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Sling TSi Flight Training Syllabus



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Introduction

Good flight training is foundational in maintaining aviation safety, and it is equally important when transitioning to a new type of aircraft. The Sling TSi is a modern homebuilt aircraft that has several unique features (such as electric constant speed prop) that are not available on most other training aircraft. Therefore, there is no real substitute for getting proficient in the Sling TSi than taking training in the Sling TSi itself.

Aircraft Design Characteristics

The Sling TSi is for the most part a conventional aluminum low-wing 4-place airplane with fixed tricycle gear. It has been designed and tested according to FAR Part 23 standards, but remains only available as an experimental aircraft.

Aircraft Structure

The aircraft is constructed of aluminum with pulled rivets throughout except for in the spar box and spars, which are secured with solid rivets. The canopy is constructed with composites as is the main landing gear.

Landing Gear

The main landing gear is a fixed-gear one-piece composite layup built to withstand heavy landings. The nose gear is directly-steered by the rudder pedals with no caster or bungee. This requires specific training. There is a center hand brake that is used for braking, which is also fairly uncommon.

Engine

The engine is the Rotax 915iS engine, which is a FADEC engine. It is controlled by LANE A and LANE B instead of 2 magnetos. It has dual ECUs which are controlled by the 2 Lanes and special modes. The engine has dual integrated alternators and dual electric fuel pumps. It has dual electronic fuel injection per cylinder. The engine is turbo-charged and includes an intercooler. The engine requires specific training that is included in the Sling TSi Flight Training Syllabus.

Propeller

The propeller is an Airmaster electrically controlled constant-speed propeller that has fairly unique controls requiring specific training.

Training Course Outlines

Sling TSi Specific Make and Model Initial Training, and; Sling TSi Specific Make and Model Flight Review Training

This course outline applies to both the Sling TSi Specific Make and Model Initial AND Flight Review training.

Aircraft required: Sling TSi
Flight Training Device: Not required
Special Equipment: Not required
Flight Instructor Qualifications: Commercial Pilot – Airplane SEL and Flight Instructor Airplane
Flight Instructor Experience: Completed transition training course in Sling TSi
Pre-requisites for persons receiving instruction: None for Initial Make and Model Training; at least a Private Pilot Certificate for Flight Review Training.

Ground Training: Introduction to Aircraft, Systems and Performance

Objective:

To introduce the systems and operating procedures of the Sling TSi to the pilot.

Planned Duration of Lesson:

2-hrs.

Accomplishments and Completion Standards:

The pilot has met the standards when they are able to demonstrate an understanding of the knowledge via a verbal quiz with the Instructor.

**Discuss these items with your transition-training flight instructor using the aircraft Pilot Operating Handbook, Sling TSi POH, or other references and appropriate.*

- Flight Characteristics of the Sling TSi Aircraft
- Aircraft Flight Controls and Systems
- Identify *Unique* Controls, Configurations, of the Aircraft Used incl. handbrake, propeller control
- Engine Management using the 915iS FADEC Engine
- Engine Systems related to the 915iS FADEC Engine, fuel pumps, alternators, ECUs
- Stall Characteristics and Indications
- Aircraft Operating Limitations

- Weight and Balance
- V Speeds (*Vs, Vr, Vx, Vy, Va, Vno, Vne, best glide, cruise climb, acro-entry*)
- Aircraft Performance (Climb, Glide, Takeoff and Landing Distance, High DA)
- Spin Characteristics
- Cockpit Management
- Taxi Techniques
- Usage of Hand Brakes during Taxi, Takeoff and Landing
- Maximum Crosswind Component
- Takeoff Profile
- Climb Profile and Climb Performance
- Torque, P-factor and Gyroscopic Effect, as appropriate, on Takeoff
- Approach and Landing Flight Profile
- Awareness of High Sink Rates with Low Airspeeds on Approach
- Landing Flare and Touchdown
- Go Arouns & Recovery from Bounced or Ballooned Landings
- Emergency Procedures
- Use of the whole airframe parachute, if equipped

Flight Lesson #1: Basic Introduction and Flight Demonstration

Objective:

To become familiar with the basic operating procedures and flight characteristics of the Sling TSi.

Planned Duration of Lesson:

1-hr, to be repeated until standard is met.

Accomplishments and Completion Standards:

The pilot has met the standards when they are able to follow the aircraft checklists without any assistance and perform the maneuvers below to the same standards outlined in the FAA Private Pilot ACS document.

Aircraft Pre-flight

- Normal procedures and techniques
- Standard entry and exit procedures
- Canopy latch and emergency egress
- Cockpit familiarization
- Checklist usage
- Review fuel and oil capacity and consumption
- Passenger safety and pre-takeoff briefs

Engine Start, Taxi and Run-up

- Start
- ECU Operation
- Control positioning

Normal Takeoff and Climb (Demonstrated)

- Normal operations
- Aborted takeoff procedures

Aircraft Familiarization

- Basic aircraft control
- Pitch attitude familiarization
- Effect of trim
- Engine operation

Normal Descent and Landing (Demonstrated)

- Normal operations
- Effect of flaps
- Effect of wind
- Energy management

Shut Down and Securing Aircraft

- Checklist usage
- Post-flight Inspection

Flight Lesson #2: Basic Maneuvers

Objective:

To improve familiarity of the operating procedures of the Sling TSi and the flight characteristics during performance maneuvers, slow flight, stalls and ground reference maneuvers.

Planned Duration of Lesson:

1.5-hr, to be repeated until standard is met.

Accomplishments and Completion Standards:

The pilot has met the standards when they are able to follow the aircraft checklists without any assistance and perform the maneuvers below to the same standards outlined in the FAA Private Pilot ACS document.

Normal Takeoff and Climb (Demonstrated)

- Normal operations
- Maintaining directional control

Basic Flight Maneuvers

- Straight and level flight
- Normal climbs and descents
- Normal turns (30 degree bank 360 left and right)

Performance Maneuvers

- Steep turns (45 degrees left and right)
- Slow flight (clean, partial and full flaps)

Stall Maneuvers

- Stall awareness
- Power off stalls
- Effect of flap settings
- Power on stalls
- Spin awareness and prevention

Ground Reference Maneuvers

- S-turns across a road
- Turns around a point
- Rectangular course

Normal Descent and Landing (Demonstrated)

- Normal operations
- Maintaining directional control

Flight Lesson #3: Takeoff and Landing

Objective:

To improve familiarity of the operating procedures of the Sling TSi and flight skills related to landings and takeoffs, crosswind control, slips and emergency procedures.

Planned Duration of Lesson:

1.5-hr, to be repeated until standard is met.

Accomplishments and Completion Standards:

The pilot has met the standards when they are able to follow the aircraft checklists without any assistance and perform the maneuvers below to the same standards outlined in the FAA Private Pilot ACS document.

Takeoff Maneuvers

- Normal and crosswind procedures
- Short field and soft field procedures
- Crosswind takeoff
- Aborted takeoff

Landing Maneuvers

- Normal and crosswind procedures
- Stabilized approach using power and trim
- Short field and soft field procedures
- Slips
- No flap landing
- Mitigating high sink rates when slow
- Crosswind and gusty landing procedures

Emergency Procedures

- Complete power loss
- Partial power loss
- Return to landing (i.e. the "Impossible turn")
- Electrical system / instrument failure
- ECU Lane Alarm States
- Airframe Parachute usage

Sling TSi Instrument Competency Training for Specific Make and Model

This course is designed to provide safe training on the equipment and procedures used for IFR flight in the Sling TSi

Aircraft required: Sling TSi
Flight Training Device: Not required
Special Equipment: View-limiting device
Flight Instructor Qualifications: Commercial Pilot – Airplane SEL and Flight Instructor – Instrument (CFII)
Flight Instructor Experience: Completed transition training course in Sling TSi
Pre-requisites for persons receiving instruction: At least a Private Pilot Certificate with an Airplane rating, working towards the Instrument rating and completed the Sling TSi Specific Make and Model Training Course (above)

Ground Training: Sling TSi IFR Systems and Usage

Objective:

To introduce the avionics and other systems and IFR operating procedures of the Sling TSi to the pilot.

Planned Duration of Lesson:

4-hrs.

Accomplishments and Completion Standards:

The pilot has met the standards when they are able to demonstrate an understanding of the knowledge via a verbal quiz with the Instructor.

**Discuss these items with your transition-training flight instructor using the aircraft Pilot Operating Handbook, Sling TSi POH, or other references and appropriate.*

- Familiarization of the G3X Touch Display for IFR Flying
- Familiarization of the GTN650 Navigator for IFR Flying
- Familiarization of the Garmin Autopilot for IFR Flying
- Familiarization of the Heated Pitot Tube
- Single-Pilot Resource Management
- Risk Management
- Task Management
- Controlled Flight Into Terrain Awareness
- Automation Management
- Aeronautical Decision Making

Instrument Flight Lesson #1: Instrument Skills in the Sling TSi

Objective:

To introduce basic Instrument Skill familiarity in the Sling TSi to the pilot, using available systems.

Planned Duration of Lesson:

1.5-hr, to be repeated until standard is met.

Accomplishments and Completion Standards:

The pilot has met the standards when they are able to follow the aircraft checklists without any assistance and perform the maneuvers below to the same standards outlined in the FAA Instrument Rating ACS document.

In-Flight, under the hood as required

- Pitch and Power for basic instrument maneuvers
- Straight and level flight
- Airspeed changes in level flight
- Standard rate turns
- 180 degree turns
- Constant airspeed climbs and descents
- Turning climbs and descents
- Level-offs
- Loss of primary flight instrument – heading indicator
- Compass turns to magnetic headings
- Timed turns to magnetic headings
- Unusual attitude recoveries
- Navigating on Autopilot

Instrument Flight Lesson #2: GPS and VOR Navigation in the Sling TSi

Objective:

To practice navigating (and recovering from unusual attitudes) with the use of IFR Navigation systems and the Autopilot in the airplane while improving familiarity in the Sling TSi systems and procedures.

Planned Duration of Lesson:

1.5-hr, to be repeated until standard is met.

Accomplishments and Completion Standards:

The pilot has met the standards when they are able to follow the aircraft checklists without any assistance and perform the maneuvers below to the same standards outlined in the FAA Instrument Rating ACS document.

In-Flight, under the hood as required

- Navigating to a waypoint or fix at safe altitude
- Navigation system course intercepting and tracking (GPS)
- VOR accuracy check
- VOR navigation
- Navigation course intercepting and tracking (VOR)
- Victor airway intercepting and tracking
- Recovery from unusual flight attitudes
- Following published departure procedures
- Holding Patterns
- Navigating on Autopilot

Instrument Flight Lesson #3: Precision and Non-precision Approaches in the Sling TSi

Objective:

To practice flying precision and non-precision approaches with the use of IFR Navigation systems and the Autopilot in the airplane while improving familiarity in the Sling TSi systems and procedures.

Planned Duration of Lesson:

1.5-hr, to be repeated until standard is met.

Accomplishments and Completion Standards:

The pilot has met the standards when they are able to follow the aircraft checklists without any assistance and perform the maneuvers below to the same standards outlined in the FAA Instrument Rating ACS document.

In-Flight, under the hood as required

- Approach briefing
- Vectors to final approach course
- Intercept and track localizer course
- Intercept and track glideslope
- Load and verify RNAV approach into GTN650
- RNAV approaches with vertical guidance
- Intercept and track RNAV approach course and vertical guidance
- Descent to the MDA
- Execute missed approach procedure, with autopilot usage and without
- Transition to landing from an approach