

# **CFI Bootcamp**

*Flight Instructor Training*

Regulations

# Airworthiness and InOp Equipment

How well do you know

# Airworthiness and InOp Equipment

## Airworthiness – General Determination

An airplane must conform to it's type certificate at all times

DEPARTMENT OF TRANSPORTATION  
FEDERAL AVIATION ADMINISTRATION

|                   |                       |
|-------------------|-----------------------|
|                   | 3A12                  |
|                   | Revision 84           |
|                   | Textron Aviation Inc. |
| 172               | 172I                  |
| 172A              | 172K                  |
| 172B              | 172L                  |
| 172C              | 172M                  |
| 172D              | 172N                  |
| 172E              | 172P                  |
| 172F (USAF T-41A) | 172Q                  |
| 172G              | 172R                  |
| 172H (USAF T-41A) | 172S                  |
|                   | July 29, 2015         |

"WARNING: Use of alcohol-based fuels can cause serious performance degradation and fuel system component damage, and is therefore prohibited on Cessna airplanes."

### TYPE CERTIFICATE DATA SHEET NO. 3A12

This data sheet which is part of Type Certificate No. 3A12 prescribes conditions and limitations under which the product for which the type certificate was issued meets the airworthiness requirements of the Federal Aviation Regulations.

Type Certificate Holder      Textron Aviation Inc.  
One Cessna Boulevard  
P.O. Box 7704  
Wichita, Kansas 67277

Type Certificate Holder Record      Cessna Aircraft Company transferred to  
Textron Aviation Inc. on July 29, 2015

I. Model 172, 4 PCLM (Normal Category), approved November 4, 1955; 2 PCLM (Utility Category), approved December 14, 1956

Engine      Continental O-300-A or O-300-B

## Airworthiness and InOp Equipment

### Type Certificates

Basis for airplane certification – Min installed equipment

## Airworthiness and InOp Equipment

### Type Certificates

[Available here](#)

## Airworthiness and InOp Equipment

### Required Equipment VFR/IFR/Night

91.205 – If you say TOMATOFLAMES I'll Zap you



# Airworthiness and InOp Equipment

## Equipment Lists

Manufacturer – Lists all installed equipment on made date

SECTION 6  
WEIGHT & BALANCE / EQUIPMENT LIST

CESSNA  
MODEL 172S

| ITEM NO | EQUIPMENT LIST DESCRIPTION            | REF DRAWING | WT LBS | ARM INS. |
|---------|---------------------------------------|-------------|--------|----------|
|         | <b>73 - ENGINE FUEL &amp; CONTROL</b> |             |        |          |
| 73-01-S | EGT/FUEL FLOW INDICATOR               | 83277-4     | 0.6    | 7.8      |
|         | <b>77 - ENGINE INDICATING</b>         |             |        |          |
| 77-01-R | RECORDING TACHOMETER INSTALLATION     | 83329-5     | 1.0    | 12.1     |
|         | <b>78 - EXHAUST</b>                   |             |        |          |
| 78-01-R | EXHAUST SYSTEM INSTALLATION           | 9954100-1   | 16.3*  | -20.0*   |
|         | - MUFFLER & TAILPIPE WELD ASSY        | 9954000-2   | 4.6    | -22.7    |
|         | - SHROUD ASSEMBLY, MUFFLER HEATER     | 9954100-3   | 0.8    | -22.7    |
|         | <b>79 - OIL</b>                       |             |        |          |
| 79-01-R | OIL COOLER INSTALLATION               | 0550385-1   | 3.3*   | -11.0*   |
|         | - OIL COOLER, STEWART WARNER          | 10877A      | 2.3    | -11.0    |
| 79-02-R | OIL PRESSURE & TEMPERATURE INDICATOR  | 83279-1     | 0.4    | 16.5     |

## Airworthiness and InOp Equipment

### Kinds of Operation Equipment List - KOEL

Limitations section of the POH – Typically G1000 type

Cirrus Design  
SR20

Section 2  
Limitations

| System,<br>Instrument,<br>and/or<br>Equipment | Kinds of Operation |            |            |            | Remarks,<br>Notes,<br>and/or<br>Exceptions |
|---|--------------------|------------|------------|------------|--|
|   | VFR<br>Day         | VFR<br>Nt. | IFR<br>Day | IFR<br>Nt. |  |
| Exhaust Gas<br>Temperature Indication         | —                  | —          | —          | —          |  |
| Fuel Flow Indication                          | 1                  | 1          | 1          | 1          |  |
| Manifold Pressure<br>Indication               | 1                  | 1          | 1          | 1          |  |
| Oil Pressure Indication                       | 1                  | 1          | 1          | 1          |  |



## Airworthiness and InOp Equipment

### Kinds of Operation Equipment List - KOEL

Lists what equipment is required for a type of operation

# Airworthiness and InOp Equipment

## Form 337 – Major Modification or Repair and STC

The only way to install equipment not original is 337 or STC



Form 337 Major Modification or Repair and STC. The form is divided into several sections: 1. Aircraft Information (Make, Model, Serial No., etc.), 2. Description of Work (Type of modification, location, etc.), 3. Approval (Signature of the person performing the work, date, etc.), 4. Approval of the FAA (Signature of the FAA representative, date, etc.), 5. Remarks (Additional information, etc.).



Supplemental Type Certificate. Issued by the Federal Aviation Administration. The certificate is for a modification to a Cessna 441 aircraft. The modification is the installation of a Rotax 580 engine. The certificate is issued to V. F. Klyburn, P. O. Box 112, Blue Springs, MO 64015. The certificate is valid for the aircraft model Cessna 441. The certificate is issued on 11 January 1985. The certificate is signed by the FAA representative on 11 January 1985. The certificate is signed by the applicant on 11 January 1985.

## Airworthiness and InOp Equipment

### STC – Supplemental Type Certificate

Blanket FAA approval for a particular thing on specific makes and models

## Airworthiness and InOp Equipment

### STC – Supplemental Type Certificate

Will include new limitations if applicable – Ex. 172N 180HP

## Airworthiness and InOp Equipment

**STC – Supplemental Type Certificate**

Gross weight increase of 150 lbs.

# Airworthiness and InOp Equipment

## Form 337 – Major Alteration or Repair

### A&P Installs new equipment – Documents on this form

**NOTICE**  
Weight and balance or operating limitation changes shall be entered in the appropriate aircraft record. An alteration must be compatible with all previous alterations to assure continued conformity with the applicable airworthiness requirements.

**Description of Work Accomplished**  
(If more space is required, attach additional sheets. Identify with aircraft nationality and registration mark and date work completed.)

1. Installed (4) bracket assemblies in seat pan to accept Cessna 150 seat rails and seats. Brackets fabricated from 2024 T3, using AN 470 AD 4-4 rivets and MS structural screws in fabrication and fasteners to seat pan (Drawing attached)
2. Seat belts and shoulder harness retain original attachment to primary structure.
3. Cessna 150 control wheels and shafts installed in lieu of the original C140 units
4. Overhead dome, red instrument lights, speaker support assembly and Syn wings installed with minor modifications from an early 150.
5. Installed a Texas Aero plastics prepared interior kit, including headliner for a Cessna 140.
6. Weight and Balance and Equipment List revised to reflect the above changes.

XX NOTE: Cessna A.D. 87-20-03 R2 Seat rails now apply to this Aircraft.

- End -

Additional Sheets Are Attached

## Airworthiness and InOp Equipment

**Form 337 – Major Alteration or Repair**

Approved by an IA, DAE or FAA Inspector

## Airworthiness and InOp Equipment

### Form 337 – Major Alteration or Repair

Temporary installations (Velcro etc.) don't require a 337





## Airworthiness and InOp Equipment

### Required Inspections/Tests

AVIATED

## Airworthiness and InOp Equipment

### Required Inspections/Tests

Annual – 12 Cal Mos. – 91.409





## Airworthiness and InOp Equipment

### Required Inspections/Tests

100 Hour – Each 100 hours (usually tach) – 91.409



# Airworthiness and InOp Equipment

## Required Inspections/Tests

Altimeter Static Inspection/Test – 24 Cal Mos. – 91.411



# Airworthiness and InOp Equipment

## Required Inspections/Tests

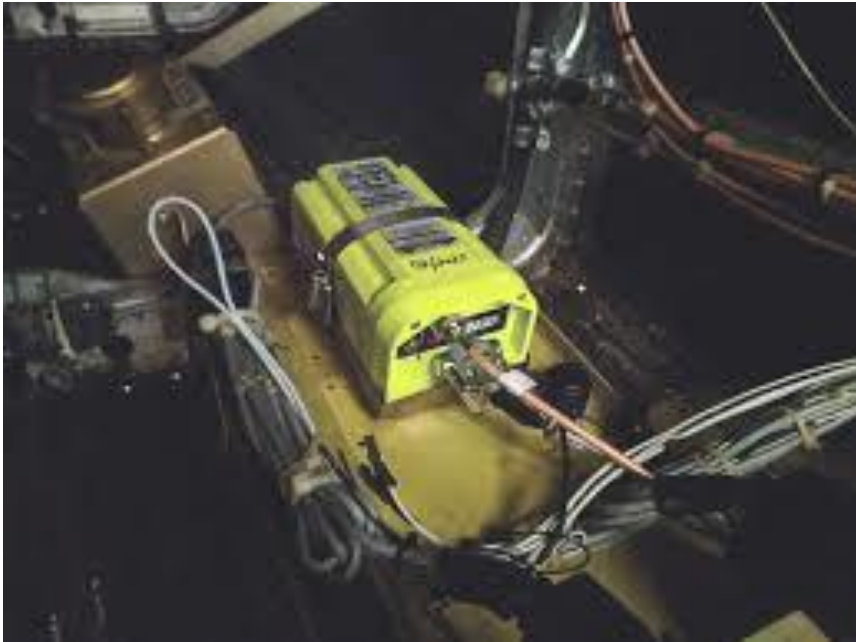
Transponder Inspection/Test – 24 Cal Mos. – 91.413



## Airworthiness and InOp Equipment

### Required Inspections/Tests

ELT Inspection – 12 Cal Mos. – 91.207(d)



## Airworthiness and InOp Equipment

### Required Inspections/Tests

ELT Battery Replacement – 1 hr cumulative use, 50% life if rechargeable or battery replacement date - 91.207(c)





## Airworthiness and InOp Equipment

### Required Inspections/Tests

ADs – Airworthiness Directives – One time or Recurring

[All about ADs from FAA Here](#)

# Airworthiness and InOp Equipment

## Required Inspections/Tests

Logged by AD number, date and method of compliance and date/time of next action in the logbook or other record

FAA Airworthiness Directive Compliance Record

001-10-01 AIRCRAFT HANDBOOK, FLORIDA, 001-10-01 Report Pursuant to UNIVERSITY AIR CONTROL

Current Revision: 001-10-01 (10-01-01) (10-01-01) Aircraft Registration:

| FAA AD Number (including Title) | Description   | Compliance Method            | Inspection Method (if applicable) | Date of Compliance | Method of Compliance | Signature | Date |
|---------------------------------|---|------------------------------|-----------------------------------|--------------------|----------------------|-----------|------|
| 71-25-01 (71-25-01)             | TO PREVENT THE POSSIBILITY OF FAILURE OF THE MAIN DEAM (STRUC 14) | BY AD AIRCRAFT SERIAL NUMBER |                                   |                    |                      |           |      |
| 71-25-02 (71-25-02)             | TO PREVENT THE POSSIBILITY OF FAILURE OF THE MAIN DEAM (STRUC 14) | BY AD AIRCRAFT SERIAL NUMBER |                                   |                    |                      |           |      |
| 71-25-03 (71-25-03)             | TO PREVENT THE POSSIBILITY OF FAILURE OF THE MAIN DEAM (STRUC 14) | BY AD AIRCRAFT SERIAL NUMBER |                                   |                    |                      |           |      |
| 71-25-04 (71-25-04)             | TO PREVENT THE POSSIBILITY OF FAILURE OF THE MAIN DEAM (STRUC 14) | BY AD AIRCRAFT SERIAL NUMBER |                                   |                    |                      |           |      |
| 71-25-05 (71-25-05)             | TO PREVENT THE POSSIBILITY OF FAILURE OF THE MAIN DEAM (STRUC 14) | BY AD AIRCRAFT SERIAL NUMBER |                                   |                    |                      |           |      |
| 71-25-06 (71-25-06)             | TO PREVENT THE POSSIBILITY OF FAILURE OF THE MAIN DEAM (STRUC 14) | BY AD AIRCRAFT SERIAL NUMBER |                                   |                    |                      |           |      |
| 71-25-07 (71-25-07)             | TO PREVENT THE POSSIBILITY OF FAILURE OF THE MAIN DEAM (STRUC 14) | BY AD AIRCRAFT SERIAL NUMBER |                                   |                    |                      |           |      |
| 71-25-08 (71-25-08)             | TO PREVENT THE POSSIBILITY OF FAILURE OF THE MAIN DEAM (STRUC 14) | BY AD AIRCRAFT SERIAL NUMBER |                                   |                    |                      |           |      |
| 71-25-09 (71-25-09)             | TO PREVENT THE POSSIBILITY OF FAILURE OF THE MAIN DEAM (STRUC 14) | BY AD AIRCRAFT SERIAL NUMBER |                                   |                    |                      |           |      |
| 71-25-10 (71-25-10)             | TO PREVENT THE POSSIBILITY OF FAILURE OF THE MAIN DEAM (STRUC 14) | BY AD AIRCRAFT SERIAL NUMBER |                                   |                    |                      |           |      |

# Airworthiness and InOp Equipment

## Minimum Equipment List

Manufacturer developed – User Modified – FAA approved

| U.S. DEPARTMENT OF TRANSPORTATION<br>FEDERAL AVIATION ADMINISTRATION |                            | MASTER MINIMUM EQUIPMENT LIST   |   |   |   |                |
|--|----------------------------|---|---|---|---|----------------|
| REVISION NO. 62<br>DATE: XX/XX/XXXX                                  |                            | PAGE NO. 34-5   |   |   |   |                |
| AIRCRAFT:<br>Boeing B-737  |                            | TABLE KEY<br>1. REPAIR CATEGORY<br>2. NO. INSTALLED<br>3. NO. REQUIRED FOR DISPATCH<br>4. REMARKS OR EXCEPTIONS |   |   |   |                |
| 34. Navigation   |                            |   |   |   |   |                |
| Sequence No.   | Item                       | 1   | 2 | 3 | 4   | Change<br>Item |
| 07   | Standby Horizon Indicator  |   |   |   |   | 1              |
| 07-01  | Standby Altitude Indicator | 0   | 1 | 0 | May be inoperative provided:<br>a) Operations are conducted in Day VMG only, and<br>b) Operations are not conducted into known or forecast over-the-top conditions. |                |

## Airworthiness and InOp Equipment

### Minimum Equipment List

Lists all equipment that CAN be Inop

## Airworthiness and InOp Equipment

### Minimum Equipment List

Actions that must be taken prior to flight

## Airworthiness and InOp Equipment

### Minimum Equipment List

Time/Days the item can be inop

## Airworthiness and InOp Equipment

### Minimum Equipment List

Becomes a required document in the airplane

## Airworthiness and InOp Equipment

### Operating an Airplane with Inoperative Instruments or Equipment

91.213(c) – Instructions if an MEL has been approved



# Airworthiness and InOp Equipment

## Operating an Airplane with Inoperative Instruments or Equipment

Use the MEL to determine what needs to be done

| U.S. DEPARTMENT OF TRANSPORTATION<br>FEDERAL AVIATION ADMINISTRATION |                            | MASTER MINIMUM EQUIPMENT LIST   |   |   |   |                |
|--|----------------------------|---|---|---|---|----------------|
| REVISION NO. 62<br>DATE: XXXX/XXXX                                   |                            | PAGE NO. 34-5   |   |   |   |                |
| AIRCRAFT:<br>Boeing B-737  |                            | TABLE KEY<br>1. REPAIR CATEGORY<br>2. NO. INSTALLED<br>3. NO. REQUIRED FOR DISPATCH<br>4. REMARKS OR EXCEPTIONS |   |   |   |                |
| <b>34. Navigation</b>  |                            |   |   |   |   |                |
| Sequence No.   | Item                       | 1   | 2 | 3 | 4   | Change<br>Rate |
| 07   | Standby Horizon Indicator  |   |   |   |   | 1              |
| 07-01  | Standby Altitude Indicator | B   | 1 | 0 | May be inoperative provided:<br>a) Operations are conducted in Day VMC only, and<br>b) Operations are not conducted into known or forecast over-the-top conditions. |                |

## Airworthiness and InOp Equipment

### Operating an Airplane with Inoperative Instruments or Equipment

91.213(d) – Operations without an approved MEL

## Airworthiness and InOp Equipment

### Operating an Airplane with Inoperative Instruments or Equipment

Are the instruments part of 91.205 for the flight?



## Airworthiness and InOp Equipment

### Operating an Airplane with Inoperative Instruments or Equipment

Is the equipment listed as required on the equipment list?

CESSNA  
MODEL 172P

SECTION 8  
WEIGHT & BALANCE/  
EQUIPMENT LIST

### EQUIPMENT LIST

The following equipment list is a comprehensive list of all Cessna equipment available for this airplane. A separate equipment list of items installed in your specific airplane is provided in your aircraft file. The following list and the specific list for your airplane have a similar order of listing.

This equipment list provides the following information:

An **item number** gives the identification number for the item. Each number is prefixed with a letter which identifies the **descriptive** grouping (example: A, Powerplant & Accessories) under which it is listed. Suffix letters identify the equipment as a required item, a standard item or an optional item. Suffix letters are as follows:

- R = required items of equipment for FAA certification
- S = standard equipment items
- O = optional equipment items replacing required or standard items
- A = optional equipment items which are in addition to required or standard items

## Airworthiness and InOp Equipment

### Operating an Airplane with Inoperative Instruments or Equipment

If a KOEL exists – can you operate with this configuration?

## Airworthiness and InOp Equipment

### Operating an Airplane with Inoperative Instruments or Equipment

Is the equipment required by an AD?

## Airworthiness and InOp Equipment

### Operating an Airplane with Inoperative Instruments or Equipment

Can the pilot safely operate the airplane without the equipment working?

## Airworthiness and InOp Equipment

### Operating an Airplane with Inoperative Instruments or Equipment

Can you remove or deactivate the equipment?





## Airworthiness and InOp Equipment

### Operating an Airplane with Inoperative Instruments or Equipment

Remember that some removals/deactivations would require a certified maintenance person to do this

## Airworthiness and InOp Equipment

### Operating an Airplane with Inoperative Instruments or Equipment

Deactivation means – Inability to turn the system ON

## Airworthiness and InOp Equipment

### Operating an Airplane with Inoperative Instruments or Equipment

No longer possible for the equipment to be used in any way

## Airworthiness and InOp Equipment

Operating an Airplane with Inoperative Instruments or Equipment

Remove/Deactivate the equipment and Placard INOPERATIVE



## Airworthiness and InOp Equipment

### Operating an Airplane with Inoperative Instruments or Equipment

If maintenance is required – Record in the logbook

## Airworthiness and InOp Equipment

### Operating an Airplane with Inoperative Instruments or Equipment

The airplane may not be flown until the next required inspection

## Airworthiness and InOp Equipment

### Operating an Airplane with Inoperative Instruments or Equipment

Must be repaired, removed or reinspected at that time

## Airworthiness and InOp Equipment

### Operating an Airplane with Inoperative Instruments or Equipment

In each case a logbook entry must be made



## Airworthiness and InOp Equipment

### Special Flight Permit – “Ferry Permit”

Issued by FSDO – Must qualify the airplane

## Airworthiness and InOp Equipment

### Special Flight Permit – “Ferry Permit”

Used one time to ferry an airplane that is otherwise unairworthy

**Airworthiness and InOp Equipment**

**Special Flight Permit – “Ferry Permit”**

**[All about Special Flight Permits from FAA](#)**

## Airworthiness and InOp Equipment

### A look at some Legal Interpretations

Whether an airplane is required to have a 100-hr Inspection

## Airworthiness and InOp Equipment

### A look at some Legal Interpretations

Whether both the beacon and anti-collision lights must work

## Airworthiness and InOp Equipment

A look at some Legal Interpretations

Can the equipment be re-inspected indefinitely?

## Airworthiness and InOp Equipment

### A look at some Legal Interpretations

When an airplane is flown over the 100-hour inspection – How far can the airplane be flown?

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One week of flight/ground – Dedicated airplanes/CFIs

From us to you...

## Program

Checkride - Prescheduled

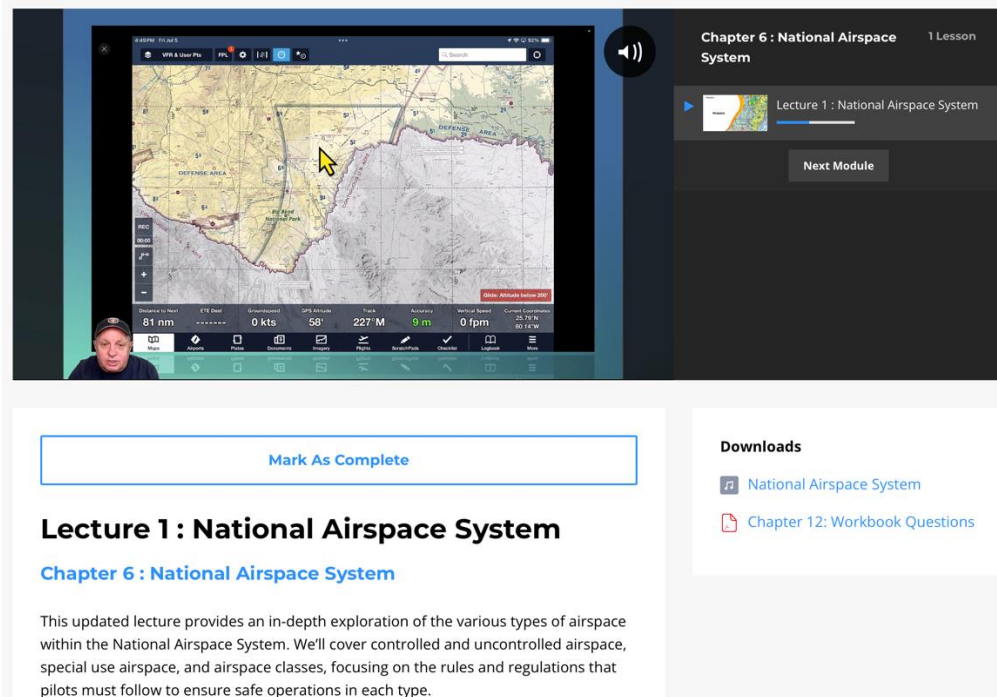
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From us to you...

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The screenshot shows a video player displaying a flight simulator interface with a map of the National Airspace System. The video player includes a volume icon and a speaker icon. To the right of the video player, the course title 'Chapter 6 : National Airspace System' and '1 Lesson' are visible. Below the video player, there is a 'Mark As Complete' button. The main content area features the title 'Lecture 1 : National Airspace System' and 'Chapter 6 : National Airspace System'. A paragraph of text describes the lecture's content. To the right, a 'Downloads' section lists 'National Airspace System' and 'Chapter 12: Workbook Questions'.

[Mark As Complete](#)

### Lecture 1 : National Airspace System

[Chapter 6 : National Airspace System](#)

This updated lecture provides an in-depth exploration of the various types of airspace within the National Airspace System. We'll cover controlled and uncontrolled airspace, special use airspace, and airspace classes, focusing on the rules and regulations that pilots must follow to ensure safe operations in each type.

**Downloads**

- [National Airspace System](#)
- [Chapter 12: Workbook Questions](#)

In Conclusion...

## Past Power Hour Information

[Click here to get outlines of previous power hours](#)

### Power Hour Lesson Outlines

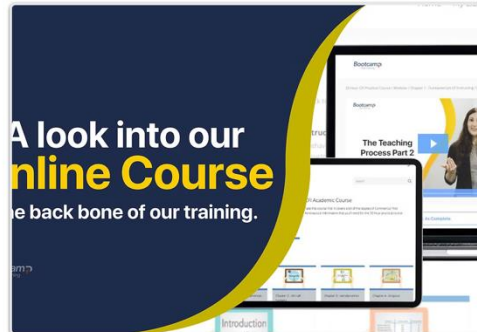
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How to Make Being a Flight Instructor a Career

March 8, 2025 at 12:00:00 PM



A look into the products CFI Bootcamp has to offer

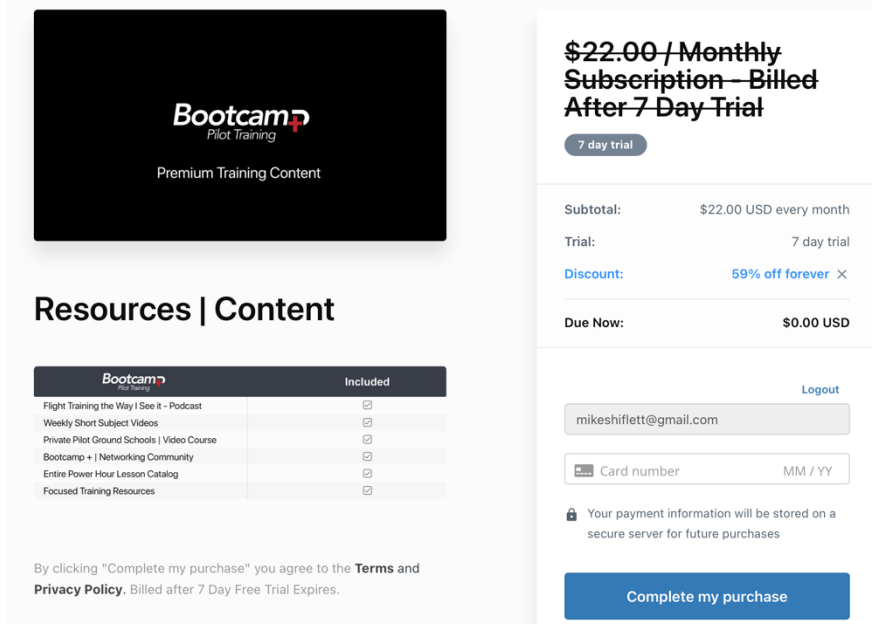
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| Bootcamp                                    | Included                            |
|---|-------------------------------------|
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| Weekly Short Subject Videos                 | <input checked="" type="checkbox"/> |
| Private Pilot Ground Schools   Video Course | <input checked="" type="checkbox"/> |
| Bootcamp +   Networking Community           | <input checked="" type="checkbox"/> |
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| Focused Training Resources                  | <input checked="" type="checkbox"/> |

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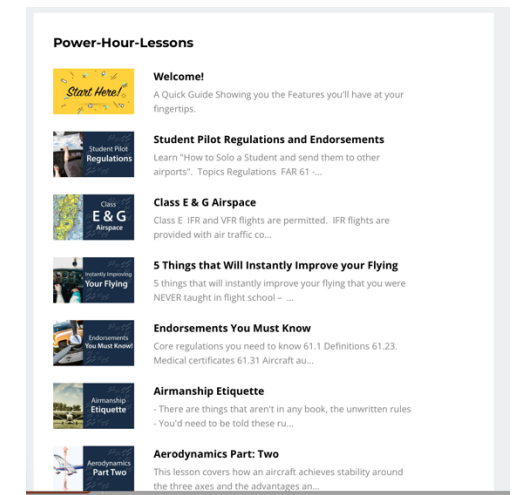
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Learn "How to Solo a Student and send them to other airports". Topics Regulations FAR 61 ...
- Class E & G Airspace**  
Class E IFR and VFR flights are permitted. IFR flights are provided with air traffic co...
- 5 Things that Will Instantly Improve your Flying**  
5 things that will instantly improve your flying that you were NEVER taught in flight school - ...
- Endorsements You Must Know**  
Core regulations you need to know 61.1 Definitions 61.23. Medical certificates 61.31 Aircraft au...
- Airmanship Etiquette**  
- There are things that aren't in any book, the unwritten rules - You'd need to be told these ru...
- Aerodynamics Part: Two**  
This lesson covers how an aircraft achieves stability around the three axes and the advantages an...

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