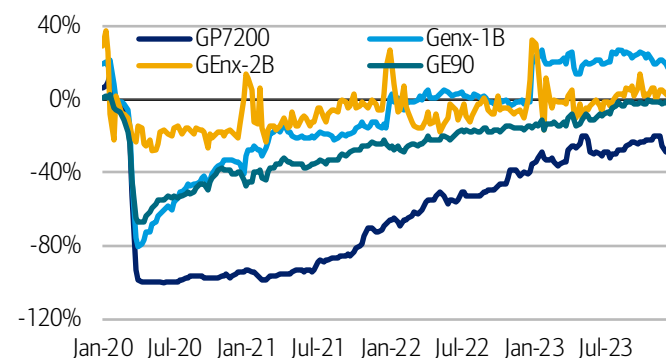


Source: BofA Global Research, Flightradar24

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Exhibit 5: Widebody engine thrust vs 2019

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

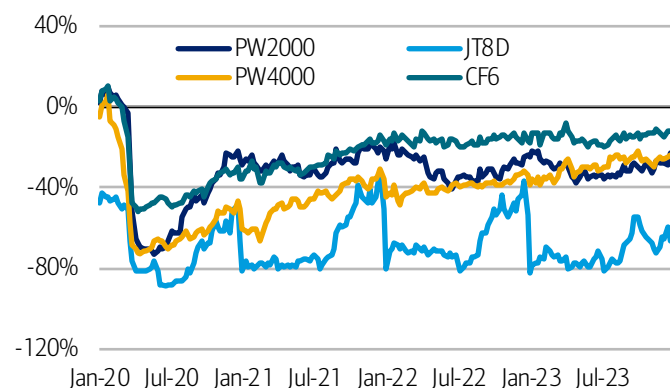


Source: BofA Global Research, Flightradar24

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Exhibit 6: Freight dominated engine thrust vs 2019

JT8D has sharply declined YTD vs FY19

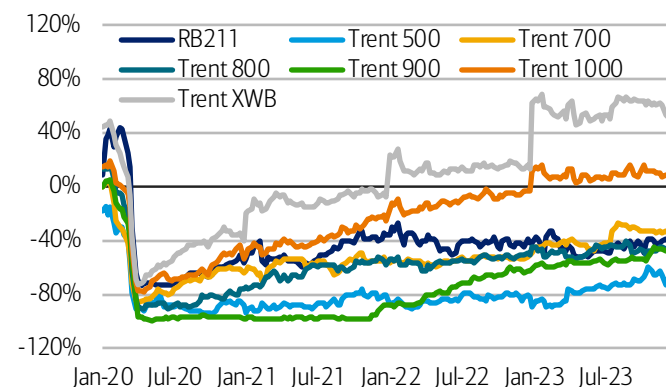


Source: BofA Global Research, Flightradar24

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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%	-18%
QTD vs 2019	1%	7%	2%	-18%
MTD vs 2019	1%	7%	2%	-18%

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
Previous week vs 2019	-9%	-3%	-4%	-17%
Latest week vs 2019	-8%	-1%	-2%	-16%
Latest day vs 2019	1%	7%	2%	-18%

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%	325%	-85%	1%
QTD vs 2019	-15%	-11%	236%	-24%	325%	-85%	1%
MTD vs 2019	-15%	-11%	236%	-24%	325%	-85%	1%
Previous week vs 2019	-20%	-18%	88%	-27%	115%	-59%	-9%
Latest week vs 2019	-18%	-17%	84%	-26%	111%	-66%	-8%
Latest day vs 2019	-15%	-11%	236%	-24%	325%	-85%	1%

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	GE9x-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%

YTD vs 2019	-21%	-22%	-29%	-12%	2%	48%	63%	-43%	-81%	-30%	-36%	-48%	29%	11604%	132%	7%
QTD vs 2019	-21%	-22%	-29%	-12%	2%	48%	63%	-43%	-81%	-30%	-36%	-48%	29%	11604%	132%	7%

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)
MTD vs 2019	-21%	-22%	-29%	-12%	2%	48%	63%	-43%	-81%	-30%	-36%	-48%	29%	11604%	132%	7%
Previous week vs 2019	-29%	-29%	-25%	-12%	-1%	18%	10%	-36%	-64%	-32%	-47%	-50%	10%	168%	57%	-3%
Latest week vs 2019	-29%	-22%	-24%	-11%	0%	19%	32%	-39%	-64%	-31%	-44%	-49%	9%	175%	59%	-1%
Latest day vs 2019	-21%	-22%	-29%	-12%	2%	48%	63%	-43%	-81%	-30%	-36%	-48%	29%	11604%	132%	7%

Source: BofA Global Research, Flightradar24

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