Variability Chart for Data

Group Means
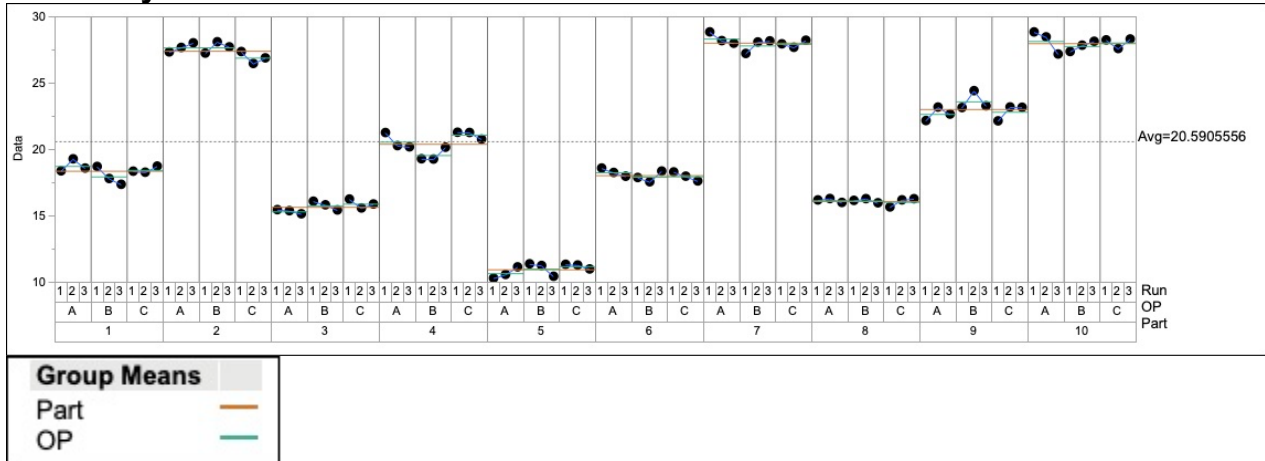Part ——
OP ——

It is obvious that Parts are the most significant component in the study.   The following tables are treating each component as nested (which is incorrect)

Variance Components (nested)

Component	Var Component	% of Total		Sqrt(Var Comp)
Part	34.531502	99.2		5.8764
OP[Part]	0.088049	0.3		0.2967
Run[Part,OP]	0.198016	0.6		0.4450
Total	34.817568	100.0		5.9006

Gauge R&R

The following tables labeling looks incorrect to me.   Parts is not part of reproducibitiy? And Part variance is not the Variance of Run.

Measurement Source	Variation (6*StdDev)	which is 6*sqrt of
Repeatability	0.000000	V(Within)
Reproducibility	35.303029	V(Part) + V(OP[Part])
Part	35.258107	V(Part)
OP[Part]	1.780385	V(OP[Part])
Gauge R&R	35.303029	V(Within) + V(Part) + V(OP[Part])
Part Variation	2.669940	V(Run)
Total Variation	35.403848	V(Within) + V(Part) + V(OP[Part]) + V(Run)

Variance Components for Gauge R&R

Component	Var Component	% of Total	
Gauge R&R	34.619552	99.43	
Repeatability	0.000000	0.00	
Reproducibility	34.619552	99.43	
Part-to-Part	0.198016	0.57	

Variability Gauge (crossed then nested)
Switching to Bayesian estimates because of negative REML variance component(s).
Bayesian Variance Component Estimates
This looks reasonable

Random Effect	Var Component	Pct of Total
Part	28.26223	99.055
OP	0.0075836	0.027
Part*OP	0.0706611	0.248
Run[Part,OP]	0.1913359	0.671
Total	28.531811	100.000

Residual is Run[Part,OP]

Variance Components

Component	Var Component	% of Total		Sqrt(Var Comp)
Part	28.262230	99.1	▭	5.3162
OP	0.007584	0.0		0.0871
Part*OP	0.070661	0.2		0.2658
Run[Part,OP]	0.191336	0.7		0.4374
Total	28.531811	100.0	▭	5.3415

Again the following analysis looks incorrect?
Gauge R&R (crossed then nested)

Measurement Source	Variation (6*StdDev)	which is 6*sqrt of
Repeatability	0.000000	V(Within)
Reproducibility	31.941464	V(Total)-V(Run)-V(Within)
Part	31.897340	V(Part)
OP	0.522504	V(OP)
Part*OP	1.594929	V(Part*OP)
Gauge R&R	31.941464	V(Total)-V(Run)
Part Variation	2.624518	V(Run)
Total Variation	32.049106	V(Total)

Variance Components for Gauge R&R

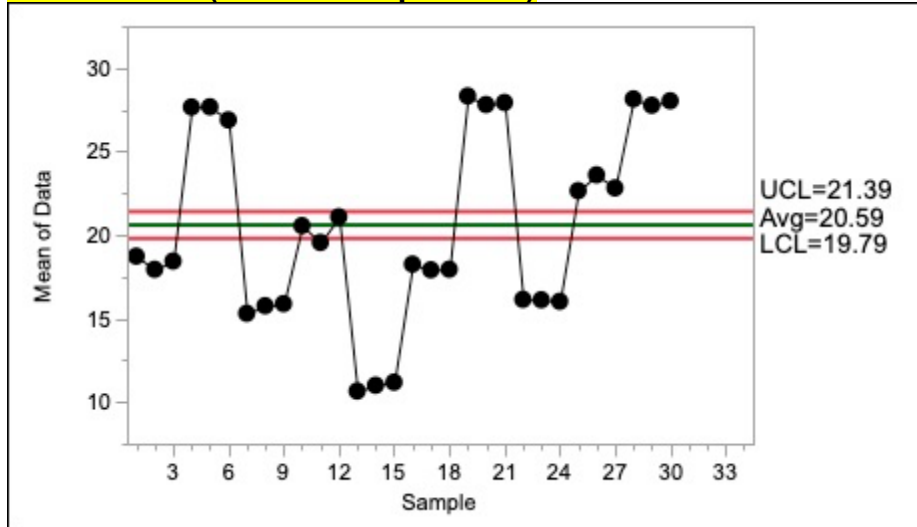| Component	Var Component	% of Total	
Gauge R&R	28.340475	99.33	▭
Repeatability	0.000000	0.00	
Reproducibility	28.340475	99.33	▭
Part-to-Part	0.191336	0.67	

•This analysis is for crossed then nested
Again, the above tables appear incorrect in the labeling (could be my mistake?)

Variables Control Chart
These charts appear correct.

XBar of Data (Parts and Operators)

Note: The sigma was calculated using the range.
R of Data (Repeats)