Leadplane Training Lesson Plan

Leadplane Profile and Exit Maneuver

07-04-N9065-HO

Objective:

To familiarize the student with the Leadplane profile and exit maneuver (Phase 1).

To develop the student's proficiency with flying the leadplane profile and exit maneuver (Phase 2).

Content:

The standard leadplane profile is like a standard traffic pattern at an airport. Terrain will be the most prevalent factor that will force an adjustment to the pattern. Winds, other aircraft, smoke and visibly issues will also cause an adjustment in the pattern flown.

To have a basic starting place to adjust from, consider flying a pattern over flat terrain where a downwind, base, and final leg turns are perpendicular to each other. The pattern altitude will be from 800 to 1000 feet above the drop height.

Configure flaps and power setting to maintain target airspeed on downwind. Start a descent on downwind once past the retardant start point and lose approximately 200 feet prior to base turn. Start the base turn after a point where the aircraft will be wings level on final. With a 500 foot per minute descent rate and a standard rate turn, the aircraft will lose approximately 500 feet on base. There will be approximately 200 feet to lose on final.

Start adding power and accelerating prior to the start point. This will provide additional energy for the exit maneuver and allow the leadplane to get out of the tanker's way sooner. Do not start adding power too early or the leadplane will get too far ahead of the tanker.

The minimum drop height above the vegetation is 60 feet for SEATs, 150 feet for LATs and 200 feet for VLATs. These drop heights are based on a coverage level 4. It is important for the retardant to "rain" vertically with little or no forward movement. The airtanker pilot is responsible for maintaining safe drop heights. As coverage level increases, the mass of the retardant is greater and takes longer to stop its forward movement and rain vertically down on the fuels. As coverage level increases so does minimum drop height. See the SEAT, LAT, VLAT and MAFFS lesson plans for drop heights at higher coverage levels.

When the leadplane is over the start point, identify the start point with a verbal, start “here." When the word “here” is broadcasted, the smoke system should simultaneously be started.

During the exit maneuver smoothly roll in to a 30-degree bank and then initiate a climb. The flaps, if they were used, can be raised and the power adjusted. The objective of the exit maneuver is to get out of the tankers way and to climb away from the terrain. The climb can be initiated first and then the bank if terrain dictates.

Avoid the desire to look back at the retardant drop. Seeing the drop will not affect the outcome. It is critical that the pilot’s attention is focused on managing the aircraft while climbing away from the ground and accelerating. The environment in front of the leadplane is far more important to pay attention to than the environment that is behind the aircraft.

In the event of a split drop where the second half of the load will be tied into the end of the first half of the drop, but at a different angle, there is a decision to be made. It must be determined if flying a pattern to evaluate the drop is more important than continuing to fly the exit so that the tanker can follow the leadplane back to a downwind to make the second drop. It is usually better to stay with the tanker and evaluate the first half of the drop from the downwind position rather than disengaging from the tanker to fly over the drop to evaluate it. Rejoining with the tanker takes much more time and air space as well as disrupting the sequencing of aircraft. Asking the ATGS, other tankers or ground forces to evaluate the drop are other options.

Caution should be used to avoid asymmetrical G loading. When an aircraft is maneuvered in two plains simultaneously, the aircraft is subjected to asymmetrical G loading. Asymmetrical G loading creates a differential in the loading of one wing relative to the other. The wing on the outside of the turn is subjected to greater G forces then the wing on the inside of the turn. This can result in structural damage to the aircraft.

An airplane’s asymmetrical G limit for any given weight is 2/3 of the symmetrical G load limit at the same weight for the same aircraft. Therefore, an aircraft can be damaged when flying with asymmetrical G loads even if the aircraft is flown below the Va speed for a given weight.

The primary goal of maneuvering the aircraft about one axis prior to another is to avoid asymmetrical G loading.

Leadplane patterns should be downhill, down canyon, down sun with the greatest degree of safety in mind. Maintain the agreed upon airspeed to maintain separation between the leadplane and airtanker. A descending approach with a constant rate of descent is desired, terrain permitting. Brief the airtanker pilot ahead of time if special maneuvering is anticipated. Advise the airtanker of hazards (i.e. turbulence, down air, restrictions to visibility, obstacles, etc.).

3 Basic Leadplane Profiles

Lead Profile

In a lead profile the leadplane will be in front of the tanker. The tanker will have the responsibility for separation between the two aircraft once the aircraft are joined up.

Chase Profile

In a chase profile the leadplane will be behind the tanker. It is best to stay slightly above the tankers flight path, to stay out of the wake turbulence, and slightly outside the tankers turn. The leadplane has responsibility for separation. The leadplane can verbally confirm or adjust the position of the tanker when on final. The leadplane adjusts airspeed and pattern to match the tankers.

Show Me Profile

In a show me profile the tanker will stay at altitude while the leadplane descends and fly's the pattern as briefed. The tanker will position itself so it can see the leadplane. The tanker will adjust its pattern so when the leadplane finishes the show me run, and is climbing up to pattern altitude, the tanker can maneuver in behind the leadplane as it turns to downwind.

Aircraft Configuration

Depending on the leadplane aircraft, a higher prop RPM setting will be used to maximize thrust. Flaps can be used to help control airspeed while descending during the lead profile.

Profile Illusions

Flight profile over higher terrain than the drop: The visual illusion will be that the leadplane is low during the maneuver which will create a higher than normal altitude on final.

Flight profile over lower terrain than the drop: The visual illusion will be that the leadplane is high during the maneuver which will create a lower than normal altitude on final.

Flight profile over flat terrain: The visual illusion will be that the leadplane is high during the maneuver, especially with short vegetation, which will create a lower than normal altitude on final.

To minimize profile illusions, determine pattern altitudes and fly the altitudes prior to a retardant drop.

Completion Standards:

The lesson is complete when the student can demonstrate the leadplane profile and exit maneuver in a training environment for Phase I and in a fire environment for Phase II. When the student performs the leadplane profile and exit maneuver, the safety of flight will never be in question. The maneuvers will be accomplished without the reliance on the evaluator.