



Sunny Swift

"Slow flight awareness 2/3. Mass and balance"

IN EPISODE 25, JAKUB WAS KEEN TO PRACTISE SPINS. HE AND SUNNY ARE PREPARING A TRAINING FLIGHT FOR HIS AEROBATIC RATING. THEY WILL FLY A CAP10, WHICH IS APPROVED FOR SPINS.

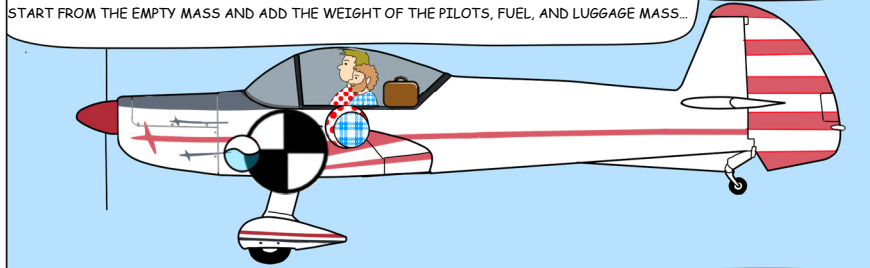
THE PURPOSE OF THE FLIGHT WILL BE TO EXPLORE INTENDED SPINS. FOR SPIN RECOVERY, IT'S CRITICAL TO ENSURE THAT THE PLANE IS WITHIN THE MASS AND BALANCE ENVELOPE IT WAS DESIGNED FOR.

LET'S DO THE M&B CALCS ACCORDING TO SECTION 6 OF THE AFM.

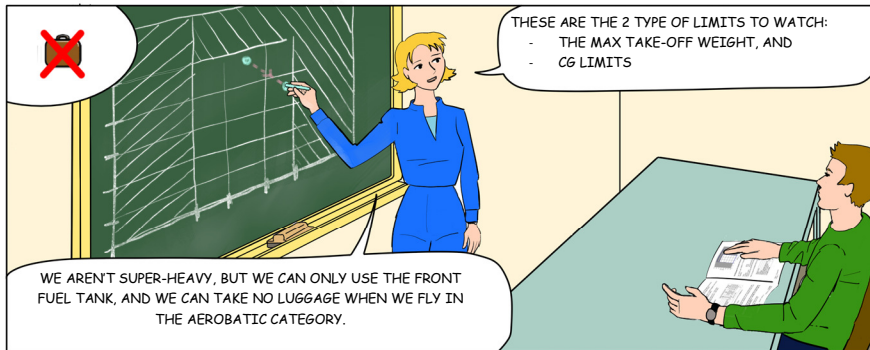


FIND THE EMPTY MASS OF YOUR PARTICULAR AIRCRAFT. THEY ARE ALL DIFFERENT. ENSURE THE DATA IS UP TO DATE BY LOOKING FOR THE MOST RECENT WEIGHT REPORT.

START FROM THE EMPTY MASS AND ADD THE WEIGHT OF THE PILOTS, FUEL, AND LUGGAGE MASS...



PERFORM THE CALCULATION FOR THE BEGINNING AND THE END OF THE FLIGHT. BE AWARE THAT WE ARE USING THE FRONT FUEL TANK, WHICH IS LOCATED FORWARD OF THE CG. CONSUMING THE FUEL WILL GRADUALLY MOVE THE CG BACKWARDS.



THESE ARE THE 2 TYPE OF LIMITS TO WATCH:
- THE MAX TAKE-OFF WEIGHT, AND
- CG LIMITS

WE AREN'T SUPER-HEAVY, BUT WE CAN ONLY USE THE FRONT FUEL TANK, AND WE CAN TAKE NO LUGGAGE WHEN WE FLY IN THE AEROBATIC CATEGORY.

THE AIRCRAFT HAS BEEN CERTIFIED TO RECOVER FROM A 6-TURN SPIN IN LESS THAN ONE AND A HALF TURNS. THIS IS ONLY IF THE MASS AND CG ARE WITHIN THE EXISTING ENVELOPE.

IMPROPER LOADING DECREASES THE EFFICIENCY AND PERFORMANCE OF THE AIRCRAFT. ABNORMAL STRESSES OR CHANGED FLYING CHARACTERISTICS MAY HAVE CATASTROPHIC RESULTS.

FOR SPINS, A CG AFT OF THE CERTIFIED LIMITS MEANS LESS RUDDER AND ELEVATOR AUTHORITY, LOWER STABILITIES, AND POSSIBLY A FLAT, UNRECOVERABLE SPIN.



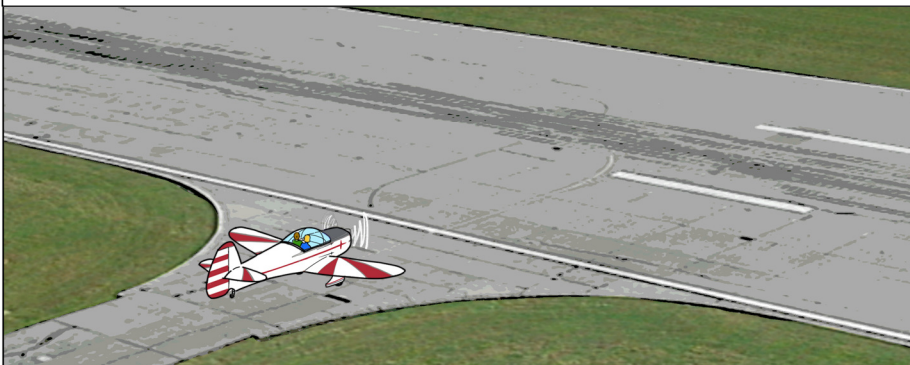
FLYING OUTSIDE THE APPROVED ENVELOPE IS EXTREMELY DANGEROUS!

MASS AND CG CAN BE CALCULATED WITH MANY APPLICATIONS.

HOWEVER THE DATA SHOULD COME FROM THE SPECIFIC AIRCRAFT AFM AND SHOULD HAVE BEEN PROPERLY VALIDATED.



THE FLIGHT PREPARATION HAS BEEN COMPLETED, INCLUDING THE MASS AND BALANCE CHECK. JAKUB AND SUNNY ARE NOW READY FOR TAKE-OFF.



WE WILL FOLLOW THEIR FLIGHT IN THE NEXT EPISODE "SPIN RECOVERY"

You can find links to

- **Mass and Balance references** in the "related content" section

Please send your comments and ideas to generalaviation@easa.europa.eu

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