

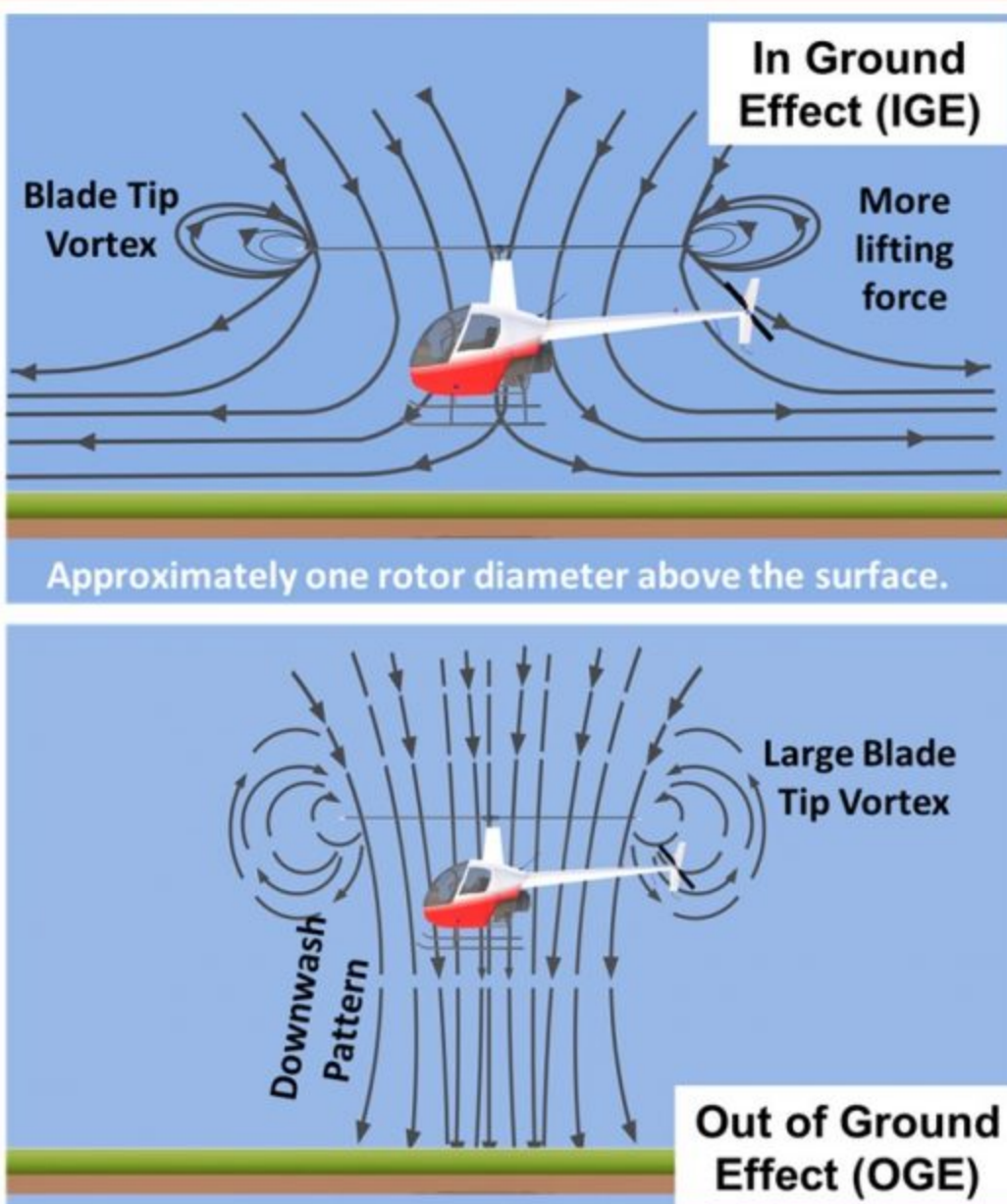
Helicopter Gauges & Controls



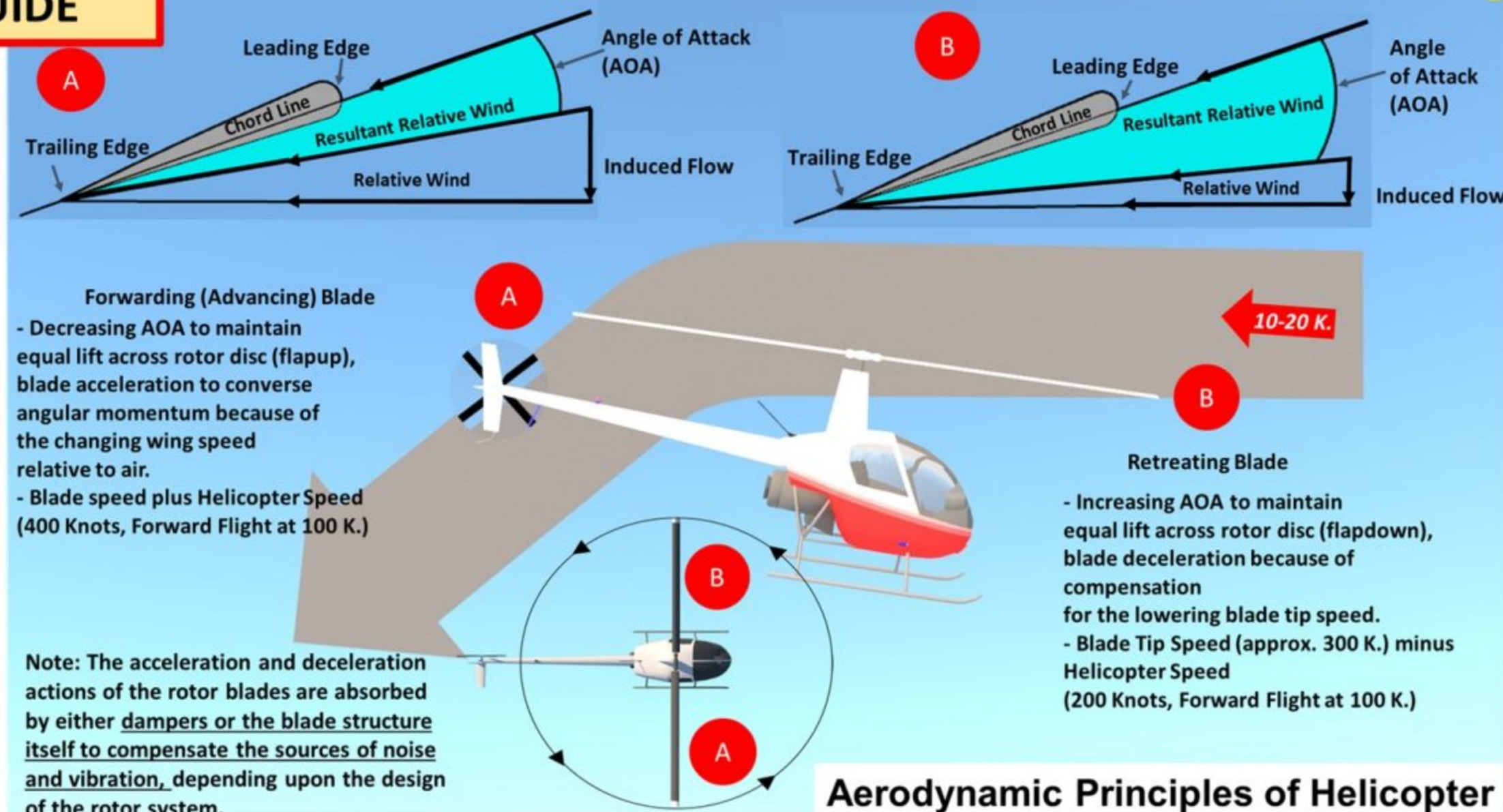
- (1)- Vertical Speed Indicator-VSI,
- (2)- Attitude Indicator (AI), Artificial Horizon
- (3)- Warning & Caution Advisory Panel Lights,
- (4)- Airspeed Indicator, (5)- Engine and Rotor Tachometer,
- (6) Manifold Pressure, (7)- Heading Indicator,
- (8) Altimeter, (9) Carburetor Air Temperature,
- (10) LH- Ammeter, RH- Engine Oil Pressure, (11)- LH- Auxiliary Fuel Tank Quantity, RH- Oil Temperature, (12)- LH- Main Fuel Tank Quantity, RH-Cylinder Head Temperature, (13) - Clock, (14) Panel Lights, -Navigation Lights , Strobe Light (15)- Clutch Switch,
- (16) -Alternator Switch (17)- Master Battery, (18)- Ignition Switch (L&R Magnetos) (19)- Cabin Air Vent,(20)- Radio Control Panel,
- (21)- GPS for Navigation & WAAS, (22)- Mixture Control (Fuel Shutoff), (23)- LH- Cyclic Friction, RH- Cyclic Trim Control,
- (24)- VOR Indicator (Glide Slope & Localizer)

Note: - Warning & Caution Advisory Panel Lights (3): Clutch, MR Temp, MR Chip, Carbon Monoxide, Starter ON, TR Chip, LOW Fuel, LOW RPM.
- The auxiliary (11) tank is interconnected with main tank (12) and is located somewhat higher so it will become empty first while fuel still remains in the main tank. The fuel shutoff valve (22) controls flow both tanks to the engine.

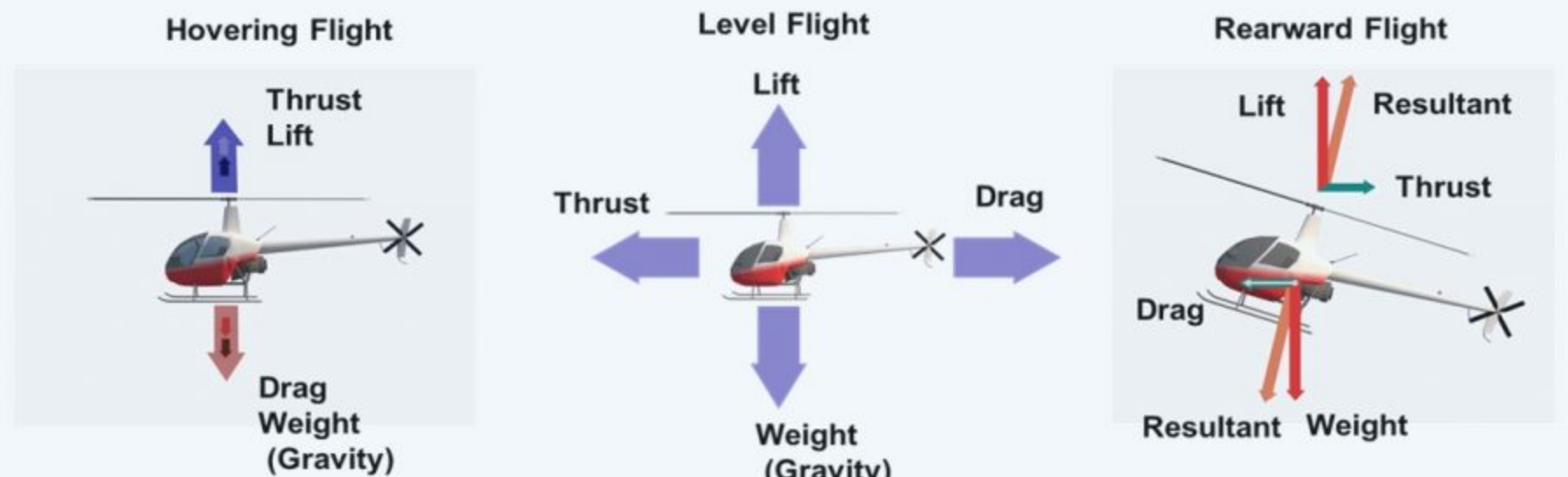
HELICOPTER PILOT TRAINING STUDY GUIDE



Refer to the POH to calculate IGE/OGE hover ceilings under various conditions of gross weight, altitude, temperature, and power.



Aerodynamic Principles of Helicopter



Aerodynamic Forces in Rotorsystem

Limitations & Recommended Airspeeds (KIAS) (*)		Take-off, Climb & Landing Approach	
MTOW – Alpha, Beta & Beta II	622 Kg	Max. Rate of Climb - Vy	53
	1370 Lb	Max. Range (Power ON)	83
Max. Per Seat (Including Baggage Area)	109 Kg	Autorotation (Establish approximately)	65
	240 Lb	Max. Range In Autorotation (Establish approximately)	75
Max. Baggage Compartment	23 Kg/50 Lb	Rotor RPM Approximately	90 %
Min. Solo Pilot Weight ... with std.fuel	59 kg/130 Lb	Never-Exceed Airspeed Vne (Up to 3000 feet density altitude)	102
.... with aux.fuel	61 kg/ 135 Lb		

Effects of Being Beyond CG Limits

- ### Aft Center of Gravity Limit
- CG Too Far AFT
 - ✓ Nose High
 - ✓ possible to strike tail on landing
 - ✓ Gust may cause loss of control or flap blades back & boom strike
 - ✓ Solo Flight & Full Fuel

Fore Center of Gravity Limit

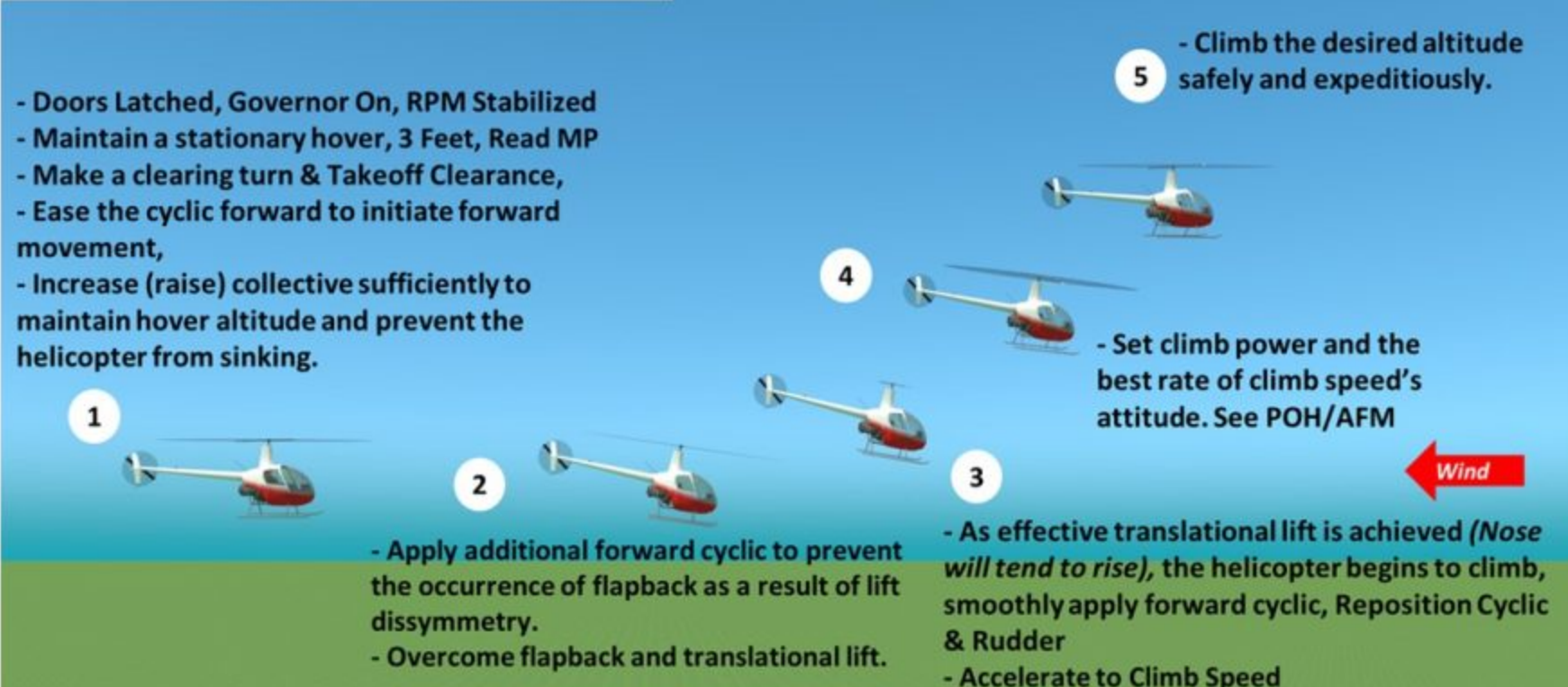
- CG Too Far Forward
- ✓ Nose Down
- ✓ May not be able to flare in autorotation
- ✓ May not be able to pull back for deceleration
- ✓ It may be worse as fuel burned

Lateral Center of Gravity Limit

- CG Too Far L&R
- ✓ May cause loss of control
- ✓ May cause dynamic rollover
- ✓ It may be worse as fuel burned

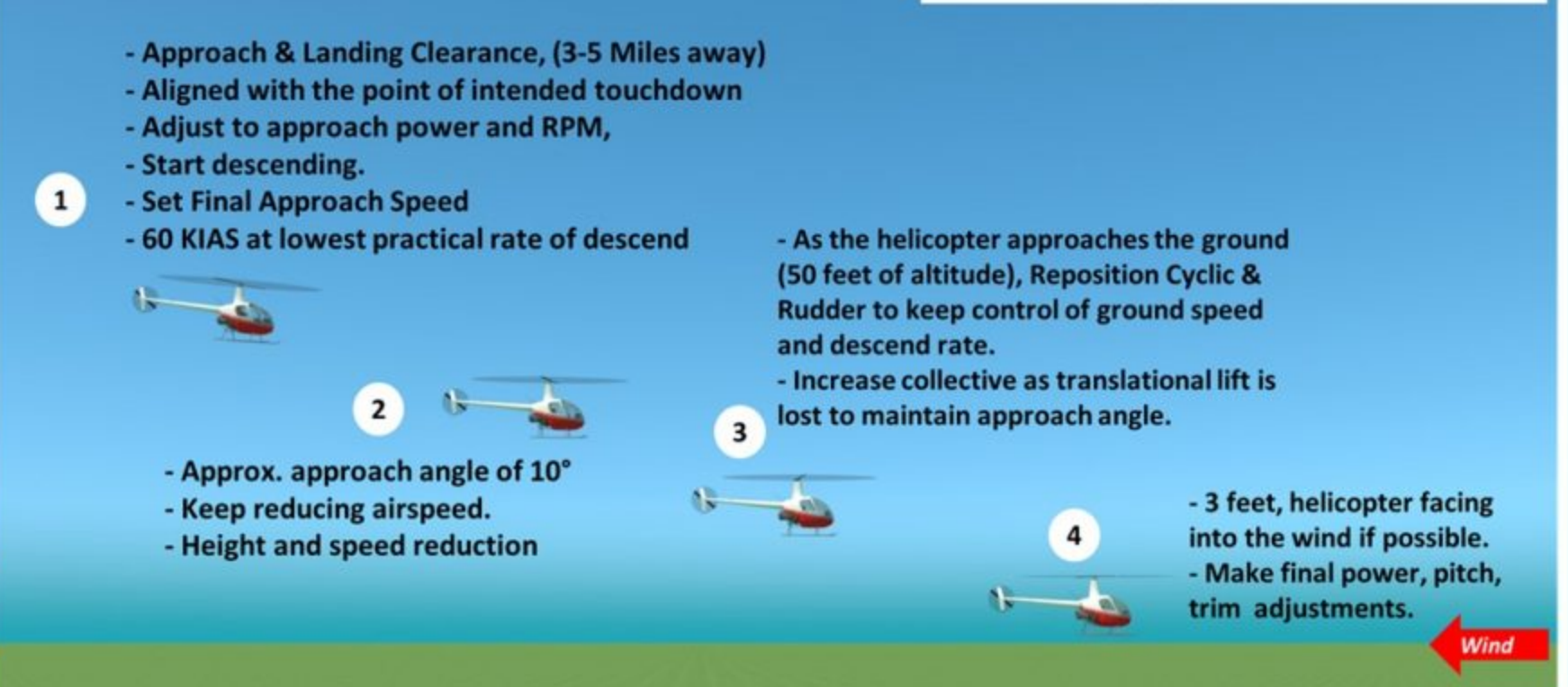
Governor/Correlator is a sensing device that senses rotor and engine rpm and makes the necessary adjustments in order to keep rotor rpm constant. The helicopter incorporates a throttle correlator which automatically rolls some throttle ON and OFF as the collective is raised and lowered.
Note: Governor is inactive below 80 % Engine RPM.
YAW String (Slip string) is a simple device for indicating a slip or skid in a helicopter in flight. It performs the same function as the **slip-skid indicator ball**. Technically, it measures sideslip angle due to insufficient pedal in the direction of the turn.

Normal Takeoff From A Hover



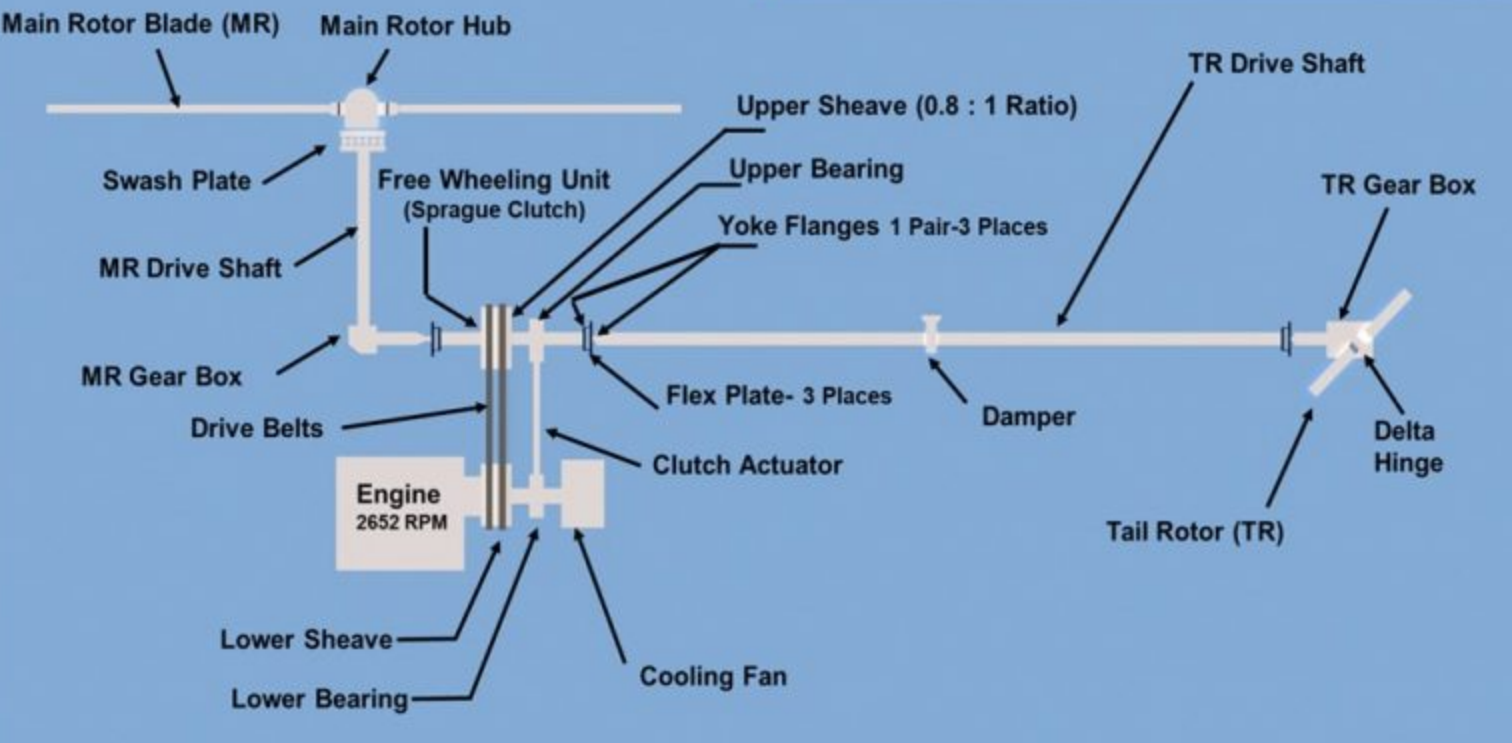
Note: If the takeoff is made during crosswind conditions, the helicopter is flown in a slip during the early stages of the maneuver. The cyclic is held into the wind a sufficient amount to maintain the desired ground track for the takeoff.

Normal Approach To A Hover



Note: Initially at 60 KTS and 300 feet AGL, Be sure rate of descent is less than 300 FPM before airspeed is reduced 30 KIAS. Prior to landing, Refer to Landing Checklist & the area must be checked to ensure if it is free of obstacles and the landing surface is suitable.

Helicopter Components – Drive System



Note: Refer to Pilot Operating Handbook (POH) to find out the operating conditions of the systems & engine operating parameters and specific instructions that pilots comply to operate the helicopter safely.

Private, Commercial Practical Test Standards for Rotorcraft	
Subject Title	Task / Objective
Preflight Preparation	Certificates and Documents, Airworthiness Requirements, Weather Information, Cross-Country Flight Planning, National Airspace System (NAS), Performance and Limitations, Operation of Systems, Aeromedical Factors, Physiological Aspects of Night Flying, Lighting and Equipment for Night Flying.
Preflight Procedures	Preflight Inspection, Cockpit Management, Engine Starting and Rotor Engagement, Runway Incursion Avoidance, Before Takeoff Check.
Airport and Heliport Operations	Radio Communications and ATC Light Signals, Traffic Patterns, Airport/Heliport, Runway, Helipad, and Taxiway, Signs, Markings, and Lighting.
Hovering Maneuvers	Vertical Takeoff and Landing, Slope operations, Surface Taxi, Hover Taxi, Air Taxi.
Takeoffs, Landings, and Go-Arounds	Normal and Crosswind Takeoff and Climb, Normal and Crosswind Approach, Maximum Performance Takeoff and Climb, Steep Approach, Rolling Takeoff, Shallow Approach and Running/Roll-On Landing, Go-Around.
Performance Maneuvers	Rapid Deceleration, Straight in Autorotation, 180° Autorotation, Approach and Landing with Simulated Powerplant Failure – Multiengine Helicopter.
Navigation	Pilotage and Dead Reckoning, Radio Navigation and Radar Services, Diversion, Lost Procedures.
Basic Instrument Maneuvers	Straight-and-Level Flight, Constant Airspeed Climbs, Constant Airspeed Descents, Turns to Headings, Radio Communications, Navigation Systems/Facilities, and Radar Services.
Emergency Operations	Power Failure at a Hover, Power Failure at Altitude, Systems and Equipment Malfunctions, Settling-With-Power, Low Rotor RPM Recovery, Dynamic Rollover, Ground Resonance, Low G Conditions, Emergency Equipment and Survival Gear.
Night Operations	Night Preparation (Physiological aspects, Airport-Runway – Taxiway Lighting systems), Night orientation.
Special Operations	Slope Operations, High/Low Reconnaissance, Confined Area Operation, Pinnacle/Platform Operations.
Postflight Procedures	After Landing, Parking and Securing. (shutdown, securing, and postflight inspection, Documenting in-flight/postflight discrepancies).