Gyroplane questions – from Rotorcraft SPORT PILOT bank

(These gyroplane questions were added to the gyroplane specific Sport Pilot Written test. The sport Pilot tests are now specific for aircraft type – i.e.: gyroplane)

FAA Question Number: **2350**
FAA Knowledge Code: **H777**
(Refer to Figure 36.)

GIVEN:	**Weight**	**Moment**
Gyroplane basic weight	1,315	150.1 (oil included)
Pilot weight	140	?
Passenger weight	150	?
27 gal fuel	162	?

The CG is located

- **A.** Outside the CG envelope; the maximum gross weight is exceeded.
- **B.** Outside the CG envelope; the maximum gross weight and the gross-weight moment are exceeded.
- **X** **C.** Within the CG envelope; neither maximum gross weight nor gross-weight moment is exceeded.

Total the weights and moments to determine if the CG is within limits.

Item	Weight	Moment
Gyroplane	1,315	150.1
Pilot	140	7.2
Passenger	150	12.6
27 gallons gas	+ 162	+ 17.8
Total	1,767	187.7

These figures fall within permitted weight and CG. — FAA-H-8083-1, Chapter 7

FAA Question Number**: 2351**
FAA Knowledge Code: **H777**
(Refer to Figure 36.)

GIVEN:	**Weight**	**Moment**
Gyroplane basic weight	1,315	154.0 (oil included)
Pilot weight	145	?
Passenger weight	153	?
27 gal fuel	162	?

The CG is located

A. Outside the CG envelope; the maximum gross weight is exceeded.
X **B.** Outside the CG envelope; the maximum gross weight and the gross-weight moment are exceeded.
C. Within the CG envelope; neither maximum gross weight nor gross-weight moment is exceeded.

Total the weights and moments to determine if the CG is within limits.

Item	**Weight**	**Moment**
Gyroplane	1,315	154.0
Pilot	145	7.4
Passenger	153	12.8
27 gallons gas	+ 162	+ 17.6
Total	1,775	191.8

These figures fall within permitted weight but outside CG. — FAA-H-8083-1, Chapter 7

FAA Question Number: **2349**
FAA Knowledge Code: **H780**
What precaution should be taken while taxiing a gyroplane?

A. The cyclic stick should be held in the neutral position at all times
X **B.** Avoid abrupt control movements when blades are turning.
C. The cyclic stick should be held slightly aft of neutral at all times.

Answer: Avoid abrupt control motions while taxiing. — FAA-H-8083-21, Chapter 20

Comment: Confusing and likely mis-informed answers! Gyroplanes rotors should be stopped when taxiing. Taxiing with the rotors spinning can lead to severe bumping - but true if taxiing with the rotors turning slowly, any movement of the cyclic will be a handful for the pilot to handle as the rotor flaps against its flapping limits. The more correct answer, IMHO, could be A. Even if the rotor is turning, a neutral position would reduce the possibility of the rotor flapping to hit the prop or something else, and the minimal blade AOA that a neutral cyclic presents reduces the effects of gusty winds while taxiing. Answer A is the only answer similar to choices in Commercial (5.7.3.8) and Instructor (7.0.9.2) similar test questions. **For this reason, I think A is the answer the FAA expects!** The more correct answer would be to taxi with the rotor stopped,

aligned fore/aft, and with the stick near full forward in the laterally neutral position. This results in a mostly level rotor, well clear of the prop and other aircraft components, presenting minimal blade AOA to gusty winds, and avoiding inadvertently hitting things with the rotor while taxiing. Some people suggest to have the rotor spinning significantly to avoid severe flapping on rough ground.
– Greg Gremminger

FAA Question Number: **2328**
FAA Knowledge Code: **H781**
Select the true statement concerning gyroplane taxi procedures.

X **A.** Taxi speed should be limited to no faster than a brisk walk in ideal conditions.
B. The cyclic stick should be held in the neutral position at all times.
C. The cyclic stick should be held slightly aft of neutral at all times.

Answer: A gyroplane should not be taxied in close proximity to people or obstructions while the rotor is turning. In addition, taxi speed should be limited to no faster than a brisk walk in ideal conditions, and adjusted appropriately according to the circumstances. — FAA-H-8083-21, Chapter 20

FAA Question Number: **2331**
FAA Knowledge Code: **H766**
Select the true statement concerning gyroplane taxi procedures.

X **A**. Avoid abrupt control movements when blades are turning.
B. The cyclic stick should be held in the neutral position at all times.
C. The cyclic stick should be held slightly aft of neutral at all times.

Answer: A gyroplane should not be taxied in close proximity to people or obstructions while the rotor is turning. In addition, taxi speed should be limited to no faster than a brisk walk in ideal conditions, and adjusted appropriately according to the circumstances. Avoid abrupt control motions while taxiing.— FAA-H-8083-21, Chapter 20

FAA Question Number: **2329**
FAA Knowledge Code: **H796**
If ground resonance is experienced during rotor spin-up, what action should you take?

A. Taxi to a smooth area.
B. Make a normal takeoff immediately.
X **C.** Close the throttle and slowly raise the spin-up lever.

Answer: A corrective action for ground resonance is an immediate takeoff if RPM is in proper range (for helicopters) or an immediate closing of the throttle and placing the blades in low pitch if the RPM is low. “During spin-up” implies low RPM, so closing the throttle is appropriate.— FAA-H-8083-21, Chapter 21

Comment: This question is inappropriate for the Sport Pilot test. Sport Pilots are limited to flying semi-rigid 2-blade rotors. Ground resonance only occurs with 3 or more rotor blades. This is actually a helicopter question, but watch for it on the test!!???
– Greg Gremminger

FAA Question Number: **2330**
FAA Knowledge Code: **H796**
If the pilot experiences ground resonance, and the rotor RPM is not sufficient for flight,

- **A.** Open the throttle full and liftoff.
- **X** **B.** Apply the rotor brake and stop the rotor as soon as possible.
- **C.** Attempt to takeoff at that power setting.

Answer: Ground resonance is an aerodynamic phenomenon associated with fully-articulated rotor systems. It develops when the rotor blades move out of phase with each other and cause the rotor disc to become unbalanced. This condition can cause a helicopter to self-destruct in a matter of seconds. However, for this condition to occur, the helicopter must be in contact with the ground. If you experience ground resonance, and the rotor RPM is not yet sufficient for flight, apply the rotor brake to maximum and stop the rotor as soon as possible. If ground resonance occurs during takeoff, when RPM is sufficient for flight, lift off immediately.— FAA-H-8083-21, Chapter 21

Comment: This question is inappropriate for the Sport Pilot test. Sport Pilots are limited to flying semi-rigid 2-blade rotors. Fully-articulated rotor systems are not allowed for Sport Pilots! Ground resonance only occurs with 3 or more rotor blades.
– Greg Gremminger

FAA Question Number: **2332**
FAA Knowledge Code: **H766**
During the transition from pre-rotation to flight, all rotor blades change pitch

- **A.** Simultaneously to the same angle of incidence.
- **X** **B.** Simultaneously but to different angles of incidence.
- **C.** To the same degree at the same point in the cycle of rotation.

Answer: Compensation for dissymmetry of lift requires constant change in the blade angle of incidence, with one increasing as another simultaneously decreases. During the transition from prerotation to flight (or any time there is dissymmetry of lift) all rotor blades change pitch simultaneously, but to different angles of incidence. — FAA-H-8083-21, Chapter 20