obstacles during a landing approach to a short runway. The airspeed used for this descent condition is recommended by the AFM/POH and is normally no greater than 1.3 V_{SO}. Some characteristics of the minimum safe airspeed descent are a steeper-than-normal descent angle, and the excessive power that may be required to produce acceleration at low airspeed should "mushing" and/or an excessive rate of descent be allowed to develop.

Emergency descent—some airplanes have a specific procedure for rapidly losing altitude. The AFM/POH specifies the procedure. In general, emergency descent procedures are high drag, high airspeed procedures requiring a specific airplane configuration (such as power to idle, propellers forward, landing gear extended, and flaps retracted) and a specific emergency descent airspeed. Emergency descent maneuvers often include turns.

Glides

A glide is a basic maneuver in which the airplane loses altitude in a controlled descent with little or no engine power; forward motion is maintained by gravity pulling the airplane along an inclined path and the descent rate is controlled by the pilot balancing the forces of gravity and lift. To level off from a partial power descent using a 1,000 feet per minute descent rate, use 10 percent (100 feet) as the lead point to begin raising the nose to stop descent and increasing power to maintain airspeed.

Although glides are directly related to the practice of power-off accuracy landings, they have a specific operational purpose in normal landing approaches, and forced landings after engine failure. Therefore, it is necessary that they be performed more subconsciously than other maneuvers because most of the time during their execution, the pilot will be giving full attention to details other than the mechanics of performing the maneuver. Since glides are usually performed relatively close to the ground, accuracy of their execution and the formation of proper technique and habits are of special importance.

The glide ratio of an airplane is the distance the airplane travels in relation to the altitude it loses. For example, if an airplane travels 10,000 feet forward while descending 1,000 feet, its glide ratio is 10 to 1.

The best glide airspeed is used to maximize the distance flown. This airspeed is important when a pilot is attempting to fly during an engine failure. The best airspeed for gliding is one at which the airplane travels the greatest forward distance for a given loss of altitude in still air. This best glide airspeed occurs at the highest lift-to-drag ratio (L/D). *[Figure 3-23]* When gliding at airspeed above or below the best glide airspeed, drag increases. Any change in the gliding airspeed results in a proportional change in the distance flown. *[Figure 3-24]* As the glide airspeed is increased or decreased from the best glide airspeed, the glide ratio is lessened.

Variations in weight do not affect the glide angle provided the pilot uses the proper airspeed. Since it is the L/D ratio that determines the distance the airplane can glide, weight does not affect the distance flown; however, a heavier airplane must fly at a higher airspeed to obtain the same glide ratio. For example, if two airplanes having the same L/D ratio but different weights start a glide from the same altitude, the heavier airplane gliding at a higher airspeed arrives at the same touchdown point in a shorter time. Both airplanes cover the same distance, only the lighter airplane takes a longer time.

Since the highest glide ratio occurs at maximum L/D, certain considerations must be given for drag producing components of the airplane, such as flaps, landing gear, and cowl flaps. When drag increases, a corresponding decrease in pitch attitude is required to maintain airspeed. As the pitch is lowered, the glide path steepens and reduces the distance traveled. To maximize the distance traveled during a glide, all drag producing components must be eliminated if possible.

Wind affects the gliding distance. With a tailwind, the airplane glides farther because of the higher groundspeed. Conversely, with a headwind, the airplane does not glide as far because of the slower groundspeed. This is important for a pilot to understand and manage when dealing with engine-related emergencies and any subsequent forced landing.

Certain considerations must be given to gliding flight. These considerations are caused by the absence of the propeller slipstream, compensation for p-factor in the airplane's design, and the effectiveness of airplane control surfaces

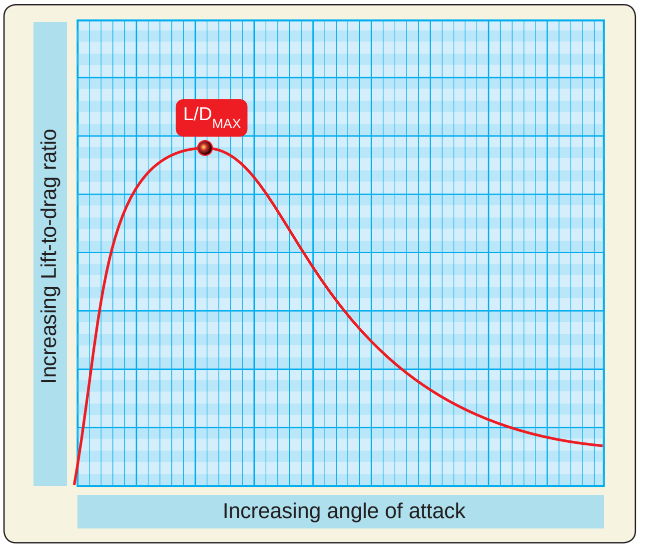

Figure 3-23. L/D_{MAX}.