Effects of Heavy, Forward & Aft CG on Performance

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| **Condition** | **Heavy** | **Forward CG** | **Aft CG** |
| T/O speed | Higher |  |  |
| Takeoff distance | Longer |  |  |
| Rate of climb | Lower | Lower | Higher |
| Max altitude | Lower | Lower | Higher |
| Cruising speed | Slower | Slower | Faster |
| Range | Less | Less | More |
| Maneuverability | Less |  |  |
| Stall speed | Higher | Higher | Lower |
| Landing speed | Higher |  |  |
| Landing roll | Longer |  |  |

Effects of Forward & Aft CG on Stability & Controllability

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| **Condition** | **Forward CG** | **Aft CG** |
| Pitch Stability | More Stable | Less Stable |
| Pitch Controllability | Increased | Decreased |
| Stall/Spin Recovery | Easier | More Difficult |
| Flare | More Difficult | Easier |