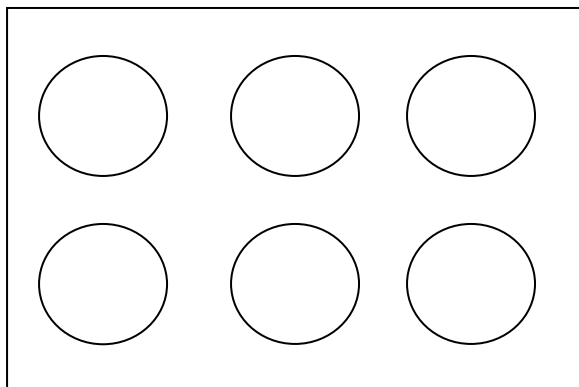
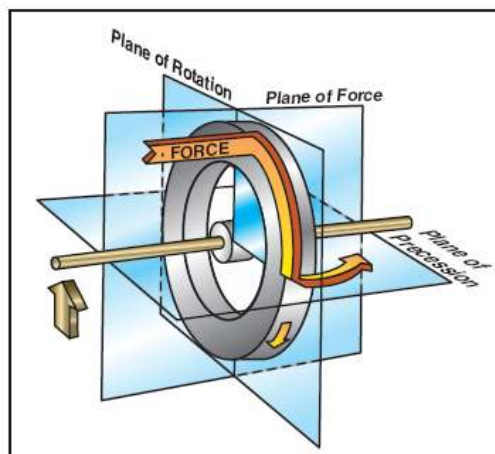


Flight Instruments

Can you label the flight instruments?

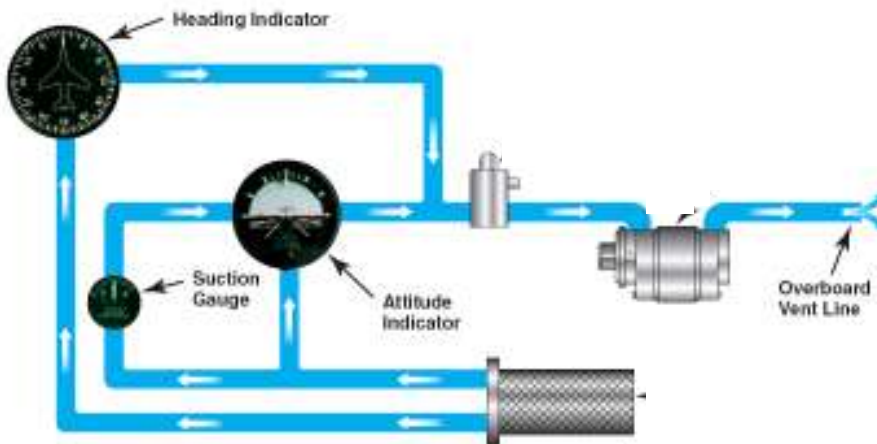


The gyroscopic principles are _____ and _____.

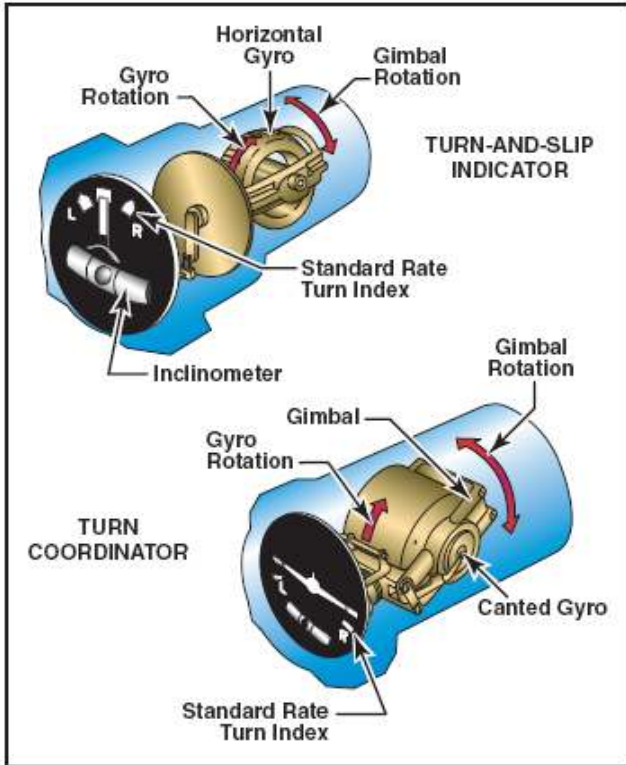


Label the filter, pressure relief valve, and vacuum pump
 →

Draw one arrow where the air enters and another where the air exits.



Turn Coordinator and Turn-and-Slip Indicator



The gyros in both the turn coordinator and turn-and-slip indicator are mounted so that they rotate in the _____ plane. The gimbal in the turn coordinator is set at an angle, or _____, which means precession allows the gyro to sense both rate of _____ and rate of _____. The gimbal in the turn-and-slip indicator is horizontal. In this case, precession allows the gyro to sense only rate of _____. When the miniature airplane or needle is aligned with the turn index, you are in a standard-rate turn. Since a coordinated turn requires you to bank the airplane, the turn coordinator provides an indirect indication of _____.

Slipping or Skidding?



The airplane on the left is _____.

The airplane on the right is _____.



Standard Rate Turns

A standard rate turn is _____ degrees per second.

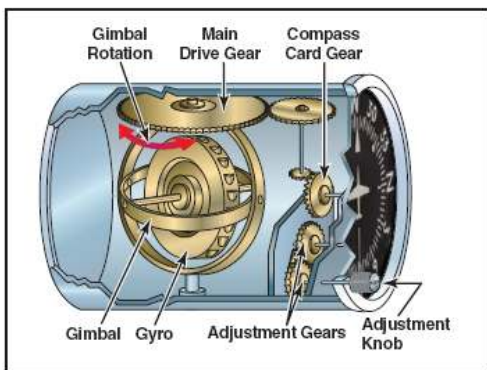
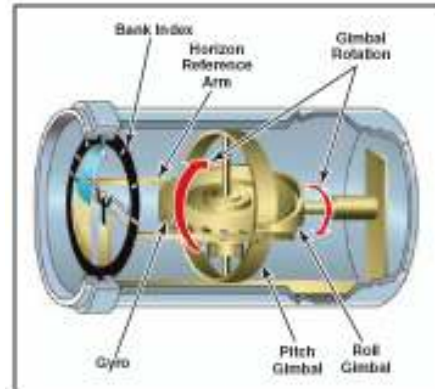
Turning 180° in a standard rate turn takes _____ seconds.

Turning 90° in a half-standard rate turn takes _____ seconds.

Turning a full 360° in a standard rate turn would take _____.

Attitude Indicator

The gyro in the attitude indicator spins in the _____ plane. Two mountings, or gimbals, are used so that both _____ and _____ can be sensed simultaneously. Due to rigidity in space, the gyro remains in a fixed position relative to the horizon as the case and the airplane rotate around it.



Heading Indicator

The gyro in the heading indicator spins in the _____ plane. Rigidity in space enables it to maintain this alignment. A single gimbal permits the gyro to sense changes in direction.

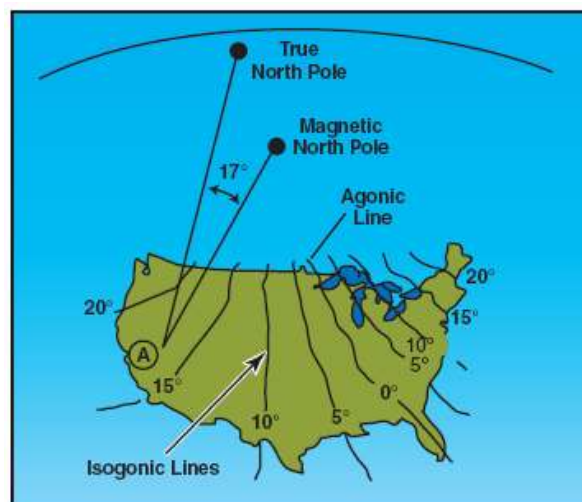
Magnetic Compass

Label the lubber line, compass card, fluid, magnets (general location), deviation card, and adjustment screws.



Compass Errors

1. **V** _____ is the angular difference between true and _____ north.
2. **Deviation** is caused by magnetic fields from _____ and _____ components in the aircraft.



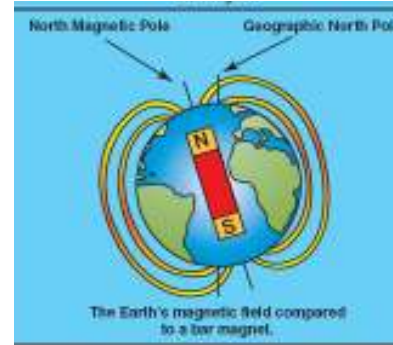
3. **Magnetic** _____ is the tendency of the compass needles to point to the magnetic pole. The greatest error occurs at the _____ and zero at the _____. Since the compass card is designed to respond only to the horizontal plane of the earth's magnetic field, it turns freely only in the horizontal plane. Any movement of the card from the horizontal results in dip errors.

a. Northerly Turning Error:

U _____
 N _____
 O _____
 S _____

b. Acceleration Error:

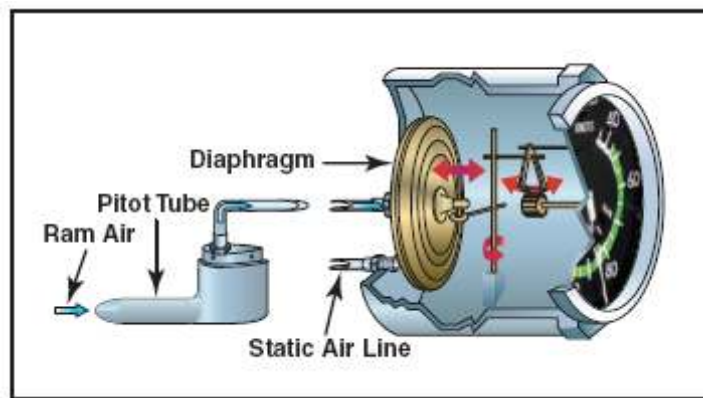
A _____
 N _____
 D _____
 S _____



4. **O** _____ Error - results from erratic movement of the compass which may be caused by turbulence or rough control technique.

Airspeed Indicator

Ram air pressure from the _____ is directed to a _____ inside the airspeed indicator. The airtight case is vented to the static port. As the diaphragm expands or contracts, a mechanical linkage moves the needle on the face of the indicator.

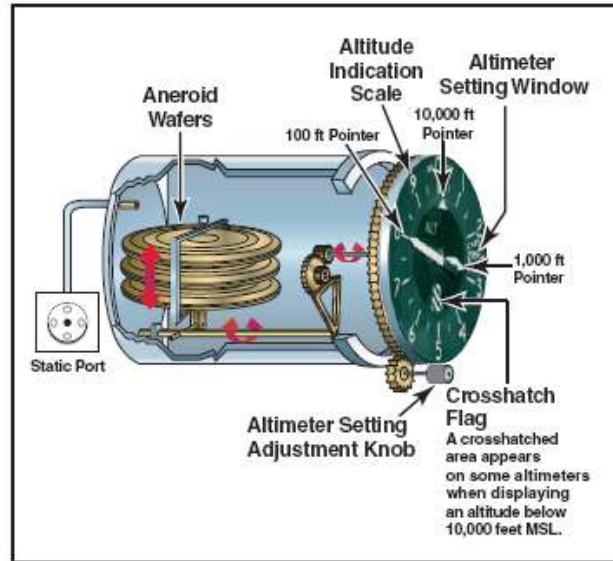


Types of Airspeed (ICE-T)

I _____ is what reads on the face of the instrument.
 C _____ is _____ corrected for installation error. (pitot tube position)
 E _____ is _____ corrected for compressibility. (above 200 kts)
 T _____ is _____ corrected for non-standard temperature & pressure
 ... and don't forget groundspeed.

Altimeter

The main component of the altimeter is a stack of sealed _____
_____. They expand and contract as atmospheric pressure from the static source changes. The mechanical linkage translates these changes into needle movements on the dial.



Types of Altitude

T _____ altitude is the exact height of an aircraft above MSL.

A _____ altitude is the exact height of an aircraft AGL.

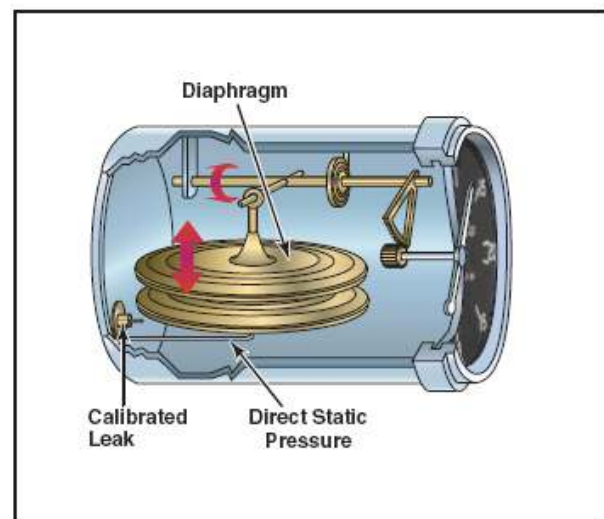
I _____ altitude is the altitude above MSL when the _____ altimeter setting is adjusted to the barometric scale.

P _____ altitude is the IA corrected for non-standard _____. It can be found by setting the altimeter to _____.

D _____ altitude is the PA corrected for non-standard _____.

VSI

Although the sealed case and diaphragm are both connected to the static port, the air inside the case is restricted through a _____. When the pressures are equal, the needle reads zero. As you enter a climb or descent, the static pressure inside the _____ instantly changes, and the needle registers an immediate change in vertical direction. When the pressure differential stabilizes at a definite ratio, the needle registers the rate of altitude change.



Some information has been obtained from: <http://pilotsweb.com/navigate/compass.htm> and <http://www.aviation.uiuc.edu/UnitsPPD/ptCourseWork/AV1130/BillJonesWeb/instr4.html>