Supplemental Type Certificate

STC Number:
SA1531NM

This certificate issued to:
Flock Dave

STC Holder's Address:
506 Holyoke Ct.
Ft Collins CO 80525
United States

Description of the Type Design Change:
Modification of the Union Aviation Supplemental Type Certificate No. SA860SO for portable rudder/brake hand control by adapting the control to 'Nyla fill' rudder pedals.

Application Date:
11/27/1982

Status:
Amended, 07/10/2003

Responsible Office:
ANM-100D Denver Aircraft Certification Office Tel: (303) 342-1080

TC Number -- Make -- Model:
3A12 -- Cessna Aircraft Company, The -- 172I
3A12 -- Cessna Aircraft Company, The -- 172K
3A12 -- Cessna Aircraft Company, The -- 172L
3A12 -- Cessna Aircraft Company, The -- 172M
3A12 -- Cessna Aircraft Company, The -- 172N
3A12 -- Cessna Aircraft Company, The -- 172P
3A12 -- Cessna Aircraft Company, The -- 172Q
3A12 -- Cessna Aircraft Company, The -- 172R
3A12 -- Cessna Aircraft Company, The -- 172S

Full Text of STC:

Comments

Comments:

FAA APPROVED

AIRPLANE FLIGHT MANUAL SUPPLEMENT

FOR

CESSNA CE-172

WITH

UNION AVIATION HAND CONTROL

Reg. No. _____ S/N _____

This Supplement must be attached to the FAA Approved Airplane Flight Manual when the Union Aviation Hand Control is installed in accordance with STC SA860SO. The Information contained herein supplements the information of the basic Airplane Flight Manual. For Limitations, Procedures and Performance information not contained in this Supplement, consult the basic Airplane Flight Manual.

FAA APPROVED: Original signed by John F.Vogel
Chief, Engineering and Manufacturing Branch
Federal Aviation Administration
Atlanta, Georgia

DATE: Original dated October 21, 1975

FAA Approved
Rev. A DEC 2 0 2004

U.S. Department
of Transportation
**Federal Aviation
Administration**

Atlanta Aircraft Certification Office
One Crown Center
1895 Phoenix Blvd., Suite 450
Atlanta, Georgia 30349

DEC 2 1 2004

Jeffrey Messikian
28 Mulcahy Drive
East Hartford, CT 06118

Dear Mr. Messikian:

The Atlanta Aircraft Certification Office has received and reviewed your request to revise the Airplane Flight Manual Supplement (AFMS) for Supplemental Type Certificate (STC) No. SA860SO. Acceptance of your request to revise the AFMS is based on the authorization that you received form the certificate holder, Union Aviation, Inc. Your proposed AFMS changes have been reviewed, edited and coordinated with the Windsor Locks Flight Standards District Office (FSDO) NE-FSDO-03.

The revision to the AFMS has been approved and is enclosed for your use.

Sincerely,

Eugene L. Bollin

Eugene L. Bollin
Associate Manager, ACE-116A
Atlanta Aircraft Certification Office

Enclosure

cc: FSDO NE-FSDO-03
Union Aviation, Inc.

FAA APPROVED

AIRPLANE FLIGHT MANUAL SUPPLEMENT

FOR

CESSNA CE-172

WITH

UNION AVIATION HAND CONTROL

Reg. No. _____ S/N _____

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FAA APPROVED

XXXXX XXXXXX
Manager, Aircraft Certification Office
Federal Aviation Administration
Atlanta, Georgia

DATE:

Union Aviation, Inc.
P.O. Box # 207
Sturgis, Kentucky 42459

FAA APPROVED AIRPLANE FLIGHT MANUAL SUPPLEMENT
UNION AVIATION HAND CONTROL

LOG OF REVISIONS

Revision Number	Page Number(s)	Description	FAA Approved	Date of Approval
A	6	Limitations added para.2	Eugene L. Bollin	DEC 2 0 2004
	All	added inst. instr.	Mgr. ACE-115A for	

Union Aviation, Inc.
P.O. Box # 207
Sturgis, Kentucky 42459

FAA APPROVED AIRPLANE FLIGHT MANUAL SUPPLEMENT
UNION AVIATION HAND CONTROL

LOG OF REVISIONS

Revision Number	Page Number(s)	Description	FAA Approved	Date of Approval

Cessna 172
FAA Approved
Date:

Union Aviation, Inc.
P.O. Box # 207
Sturgis, Kentucky 42459

FAA APPROVED AIRPLANE FLIGHT MANUAL SUPPLEMENT
UNION AVIATION HAND CONTROL

Table of Contents

Cessna 172
FAA Approved
DATE:

Union Aviation, Inc.
P.O. Box # 207
Sturgis, Kentucky 42459

FAA APPROVED AIRPLANE FLIGHT MANUAL SUPPLEMENT
UNION AVIATION HAND CONTROL

SECTION I
GENERAL

The information in this document is FAA Approved material which together with the basic Cessna CE-172, 172A, 172B, 172C, 172D, 172E, 172F, 172G, 172H, 172J, 172K, 172L, 172M and 172N Airplane Flight Manual, is applicable and must be carried in the basic manual when the airplane is modified by the installation of a hand-operated rudder control system in accordance with Supplemental Type Certificate SA860SO.

The Union Aviation Hand Control enables the pilot to have full rudder, nose wheel and brake control of the aircraft. The control arm extends from the rudder pedals upward and rearward on the pilot's right side. The control ring is mounted on the control arm at the upper end and is adjustable for the pilot's requirements. The pilot with his arm inserted through the ring may position his hand on the throttle and move the control left or right as required with forearm and wrist movement. Movement of the control arm to the left deploys the left rudder. By raising the bar in the left position left rudder is still deployed and the left brake is activated. Movement to the right attains the same results with right rudder or rudder and brake. With the control centered and the rudder pedals in neutral position, lifting of the arm activates both brakes.

If the pilot chooses to use the control without the control ring attached he may develop his own techniques moving his right hand from the bar to the throttle or flaps. This may limit the utility of the control.

Cessna 172
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Taxi

During taxi the nose wheel is steered through rudder deployment and if required brake may be used. Due to the amount of travel required it may be advisable to use the left hand to operate the control in hard left turns leaving the right arm for throttle control. Also, the left hand may be used to hold brake while the run-up is conducted. The control wheel can be left free during normal taxi conditions.

Takeoff

With the pilot's hand through the control ring and on the throttle advance the throttle while gradually adding right forearm pressure to offset the torque and maintain runway heading. Lift off is accomplished in the normal manor with the left hand on the control wheel. At the pilot's discretion he may remove his arm from the ring and maintain rudder pressure, holding the bar or ring in his right hand. During rotation maintain climb attitude to preclude nose wheel touchdown should the aircraft contact the runway after liftoff. Directional control is maintained with coordinated rudder and aileron during climb out.

Flight Operation

During flight many maneuvers can be made without use of the rudder. However, the pilot can use the control to perform slips, stalls and other maneuvers with his arm through the control ring and hand on the throttle, or simply using the control with his right hand.

Landing

The landing approach is made with the pilot's arm through the control ring and his hand on the throttle. Normal crosswind landing techniques are used as required. With the pilot's left hand on the control wheel and his right forearm providing directional control with rudder and his right hand controlling the throttle. Flaps should be extended as desired early on final approach because it may require removing the pilot's arm from the control ring to reach the flap control.

Aborted Landings

Normal procedures for a go-around should be used. The pilot may have to remove his arm form the control bar for flap retraction. This should be done only if the aircraft is not in contact with the ground.

SECTION II
LIMITATIONS

1. The Following placard is to be installed on the Rudder Hand Control in full view of the Pilot:

"OPERATION OF THE AIRCRAFT WITH THE HAND-CONTROLLED RUDDER SYSTEM INSTALLED MUST BE CONDUCTED IN ACCORDANCE WITH THE UNION AVIATION, INC. FAA APPROVED AFM SUPPLEMENT DATED_____."

2. Prior to Solo operation of the aircraft by a (student or private) pilot, authorization (Pilot Logbook Endorsement) by either a Certificated Flight Instructor (CFI) or FAA Operations Safety Inspector must have been obtained.

3. Prior to operation of the aircraft by a certificated pilot, proficiency in the use of the system must have been demonstrated to an FAA Operations Safety Inspector in accordance with 14 CFR Section 67.401, Special Issuance of Medical Certificates.

4. Maximum demonstrated cross-wind velocity is 12 knots.

SECTION III
EMERGENCY PROCEDURES

No change.

SECTION IV
NORMAL PROCEDURES

The control is designed to provide fully operated hand control in Cessna CE-172, 172A, 172B, 172C, 172D, 172E, 172F, 172G, 172H, 172J, 172K, 172L, 172M and 172N aircraft. FAA approved by Supplemental Type Certificate SA860SO.

Cessna 172
FAA Approved
DATE:

The control attaches to the rudder pedals in accordance with the attached installation instructions.

Prior to flight the pilot should ensure there is full braking and rudder movement. The Union Aviation Hand Control FAA approved AFM Supplement Dated XXXXXX is required when this control is installed. An appropriate maintenance record entry:

INSTALLED UNION AVIATION HAND CONTROL IN ACCORDANCE WITH STC SA860SO. ENSURED THERE IS FULL BRAKING AND RUDDER MOVEMENT.

AIRCRAFT TOTAL TIME:_____
PILOTS NAME & CERT#:_____

The hand control can be operated from either the left or right pilot position. It does not interfere with the normal rudder leg operation by either pilot.

SECTION V
PERFORMANCE

No Change.

SECTION VI
WEIGHT AND BALANCE

See current weight and balance data.

Cessna 172
FAA Approved
DATE:

SECTION VII
AIRPLANE & SYSTEM DESCRIPTION

See Union Aviation, Inc STCSA860SO, Installation instructions for aircraft Hand Control for complete description of the system.

INSTALLATION INSTRUCTIONS

A. Bracket Attachment

Begin installation by attaching Brackets C-3-1L or C-3-4L and C-3-1R or C-3-4R to the respective rudder pedals. C-3-1L to the left rudder and C-3-1R to the right rudder.

Position brackets in place, make sure they rest squarely on the top of the rudder pedals and that they are as close to the center of the pedal as side clearance will allow.

To permanently attach brackets C-3-1L and R mark and drill ¼" holes for bracket mounting bolts C-3-2 and nuts C-3-3. The holes are <u>not</u> required for the portable brackets C-3-4L and R.

Attach and secure 4 bolts C-3-2 and nuts C-3-3.

For portable installation position brackets C-3-4L, C-3-4R in place and tighten bolts C-3-2 securely and lock in place with check nuts C-2-7. The security of these bolts should be included in the preflight check of the aircraft prior to any flight. C-2-7 is also used as a check nut for brake adjustment bolts.

B. *Assembly of Spherical Pivots C-5-1

Screw check nuts C-5-2 on both C-5-1 pivots about one-inch in on shaft.

Screw the threaded shafts of the pivots into each bracket until the shaft becomes flush with the back side of the bracket's threaded collar, and the pivot's retainer is at a right angle with the bracket top.

Tighten check nuts.

C. *Control Unit Assembly

Insert brake adjustment bolts and check nuts C-2-6 and C-2-7 in the pivot blocks C-2-2. The end of the bolts should extend approximately ¼ inch into the channel.

D. *Attach Control Unit to Brackets

With the unit in front of the pedals and below, raise the left side and slide the end of Control Bar C-2-1 into the left pivot.

Slide the bar to the extreme left while raising it then slip the right end of the Control Bar into the right pivot.

Install washers C-2-9 and pins C-2-8 on the terminal ends of the Control Bar.

Attach "J" Bars C-4-1 on to the pivot blocks C-2-2 with Clevis pin C-2-3 Washers C-2-4 and Cotter pin C-2-5. Notice the middle hole in the "J" Bar is used in this installation.

The inside radius of the "J" Bar should be a minimum of one-half inch below the bottom edge of the rudder pedal. If this is not the case change the mounting hole on the top of the "J" Bar to provide the needed clearance.

*The units are shipped with these assembled.

E. Adjustment

Upward travel of the control arm should provide full braking before the arm comes in contact with the instrument panel, control yolk (all positions) or throttle, carb heat etc. Conversely braking action should not be effected while the arm is in it's down position.

Braking action can be changed by changing the position of adjusting bolts C-2-6. As the bolts are turned in (clockwise) the brakes will be engaged sooner relative to control arm vertical/up movement. Conversely turning this bolt out (counter-clockwise) brake action will be delayed.

If full rudder movement is not attained in lateral movement of the control arm, adjustment of the spherical pivots in or out will provide a change in the control arm position, providing more clearance as needed. Any change in the spherical pivots position will require further adjustment of the brake adjustment screws.

The Unit is designed so the control arm and control bar will have adequate clearance. If adjustments do not provide the required clearances the control arm may be bent provided no stress is placed on the control bar, or the weld attaching the control arm to the control bar.

F. Checks

Check pins at the control bar ends for security.

Check the ends of the Control Bar and bracket for sufficient clearance between the center console and the left wall of the fuselage through full travel of the unit.

Check clearances of the control arm in all positions with control wheel, throttle, carburetor heat, etc in their respective full travel positions.

G. Control Removal

Remove "J" Bars and loosen bolts that attach brackets and remove unit.

For the hand control to work safely and efficiently it is important that the rudder and brake systems of the aircraft be in good condition Check the rudder system for weak springs and replace them if necessary.

H. Parts List

Part #	Quantity	Part Name
C-1-1	1	Control Arm
C-2-1	1	Control Bar
C-3-1L	1	Bracket, Left
C-3-1R	1	Bracket, Right
C-4-1	2	"J" Bars
C-6-1	1	Control Ring
C-5-1	2	Spherical Pivot
C-2-3	2	Clevis Pin
C-2-4	4	Clevis Pin Washers
C-2-5	2	Clevis Pin Cotter Pins
C-2-6	2	Adjustment Bolt
C-2-7	2	Adjustment Bolt-Check Nut
C-2-8	2	Control Bar Pin
C-2-9	2	Control Bar Washer
C-3-2	4	Bracket Attachment Bolts
C-3-3	4	Bracket Attachment Nuts
C-5-2	2	Spherical Pivot Check Nut
C-3-4L	1	Bracket, Left Portable
C-3-4R	1	Bracket, Right Portable

Cessna 172
FAA Approved
DATE:

INSTALLED UNION AVIATION HAND CONTROL IN ACCORDANCE WITH STC SA860SO. ENSURED THERE IS FULL BRAKING AND RUDDER MOVEMENT.

AIRCRAFT TOTAL TIME:______________________

PILOTS NAME & CERT#:______________________

REMOVED UNION AVIATION HAND CONTROL IN ACCORDANCE WITH STC SA860SO.

AIRCRAFT TOTAL TIME:______________________

PILOTS NAME & CERT#:______________________

INSTALLED UNION AVIATION HAND CONTROL IN ACCORDANCE WITH STC SA860SO. ENSURED THERE IS FULL BRAKING AND RUDDER MOVEMENT.

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